FINAL
SUBSEQUENT ENVIRONMENTAL IMPACT REPORT
No. 2021-001

WARD LAKE QUARRY EXPANSION
Use Permit Amendment (No. 2021-003)
Reclamation Plan Amendment (No. 2021-001)

State Clearinghouse No. 2021040627

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1.0 EXECUTIVE SUMMARY

Lassen County (County) is a Lead Agency under the California Environmental Quality Act (CEQA) and the County's Department of Planning and Building Services is responsible for preparing the Subsequent Environmental Impact Report (SEIR for Use Permit Amendment No. 2021-003 and Reclamation Plan Amendment No. 2021-001 addressing the proposed 78.6-acre mine boundary expansion at the existing Ward Lake Quarry (proposed Project) (State Clearinghouse No. 2021040627). This SEIR has been prepared in conformance with CEQA (California Public Resources Code [PRC] §21000 et seq.), California CEQA Statutes and Guidelines (California Code of Regulations [CCR], Title 14, §15000 et seq.), and the rules, regulations, and procedures for implementation of CEQA, as adopted by the County.

The Final SEIR allows the public and the Lead Agency an opportunity to review revisions to the Draft SEIR, the responses to comments, and other components of the SEIR, such as the Mitigation and Monitoring Program (MMP), prior to approval of the proposed Project. The Final SEIR serves as the environmental document to support a decision on the proposed Project. The Final SEIR is comprised of the following elements:

- Draft SEIR
- Draft SEIR Technical Appendices
- Mitigation and Monitoring Program
- Comments and Responses

After completing the Final SEIR, and before approving the proposed Project, the Lead Agency (Lassen County) must make the following three certifications as required by §15090 of the State CEQA Guidelines:

- That the Final SEIR has been completed in compliance with CEQA;
- That the Final SEIR was presented to the decision-making body of the Lead Agency, and the decision making body reviewed and considered the information in the Final SEIR prior to approving the project; and
- That the Final SEIR reflects the Lead Agency's independent judgment and analysis.

Additionally, pursuant to §15093(b) of the State CEQA Guidelines, when a Lead Agency approves a project that would result in significant, unavoidable impacts that are disclosed in the Final SEIR, the agency must submit in writing its reasons for supporting the approved actions. This is referred to as the Statement of Overriding Considerations. Based upon the findings of this Final SEIR, implementation of the proposed Project, as currently proposed, will require the County to adopt a Statement of Overriding Considerations due to significant unavoidable impacts to biological resources (see Draft SEIR, pp. 17 – 18). These certifications and the Findings of Fact are included in a separate Findings document. Both the Final SEIR and the Findings have been submitted to the County for consideration prior to taking action on the proposed Project.

1.1 Public Review Process

The County initiated the SEIR process with the preparation and circulation of a Notice of Preparation (NOP) for a 30-day public review period beginning on April 28, 2021. The purpose of the NOP was to solicit comments from public agencies on issues germane to that agency that should

be considered in the Draft SEIR. The NOP and comment letters received are included in Appendix A of the Draft SEIR. Comment letters received in response to the NOP were considered during preparation of the Draft SEIR.

The Draft SEIR for the proposed Project was circulated for review and comment by the public, agencies, and organizations. The Draft SEIR was also circulated to State agencies for review through the State Clearinghouse, Office of Planning and Research. The 45-day public review period ran from March 29, 2022 to May 12, 2022.

Section 3.0, *Response to Comments*, contains the list of persons, organizations and public agencies commenting on the content and adequacy of the Draft SEIR. Additions or modifications to the proposed project and/or mitigation measures will be considered by the County's decision-making body during the public hearing process.

1.2 ERRATA to the Draft SEIR Text

This section includes minor edits to the Draft SEIR. These modifications result in response to comment received during the Draft SEIR public review period. Revisions herein do not result in new significant environmental impacts, and thus do not constitute significant new information. Nor do they alter the conclusions of the environmental analysis. Added or modified text is underlined (example) while deleted text is struck out (~~example~~).

This ERRATA has been prepared in response to agency comments received on the Draft SEIR. Additional editorial changes have been initiated by County staff are hereby incorporated. These clarifications and modifications are not considered to result in any new or greater impacts than identified and addressed in the Draft SEIR.

The revisions, as noted below, fall within the scope of the original Project analysis included in the Draft SEIR and do not result in an increase to any identified impacts or produce any new impacts. No new significant environmental impact would result from the changes or from a new mitigation measure proposed to be implemented. Therefore, no significant revisions have been made which would require recirculation of the Draft SEIR pursuant to State CEQA Guidelines §15088.5 (Recirculation of an SEIR Prior to Certification). Consistent with §15088.5(b) of the State CEQA Guidelines recirculation of an SEIR is not required where changes or new information added to the SEIR merely clarifies for amplifies or makes insignificant modifications to an adequate SEIR.

CHAPTER 1.0 – INTRODUCTION

No change or revision is necessary.

CHAPTER 2.0 – EXECUTIVE SUMMARY

No change or revision is necessary.

CHAPTER 3.0 – PROJECT DESCRIPTION

No change or revision is necessary.

CHAPTER 4.0 – ENVIRONMENTAL SETTING, IMPACT ANALYSIS, AND MITIGATION MEASURES

Section 4.1 – Introduction

No change or revision is necessary.

Section 4.2 – Aesthetics and Visual Resources

No change or revision is necessary.

Section 4.3 – Agriculture and Forestry Resources

No change or revision is necessary.

Section 4.4 – Air Quality

No change or revision is necessary.

Section 4.5 – Biological Resources

The following mitigation measures in Section 4.5, *Biological Resources*, have been revised as follows:

MM 4.5-1: To avoid impacts on burrowing owls and other nesting birds, including raptors protected under State and federal regulations, the following shall be implemented (removal of raptor nests at any time of year is prohibited unless appropriate permits are obtained).

a. *Burrowing owls*. A qualified biologist shall conduct preconstruction surveys for burrowing owls in accordance with the *Staff Report on Burrowing Owl Mitigation* prepared by the California Department of Fish and Game (CDFW) (March 7, 2012). Upon completion, survey results shall be provided to Lassen County and the California Department of Fish and Wildlife.

Where physical or visual access is available, survey coverage shall extend 500 feet around the project site where suitable habitat for burrowing owls is present. A minimum of four field surveys shall be conducted: at least one between February 15th and April 15th; and a minimum of three surveys, at least three weeks apart, between April 15th and July 15th, with at least one survey after June 15th. Survey methods and survey reports shall be in accordance with the CDFW Staff Report and be provided to Lassen County and the California Department of Fish and Wildlife. If no active burrows are observed, the site shall be reinspected by a qualified biologist no more than one week prior to initiation of construction to ensure that owls are not present.

If an active burrow is observed in the project site, the County shall consult with CDFW regarding establishing a non-disturbance buffer around the burrow, or implementing passive relocation methods to exclude the owls from the site prior to commencement of construction. No burrowing owls shall be excluded from occupied burrows until a burrowing owl exclusion and

relocation plan is approved by CDFW. Following owl exclusion and burrow demolition, the site shall be monitored by a qualified biologist to ensure burrowing owls do not reoccupy the site prior to construction.

In the event of loss of burrowing owl nests, a mitigation and monitoring plan shall be prepared by a qualified biologist to identify methods to offset the loss at a minimum ~~1~~2:1 ratio (e.g., establishing a permanent conservation easement to provide for burrowing owl nesting, foraging, wintering, and dispersal, including completing habitat enhancements within the conservation easement area as necessary. The mitigation and monitoring plan shall be approved by CDFW prior to commencement of construction.

b. *For all other bird species*. If vegetation removal or ground disturbance activities occur between February 1st and August 31st, a pre-construction nesting survey shall be conducted by a qualified biologist to identify active nests in and adjacent to the work area. Surveys shall begin prior to sunrise and continue until vegetation and nests have been sufficiently observed. The survey shall consider acoustic impacts and line-of-sight disturbances occurring as a result of the project in order to determine a sufficient survey radius to avoid nesting birds. At a minimum, the survey report shall include a description of the area surveyed, date and time of the survey, ambient conditions, bird species observed in the area, a description of any active nests observed, any evidence of breeding behaviors (e.g., courtship, carrying nest materials or food, etc.), and a description of any outstanding conditions that may have impacted the survey results (e.g., weather conditions, excess noise, the presence of predators, etc.). The survey shall be conducted no more than one week prior to the initiation of construction and the survey report shall be provided to Lassen County and the California Department of Fish and Wildlife. If construction activities are delayed or suspended for more than one week after the pre-construction survey, the site shall be resurveyed.

If active nests are found, appropriate actions shall be implemented to ensure compliance with the Migratory Bird Treaty Act and California Fish and Game Code. Compliance measures may include, but are not limited to, exclusion buffers, sound-attenuation measures, seasonal work closures based on the known biology and life history of the species identified in the survey, as well as ongoing monitoring by biologists.

MM 4.5-3: Prior to new ground disturbance and annually thereafter, a pre-construction survey shall be conducted by a qualified biologist to determine the presence of pygmy rabbits, white-tailed jackrabbits, and other special-status wildlife species that may be present onsite. Survey reports shall be provided to Lassen County and the California Department of Fish and Wildlife. If special-status animal species are identified within the project site, a qualified biologist, in consultation with the California Department of Fish and Wildlife, shall recommend avoidance measures for protection of the species.

MM 4.5-4: Prior to new ground disturbance, a qualified bat biologist familiar with pallid bats (*Antrozous pallidus*) shall conduct a survey in areas that contain rock outcrops or other potentially suitable roosting habitat for pallid bats. Survey reports shall be provided to Lassen County and the California Department of Fish and Wildlife. If an active maternity roost is present, a qualified bat biologist, in consultation with the California

Department of Fish and Wildlife, shall establish a suitable buffer zone to ensure that active bat nurseries are not adversely affected. If non-breeding bats are found in rock outcrops within the disturbance footprint, the individuals shall be safely evicted under the direction of a qualified bat biologist.

MM 4.5-5: Prior to new ground disturbance and annually thereafter, a botanical survey shall be conducted during the blooming season when special-status plants known to occur in the region would be identifiable. Survey reports shall be provided to Lassen County and the California Department of Fish and Wildlife. If special-status plants are present, a suitable buffer zone(s) shall be determined by a qualified biologist in consultation with the ~~California Department of Fish and Wildlife (~~CDFW~~)~~ and exclusionary fencing shall be placed prior to commencement of earth-disturbing activities.

If avoidance is not possible, CDFW shall be contacted to determine a satisfactory method of mitigation. Mitigation shall be undertaken concurrently with or in advance of the earth-disturbing activities.

MM 4.5-6: All construction personnel participating in earth-disturbing activities and their supervisors shall receive training by a qualified biologist regarding protective measures for special-status plant and animal species and sensitive habitats that could exist in the study area. When new personnel are hired, proof that newly hired personnel have received mandatory training shall be provided to Lassen County and the California Department of Fish and Wildlife before starting work. At a minimum, the training shall include the following:

a. A review of the special-status species that could occur in the project site, the locations where the species could occur, the laws and regulations that protect these species, and the consequences of noncompliance with those laws and regulations.
b. Procedures to be implemented in the event that these species are encountered during construction.
c. A review of sensitive habitats that occur in the study area and the location of the sensitive habitats.
d. A review of applicable mitigation measures, standard construction measures, best management practices, and resource-agency permit conditions that apply to the protection of special-status species and sensitive habitats.

MM 4.5-7: To minimize impacts from the loss of wildlife habitat, site disturbance in the expansion area shall not exceed two 5-acre increments while concurrently reclaiming the first 5-acre increment. After the initial excavation of two 5-acre increments, disturbance shall not exceed 5-acres at any given time. Reclamation in the expansion area shall be completed concurrently with mining operations in accordance with the adopted Reclamation Plan Amendment (see Reclamation Plan Amendment revised March 2022). Reclamation, including seeding, must commence within two years following completion of mining in each five-acre area in order to minimize the total area disturbed at any given time and to allow for restoration of the vegetative cover. The following, at minimum, shall be implemented:

- The final slope of the proposed expansion area shall be 1:1 (H:V). Mine faces shall be shaped to have a 50-foot highwall and 12-foot benches at a 1:1 (H:V) slope. The area composed of hard rock and highwalls shall be graded at an inclination as to meet the minimum factor of safety (FOS). Benches shall be constructed to drain to the margins of the highwall and/or to centralized collection areas that capture and convey drainage to the bottom of the cut slope.

- The quarry floor and benches in the expansion area shall be seeded with a mix of sagebrush (Artemisia tridentate) at two pounds of PLS per acre, rabbitbrush (*Ericameria nauseosa*) at four pounds of PLS per acre, bitterbrush (*Purshia tridentate*) one pound of pure seed per acre and blue bunch wheat grass(*Elymus spicatus*) at three pounds per acre.

  Seed shall be ordered from a reputable supplier that collected or grew out seed from a source as close to the project site as possible. Seed shall be properly labeled as genus, species, subspecies, variety, and source. Weed seed shall not exceed 0.5 percent of the PLS and inert material. Seeds shall be broadcast using a tractor-mounted seeder and then tracked in with machinery. Seeding shall take place in the fall prior to the first rain. Hand planting shall be conducted in the spring as the soil temperatures warm. Refer to Reclamation Plan Amendment (revised March 2022) contained in Appendix B of the Draft SEIR, for additional restoration success criteria.

Section 4.6 – Cultural and Tribal Cultural Resources

No change or revision is necessary.

Section 4.7 – Energy

No change or revision is necessary.

Section 4.8 – Geology and Soils

No change or revision is necessary.

Section 4.9 – Greenhouse Gases Emissions

No change or revision is necessary.

Section 4.10 – Hazards and Hazardous Materials

No change or revision is necessary.

Section 4.11 – Hydrology and Water Quality

No change or revision is necessary.

Section 4.12 – Land Use and Planning

No change or revision is necessary.

Section 4.13 – Noise

No change or revision is necessary.

Section 4.14 – Transportation

No change or revision is necessary.

Section 4.15 – Wildfire

No change or revision is necessary.

CHAPTER 5.0 – OTHER CEQA CONSIDERATIONS

No change or revision is necessary.

CHAPTER 6.0 – ALTERNATIVES

No change or revision is necessary.

CHAPTER 7.0 – LIST OF PREPARERS

No change or revision is necessary.

CHAPTER 8.0 – REFERENCES

No change or revision is necessary.

2.0 MITIGATION AND MONITORING PROGRAM

2.1 Mitigation and Monitoring Program Contents

This section contains the proposed Mitigation and Monitoring Program (MMP) for the proposed Ward Lake Quarry Expansion (UP No. 2021-003 & RP No. 2021-001) (State Clearinghouse No. 2021040627). The MMP includes a brief discussion of the legal basis for and the purpose of the program, discussion, and direction regarding complaints about noncompliance, a key to understanding the monitoring matrix, and the monitoring matrix itself.

2.2 Legal Basis of and Purpose for the Mitigation Monitoring Program

California Public Resources Code §21081.6(a)(1) requires public agencies to adopt mitigation monitoring or reporting programs whenever the agencies adopt CEQA Findings in connection with the approval of projects requiring Environmental Impact Reports (EIRs) and whenever agencies adopt Mitigated Negative Declarations (MNDs). This requirement facilitates implementation of all mitigation measures adopted through the California Environmental Quality Act (CEQA) process.

The MMP contained herein is intended to satisfy the requirements of CEQA as they relate to the EIR prepared for the proposed Project. It is intended to be used by County staff, participating agencies, the applicant, contractors, and mitigation monitoring personnel during implementation of the proposed Project. Mitigation is defined by State CEQA Guidelines §15370 as a measure that does any of the following:

- Avoids impacts altogether by not taking a certain action or parts of an action.
- Minimizes impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifies impacts by repairing, rehabilitating, or restoring the impacted environment.
- Reduces or eliminates impacts over time by preservation and maintenance operations during the life of the project.
- Compensates for impacts by replacing or providing substitute resources or environments.

2.3 Mitigation Monitoring Table

Table 2-1, *Mitigation Monitoring Program*, identifies the mitigation measures proposed for the Project. The table has the following columns:

Mitigation Measure/Summary. Lists the mitigation measures identified within the SEIR for a specific impact, along with the number for each measure enumerated in the SEIR.

Monitor Responsibility. References the County department of any other public agency with which coordination is required to satisfy the identified mitigation measure.

Timing. Identifies at what point in time, review process, or phase the mitigation measures will be completed.

Verification. Spaces to be initialed and dated by the individual designated to verify adherence to a specific mitigation measure.

2.4 Non-Compliance Complaints

Any person or agency may file a complaint asserting noncompliance with the mitigation measures associated with the proposed project. The complaint shall be directed to the County in written form, providing specific information on the asserted violation. The County shall conduct an investigation and determine the validity of the complaint. If noncompliance with a mitigation measure has occurred, the County shall take appropriate action to remedy any violation. The complainant shall receive written confirmation indicating the results of the investigation or the final action corresponding to the particular noncompliance issue.

Table 2-1
MITIGATION MONITORING PROGRAM

Mitigation Measure	Implementation Phase	Monitoring Phase	Enforcing Agency	Verification of Compliance		
				Initials	Date	Remarks
Section 4.4 – Air Quality						
MM 4.4-1: The Project applicant shall ensure compliance with Lassen County APCD rules for fugitive dust emissions. Based on Lassen County APCD Rule 4:18 (Fugitive Dust Emissions), reasonable precautions shall be taken to prevent particulate matter from becoming airborne, including, but not limited to, the following provisions: • *Cover trucks*. Covering open bodied trucks when used for transportation materials likely to give rise to airborne dust. • *Filter and containment*. Installation and use of hoods, fans, and other fabric filters to enclose and vent the handling of dusty materials. Containment methods may be employed during sandblasting and other similar operations. • *Dust suppression*. The application of asphalt, oil, water or suitable chemicals to dirt roads, material stockpiles, land clearing, excavation, grading or other surfaces which can give rise to airborne dusts. • *Good housekeeping*. The prompt removal of earth or other material from paved streets onto which earth or other material for earth moving equipment, erosion by water, or other means has been deposited.	During mining activities	Throughout the duration of mine operations	County of Lassen Planning Department; Lassen County APCD			
Section 4.5 – Biological Resources						
MM 4.5-1: To avoid impacts on burrowing owls and other nesting birds, including raptors protected under State and federal regulations, the following shall be implemented (removal of raptor nests at any time of year is prohibited unless appropriate permits are obtained). a. *Burrowing owls*. A qualified biologist shall conduct preconstruction surveys for burrowing owls in accordance with the *Staff Report on Burrowing Owl Mitigation* prepared by the California Department of Fish and Game (CDFW) (March 7, 2012). Upon completion, all survey results shall be submitted to Lassen County and the California Department of Fish and Wildlife.	Prior to any ground disturbance activities	Throughout the duration of mine operations	Lassen County Planning Department			

Mitigation Measure	Implementation Phase	Monitoring Phase	Enforcing Agency	Verification of Compliance		
				Initials	Date	Remarks
Where physical or visual access is available, survey coverage shall extend 500 feet around the project site where suitable habitat for burrowing owls is present. A minimum of four field surveys shall be conducted: at least one between February 15th and April 15th; and a minimum of three surveys, at least three weeks apart, between April 15th and July 15th, with at least one survey after June 15th. Survey methods and survey reports shall be in accordance with the CDFW Staff Report and provided to Lassen County and the California Department and Fish and Wildlife. If no active burrows are observed, the site shall be reinspected by a qualified biologist no more than one week prior to initiation of construction to ensure that owls are not present. If an active burrow is observed in the project site, the County shall consult with CDFW regarding establishing a non-disturbance buffer around the burrow, or implementing passive relocation methods to exclude the owls from the site prior to commencement of construction. No burrowing owls shall be excluded from occupied burrows until a burrowing owl exclusion and relocation plan is approved by CDFW. Following owl exclusion and burrow demolition, the site shall be monitored by a qualified biologist to ensure burrowing owls do not reoccupy the site prior to construction. In the event of loss of burrowing owl nests, a mitigation and monitoring plan shall be prepared by a qualified biologist to identify methods to offset the loss at a minimum 2:1 ratio (e.g., establishing a permanent conservation easement to provide for burrowing owl nesting, foraging, wintering, and dispersal, including completing habitat enhancements within the conservation easement area as necessary. The mitigation and monitoring plan shall be approved by CDFW prior to commencement of construction. b. *For all other bird species*. If vegetation removal or ground disturbance activities occur between February 1st and August 31st, a pre-construction nesting survey shall be conducted by a						

Mitigation Measure	Implementation Phase	Monitoring Phase	Enforcing Agency	Verification of Compliance		
				Initials	Date	Remarks
qualified biologist to identify active nests in and adjacent to the work area. Surveys shall begin prior to sunrise and continue until vegetation and nests have been sufficiently observed. The survey shall consider acoustic impacts and line-of-sight disturbances occurring as a result of the project in order to determine a sufficient survey radius to avoid nesting birds. At a minimum, the survey report shall include a description of the area surveyed, date and time of the survey, ambient conditions, bird species observed in the area, a description of any active nests observed, any evidence of breeding behaviors (e.g., courtship, carrying nest materials or food, etc.), and a description of any outstanding conditions that may have impacted the survey results (e.g., weather conditions, excess noise, the presence of predators, etc.). The survey shall be conducted no more than one week prior to the initiation of construction. Upon completion, all survey results shall be submitted to Lassen County and the California Department of Fish and Wildlife. If construction activities are delayed or suspended for more than one week after the pre-construction survey, the site shall be resurveyed. If active nests are found, appropriate actions shall be implemented to ensure compliance with the Migratory Bird Treaty Act and California Fish and Game Code. Compliance measures may include, but are not limited to, exclusion buffers, sound-attenuation measures, seasonal work closures based on the known biology and life history of the species identified in the survey, as well as ongoing monitoring by biologists.						
MM 4.5-2: Throughout the life of the mine, if milkweed (*Asclepias* spp.*)* is observed onsite during the breeding season/pupae development season (spring-summer) for the monarch butterfly, the plant shall be inspected for caterpillars by a qualified biologist. If developing monarch caterpillars are present, the plant shall be avoided until butterflies have emerged and the plant is no longer in use.	Prior to any ground disturbance activities	Throughout the duration of mine operations	Lassen County Planning Department			
MM 4.5-3: Prior to new ground disturbance and annually thereafter, a pre-construction survey shall be conducted by a	Prior to any ground	Throughout the duration of	Lassen County Planning			

Mitigation Measure	Implementation Phase	Monitoring Phase	Enforcing Agency	Verification of Compliance		
				Initials	Date	Remarks
qualified biologist to determine the presence of pygmy rabbits, white-tailed jackrabbits, and other special-status wildlife species that may be present onsite. If special-status animal species are identified within the project site, a qualified biologist, in consultation with the California Department of Fish and Wildlife, shall recommend avoidance measures for protection of the species. Upon completion, all survey results shall be submitted to Lassen County and the California Department of Fish and Wildlife.	disturbance activities	mine operations	Department			
MM 4.5-4: Prior to new ground disturbance, a qualified bat biologist familiar with pallid bats (*Antrozous pallidus*) shall conduct a survey in areas that contain rock outcrops or other potentially suitable roosting habitat for pallid bats. Survey reports shall be submitted to Lassen County and the California Department of Fish and Wildlife. If an active maternity roost is present, a qualified bat biologist, in consultation with the California Department of Fish and Wildlife, shall establish a suitable buffer zone to ensure that active bat nurseries are not adversely affected. If non-breeding bats are found in rock outcrops within the disturbance footprint, the individuals shall be safely evicted under the direction of a qualified bat biologist.	Prior to any ground disturbance activities	Throughout the duration of mine operations	Lassen County Planning Department			
MM 4.5-5: Prior to new ground disturbance and annually thereafter, a botanical survey shall be conducted during the blooming season when special-status plants known to occur in the region would be identifiable. Survey reports shall be submitted to Lassen County and the California Department of Fish and Wildlife. If special-status plants are present, a suitable buffer zone(s) shall be determined by a qualified biologist in consultation with the CDFW and exclusionary fencing shall be placed prior to commencement of earth-disturbing activities. If avoidance is not possible, CDFW shall be contacted to determine a satisfactory method of mitigation. Mitigation shall be undertaken concurrently with or in advance of the earth-disturbing activities.	Prior to any ground disturbance activities	Throughout the duration of mine operations	Lassen County Planning Department			

Mitigation Measure	Implementation Phase	Monitoring Phase	Enforcing Agency	Verification of Compliance		
				Initials	Date	Remarks
MM 4.5-6: All construction personnel participating in earth-disturbing activities and their supervisors shall receive training by a qualified biologist regarding protective measures for special-status plant and animal species and sensitive habitats that could exist in the study area. When new personnel are hired, the proof that they receive the mandatory training shall be submitted to Lassen County Survey reports shall be submitted to Lassen County and the California Department of Fish and Wildlife before starting work. At a minimum, the training shall include the following: a. A review of the special-status species that could occur in the project site, the locations where the species could occur, the laws and regulations that protect these species, and the consequences of noncompliance with those laws and regulations. b. Procedures to be implemented in the event that these species are encountered during construction. c. A review of sensitive habitats that occur in the study area and the location of the sensitive habitats. d. A review of applicable mitigation measures, standard construction measures, best management practices, and resource-agency permit conditions that apply to the protection of special-status species and sensitive habitats.	Prior to any ground disturbance activities	Throughout the duration of mine operations	Lassen County Planning Department			
MM 4.5-7: To minimize impacts from the loss of wildlife habitat, site disturbance in the expansion area shall not exceed two 5-acre increments while concurrently reclaiming the first 5-acre increment. After the initial excavation of two 5-acre increments, disturbance shall not exceed 5-acres at any given time. Reclamation in the expansion area shall be completed concurrently with mining operations in accordance with the adopted Reclamation Plan Amendment (see Reclamation Plan Amendment revised March 2022). Reclamation, including seeding, must commence within two years following completion of mining in each five-acre area in order to minimize the total area disturbed at any given time and to allow for restoration of the vegetative cover. The following, at minimum, shall be implemented:	During mining operations within the expansion area.	Throughout the duration of mine operations	Lassen County Planning Department			

Mitigation Measure	Implementation Phase	Monitoring Phase	Enforcing Agency	Verification of Compliance		
				Initials	Date	Remarks
• The final slope of the proposed expansion area shall be 1:1 (H:V). Mine faces shall be shaped to have a 50-foot highwall and 12-foot benches at a 1:1 (H:V) slope. The area composed of hard rock and highwalls shall be graded at an inclination as to meet the minimum factor of safety (FOS). Benches shall be constructed to drain to the margins of the highwall and/or to centralized collection areas that capture and convey drainage to the bottom of the cut slope. • The quarry floor and benches in the expansion area shall be seeded with a mix of sagebrush (Artemisia tridentate) at two pounds of PLS per acre, rabbitbrush (*Ericameria nauseosa*) at four pounds of PLS per acre, bitterbrush (*Purshia tridentate*) one pound of pure seed per acre and blue bunch wheat grass(*Elymus spicatus*) at three pounds per acre. Seed shall be ordered from a reputable supplier that collected or grew out seed from a source as close to the project site as possible. Seed shall be properly labeled as genus, species, subspecies, variety, and source. Weed seed shall not exceed 0.5 percent of the PLS and inert material. Seeds shall be broadcast using a tractor-mounted seeder and then tracked in with machinery. Seeding shall take place in the fall prior to the first rain. Hand planting shall be conducted in the spring as the soil temperatures warm. Refer to Reclamation Plan Amendment (revised March 2022) contained in Appendix B of the Draft SEIR, for additional restoration success criteria.						
MM 4.5-8: To ensure no additional foraging habitat loss, all remaining areas of the mine parcels shall remain undisturbed for the duration of mining. This includes the remaining portions of Lassen County Assessor's Parcel Number (APN) 109-100-059 and APN 109-100-060 (i.e., all portions of the parcels outside of the reclamation boundary for the current mine operation (as of 2021) and the proposed 2021 mine expansion boundary).	Prior to any ground disturbance activities	Throughout the duration of mine operations	Lassen County Planning Department			
MM 4.5-9: *Limits on Operation*. The operator shall continue limits on operations from January 1st to March 31st. Impacts can be	Prior to any ground	Throughout the duration of	Lassen County Planning			

Mitigation Measure	Implementation Phase	Monitoring Phase	Enforcing Agency	Verification of Compliance		
				Initials	Date	Remarks
lessened through continuing seasonal operating restrictions included in the Condition of Approval for Use Permit No. 96056: *Except in a state of emergency, as declared by the local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville, no grading, excavating, or blasting on the site shall be allowed between January 1st and March 31st Annually.*	disturbance activities	mine operations	Department			
MM 4.5-10: *Operating Conditions of Use Permit No. 2018-003*. The operator shall continue the Conditions of Approval for Use Permit Amendment No. 2018-003. Impacts can be lessened with the seasonal operating restrictions and light and noise reductions included in the Conditions of Approval for Use Permit Amendment No. 2018-003.	Prior to any ground disturbance activities	Throughout the duration of mine operations	Lassen County Planning Department			
Section 4.6 – Cultural and Tribal Cultural Resources						
MM 4.6-1: Prior to ground disturbing activities with the expansion area, a non-disturbance area for WARD-PRE-01 shall be defined and marked by a qualified archaeologist. Once the non-disturbance area is delineated, one of the following options shall be implemented by the Project proponent: • *Resource Avoidance*. The Project shall be redesigned to avoid all ground disturbances within the established non-disturbance area and long-term access restrictions shall be established (fencing or deed restrictions) to preclude disturbance to the resource. • *Evaluation and Data Recovery*. WARD-PRE-01 shall be evaluated for eligibility for inclusion in the CRHR by a qualified archaeologist. The results of the evaluation shall be submitted to Lassen County. If the evaluation is negative (i.e., not historically significant), no further mitigation is required. If the property is found to be an historical resource and data recovery through excavation is the only feasible mitigation, a data recovery plan, which makes provisions for adequately recovering the scientifically consequential information from and about the historical resource, shall be prepared and adopted prior to any excavation being undertaking. The study	Prior to any ground disturbance activities	Throughout the duration of mine operations	Lassen County Planning Department			

Mitigation Measure	Implementation Phase	Monitoring Phase	Enforcing Agency	Verification of Compliance		
				Initials	Date	Remarks
shall be deposited with the California Historical Resources' Regional Information Center.						
MM 4.6-2: *Inadvertent Discovery of Cultural Resources*. If subsurface deposits believed to be cultural or human in origin are discovered during construction, then all work must halt within a 50-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeology, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. If the professional archaeologist determines that the find does not represent a cultural resource, then work may resume immediately, and no agency notifications are required. If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, then he or she shall immediately notify the County, which shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be eligible for inclusion in the NRHP or CRHR. Work cannot resume within the no-work radius until the County, through consultation as appropriate, determines that the site either: 1) is not eligible for the NRHP or CRHR; or 2) that the treatment measures have been completed to its satisfaction.	During mining activities	Throughout the duration of mine operations	Lassen County Planning Department			
MM 4.6-3: *Unanticipated Discovery of Human Remains*. In the evert of the discovery of human remains, or remains that are potentially human, the contractor shall ensure reasonable protection measures are taken to protect the discovery from disturbance (Assembly Bill [AB] 2641). The archaeologist shall notify the Lassen County Coroner (as per §7050.5 of the Health and Safety Code). The provisions of §7050.5 of the California Health and Safety Code, §5097.98 of the California PRC, and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the project (§5097.98 of the PRC). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations	During mining activities	Throughout the duration of mine operations	Lassen County Planning Department			

Mitigation Measure	Implementation Phase	Monitoring Phase	Enforcing Agency	Verification of Compliance		
				Initials	Date	Remarks
concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, then the NAHC can mediate (§5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (§5097.98 of the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work cannot resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.						
Section 4.8 – Geology and Soils						
MM 4.8-1: *Avoid and Minimize Impacts to Paleontological Resources*. Should any potentially unique paleontological resources (fossils) be encountered during development activities, work shall be suspended, and the County shall be immediately notified. At that time, the County will coordinate any necessary investigation of the discovery with a qualified paleontologist. The project proponent shall be required to implement mitigation necessary for the protection of paleontological resources. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures.	During mining activities	Throughout the duration of mine operations	Lassen County Planning Department			
Section 4.13 – Noise						
MM 4.13-1: *Materials Haul Truck Operations*. To maintain traffic noise below 65 dB Ldn, the operator shall continue to comply with Condition of Approval #8 of Use Permit Amendment No. 2018-003 which limits truck trips to an average of 26 round trips (26 arriving and 26 departing) throughout the calendar year and a daily maximum of 275 round trips (275 arriving and 275 departing).	During mining activities	Throughout the duration of mine operations	Lassen County Planning Department			
MM 4.13-2: *Material Haul Truck Counts*. Prior to commencement of mining activities within the quarry expansion area, the mine operator shall install pneumatic road tubes or other similar methods to quantify daily truck trips in an effort to ensure that	Prior to mining within the quarry expansion area	Throughout the duration of mine operations	Lassen County Planning Department			

Mitigation Measure	Implementation Phase	Monitoring Phase	Enforcing Agency	Verification of Compliance		
				Initials	Date	Remarks
annual truck counts do not exceed limitations imposed by Condition of Approval #8 of Use Permit Amendment No. 2018-003. Results of the counts shall be provided to the County on an annual basis (January 1st of each year) throughout the duration of mining activities.						
MM 4.13-3: *Plant and Expansion Area Operations*. The following measures shall be implemented: • Restrict crushing operations to the daytime hours of 7:00 a.m. to 10:00 p.m. • The operator shall continue to limit winter operation (no grading, excavating, or blasting per Resolution No. 97-067, Condition #21). • The operator shall limit 24-hour operations to April 1st to December 31st annually. • The operator shall not grade or excavate between 7:00 p.m. and 7:00 a.m. or blast between 6:00 p.m. and 7:00 a.m.	During mining activities	Throughout the duration of mine operations	Lassen County Planning Department			

3.0 COMMENTS AND RESPONSES

Lassen County's responses to comments on the Ward Lake Quarry Expansion (UP No. 2021-003 & RP No. 2021-001) Draft SEIR represent a good-faith, reasoned effort to address the environmental issues identified by the comments. As discussed in §15088(a) of the State CEQA Guidelines, the Lead Agency is not required to respond to all comments on the Draft SEIR, but only to those comments that *raise significant environmental issues*.

The Final SEIR presents the environmental information and analyses that have been prepared for the proposed Project, including comments received addressing the adequacy of the Draft SEIR, and responses to those comments. In addition to the responses to comments, clarifications, corrections, or minor revisions have been made to the Draft SEIR. This document and the Mitigation Monitoring Program (MMP) will be used by the Planning Commission in the decision-making process for the proposed Project.

Section 15088 of the State CEQA Guidelines requires that the Lead Agency evaluate comments on environmental issues received from persons and agencies that reviewed the Draft SEIR and prepare a written response addressing each of the comments received. The response to comments is contained in this section. These comments and responses, together with the Draft SEIR and changes to its text, together comprise the Final SEIR. Any additional County recommendations or requirements during the certification will make up the final components of the Final SEIR. The following is an excerpt from the State CEQA Guidelines §15132:

The Final EIR shall consist of:

(a) The Draft EIR or a version of the draft.
(b) Comments and recommendations received on the Draft EIR either verbatim or in summary.
(c) A list of persons, organizations and public agencies commenting on the Draft EIR.
(d) The responses of the Lead Agency to significant environmental points raised in the review and consultation process.
(e) Any other information added by the Lead Agency.

3.1 Comments Received

A list of agencies, organizations, and interested persons who have commented on the content and adequacy of the Draft SEIR is provided below. A copy of each numbered comment letter and a lettered response to each comment is provided in Section 3.1, *Responses*.

Federal Agencies

No federal agencies submitted comments on the Draft SEIR.

State Agencies

Letter 1 California Department of Fish and Wildlife – May 20, 2022

Lassen County Planning Commission

No comments on the Draft SEIR were submitted by the Lassen County Planning Commission.

Native American Groups

No Native American groups submitted comments on the Draft SEIR.

Organizations

No organizations submitted comments on the Draft SEIR.

Interested Persons

No interested persons submitted comments on the Draft SEIR.

3.2 Responses

Written comments received on the Draft SEIR during the public review period are addressed in their entirety in this section. Each comment has been assigned a reference code. The responses to reference code comments follow each letter. A response is provided for each comment raising significant environmental issues, as received by the County during the Draft SEIR public review period. Where appropriate, the commenter may be referenced back to prior responses.

Letter 1 – California Department of Fish and Wildlife (May 20, 2022)

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Northern Region
601 Locust Street
Redding, CA 96001
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

May 20, 2022

Cortney Flather, Natural Resources Technician
County of Lassen
Department of Planning and Building Services
707 Nevada Street, Suite 5
Susanville, CA 96130
CFlather@co.lassen.ca.us

SUBJECT: REVIEW OF DRAFT SUBSEQUENT ENVIRONMENTAL IMPACT REPORT EIR #2021-001 WARD LAKE QUARRY EXPANSION, USE PERMIT AMENDMENT (# 2021-003) AND RECLAMATION PLAN AMENDMENT (# 2021-001), STATE CLEARINGHOUSE NUMBER 2018022056, ASSESSOR'S PARCEL NUMBERS 109-100-059 AND 109-100-060, NEAR COMMUNITY OF LITCHFIELD, LASSEN COUNTY

Dear Cortney Flather:

The California Department of Fish and Wildlife (Department) has reviewed the Draft Subsequent Environmental Impact Report (DSEIR) dated March 2022, for the above-referenced project (Project). As a trustee for the State's fish and wildlife resources, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and their habitat. As a responsible agency, the Department administers the California Endangered Species Act and other provisions of the Fish and Game Code that conserve the State's fish and wildlife public trust resources. The Department offers the following comments and recommendations on this Project in our role as a trustee and responsible agency pursuant to the California Environmental Quality Act (CEQA), California Public Resources Code §21000 et seq.

1a.

Project Description

The Project as described is an amendment to Use Permit #2021-003 and Reclamation Plan #2021-001 and includes "*expansion of approximately 78.6 acres with an associated additional volume of 5,000,000 tons of material, extension of the life of the mine from 2030 to 2050 and increase in the maximum volume extracted per year from 100,000 tons to 200,000 tons. These amendments will allow the facility to continue to provide local construction materials in Lassen County.*"

Conserving California's Wildlife Since 1870

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The DSEIR further states, "*The expansion will follow the same operating procedures already approved for the current operations. Activities at the processing location will not change. The current mine face will be reclaimed as the expansion area is mined.*"

The Project is located approximately three miles northwest of the Community of Litchfield on Assessor's Parcel Numbers 109-100-059 and 109-100-060. 1a. Cont.

Comments and Recommendations

The Department has consulted and commented on this Project since 2018.

The Department has the following comments and recommendations as they pertain to biological resources:

Mitigation Measures

All mitigation measures stating, "Upon completion, all survey results shall be submitted to Lassen County" should be changed to include the Department. The sentence should read, "Upon completion, all survey results shall be submitted to Lassen County **and the California Department of Fish and Wildlife**." 1b.

Mitigation measure 4.5-1(a) states in the event nesting burrowing owls are found, a mitigation and monitoring plan shall be prepared to identify methods to offset the loss of nesting habitat at a minimum 1:1 ratio. The Department recommends this ratio be changed to a minimum of 2:1 to offset indirect impacts from disturbance and account for differences in habitat quality; a 1:1 ratio may unintentionally create a loss of habitat for the species. 1c.

Mitigation measure 4.5-4 states, "*Prior to new ground disturbance, a qualified biologist shall conduct a survey in areas that contain rock outcrops or other potentially suitable roosting habitat for pallid bats.*" The Department recommends this sentence say, "Prior to new ground disturbance, a qualified **bat** biologist **familiar with pallid bats (*Antrozous pallidus*)**, shall conduct a survey in areas that contain rock outcrops or other potentially suitable roosting habitat." Within this mitigation measure, the Department recommends using qualified **bat** biologist, not qualified biologist. Further, if a maternity roost, hibernacula, or other type of roost is found, additional mitigation may be necessary as roost sites are a limiting factor for this species. 1d.

Mitigation measure 4.5-7 is written with no success criteria although the Reclamation Plan, dated February 2021 and revised March 2022, is referenced. The Department recommends the measures from the Reclamation Plan be included in this mitigation measure to make it clear restoration success criteria are 1e.

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Cortney Flather, Natural Resources Technician
County of Lassen
May 20, 2022
Page 3

included. Further, this measure, along with 4.5-8, is intended to help minimize impacts to mule deer (*Odocoileus hemionus*) and pronghorn (*Antilocapra americana*), presumably by restoring the area after it has been mined. The Department recommends the County and/or the Project applicant place a conservation easement or some other permanent protection over the area proposed not to be mined. Restoring sagebrush scrub is difficult and takes decades. Protecting intact habitat, in perpetuity, is the best type of mitigation for large migrating mammals.

1e. Cont.

If you have any questions, please contact Amy Henderson, Senior Environmental Scientist, at (530) 598-7194, or by email at R1CEQARedding@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Rebecca Garwood
B5D12ECE94324AF...

For Tina Bartlett, Regional Manager
Northern Region

ec: State Clearinghouse
State.Clearinghouse@opr.ca.gov

Amy Henderson
California Department of Fish and Wildlife

Habitat Conservation Planning Branch

Response to Letter 1 – California Department of Fish and Wildlife

Response 1a: The participation of the California Department of Fish and Wildlife (CDFW or the Department) in the public review of this document is appreciated. The CDFW provides introductory remarks to the letter, including a summary of the proposed project. No response is necessary.

Response 1b: The CDFW request that all survey results submitted to Lassen County also be submitted to the Department. As appropriate, mitigation measures noted within Section 4.5 of the Draft SEIR will be updated to reflect this request and included in the Mitigation Monitoring Program (MMP) and Final SEIR.

Response 1c: The CDFW requests that Mitigation Measure 4.5-1a in Section 4.5 of the Draft SEIR related to burrowing owls be revised to require a minimum of 2:1 to offset indirect impacts from disturbance and to account for differences in habitat quality. The MMP and Final SEIR will reflect this request.

Response 1d: The CDFW requests that Mitigation Measure 4.5-4 in Section 4.5 of the Draft SEIR related to pallid bats be revised to include a qualified bat biologist. The MMP and Final SEIR will reflect this request.

Response 1e: The CDFW requests that Mitigation Measure 4.5-7 in Section 4.5 of the Draft SEIR be updated to include recommended measures from the Reclamation Plan (revised March 2022) to make it clear restoration success criteria have been included. The MMP and Final SEIR will reflect this request.

Implementation of the revised March 2022 Reclamation Plan would sufficiently mitigate the loss of habitat as a result of mining activities. Areas outside the proposed mine areas would not be disturbed as part of the proposed Project. The mine operator may, in the future, consider conservation easements or other permanent protections measures within areas not to be mined. However, conservation easements are not necessary to reduce project-level or cumulative impacts related to biological resources to less than significant levels. No additional revision to the Draft SEIR is required and no further response is necessary.

DRAFT
SUBSEQUENT ENVIRONMENTAL IMPACT REPORT
No. 2021-001

WARD LAKE QUARRY EXPANSION
Use Permit Amendment (No. 2021-003)
Reclamation Plan Amendment (No. 2021-001)

State Clearinghouse No. 202110627

Prepared for:

Lassen County

Technical Assistance by:

VESTRA Resources Inc.
5300 Aviation Drive
Redding, California 96002

MARCH 2022

DRAFT
SUBSEQUENT ENVIRONMENTAL IMPACT REPORT
No. 2021-001

WARD LAKE QUARRY EXPANSION
Use Permit Amendment (No. 2021-003)
Reclamation Plan Amendment (No. 2021-001)

State Clearinghouse No. 202110627

MARCH 2022

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1.0 INTRODUCTION

1.1 Purpose of Environmental Impact Report

Lassen County (County) is a Lead Agency under the California Environmental Quality Act (CEQA) and the County's Department of Planning and Building Services is responsible for preparing the Draft Subsequent Environmental Impact Report (DSEIR for Use Permit Amendment No. 2021-003 and Reclamation Plan Amendment No. 2021-001 addressing the proposed 78.6-acre mine boundary expansion at the existing Ward Lake Quarry (proposed Project) (State Clearinghouse No. 2021010627). This DSEIR has been prepared in conformance with CEQA (California Public Resources Code [PRC] §21000 et seq.), California CEQA Statutes and Guidelines (California Code of Regulations [CCR], Title 14, §15000 et seq.), and the rules, regulations, and procedures for implementation of CEQA, as adopted by the County.

CEQA requires the preparation of an EIR prior to approving any project that may have a significant effect on the environment. For the purposes of CEQA, the term project refers to the whole of an action, which has the potential for resulting in a direct physical change or a reasonably foreseeable indirect physical change in the environment (CEQA Guidelines §15378[a]). Pursuant to CEQA's definition, the County has determined that the proposed Use Permit Amendment No. 2021-003 and Reclamation Plan Amendment No. 2021-001 is a project, which has the potential for resulting in significant environmental effects. The purpose of this DSEIR is to review the existing conditions, analyze potential environmental impacts, and identify feasible mitigation measures to reduce potentially significant effects related to the proposed Project.

An EIR is an informational document that apprises decision-makers and the general public of the potential significant environmental effects of a proposed action. An EIR must describe a reasonable range of feasible alternatives to the project and identify possible means to minimize the significant effects. The Lassen County Planning Commission and the Board of Supervisors will consider the information in the SEIR, including the public comments and staff response to those comments, during the public hearing process. As a legislative action, the final decision is made by the Board of Supervisors, who may approve, conditionally approve, or deny the project. As provided in CEQA Guidelines §15021, public agencies are charged with the duty to avoid or minimize environmental damage where feasible. The public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social issues. The purpose of an EIR is to identify:

- The significant potential impacts of the project on the environment and indicate the manner in which those significant impacts can be avoided or mitigated;
- Any unavoidable adverse impacts that cannot be mitigated; and
- Reasonable and feasible alternatives to the project that would eliminate any significant adverse environmental impacts or reduce the impacts to a less than significant level.

An EIR also discloses growth inducing impacts; impacts found not to be significant; and cumulative impacts of the project when taken into consideration with past, present, and reasonably anticipated future projects.

The County, which has the principal responsibility of processing and approving a proposed project, and other public agencies that may use this SEIR in the decision making or permit process, will consider the information in this SEIR, along with other information that may be presented during the CEQA process. CEQA requires an EIR that reflects the independent judgment of the lead agency regarding the impacts, the level of significance of the impacts both before and after mitigation implementation, and mitigation measures proposed to reduce the impacts. Environmental impacts are not always mitigable to a level considered less than significant; in those cases, impacts are considered significant unavoidable impacts. In accordance with §15093(b) of the CEQA Guidelines, if a public agency approves a project that has significant impacts that are not substantially mitigated (i.e., significant unavoidable impacts), the agency shall state in writing the specific reasons for approving the project, based on the Final EIR and any other information in the public record for the project. This is termed, per §15093 of the CEQA Guidelines, a "statement of overriding considerations."

This document analyzes the environmental effects of the proposed Project to the degree of specificity appropriate to the current proposed action, as required by §15146 of the CEQA Guidelines. The analysis considers the actions associated with the proposed Project to determine the short-term and long-term effects associated with their implementation.

1.2 Subsequent EIR

In accordance with CEQA Guidelines §15121(a), the purpose of this DSEIR is to:

- Inform public agency decision makers and the public of any significant environmental effects that would result from the project.
- Identify possible ways to minimize any significant effects; and
- Identify reasonable alternatives to the project.

Pursuant to CEQA Guidelines §15162(a), when an EIR has been certified or a negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in light of the whole record, one or more of the following:

1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time of the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:

a) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

b) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

c) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

d) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Based on finding 3(b) above, the County determined that a subsequent EIR should be prepared to evaluate the impacts related to the substantial changes in the proposed Project from the currently approved mining operation.

1.3 Summary of Proposed Project

The site has been used as an active rock quarry since 1980 and currently operates under Lassen County Use Permit No. 96056, adopted in September 1997; Reclamation Plan No. 94032, adopted in July 1994; and Lassen County Use Permit No. 2018-003 and Reclamation Plan No. 2018-001 adopted in 2019.

This proposed Use Permit and Reclamation Plan Amendment requests an expansion of the quarry area, extension of the life of the mine, and increase in annual volume removed. The proposed changes to the current use permit and reclamation plan include:

- Expansion of approximately 78.6 acres, with an associated additional volume of 5,000,000 tons of material.
- Extension of life of the mine from 2030 to 2050.
- Increase of maximum volume per year from 100,000 tons to 200,000 tons per year.

Three previous EIRs have been prepared for mining operations at the Project site. These include the completion of an EIR in May 1981 (SCH No. 80062304) associated with issuance of the 1981 Use Permit for operations at the site. The mining operation again underwent CEQA review with an EIR to address operational amendments in 1997 (SCH No. 1994051008). An additional EIR (SCH No. 2018022056) was completed in 2019 to address:

- Addition of limited 24-hour operations to meet Caltrans contracting requirements,
- Extension of mine life to 2030, and
- Allowance of annual tonnage in excess of the 100,000 tons in emergency situations.

This DSEIR addresses additional changes in site operations ("proposed Project" or "proposed quarry expansion") and evaluation of the potential to result in significant impacts not addressed in the previous environmental documents prepared for the currently permitted operations at the Project site.

1.4 Documents Incorporated by Reference

CEQA Guidelines §15150 permits documents of lengthy technical detail to be incorporated by reference in an EIR. This DSEIR relies, in part, on information previously prepared for operations at the Project site, and incorporates information provided in the previous three EIRs prepared for operations at the site. The EIRs include background information on the Project site as well as analyses of the environmental impacts of the currently permitted operation at the site. Pursuant to CEQA Guidelines §15150(e)(f), these documents were used primarily to describe the environmental setting, provide general background material, or communicate descriptive technical material. The documents listed below are incorporated by reference as source documents for this DSEIR.

Lassen County General Plan

The *Lassen County General Plan*, adopted in September 1999, is the long-range planning guide for growth and development for Lassen County. The General Plan helps to ensure that day-to-day decisions conform to the long-range program designed to protect and further the public interest as related to the County's growth and development and mitigate environmental impacts. The General Plan also serves to guide the private sector of the economy in relating its development initiatives to the public plans, objectives, and policies of the County. The General Plan contains a Land Use Element, Natural Resources Element, Agriculture Element, Wildlife Element, Open Space Element, Circulation Element, and Safety and Seismic Safety Element. The County's General Plan was utilized throughout this DSEIR as the fundamental planning document governing development on the proposed Project site. Background information and policy information from the General Plan is cited in several sections of this DSEIR.

Standish-Litchfield Area Plan

The *Standish-Litchfield Area Plan* was adopted in 1986 and was intended to guide decisions regarding land use for an approximate 20-year timeframe. In the plan, it is stated, "The plan is long-range in nature and should be reviewed every five years to determine whether it still reflects community values." The Area Plan contains three categories: Environmental Safety, Natural and Cultural Resources, and Community Development. It has been more than 20 years since the Area Plan has been adopted; however, since there have not been any updates since 1986, the goals, policies, and implementation measures are still applicable to the proposed Project.

Operation of Aggregate Materials Source, Operation of Rock Crushing Plant, Operation of Asphalt Concrete Batch Plant EIR (SCH No. 80062304)

An EIR was prepared for the initial Miller's Custom Work, Inc., mining operation at the Project site in 1981. The 1981 project included the use of 80 acres within the 240-acre parcel as a source for aggregates and asphaltic concrete materials. In addition to the excavation and removal of materials, a rock crushing and asphalt concrete batch plant (hot plant) were included in the project.

The EIR included an overall description of the project, identified potentially significant adverse impacts of the project, and proposed mitigation measures to reduce or eliminate the potential adverse impacts. This document is available for inspection upon request at the County's Department of Planning and Building Services during normal business hours (Monday through Friday; 8:00 a.m. to 5:00 p.m.). The 1981 EIR identified the following impacts to be significant and unavoidable:

- Changes in Existing Topography
- Noise
- Air
- Traffic
- Impacts to Wildlife
- Aesthetics

Miller's Custom Work, Inc., Ward Lake Pit Expansion EIR (SCH No. 1994051008)

Miller's Custom Work, Inc. Ward Lake Pit Expansion Environmental Impact Report (Ward Lake Expansion EIR), SCH No. 199405108, was prepared in 1997. The project analyzed in the EIR included the expansion of an aggregate and excavation and processing operation currently operation under Lassen County Use Permits No. 79-80-44, No. 11-02-85, and No. 94032, and Reclamation Plan No. 94032. This document is available for inspection upon request at the County's Department of Planning and Building Services during normal business hours (Monday through Friday; 8:00 a.m. to 5:00 p.m.). The project analyzed in the EIR included:

- The rezoning of the parcel from U-C (Upland Conservation) to U-C-2 (Upland Conservation/Resource Management) to allow operation of a ready-mix concrete plant (already onsite and operating within limits imposed by the Superior Court).
- Onsite production of ready mix concrete added to the use permit as an allowed use.
- Increase in the height of the exposed rock quarry face from the existing +/- 84 feet to a maximum of 150 feet with associated increase in harvest volume from 500,000 cubic yards (cy) to 1,700,000 cy.
- Expansion of the season of operation from seven months (April through October) to year-round as weather permits.

The Ward Lake Pit Expansion EIR identified potentially significant impacts resulting from the expansion of the mining operation and offers mitigation measures to reduce the impacts to less than significant. The EIR focused on two issues of concern: 1) Project impacts on local deer and animal herds and 2) visual impacts. The EIR focused on these two areas and other issues taken from the August 1996 Initial Study prepared for the expansion. The Ward Lake Pit Expansion EIR identified the following impacts as significant and unavoidable:

- Short-term, close-in, visual impacts.
- Cumulative short-term, close-in, visual impacts.

Hat Creek Construction and Materials, Inc., Modifications to Ward Lake Quarry Operations Subsequent EIR (SCH No. 2018022056)

The *Hat Creek Construction and Materials Inc, Modifications to Ward Lake Quarry Operations Subsequent Environmental Impact Report*, SCH No. 2018022056, was prepared in 2019. The project analyzed in the SEIR included amendments to the operations at the site. The amendment included the following changes to existing permitted operations at the quarry:

- Allow for 24-hour mining operations, Monday through Saturday (currently, the use permit allows operations from 6:00 a.m. to 7:00 p.m., Monday through Saturday).
- Extend the life of the mine from 2020 to 2030.
- Allow annual site production in excess of the permitted 100,000 tons during federal, State, or County declared emergencies.

The SEIR identified potentially significant impacts resulting from the expansion of the mining operation associated with aesthetics, biological resources, land use and planning, noise, and traffic. Following analysis, the SEIR identified the following impacts as significant and unavoidable:

- Visual impacts associated with the nighttime headlights and onsite nighttime lighting from 24-hour operations could not be mitigated.
- Impacts to pronghorn and mule deer, found to be significant and unavoidable in previous EIRs, would remain so with the extension of the life of the mine site.
- Traffic noise on Ward Lake Road associated with truck traffic during 24-hour operations could not be mitigated and would be significant and unavoidable.

Previous EIR Mitigation Measures

The 1981, 1997, and 2019 EIRs prepared for operations at the Project site include standard conditions and mitigations measures that apply to the operation of the Project. Conditions of Approval and Operating Conditions for the current mining operation are discussed further in Section 3.5, *Proposed Use Permit and Reclamation Plan Amendments*.

1.4 Responsible and Trustee Agencies

Certain projects or actions undertaken by a Lead Agency require subsequent oversight, approvals, or permits from other public agencies to be implemented. Such other agencies are referred to as "Responsible Agencies" and "Trustee Agencies." Pursuant to CEQA Guidelines §15381 and §15386, as amended, Responsible Agencies and Trustee Agencies are respectively defined as follows:

- "Responsible Agency" means a public agency that proposes to carry out or approve a project for which a Lead Agency is preparing or has prepared an EIR or Negative Declaration. For the purposes of CEQA, the term "Responsible Agency" includes all public agencies other than the Lead Agency that have discretionary approval power over the project (CEQA Guidelines §15381).

- "Trustee Agency" means a State agency having jurisdiction by law over natural resources affected by a project that are held in trust for the people of the State of California. Trustee Agencies include . . . (CEQA Guidelines §15386).

Responsible and Trustee Agencies and other entities that may use this SEIR in their decision-making process or for informational purposes include, but may not be limited to, the following:

- California Air Resources Board
- California Department of Fish and Wildlife
- California Department of Water Resources
- California Department of Transportation
- California Regional Water Quality Control Board
- California Water Resources Control Board
- Native American Heritage Commission
- State Office of Historic Preservation

1.6 Public Scoping

In accordance with CEQA, a good-faith effort has been made during the preparation of this DSEIR to contact affected agencies, organizations, and persons who may have an interest in this Project. This effort included circulation of the Notice of Preparation (NOP) of this DSEIR by the Lead Agency to the California Office of Planning and Research on April 28, 2021. The NOP was mailed directly to parties with interest in the proposed Project. The NOP was mailed to the following agencies and organizations:

County
Lassen County Air Pollution Control District
Lassen County Assessor's Office
Lassen County Counsel
Lassen County Environmental Health Department
Lassen County Fire Warden
Lassen County Fish and Game Commission
Lassen County Public Works – Road Division

State
California Air Resources Board
California Department of Conservation, Division of Mine Reclamation
California Department of Fish and Wildlife
California Department of Forestry and Fire Protection
California Department of Parks and Recreation
California Department of Toxic Substances Control
California Department of Transportation – District 2
California Department of Water Resources
California Highway Patrol
California Office of Historic Preservation
California Office of Planning and Research – State Clearinghouse
California Regional Water Quality Control Board – Lahontan Region
California State Lands Commission

Federal
Bureau of Land Management – Susanville

Native American Groups
Greenville Rancheria of Maidu Indians
Honey Lake Maidu
Native American Heritage Commission
Pit River Tribe of California
Susanville Indian Rancheria
Washoe Tribe of Nevada and California

Fire Protection Districts
Standish-Litchfield Fire Protection District

Supervisors
Supervisor Hammond

School Districts
Shaffer Elementary School

The purpose of the NOP was to solicit comments from public agencies on issues germane to that agency that should be considered in the DSEIR. The public review period for the NOP ends approximately 30 days after public distribution of the NOP. The NOP and comment letters received are included in Appendix A. Comment letters received in response to the NOP were considered during preparation of this DSEIR.

1.7 Review of DSEIR

This DSEIR will be published and made available to local, regional, State, and federal agencies and to the interested organizations and individuals who may want to review and comment on the adequacy of the analysis include in the DSEIR. Notice of this DSEIR will also be sent directly to the parties that commented on the NOP. The DSEIR will undergo a 45-day public review period.

Following the close of the public comment period, responses to comments on the DSEIR will be prepared and published as a separate document. The DSEIR, together with the responses to comments document, will constitute the Final SEIR. The Final SEIR will be considered by the Lead Agency prior to any action taken on the proposed Project. Written comments on the DSEIR must be sent to:

Lassen County
Department of Planning and Building Services
707 Nevada Street, Suite 5
Susanville, CA 96130
Attn: Cortney Flather
Email: cflather@co.lassen.ca.us

Guidelines for Commenting on the DSEIR

The purpose of the public review of the DSEIR is to evaluate the adequacy of the environmental analysis in terms of compliance with CEQA. CEQA §15151 states the following regarding standards from which adequacy is judged:

"An EIR should be prepared with sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible."

CEQA §15204(a) provides guidance to assist members of the public and public agencies in preparing comments on a DSEIR. Section 15204.5(a) states:

"In reviewing draft EIRs, persons and public agencies should focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the project might be avoided or mitigated.

Comments are most helpful when they suggest additional specific alternatives or mitigation measures that would provide better ways to avoid or mitigate the significant environmental effects. At the same time, reviewers should be aware that the adequacy of an EIR is determined in terms of what is reasonably feasible, in light of factors such as the magnitude of the project at issue, the severity of its likely environmental impacts, and the geographic scope of the project. CEQA does not require a Lead Agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commenters. When responding to comments, lead agencies need only respond to significant environmental issues and do not need to provide all information requested by reviewers, as long as a good faith effort at full disclosure is made in the EIR."

Pursuant to the CEQA Guidelines, an effect is not considered significant in the absence of substantial evidence; therefore, comments should be accompanied by factual support. Section 15204(c) of the CEQA Guidelines states:

"Reviewers should explain the basis for their comments, and should submit data or references offering facts, reasonable assumptions based on facts or expert opinion supported by facts in support of the comments. Pursuant to Section 15064 an effect shall not be considered significant in the absence of substantial evidence."

1.8 Organization of the DSEIR

The DSEIR is organized by the following chapters:

- *Chapter 1: Introduction.* Chapter 1 describes the intended uses of this DSEIR, the environmental review approach, documents incorporated by reference, environmental review process, and document organization.

- *Chapter 2: Executive Summary.* Chapter 2 includes a summary of the proposed Project, environmental impacts and mitigation, areas of known controversy, and issues to be resolved in the DSEIR. A summary table is included presenting the summary of potential environmental impacts, their level of significance without mitigation measures, mitigation measures, and levels of significance with mitigation measures.

- *Chapter 3: Project Description.* Chapter 3 includes a description of the proposed Project background, project location, and existing conditions of the subject site. Chapter 3 also includes the project objectives, description of the project characteristics, and approvals and entitlements necessary to implement the proposed Project.

- *Chapter 4: Environmental Setting, Impact Analysis, and Mitigation Measures.* Chapter 4 describes the existing environmental setting, impacts and mitigation measures for specific areas identified by the County requiring environmental review.

- *Chapter 5: Other CEQA Considerations.* Chapter 5 discusses other CEQA issues, including growth inducing impacts, cumulative impacts, significant and unavoidable impacts on the environment, and significant irreversible environmental changes.

- *Chapter 6: Alternatives to the Proposed Project.* Chapter 6 describes the alternatives to the proposed Project, along with an analysis of the ability of the alternatives to meet the proposed Project objectives and associated environmental impacts.

- *Chapter 7: List of Preparers.* Chapter 7 contains a list of report authors and subconsultants.

- *Chapter 8: References.* Chapter 8 contains a list of documents referenced in the DSEIR.

- *Appendices.* The appendices include materials and studies that support the findings and conclusions presented in the DSEIR.

2.0 EXECUTIVE SUMMARY

2.1 Introduction

This Executive Summary section is provided in accordance with CEQA Guidelines §15123. As stated in the CEQA Guidelines §15123(a), "An EIR shall contain a brief summary of the proposed actions and its consequences. The language of the summary should be as clear and simple as reasonably practical." CEQA Guidelines §15123 (b) states, the summary shall identify:

- Each significant effect with proposed mitigation measures and alternatives that would reduce or avoid that effect.
- Areas of controversy known to Lassen County including issues raised by agencies and the public.
- Issues to be resolved including the choice among alternatives and whether or how to mitigate the significant effects.

Accordingly, this summary includes a brief synopsis of the proposed Project and alternatives, environmental impacts and mitigation, areas of known controversy, and issues to be resolved in the DSEIR. Table 2-1, *Summary of Project Impacts and Mitigation Measures* (at the end of this section), presents the summary of potential environmental impacts, their level of significance without mitigation measures, mitigation measures, and levels of significance with mitigation measures.

2.1 Project Location

The Ward Lake Quarry is located within the community of Litchfield in Lassen County, California. The site is located approximately four miles east of the California State Correctional Center (CCC). The site lies on the southwest side of Shaffer Mountain at an elevation of approximately 4,500 feet above mean sea level (msl). The community of Litchfield is located three miles to the southeast and is generally shielded from the site by topography. The City of Susanville is located approximately 14 miles to the west.

2.1 Surrounding Land Use

Land uses adjacent to the current operation boundaries are defined by the *Lassen County General Plan* as "Agricultural Residential" to the west, "Extensive Agriculture" to the north, and "Open Space" to the south and the east. Existing zoning adjacent to the current operations is O-S (Open Space District) to the south and east, U-C-A-P (Upland Conservation/Agricultural Preserve Combining District) to the north, and U-C/A-2-20-A (Upland Conservation/Agricultural Residential/Building Site Combining/Agricultural District) to the west.

The General Plan land use designations for properties adjacent to the proposed expansion area are "Extensive Agricultural" to the west, "Open Space" to the north and east, and "Mountain Resort/Belfast Initiative Area" to the north and west. The zoning designations for the adjacent parcels are U-C (Upland Conservation District) to the west and O-S (Open Space) to the south, east, and north.

Twelve residences are located within one mile of the existing quarry. The nearest residence is located approximately 470 feet from the west property line of the quarry and was constructed in approximately 2007. The nearest residence to the proposed expansion area (the same home) is approximately 4,500 feet to the south.

2.3 General Plan and Zoning

The two proposed quarry expansion parcels (APN 109-100-059 and APN 109-100-060) are designated as "Extensive Agriculture" by the *Lassen County General Plan*. APN 109-100-059 is zoned U-C-2 (Upland Conservation Resource Management District), and APN 109-100-060 is zoned U-C-A-P (Upland Conservation/Agricultural Preserve Combining District).

2.4 Mine History

The Ward Lake Quarry has been operated since 1980, initially under a use permit issued to Caltrans. Caltrans had an agreement dated November 1979 with Miller's Custom Work to use materials from the site. In 1981, Miller's Custom Work applied for and was granted an expansion of the operation to include excavation and removal of rock over an 80-acre area and installation of a hot plant for asphaltic concrete processing. The road connecting Ward Lake Road to the site was also approved at this time. An Environmental Impact Report (EIR) was prepared for that project in May 1981.

In 1994, Miller's Custom Work applied for an expansion of the 1981 permitted operation. An Initial Environmental Study/Mitigated Negative Declaration was prepared by Lassen County, the project was approved, and expanded operations began; however, a lawsuit was brought against the applicants and the County maintaining, among other items, that the Initial Environmental Study/Mitigated Negative Declaration were inadequate under CEQA and the concrete plant was not a permitted use in an area zoned U-C (Upland Conservation). The Lassen County Superior Court agreed, in part. Related to the inadequacy of the environmental review, the Initial Environmental Study/Mitigated Negative Declaration were found to be deficient in two areas – impacts to the deer and antelope herds and visual impacts. These two issues were the focus of an EIR which was prepared in June 1997.

During the 1997 amendment process, the quarry operator reduced the operating hours from 24 hours a day to between the hours of 6:00 a.m. and 7:00 p.m. The quarry previously operated as needed, 24 hours a day, seven days a week. TLT Enterprises, LLC acquired ownership of the quarry in 2011. The quarry was leased to Hat Creek Construction and Materials, Inc., which has operated it since that time.

Hat Creek Construction continued operating the Ward Lake Quarry under the original conditions outlined in Use Permit No. 96056 and previous Reclamation Plan No. 94032. In 2017, Hat Creek Construction filed an amendment to Use Permit 96065 to address changes to the operating conditions at the site. The Use Permit Amendment included:

- Modifying the operating hours to again allow for periods of 24-hour operations. This change was requested to respond to changes in State of California contracting practice requiring nighttime operation on Caltrans project to minimize daytime traffic impacts;
- Extending the life of the quarry from 2020 to 2030; and

- Increasing the annual volume to be mined per year to over 100,000 tons if responding to emergency situations.

A Subsequent EIR prepared for Use Permit Amendment No. 2018-003 was approved by the County on May 14, 2019. Although the Reclamation Plan for the site was not a primary issue and no reclamation plan amendment was submitted, the operating conditions at the site were incorporated by reference by the County into approval of Reclamation Plan Amendment No. 2018-001. No other portion of the Reclamation Plan was amended at that time.

Materials produced at the site include asphalt, concrete, various sizes of crushed rock and crushed base rock which are used as construction materials. The materials at the site have been evaluated by an independent testing laboratory and the California Department of Transportation (Caltrans) with test results indicating superior material not commonly found in the region. The quality of the resources and choice location to existing and potential market for aggregates and paving materials were the determining factors in choosing the site for the planned operations in 1981 (Miller's Custom Work, 1981).

2.5 Project Summary

The proposed Use Permit and Reclamation Plan Amendment (proposed Project) includes expansion of approximately 78.6 acres with an associated additional volume of 5,000,000 tons of material, extension of the life of the mine from 2030 to 2050, and increase in the maximum volume extracted per year from 100,000 tons to 200,000 tons. These amendments will allow the facility to continue to provide local construction materials in Lassen County.

The proposed Project includes the following modifications to existing permitted operations at the Ward Lake Quarry:

- Expansion of approximately 78.6 acres, with an associated additional volume of 5,000,000 tons of material.
- Extension of life of the mine from 2030 to 2050.
- Increase of maximum volume per year from 100,000 tons to 200,000 tons per year.

Mining of the proposed expansion area will commence upon approval of the Use Permit and Reclamation Plan Amendment. The expansion will follow the same operating procedures already approved for the current operations. Activities at the processing location will not change. The current mine face will be reclaimed as the expansion area is mined.

2.6 Project Objectives

The Project applicant has identified the following objectives for the proposed Project:

- Provide a local construction material supply to serve local and regional market demands.
- Provide a local source of materials for emergency jobs (during federal, State, or County declared emergencies) and other construction jobs requiring nighttime work.
- Extend the life of the quarry to extract additional superior materials from the site.

- Contribute to the improvement of the Lassen County economy by expanding an existing project that increases sales taxes.
- Expand an existing quarry operation without the need for either a County General Plan or Zone Amendment.

2.7 Project Alternatives

Section 15126(d) of the CEQA Guidelines mandates that all EIRs include a comparative evaluation of the proposed project with alternatives to the project that are capable of attaining most of the project's basic objectives but would avoid or substantially lessen any of the significant effects of the project. CEQA requires a "reasonable range" of alternatives, including the "no project" alternative. Chapter 6, *Alternatives*, of this DSEIR discusses each alternative in detail. The alternatives evaluated include:

Alternative 1 – No Project Alternative

The No Project Alternative includes the continuation of mining operations at the site as currently permitted under Use Permit No. 96056 and Use Permit Amendment No. 2018-003. Activities would continue to occur within the existing 160-acre mining boundary. Annual production would be limited to 100,000 tons except to supply emergency jobs. Mining activities would cease by the year 2030 and the mining area would be reclaimed.

Alternative 2 – Reduced Expansion Alternative

This alternative is similar to the proposed Project, but with a reduced expansion area and shorter mine life. As with the proposed Project, annual production would increase from 100,000 tons to 200,000 tons. The Reduced Expansion Alternative includes expansion of the mining area of the current operation to include an additional 26 acres. Due to the smaller expansion area, the life of the mine would be extended only 10 years. Mining would occur until 2040 and then the site would be reclaimed.

The location of the processing area of the operation would not change. Mining would occur as described for the proposed Project, but within the smaller expansion area. Mining activities in the expansion area would start immediately adjacent to the current mining area of the Project site and progress to the north. This alternative would require the same equipment operating at the same capacity as the proposed Project. The same average and maximum traffic volumes would be required to haul materials.

Environmentally Superior Alternative

The environmentally superior alternative is the one that would result in the fewest or least significant environmental impacts.

The Reduced Expansion Alternative would result in similar impacts as the proposed Project, but would reduce the area and time period over which impacts occur. The known cultural resource in the Project vicinity would be avoided in the smaller expansion area under the Reduced Expansion Alternative and no mitigation specific to the known cultural resource would be required. Impacts

to aesthetics and visual resources, biological resources, and geology and soils would be slightly reduced due to the smaller expansion area, but the level of significance of these impacts would not change. The mitigation measures required under the proposed Project would still be necessary for cultural and tribal cultural resources, geology, land use and air quality to reduce impacts of the Reduced Expansion Alternative to be less than significant. The mitigation measures included for biological resources will also be required to reduce impacts to biological resources, however impacts related to displacement of mule deer and pronghorn will remain significant and unavoidable. However, it should be noted that the Reduced Expansion Alternative would only partially meet the Project objectives of the Project since it would result in less overall material being provided by the operation and materials would be supplied for a shorter duration of time. The Reduced Expansion Alternative would leave up to 2,500,000 tons of superior material unavailable for use for local and regional projects that could be efficiently extracted and processed using the existing equipment and infrastructure currently at the Project site.

2.8 Environmental Impacts

Environmental Impacts Not Considered Further in this DSEIR

Section 15128 of the CEQA Guidelines states, "An EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR. Such a statement may be contained in an attached copy of an Initial Study."

An Initial Study for the proposed Project was not prepared by the County, however, information from prior EIRs conducted by the County for the Ward Lake Quarry have been reviewed and assessed to make the following no impact determinations.

- *Mineral Resources.* California's Surface Mining and Reclamation Act of 1975 (SMARA) requires the State Geologist to classify land into mineral resource zones based on the known or inferred mineral resource potential of that land. The primary goal is to ensure that important mineral resources do not become inaccessible due to uniformed land-use decisions. To this end, the California Geological Survey performs objective mineral land classification (MLC) to assist in the protection and wise development of California's mineral resources (California Department of Conservation, 2019). A search of the SMARA Mineral Lands Classification (MLC) data portal did not show any MLC related studies or maps for Lassen County or the proposed quarry expansion. There are no designated mineral deposits of regional or statewide importance within the proposed quarry expansion.

  The State of California has not designated an area of statewide or regional mineral resource significance within the proposed quarry expansion. In addition, the proposed quarry expansion is not delineated in the *Lassen County General Plan* or *Standish-Litchfield Area Plan* as a locally important mineral resource. As a result, implementation of the proposed Project will not result in the loss of availability of a mineral resource of value to the region or residents of the state or delineated locally important mineral resource. Therefore, the proposed Project will have no impact to mineral resources.

- *Population and Housing*. No new development or infrastructure is proposed as part of the quarry expansion and no additional employees are anticipated. In addition, no existing housing or people will be displaced by the proposed Project. Therefore, implementation of the proposed Project will have no impact to population and housing.

- *Public Services*. The proposed Project includes expansion of an existing mining operation. As a result, Project implementation will not increase the local population that, in turn, would require new or physically altered schools, parks, or other public facilities. Additionally, the proposed Project will not result in an impact to service ratios, response time or other performance objectives for fire or police protection which would require the construction of new or physically altered governmental facilities. Therefore, implementation of the proposed Project will have no impact to public services.

- *Utilities and Service Systems*. Implementation of proposed Project will not require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities that would result in significant environmental effects. The proposed quarry expansion will utilize the same utilities and services as the current mining operation. Additionally, the proposed Project does not include any changes that will affect solid waste at the site. Water used for dust suppression will be provided by an existing well. As discussed in Section 4.11, *Hydrology and Water Quality*, the proposed Project will not create a demand for water in excess of available groundwater supplies. Therefore, implementation of the proposed Project will not result in impacts related to utilities or service systems.

- *Recreation*. The proposed quarry expansion does not include recreational facilities and would have no foreseeable impact on existing recreational facilities; neither will the proposed Project increase the need for recreational services, as no additional employees are proposed. Therefore, implementation of the proposed Project will have no impact to recreational resources within the County.

The proposed Project will not result in impacts to these resources; therefore, impacts related to these resources are not further analyzed in this DSEIR.

Less Than Significant Impacts

The following subject areas have been identified as having a less than significant impact:

- Aesthetics and Visual Resources (Section 4.2)
- Agriculture and Forestry Resources (Section 4.3)
- Energy (Section 4.7)
- Greenhouse Gas Emissions (Section 4.9)
- Hazards and Hazardous Materials (Section 4.10)
- Hydrology and Water Quality (Section 4.11)
- Transportation (Section 4.14)
- Wildfire (Section 4.15)

Less Than Significant with Incorporation of Mitigation

The proposed Project would result in less than significant impacts with incorporation of mitigation measures on the following subject areas:

- Air Quality (Section 4.4)
- Biological Resources (Section 4.5)
- Cultural and Tribal Cultural Resources (Section 4.6)
- Geology and Soils (Section 4.8)
- Land Use and Planning (Section 4.12)
- Noise (Section 4.13)

Significant and Unavoidable Impacts

Section 15126(b) of the CEQA Guidelines requires an EIR to discuss the significant impacts of a proposed project that cannot be reduced to a less than significant level. These impacts are referred to as significant and unavoidable impacts of the project. In Sections 4.2 through 4.15 of this DSEIR, the issue areas were analyzed to determine whether Project implementation would result in a significant adverse environmental impact. Based on the analyses given in these sections, the following environmental impacts were determined to be significant and unavoidable impacts:

Biological Resources

Expansion of the mining area by an additional 78.6 acres will increase the area over which light and noise impacts will occur causing additional displacement of mule deer and American pronghorn from noise and human activity. As discussed in the 1997 Deer Impact Analysis, human activity in the Project area would displace animals escaping mid-winter snow as well as taking advantage of late-winter and early spring plant phonology or the spring green-up due to noise and activity at the site. The proposed Project will result in these impacts occurring over a larger area than the current mining operation and for a longer duration (until 2050).

The Project will continue to comply with the conditions of approval for Use Permit Amendment No. 2018-003 limiting mining activities from January 1st to March 31st each year, limiting activities occurring during nighttime hours, as well as requiring lighting to be downward facing and fully-shielded. These operating conditions will decrease the lighting and noise impacts within the expansion area. However, as discussed in previous CEQA review for the Project, a seasonal closure from at least December through March was determined to be necessary to reduce the impacts due to displacement from noise and human activity to a less than significant level. The Project will result in additional disturbance to pronghorn and mule deer. Human disturbance during a time of particular nutritional stress may effectively remove a portion of their winter range (Kucera, 1996). Because several hundred deer would potentially be affected and impacts will last for an additional 30 years (until 2050), this would be a significant environmental impact.

Adherence to Mitigation Measure 4.5-7 and Mitigation Measure 4.5-8 contained in Section 4.5, *Biological Resources*, of the DSEIR) for the current operation will reduce displacement impacts to American pronghorn and mule deer; however, this impact will remain significant and unavoidable. No additional mitigation measures are available for this impact. This is considered significant and

unavoidable. An increased closure season of all operations onsite was determined to be economically infeasible. In 1997, the Lassen County Planning Commission recommended that the Lassen County Board of Supervisors amend the season of restricted operations due to economic infeasibility of a four-month closure. Economic losses said to potentially result from the four-month annual closure would impact the mine as well as the surrounding community; a disruption of mining operations would lead to a loss of employee payroll, place a higher demand on social services in the community, and reduce availability of mined materials in the surrounding area. An increased closure season of all operations onsite has been determined to be economically infeasible.

Significant Cumulative Impacts

According to §15355 of the CEQA Guidelines, the term cumulative impacts "...refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." Individual effects that may contribute to a cumulative impact may be from a single project or a number of separate projects. Individually, the impacts of a project may be relatively minor, but when considered along with impacts of other closely related or nearby projects, including newly proposed projects, the effects could be cumulatively considerable.

This DSEIR has considered the potential cumulative effects of the proposed Project along with other current and reasonably foreseeable projects. Impacts for the following issue areas have been found to be cumulatively significant:

Biological Resources

Impacts to mule deer and antelope include direct habitat loss and displacement from human disturbance. The temporary loss of 78.6 acres of habitat was determined to be less than significant at the Project level. The loss of winter habitat resulting from the Project is cumulatively considerable in combination with the 160 acres of habitat loss from the current Ward Lake Quarry operation and additional direct habitat loss of mining activities on BLM property south of the Project site. The habitat disturbed by the existing operations and proposed expansion area will be restored in accordance with the Reclamation Plan Amendment and habitat will be enhanced following the conclusion of mining; therefore, cumulative impacts related to direct antelope and mule deer habitat loss will be less than significant.

Displacement due to human disturbance of mule deer and antelope from important winter habitat was determined to be significant and unavoidable at the Project-level since displacement impacts occur over a larger area than direct habitat loss. This impact is cumulatively considerable in combination with the existing mining operation as well as the nearby BLM pit. The proposed Project combined with the existing mining operations in the Project vicinity will result in a significant and unavoidable cumulative impact related to the displacement of mule deer and antelope from winter habitat.

2.9 Areas of Controversy, Issues Raised, and Areas Resolved in the DSEIR

As required by CEQA Guidelines §15082, the County issued a Notice of Preparation (NOP) on April 28, 2021 that summarized the proposed Project, stated its intention to prepare an EIR, and requested comments regarding the scope and content of the EIR from responsible and trustee agencies. Comments received include those received during early consultation as well as in response to the NOP for the proposed Project. The following comments letters were received (refer to Appendix A):

- California Department of Conservation, Division of Mine Reclamation (May 12, 2021).
- California Department of Fish and Wildlife (May 26, 2021).
- Native American Heritage Commission (April 28, 2021).

Section 15123(b)(3) of the CEQA Guidelines requires that an EIR contain issues to be resolved, which includes the choice among alternatives and whether or how to mitigate significant impacts. The following major issues are to be resolved:

- Determine whether the DSEIR adequately describes the environmental impacts of the proposed Project;
- Choose among alternatives;
- Determine whether the recommended mitigation measures should be adopted or modified; and
- Determine whether additional mitigation measures need to be applied to the proposed Project.

2.10 Summary of Environmental Impacts and Mitigation Measures

Under CEQA, a significant effect on the environment is defined as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. For these areas, this DSEIR discusses the impacts and mitigation measures that could be implemented by Lassen County to reduce potential adverse impacts to a level that is considered less than significant. An impact that remains significant after mitigation is considered an unavoidable adverse impact of the proposed Project. The mitigation measures presented in the DSEIR will form the basis of the *Mitigation Monitoring and Reporting Program*. Table 2-1, *Summary of Project Impacts and Mitigation Measures*, provides a summary of the environmental effects of the proposed Project identified in each technical issue chapter. The table consists of the environmental impacts, the significance of the impacts for the Project, the proposed mitigation measures, and the significance of the impacts after the mitigation measures are implemented.

Table 2-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
4.2 AESTHETIC AND VISUAL RESOURCES			
Impact 4.2-1: Have a substantial adverse effect on a scenic vista.	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.2-2: In non-urbanized areas, substantially degrade the existing visual character or quality of the public views of the site and its surroundings.	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.2-3: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	Less than Significant	No mitigation measures are required.	Less than Significant
4.3 AGRICULTURE AND FORESTRY RESOURCES			
Impact 4.3-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program (FMMP) of the California Resources Agency, to non-agricultural use.	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.3-2: Involve other changes in the existing environment that, due to their location or nature, could result in conversion of farmland to nonagricultural use.	Less than Significant	No mitigation measures are required.	Less than Significant
4.4 AIR QUALITY			
Impact 4.4-1: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard. .	Potentially Significant	MM 4.4-1: The Project applicant shall ensure compliance with Lassen County APCD rules for fugitive dust emissions. Based on Lassen County APCD Rule 4:18 (Fugitive Dust Emissions), reasonable precautions shall be taken to prevent particulate matter from becoming airborne, including, but not limited to, the following provisions: • *Cover trucks.* Covering open bodied trucks when used for transportation materials likely to give rise to airborne dust. • *Filter and containment.* Installation and use of hoods, fans, and other fabric filters to enclose and vent the handling of dusty materials. Containment methods may be employed during sandblasting and other similar operations. • *Dust suppression.* The application of asphalt, oil, water or suitable chemicals to dirt roads, material stockpiles, land	Less than Significant

Table 2-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		clearing, excavation, grading or other surfaces which can give rise to airborne dusts. • *Good housekeeping*. The prompt removal of earth or other material from paved streets onto which earth or other material for earth moving equipment, erosion by water, or other means has been deposited.	
Impact 4.4-2: Expose sensitive receptors to substantial pollutant concentrations.	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.4-3: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	Less than Significant	No mitigation measures are required.	Less than Significant
4.5 BIOLOGICAL RESOURCES			
Impact 4.5-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by DFG or U.S. Fish and Wildlife Service (USFWS).	Potentially Significant	MM 4.5-1: To avoid impacts on burrowing owls and other nesting birds, including raptors protected under State and federal regulations, the following shall be implemented (removal of raptor nests at any time of year is prohibited unless appropriate permits are obtained). a. <u>Burrowing owls</u>. A qualified biologist shall conduct preconstruction surveys for burrowing owls in accordance with the *Staff Report on Burrowing Owl Mitigation* prepared by the California Department of Fish and Game (CDFW) (March 7, 2012). Upon completion, all survey results shall be submitted to Lassen County. Where physical or visual access is available, survey coverage shall extend 500 feet around the project site where suitable habitat for burrowing owls is present. A minimum of four field	Less than Significant

Table 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES			
Impact	**Significance Before Mitigation**	**Mitigation Measures**	**Significance After Mitigation**
		surveys shall be conducted: at least one between February 15th and April 15th; and a minimum of three surveys, at least three weeks apart, between April 15th and July 15th, with at least one survey after June 15th. Survey methods and survey reports shall be in accordance with the CDFW Staff Report and provided to Lassen County. If no active burrows are observed, the site shall be reinspected by a qualified biologist no more than one week prior to initiation of construction to ensure that owls are not present. If an active burrow is observed in the project site, the County shall consult with CDFW regarding establishing a non-disturbance buffer around the burrow, or implementing passive relocation methods to exclude the owls from the site prior to commencement of construction. No burrowing owls shall be excluded from occupied burrows until a burrowing owl exclusion and relocation plan is approved by CDFW. Following owl exclusion and burrow demolition, the site shall be monitored by a qualified biologist to ensure burrowing owls do not reoccupy the site prior to construction. In the event of loss of burrowing owl nests, a mitigation and monitoring plan shall be prepared by a qualified biologist to identify methods to offset the loss at a minimum 1:1 ratio (e.g., establishing a	

Table 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES			
Impact	**Significance Before Mitigation**	**Mitigation Measures**	**Significance After Mitigation**
		permanent conservation easement to provide for burrowing owl nesting, foraging, wintering, and dispersal, including completing habitat enhancements within the conservation easement area as necessary. The mitigation and monitoring plan shall be approved by CDFW prior to commencement of construction. b. <u>For all other bird species</u>, if vegetation removal or ground disturbance activities occur between February 1st and August 31st, a pre-construction nesting survey shall be conducted by a qualified biologist to identify active nests in and adjacent to the work area. Surveys shall begin prior to sunrise and continue until vegetation and nests have been sufficiently observed. The survey shall consider acoustic impacts and line-of-sight disturbances occurring as a result of the project in order to determine a sufficient survey radius to avoid nesting birds. At a minimum, the survey report shall include a description of the area surveyed, date and time of the survey, ambient conditions, bird species observed in the area, a description of any active nests observed, any evidence of breeding behaviors (e.g., courtship, carrying nest materials or food, etc.), and a description of any outstanding conditions that may have impacted the survey results (e.g., weather conditions, excess noise, the presence of predators, etc.). The survey shall be conducted no	

Table 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES			
Impact	**Significance Before Mitigation**	**Mitigation Measures**	**Significance After Mitigation**
		more than one week prior to the initiation of construction. If construction activities are delayed or suspended for more than one week after the pre-construction survey, the site shall be resurveyed. Upon completion, all survey results shall be submitted to Lassen County. If active nests are found, appropriate actions shall be implemented to ensure compliance with the Migratory Bird Treaty Act and California Fish and Game Code. Compliance measures may include, but are not limited to, exclusion buffers, sound-attenuation measures, seasonal work closures based on the known biology and life history of the species identified in the survey, as well as ongoing monitoring by biologists. MM 4.5-2: Throughout the life of the mine, if milkweed (*Asclepias* spp.*)* is observed onsite during the breeding season/pupae development season (spring-summer) for the monarch butterfly, the plant shall be inspected for caterpillars by a qualified biologist. If developing monarch caterpillars are present, the plant shall be avoided until butterflies have emerged and the plant is no longer in use. MM 4.5-3: Prior to new ground disturbance and annually thereafter, a pre-construction survey shall be conducted by a qualified biologist to determine the presence of pygmy rabbits, white-tailed jackrabbits, and	

Table 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES			
Impact	**Significance Before Mitigation**	**Mitigation Measures**	**Significance After Mitigation**
		other special-status wildlife species that may be present onsite. If special-status animal species are identified within the project site, a qualified biologist, in consultation with the California Department of Fish and Wildlife, shall recommend avoidance measures for protection of the species. Upon completion, all survey results shall be submitted to Lassen County. MM 4.5-4: Prior to new ground disturbance, a qualified biologist shall conduct a survey in areas that contain rock outcrops or other potentially suitable roosting habitat for pallid bats. If an active maternity roost is present, a qualified biologist, in consultation with the California Department of Fish and Wildlife, shall establish a suitable buffer zone to ensure that active bat nurseries are not adversely affected. If non-breeding bats are found in rock outcrops within the disturbance footprint, the individuals shall be safely evicted under the direction of a qualified biologist. Upon completion, all survey results shall be submitted to Lassen County. MM 4.5-5: Prior to new ground disturbance and annually thereafter, a botanical survey shall be conducted during the blooming season when special-status plants known to occur in the region would be identifiable. If special-status plants are present, a suitable buffer zone(s) shall be determined by a qualified biologist in consultation with the California Department of Fish and Wildlife (CDFW) and exclusionary fencing shall be	

Table 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES			
Impact	**Significance Before Mitigation**	**Mitigation Measures**	**Significance After Mitigation**
		placed prior to commencement of earth-disturbing activities. Upon completion, all survey results shall be submitted to Lassen County. If avoidance is not possible, CDFW shall be contacted to determine a satisfactory method of mitigation. Mitigation shall be undertaken concurrently with or in advance of the earth-disturbing activities. MM 4.5-6: All construction personnel participating in earth-disturbing activities and their supervisors shall receive training by a qualified biologist regarding protective measures for special-status plant and animal species and sensitive habitats that could exist in the study area. When new personnel are hired, the proof that they receive the mandatory training shall be submitted to Lassen County before starting work. At a minimum, the training shall include the following: a. A review of the special-status species that could occur in the project site, the locations where the species could occur, the laws and regulations that protect these species, and the consequences of noncompliance with those laws and regulations. b. Procedures to be implemented in the event that these species are encountered during construction. c. A review of sensitive habitats that occur in the study area and the location of the sensitive habitats.	

Table 2-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		d. A review of applicable mitigation measures, standard construction measures, best management practices, and resource-agency permit conditions that apply to the protection of special-status species and sensitive habitats. MM 4.5-7: To minimize impacts from the loss of wildlife habitat, site disturbance in the expansion area shall not exceed two 5-acre increments, starting excavation on another 5-acre increment while concurrently reclaiming the first 5-acre increment. After the initial excavation of two 5-acre increments, disturbance shall not exceed 5-acres. At any given time. Reclamation in the expansion area shall be completed concurrently with mining operations in accordance with the adopted Reclamation Plan. Reclamation, including seeding, must commence within two years following completion of mining in each five-acre area in order to minimize the total area disturbed at any given time and to allow for restoration of the vegetative cover. MM 4.5-8: To ensure no additional foraging habitat loss, all remaining areas of the mine parcels shall remain undisturbed for the duration of mining. This includes the remaining portions of Lassen County Assessor's Parcel Number (APN) 109-100-059 and APN 109-100-060 (i.e., all portions of the parcels outside of the reclamation boundary for the current mine operation (as of 2021) and the proposed 2021 mine expansion boundary).	

Table 2-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
Impact 4.5-2: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	Potentially Significant	MM 4.5-9: *Limits on Operation*. The operator shall continue limits on operations from January 1st to March 31st. Impacts can be lessened through continuing seasonal operating restrictions included in the Condition of Approval for Use Permit No. 96056: *Except in a state of emergency, as declared by the local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville, no grading, excavating, or blasting on the site shall be allowed between January 1st and March 31st Annually.* MM 4.5-10: *Operating Conditions of Use Permit No. 2018-003*. The operator shall continue the Conditions of Approval for Use Permit Amendment No. 2018-003. Impacts can be lessened with the seasonal operating restrictions and light and noise reductions included in the Conditions of Approval for Use Permit Amendment No. 2018-003.	Significant and Unavoidable
4.6 CULTURAL AND TRIBAL CULTURAL RESOURCES			
Impact 4.6-1: The Project would cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to §15064.5.	Potentially Significant	MM 4.6-1: Prior to ground disturbing activities with the expansion area, a non-disturbance area for WARD-PRE-01 shall be defined and marked by a qualified archaeologist. Once the non-disturbance area is delineated, one of the following options shall be implemented by the Project proponent: • *Resource Avoidance.* The Project shall be redesigned to avoid all ground disturbances within the established non-disturbance area and long-term access restrictions shall be established (fencing	Less than Significant

Table 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES			
Impact	**Significance Before Mitigation**	**Mitigation Measures**	**Significance After Mitigation**
		or deed restrictions) to preclude disturbance to the resource. • *Evaluation and Data Recovery.* WARD-PRE-01 shall be evaluated for eligibility for inclusion in the CRHR by a qualified archaeologist. The results of the evaluation shall be submitted to Lassen County. If the evaluation is negative (i.e., not historically significant), no further mitigation is required. If the property is found to be an historical resource and data recovery through excavation is the only feasible mitigation, a data recovery plan, which makes provisions for adequately recovering the scientifically consequential information from and about the historical resource, shall be prepared and adopted prior to any excavation being undertaking. The study shall be deposited with the California Historical Resources' Regional Information Center. MM 4.6-2: *Inadvertent Discovery of Cultural Resources.* If subsurface deposits believed to be cultural or human in origin are discovered during construction, then all work must halt within a 50-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeology, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. If the professional	

Table 2-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		archaeologist determines that the find does not represent a cultural resource, then work may resume immediately, and no agency notifications are required. If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, then he or she shall immediately notify the County, which shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be eligible for inclusion in the NRHP or CRHR. Work cannot resume within the no-work radius until the County, through consultation as appropriate, determines that the site either: 1) is not eligible for the NRHP or CRHR; or 2) that the treatment measures have been completed to its satisfaction.	
Impact 4.6-2: The Project would disturb human remains, including those interred outside of formal cemeteries.	Potentially Significant	MM 4.6-3: *Unanticipated Discovery of Human Remains.* In the evert of the discovery of human remains, or remains that are potentially human, the contractor shall ensure reasonable protection measures are taken to protect the discovery from disturbance (Assembly Bill [AB] 2641). The archaeologist shall notify the Lassen County Coroner (as per §7050.5 of the Health and Safety Code). The provisions of §7050.5 of the California Health and Safety Code, §5097.98 of the California PRC, and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the project (§5097.98 of the PRC). The designated	Less than Significant

Table 2-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, then the NAHC can mediate (§5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (§5097.98 of the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work cannot resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.	
Impact 4.6-3: The Project would Cause a substantial adverse change in the significance of a tribal cultural resource.	Potentially Significant	See Mitigation Measures 4.6-1, 4.6-2, and 4.6-3.	Less than Significant
4.7 ENERGY			
Impact 4.7-1: Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.7-2: Conflict or obstruct a state or local plan for renewable energy or energy standards.	Less than Significant	No mitigation measures are required.	Less than Significant
4.8 GEOLOGY AND SOILS			
Impact 4.8-1: Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving: *i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?*	Less than Significant	No mitigation measures are required.	Less than Significant
ii) Strong seismic ground shaking?	Less than Significant	No mitigation measures are required.	Less than Significant

Table 2-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
iii) Seismic-related ground failure, including liquefaction?	Less than Significant	No mitigation measures are required.	Less than Significant
iv) Landslides?	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.8-2: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Potentially Significant	MM 4.8-1: *Avoid and Minimize Impacts to Paleontological Resources.* Should any potentially unique paleontological resources (fossils) be encountered during development activities, work shall be suspended, and the County shall be immediately notified. At that time, the County will coordinate any necessary investigation of the discovery with a qualified paleontologist. The project proponent shall be required to implement mitigation necessary for the protection of paleontological resources. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures.	Less than Significant
4.9 GREENHOUSE GAS EMISSIONS			
Impact 4.9-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.9-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Less than Significant	No mitigation measures are required.	Less than Significant
4.10 HAZARDS AND HAZARDOUS MATERIALS			
Impact 4.10-1: Create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.10-2: Expose people or structures to a significant risk of loss, injury or death involving wildland fires.	Less than Significant	No mitigation measures are required.	Less than Significant
4.11 HYDROLOGY AND WATER QUALITY			
Impact 4.11-1: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.11-2: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater	Less than Significant	No mitigation measures are required.	Less than Significant

Table 2-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
management of the basin.			
Impact 4.11-3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through addition of impervious surfaces, in a manner which would: i) result in substantial erosion or siltation on- or off-site; ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or offsite; or iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.11-4: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	Less than Significant	No mitigation measures are required.	Less than Significant
4.12 LAND USE AND PLANNING			
Impact 4.12-1: Conflict with Lassen County General Plan or Standish-Litchfield Area Plan.	Potentially Significant	See Mitigation Measure 4.5-1 through 4.5-8.	Less than Significant
4.13 NOISE			
Impact 4.13-1: Result in substantial temporary or permanent increase in ambient noise levels in excess of standards established in the Lassen County General Plan.	Potentially Significant	MM 4.13-1: *Materials Haul Truck Operations.* To maintain traffic noise below 65 dB Ldn, the operator shall continue to comply with Condition of Approval #8 of Use Permit Amendment No. 2018-003 which limits truck trips to an average of 26 round trips (26 arriving and 26 departing) throughout the calendar year and a daily maximum of 275 round trips (275 arriving and 275 departing). MM 4.13-2: *Material Haul Truck Counts.* Prior to commencement of mining activities within the quarry expansion area, the mine operator shall install pneumatic road tubes or other similar methods to quantify daily truck trips in an effort to ensure that annual truck counts do not exceed limitations imposed by Condition of Approval #8 of Use Permit Amendment No. 2018-003. Results of the counts shall be provided to the County on an annual basis (January 1st	Less than Significant

Table 2-1 SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES			
Impact	**Significance Before Mitigation**	**Mitigation Measures**	**Significance After Mitigation**
		of each year) throughout the duration of mining activities.	
Impact 4.13-2: Result in the generation of excessive groundborne vibration or groundborne noise levels.	Potentially Significant	MM 4.13-3: *Plant and Expansion Area Operations.* The following measures shall be implemented: • Restrict crushing operations to the daytime hours of 7:00 a.m. to 10:00 p.m. • The operator shall continue to limit winter operation (no grading, excavating, or blasting per Resolution No. 97-067, Condition #21). • The operator shall limit 24-hour operations to April 1st to December 31st annually. • The operator shall not grade or excavate between 7:00 p.m. and 7:00 a.m. or blast between 6:00 p.m. and 7:00 a.m.	Less than Significant
4.14 TRANSPORTATION			
Impact 4.14-1: Conflict with or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	Less than Significant	No mitigation measures are required.	Less than Significant
4.15 WILDFIRE			
Impact 4.15-1: The Project could substantially Impair an Adopted Emergency Response Plan or Emergency Evacuation Plan.	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.15-2: Due to Slope, Prevailing Winds, and Other Factors, the Project could Exacerbate Wildfire Risks, and thereby Expose Project Occupants to Pollutant Concentrations from a Wildfire or the Uncontrolled Spread of Wildfire.	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.15-3: Require the Installation or Maintenance of Associated Infrastructure (Such as Roads, Fuel Breaks, Emergency Water Sources, Power Lines or Other Utilities that May Exacerbate Fire Risk or that May Result in Temporary or Ongoing Impacts to the Environment.	Less than Significant	No mitigation measures are required.	Less than Significant
Impact 4.15-4: Expose People or Structures to Significant Risks, Including Downslope or Downstream Flooding or Landslides, as a Result of Runoff, Post-Fire Slope Instability, or Drainage Changes.	Less than Significant	No mitigation measures are required.	Less than Significant

Table 2-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
CUMULATIVE IMPACTS			
Aesthetics and Visual Resources			
Have a substantial adverse effect on a scenic vista.	Less than Significant	No mitigation measures are required.	Less than Significant
In non-urbanized areas, substantially degrade the existing visual character or quality of the public views of the site and its surroundings.	Less than Significant	No mitigation measures are required.	Less than Significant
Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	Less than Significant	No mitigation measures are required.	Less than Significant
Agriculture and Forestry Resources			
Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.	Less than Significant	No mitigation measures are required.	Less than Significant
Involve other changes in the existing environment that, due to their location or nature, could result in conversion of farmland to nonagricultural use.	Less than Significant	No mitigation measures are required.	Less than Significant
Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.	Potentially Significant	See Mitigation Measure 4.4-1	Less than Significant
Expose sensitive receptors to substantial cumulative pollutant concentrations.	Less than Significant	No mitigation measures are required.	Less than Significant
Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	Less than Significant	No mitigation measures are required.	Less than Significant
Biological Resources			
Have a substantial cumulative adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by DFG or U.S. Fish and Wildlife Service (USFWS).	Potentially Significant	See Mitigation Measure 4.5-1 through 4.5-8.	Less than Significant
Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	Potentially Significant	See Mitigation Measure 4.5-1 through 4.5-10.	Significant and Unavoidable
Cultural Resources and Tribal Cultural Resources			
The Project would cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to §15064.5.	Potentially Significant	See Mitigation Measure 4.6-1.	Less than Significant
The Project would disturb human remains, including those interred outside of formal cemeteries.	Potentially Significant	See Mitigation Measure 4.6-2.	Less than Significant
The Project would cause a substantial adverse change in the significance of a tribal cultural resource.	Potentially Significant	See Mitigation Measure 4.6-1 and 4.6-2.	Less than Significant

Table 2-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
Energy			
Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.	Less than Significant	No mitigation measures are required.	Less than Significant
Conflict or obstruct a state or local plan for renewable energy or energy standards.	Less than Significant	No mitigation measures are required.	Less than Significant
Geology and Soils			
Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault; ii) Strong seismic ground shaking; iii) Seismic-related ground failure, including liquefaction; or iv) Landslides.	Less than Significant	No mitigation measures are required.	Less than Significant
Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Potentially Significant	See Mitigation Measure 4.8-1.	Less than Significant
Greenhouse Gas Emissions			
Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	Less than Significant	No mitigation measures are required.	Less than Significant
Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Less than Significant	No mitigation measures are required.	Less than Significant
Hazards and Hazardous Materials			
Create a cumulative a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	Less than Significant	No mitigation measures are required.	Less than Significant
Expose people or structures to a significant cumulative risk of loss, injury or death involving wildland fires.	Less than Significant	No mitigation measures are required.	Less than Significant
Hydrology and Water Quality			
Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.	Less than Significant	No mitigation measures are required.	Less than significant
Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.	Less than Significant	No mitigation measures are required.	Less than Significant
Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through addition of impervious surfaces in a manner which would result in substantial erosion or siltation on-or off-site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or offsite; create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted	Less than Significant	No mitigation measures are required.	Less than Significant

Table 2-1
SUMMARY OF PROJECT IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
runoff; or impede or re-direct flood flows.			
Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	Less than Significant	No mitigation measures are required.	Less than Significant
Land Use			
Conflict with Lassen County General Plan or Standish-Litchfield Area Plan.	Less than Significant	No mitigation measures are required.	Less than Significant
Noise			
Result in substantial temporary or permanent increase in ambient noise levels in excess of standards established in the Lassen County General Plan.	Less than Significant	No mitigation measures are required.	Less than Significant
Result in the exposure or persons to or generation of excessive ground borne vibration or ground borne noise levels.	Less than Significant	No mitigation measures are required.	Less than Significant
Transportation			
Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	Less than Significant	No mitigation measures are required.	Less than Significant
Wildfire			
The Project Could Substantially Impair an Adopted Emergency Response Plan or Emergency Evacuation Plan.	Less than Significant	No mitigation measures are required.	Less than Significant
Due to Slope, Prevailing Winds, and Other Factors, the Project Could Exacerbate Wildfire Risks, and Thereby Expose Project Occupants to, Pollutant Concentrations from a Wildfire or the Uncontrolled Spread of Wildfire.	Less than Significant	No mitigation measures are required.	Less than Significant
Require the Installation or Maintenance of Associated Infrastructure (Such as Roads, Fuel Breaks, Emergency Water Sources, Power Lines or Other Utilities That May Exacerbate Fire Risk or That May Result in Temporary or Ongoing Impacts to the Environment.	Less than Significant	No mitigation measures are required.	Less than Significant
Expose People or Structures to Significant Risks, Including Downslope or Downstream Flooding or Landslides, As A Result of Runoff, Post-Fire Slope Instability, or Drainage Changes.	Less than Significant	No mitigation measures are required.	Less than Significant

3.0 PROJECT DESCRIPTION

The purpose of this section is to describe the proposed Project in a useful and comprehensible manner to the public, other organizations, agencies, and decision-makers. CEQA Guidelines §15124 requires a project description to contain:

- A regional map showing the location of the project and a detailed map showing the precise location and boundaries of the project;
- A statement of objectives sought by the project, including the underlying purpose of the project;
- A general description of the project's technical, economic, and environmental characteristics; and
- A statement briefly describing the intended uses of the Environmental Impact Report (EIR), including a list of agencies that are expected to use the EIR in their decision-making, a list of permits and other approvals required to implement the project, and a list of related environmental review and consultation requirements required by federal, State, and local laws, regulations, or policies.

Under CEQA, the Project Description is required to provide general information but not an engineering level of detail. The CEQA Guidelines provide: "The description of the project shall contain the following information but should not supply extensive detail beyond that needed for evaluation and review of the environmental impact.

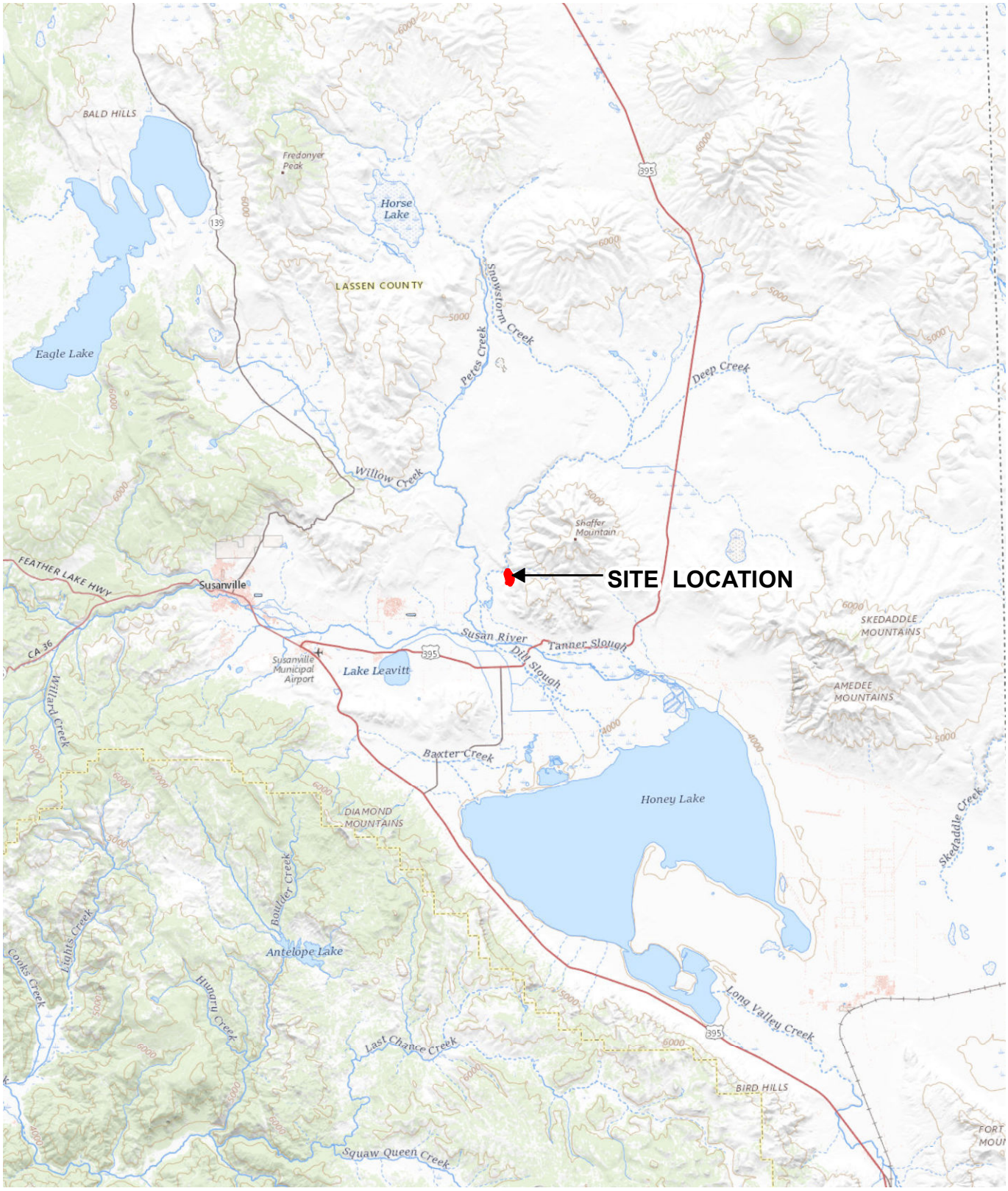
- A general description of the project's technical, economic, and environmental characteristics, considering the principal engineering proposals if any and supporting public service facilities." (CEQA Guidelines §15124[c].)

The information provided in this DSEIR section meets the requirements §15124 of the CEQA Guidelines, and provides a level of detail adequate for public, other organization and agency review and consideration of the proposed Project and the potential environmental impacts associated with Project implementation.

3.1 Site Location

The Ward Lake Quarry is located approximately three miles east of Ward Lake off of Ward Lake Road in Lassen County, approximately four miles east of the California Correctional Center (CCC). The community of Litchfield is located three miles to the southeast and is generally shielded from the site by topography. The City of Susanville is located approximately 14 miles to the west. The quarry is located in Section 32, Township 30 North, Range 14 East, Mount Diablo Base Meridian (MDBM). The latitude and longitude at the center of the site are 40° 24' 52.12' and 120° 25' 2.07', respectively. The general site location is illustrated on Figure 3-1.

Use Permit Amendment No. 2021-003 and Reclamation Plan Amendment No. 2021-001 address changes to the current operation within portions of APN 109-100-059 (historically, APN 109-100-040) and APN 109-100-060 (historically, APN 109-100-042). TNT Enterprises also owns APN 109-100-29, but no mining or other activities are proposed on this parcel.



VESTRA

FIGURE 3-1
GENERAL SITE LOCATION
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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The Project site includes the existing mining boundary as well as the proposed 78.6-acre expansion area located to the north of the existing mining boundary. The total parcel size of APN 109-100-059 is 442 acres, and the total parcel size of APN 109-100-060 is 240 acres. Parcel boundaries are illustrated on Figure 3-2.

The currently disturbed area under Use Permit No. 2018-003 is approximately 138 acres. The Reclamation Plan Amendment adds an expansion of approximately 78.6 acres. The new total area of the mine is approximately 216.6 acres. Parcel boundaries are shown on Figure 3-2. Project site layout is included as Figure 3-3.

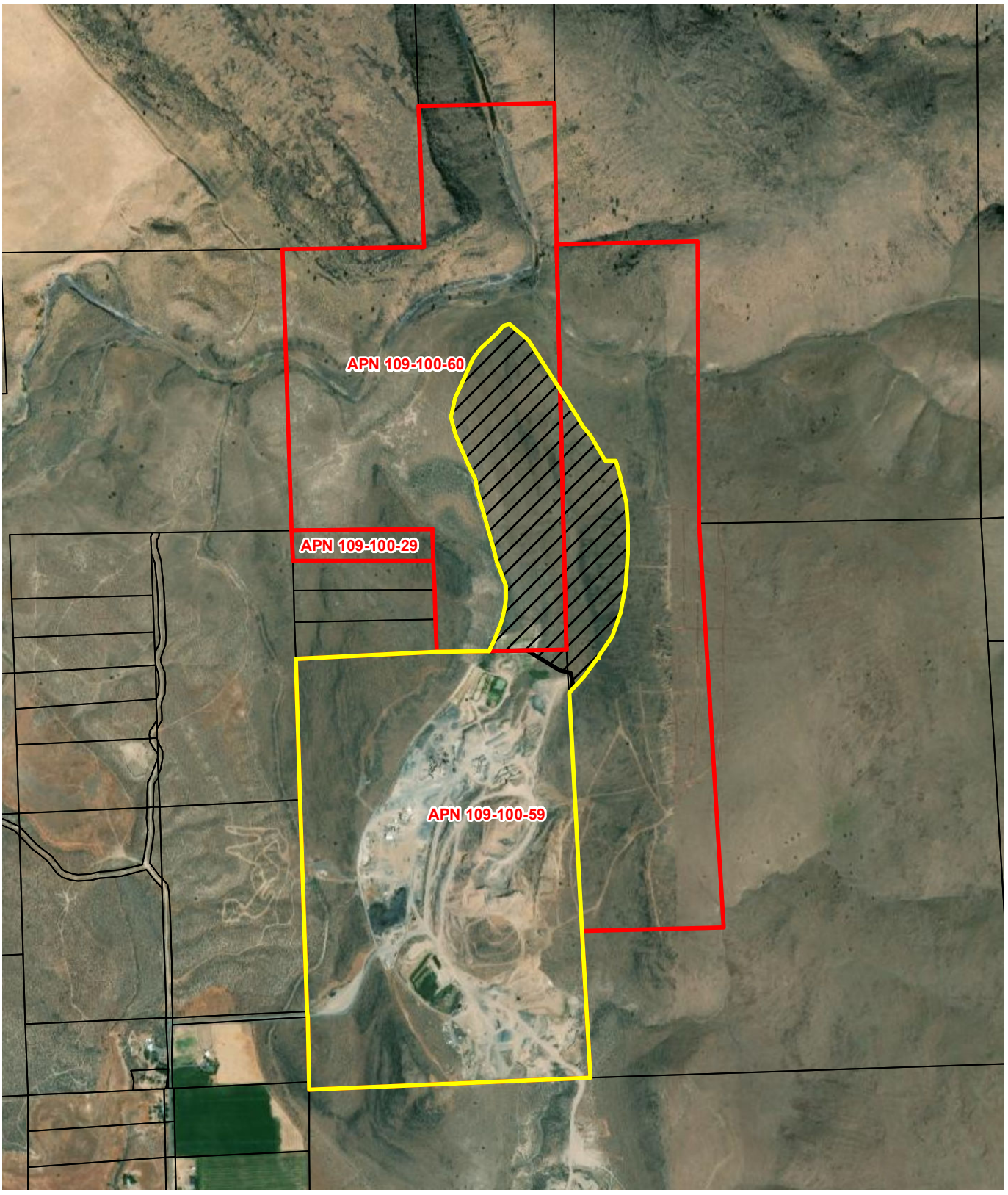
3.2 Project Background

Mining on the Project site began at a small scale in 1980 under a use permit issued to Caltrans. Caltrans had an agreement dated November 1979 with Miller's Custom Work to use materials from the site. In 1981, Miller's Custom Work applied for and was granted an expansion of the operation to include excavation and removal of rock over an 80-acre area and installation of a hot plant for asphaltic concrete processing. The road connecting Ward Lake Road to the site was also approved at this time. An EIR was prepared for that project in May 1981 (SCH No. 80062304).

In 1994, Miller's Custom Work applied for an expansion of the 1981 permitted operation. An Initial Environmental Study/Mitigated Negative Declaration was prepared by the County, the project was approved, and expanded operations began. However, a lawsuit was brought against the applicants and the County by the Maidu Nation and Everd and Iona McCain maintaining, among other items, that the Initial Environmental Study and Mitigated Negative Declaration were inadequate under CEQA and the concrete plant was not a permitted use in an area zoned U-C or Upland Conservation. The Lassen County Superior Court agreed, in part. Related to the inadequacy of the environmental review, the Initial Study and Mitigated Negative Declaration were found to be deficient in two areas: 1) impacts to the deer, and 2) antelope herds and visual impacts. These two issues were the focus of an EIR which was prepared in June 1997. The amendments to the use permit covered in the 1997 EIR included:

- The rezoning of the parcel from U-C (Upland Conservation) to U-C-2 (Upland Conservation/Resource Management District) to allow operation of a ready-mix concrete plant (already onsite and operating within limits imposed by the Superior Court).
- Onsite production of ready-mix concrete added to the use permit as an allowed use.
- Increase in the height of the exposed rock quarry face from the existing +/- 84 feet to a maximum of 150 feet with associated increase in harvest volume from 500,000 cubic yards (cy) to 1,700,000 cy.
- Expansion of the season of operation from seven months (April through October) to year-round as weather permits.

The previous Reclamation Plan was approved for the mining operation, which includes regrading of slopes to no greater than 2H:1V, benching of the quarry face, and revegetation with native plants. During the 1997 amendment process, the quarry operator reduced the operating hours from 24 hours a day to from 6:00 a.m. to 7:00 p.m. The quarry previously operated as needed, 24 hours a day, seven days a week.

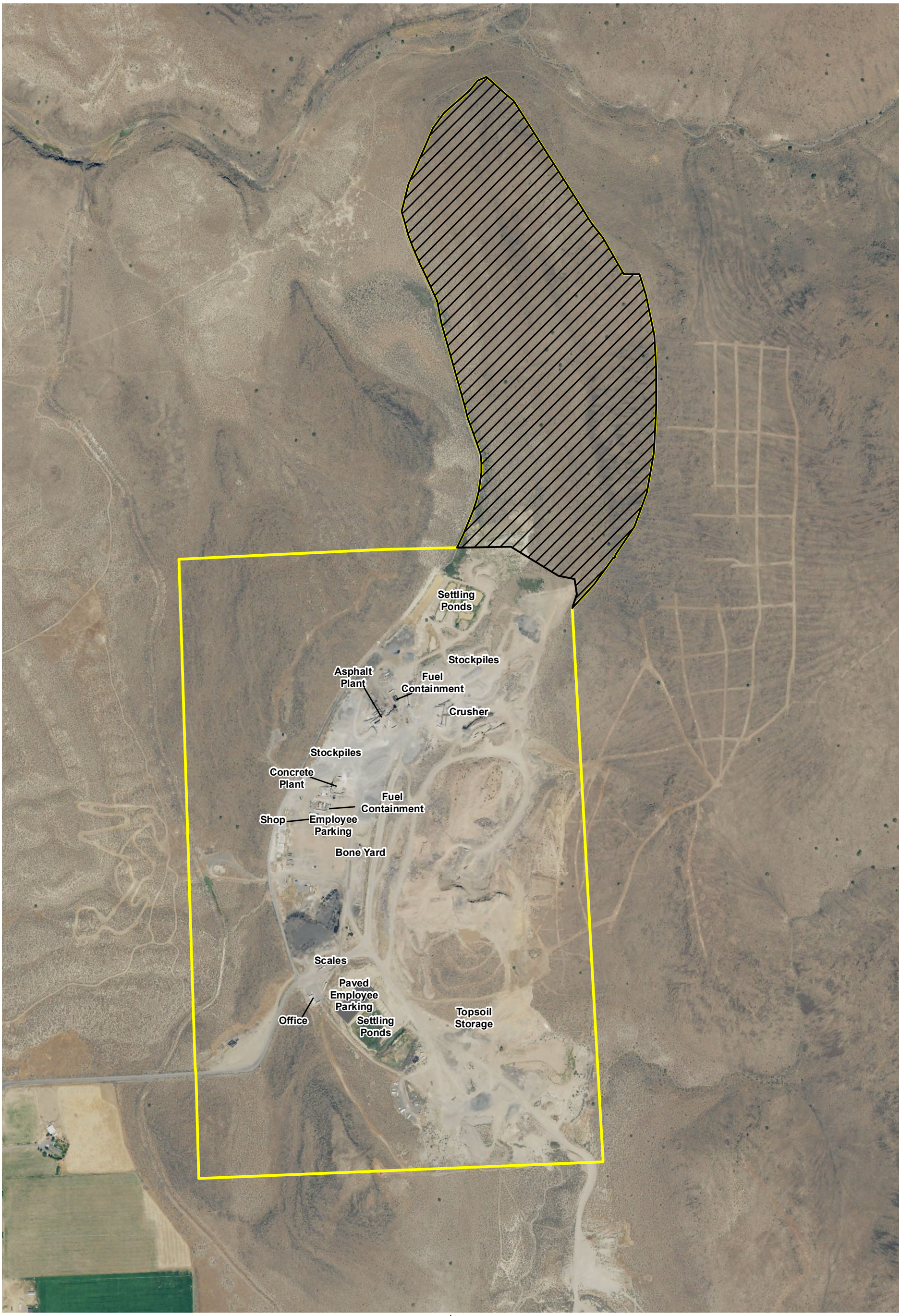


VESTRA

SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH

FIGURE 3-2
PARCEL BOUNDARIES
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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VESTRA

SOURCE: USDA NAIP 2016 AERIAL PHOTOGRAPH

FIGURE 3-3
PROJECT SITE LAYOUT
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

P:\GIS\71305\WardLakeExpansion2020\Figures\2021_EIR\71305_ProjectSiteLayout.mxd

TLT Enterprises, LLC acquired ownership of the quarry in 2011. The quarry was leased to Hat Creek Construction and Materials, Inc., which has operated it since that time. Hat Creek Construction continued operating the Ward Lake Quarry under the original conditions outlined in Use Permit No. 96056 and previous Reclamation Plan No. 94032.

In 2017, Hat Creek Construction filed an amendment to Use Permit No. 96056 to address changes to the operating conditions at the site. Use Permit No. 96056 included:

- Modifying the operating hours to again allow for periods of 24-hour operations. This change was requested to respond to changes in State of California contracting practice requiring nighttime operation on Caltrans projects to minimize daytime traffic impacts;
- Extending the life of the quarry from 2020 to 2030; and
- Increasing the annual volume to be mined per year to over 100,000 tons if responding to emergency situations.

A Subsequent EIR was completed for Use Permit Amendment No. 2018-003 and approved on May 14, 2019. Although the Reclamation Plan for the site was not a primary issue and no reclamation plan amendment was submitted, the operating conditions at the site were incorporated by reference by the County into approval of Reclamation Plan Amendment No. 2018-001. No other portion of the Reclamation Plan was amended at that time.

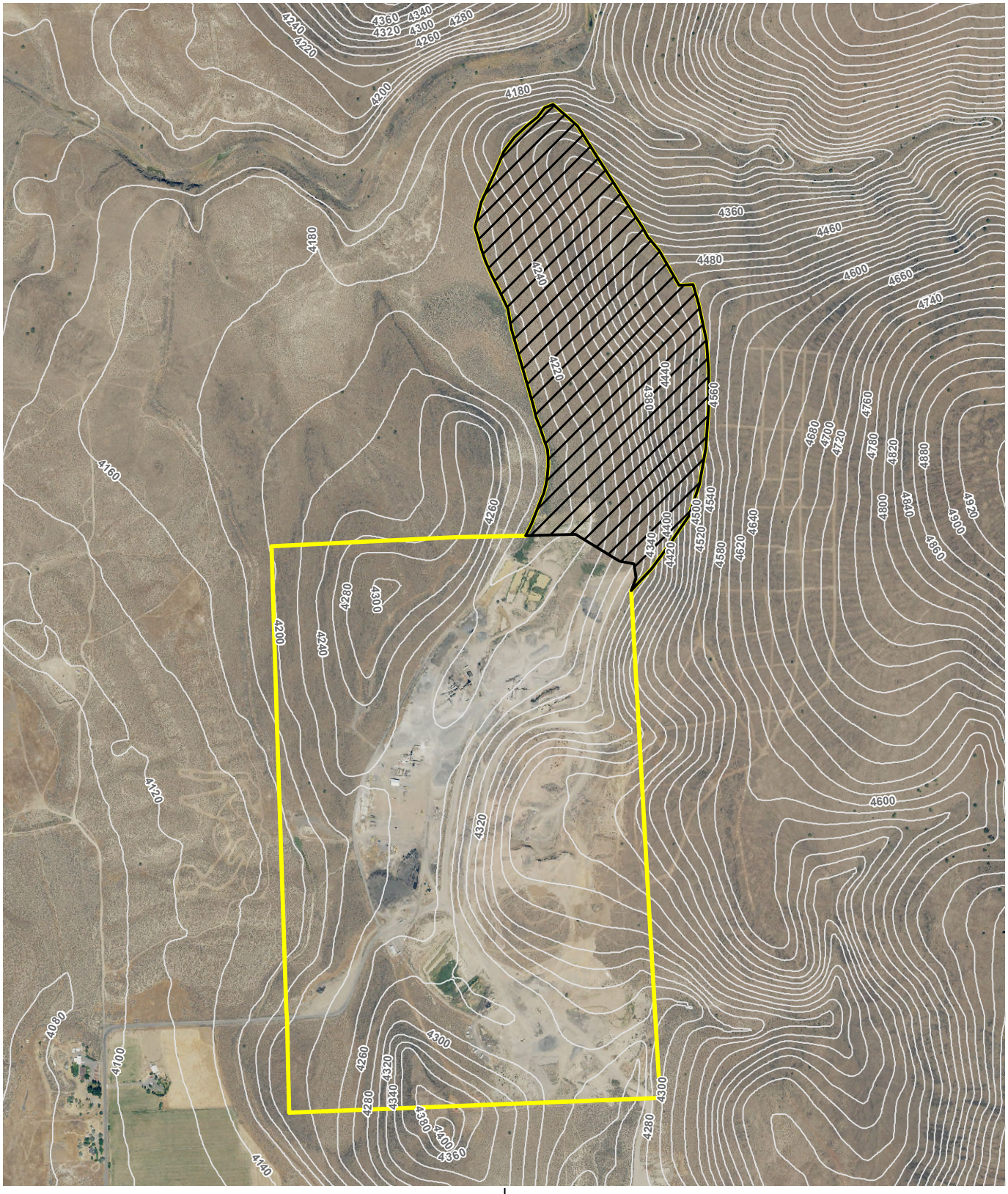
3.3 Environmental Setting

Topography

The proposed Project site is located on the southwestern side of Shaffer Mountain. Topography generally slopes from east to west with gentle to moderate slopes. Prior to mining activities, the site was characterized by a small knob rising approximately 200 feet from the current base of operations. The flat areas at the site (0 to 4 percent slopes) are used for crusher, asphalt, and stockpiles sites and steeper areas (over 16 percent slopes) are utilized for material excavation. The existing topography of the site is illustrated on Figure 3-4.

Hydrology and Water Quality

There are no existing streams or bodies of water within the boundaries of the proposed Project site. In addition, the site is not within a 100-year floodplain. There are no existing streams or bodies of water within the existing mining area or boundaries of the proposed expansion area. Drainage in the proposed expansion area occurs as sheet flow to the west and hence to an intermittent unnamed tributary to Secret Creek. Secret Creek is an intermittent stream located north of the proposed expansion area which eventually discharges into Willow Creek. The Eagle Lake Ditch is located approximately 375 feet west of the site and Ward Lake is located approximately 0.5 miles west of the site. Willow Creek is located approximately 1 mile west of the site and the Susan River is approximately 2 miles south of the site. Regional surface hydrology is illustrated on Figure 3-5.

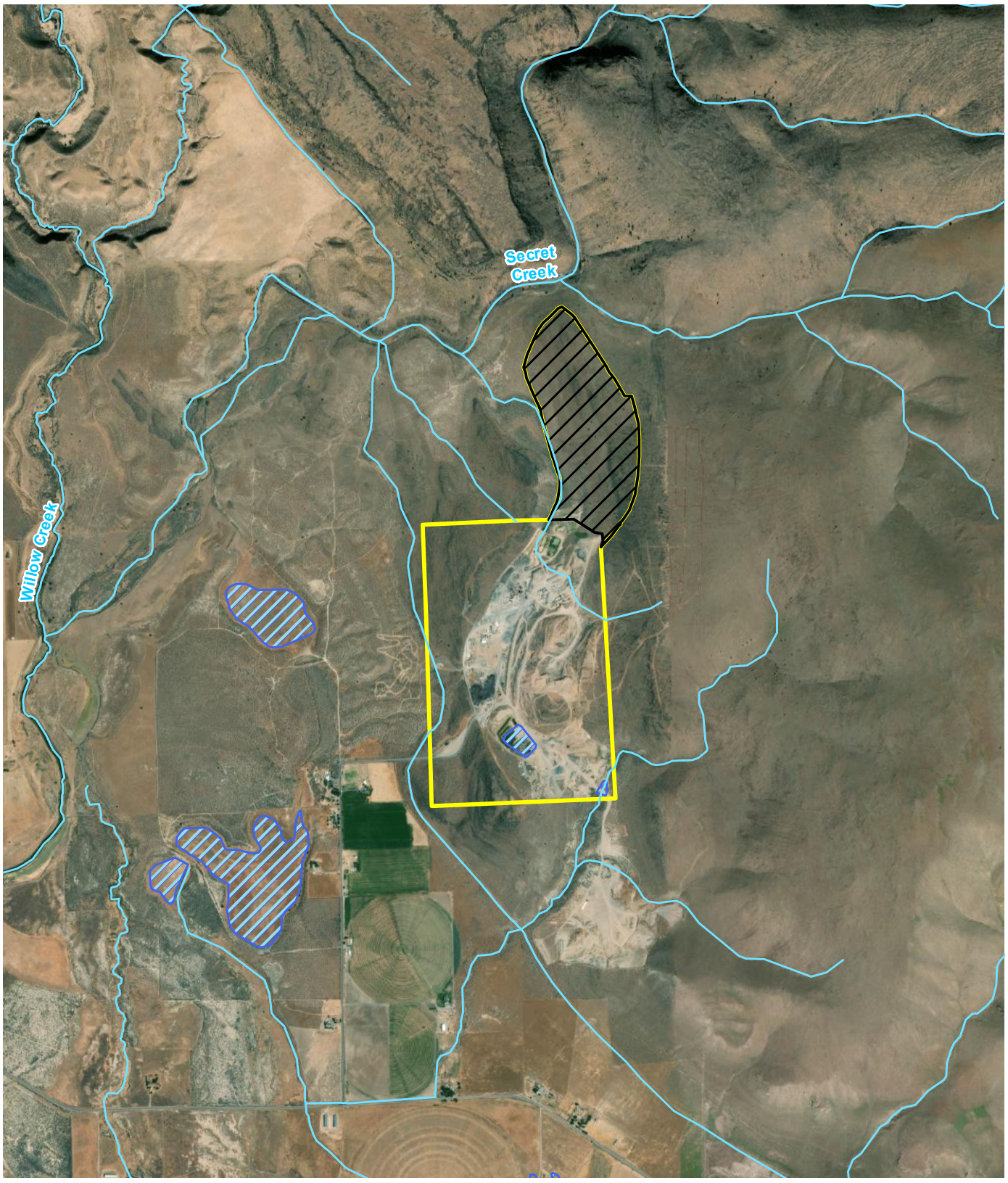


VESTRA

SOURCE: USDA NAIP 2016 AERIAL PHOTOGRAPH; USGS 10-METER DEM

FIGURE 3-4
DEM TOPOGRAPHY
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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Watercourse
Project Site
Proposed Expansion Area
Waterbody

VESTRA

0 1,000 2,000 4,000 Feet

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH; USGS 2014

FIGURE 3-5
HYDROLOGY
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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The existing quarry site is composed up of mostly fractured and weather rock; therefore, the site is pervious and a majority of stormwater infiltrates. Concentrated flows are observed only during heavy rain events. These flows are contained and slowed by berms and benches and ultimately directed into settling basins. The existing mining area of the site does not discharge stormwater and received a Notice of Non-Applicability (NONA) under *Order 2014-0057-DWQ General Permit for Stormwater Discharge Associated with Industrial Activities* in 2015.

The proposed Project site is located within the Honey Lake Valley Groundwater Basin, which has been identified as a "low priority basin" by the Department of Water Resources (DWR), signifying that it is not currently at risk for overdraft. Within this basin, *Bulletin 118* estimates the total volume of water stored in the upper 100 feet of saturated basin-fill deposits and volcanic-rock aquifers to be 10 million acre-feet. Estimates of groundwater extraction for agricultural, municipal, and industrial, and environmental wetland uses are 51,000, 15,000, and 3,800 acre-feet, respectively. Deep percolation from agricultural-applied water is estimated to be 14,000 acre-feet.

The predominant source of groundwater recharge of the mine area is percolation through the soil and weathered bedrock into the subsurface. Present mining operations have not encountered groundwater. The proposed additional mining area is currently higher in elevation than the current mining operation. The quarry floor as proposed will remain at a higher elevation than the current quarry.

One onsite groundwater well is used by the current operation for wet suppression of onsite dust. The applicant estimates up to six truckloads of water are currently used per day (4,000 gallons/load) during daytime operations with an average of 4 to 5 loads per day, amounting to approximately 38.3 acre-feet per year. As seen in the groundwater levels for monitored wells in the Project area, found in the DWR Water Data Library, there is currently no trend or pattern indicating overdraft in the basin.

Geology and Soils

The Project site is located on the margin of the Cascade Range and the Basin and Range geologic/geomorphic provinces of California. The Cascade Range province extends from the northern end of the Sierra Nevada north to the Canadian border. In the Project vicinity, the Cascade Range province is bounded to the west by the Klamath Mountain province, to the east by the Basin and Range province, to the south by the Sierra Nevada province, and to the north by the Cascade Range extending through Oregon and Washington.

The Cascade Range province consists of a north-northwest-trending, relatively linear belt of active and dormant strata and shield volcanoes. The regional geologic conditions are dominated by andesitic, rhyolitic, and andesitic volcanic rocks mantled with surficial deposits consisting of pyroclastic rocks, lahar deposits, alluvium, and local lacustrine sediments (Hinds, 1952).

The Basin and Range province is characterized by interior drainage with lakes and playas, and the typical horst and graben structure (subparallel, fault-bounded ranges separated by down-dropped basins). In these basins, moderate to extensive thicknesses of lacustrine (lake) and alluvial deposits are present.

The site is underlain by Quaternary-age terrace deposits and Pleistocene-age volcanic rocks (Grose et al. 2013; Lydon et al. 1960). The terrace deposits are near-shore emergent lacustrine deposits associated with the ancestral Lake Lahontan, which covered most of the Project region (Grose, et al. 2013). The volcanic rocks consist of interlayered basalt, andesite, and rhyolite tuff and flows labeled the Andesite Flows and Pyroclastics of Litchfield (Grose et al. 2013). Surface geology is illustrated on Figure 3-6.

The Holocene-active Honey Lake and Warm Springs Valley faults have been mapped in the Project region, with the Project site being north of the mapped trend of the Warm Springs Valley fault. Both the Honey Lake and Warm Springs faults exhibit right-lateral displacement and are significant faults within the Walker Lane fault zone (Wills, 1990). The Honey Lake fault is about 35 miles long and capable of generating a MW 7.0 earthquake (USGS, 2020b). The Warm Springs Valley fault is about 24 miles long and capable of generating a MW 6.8 earthquake (USGS, 2020b).

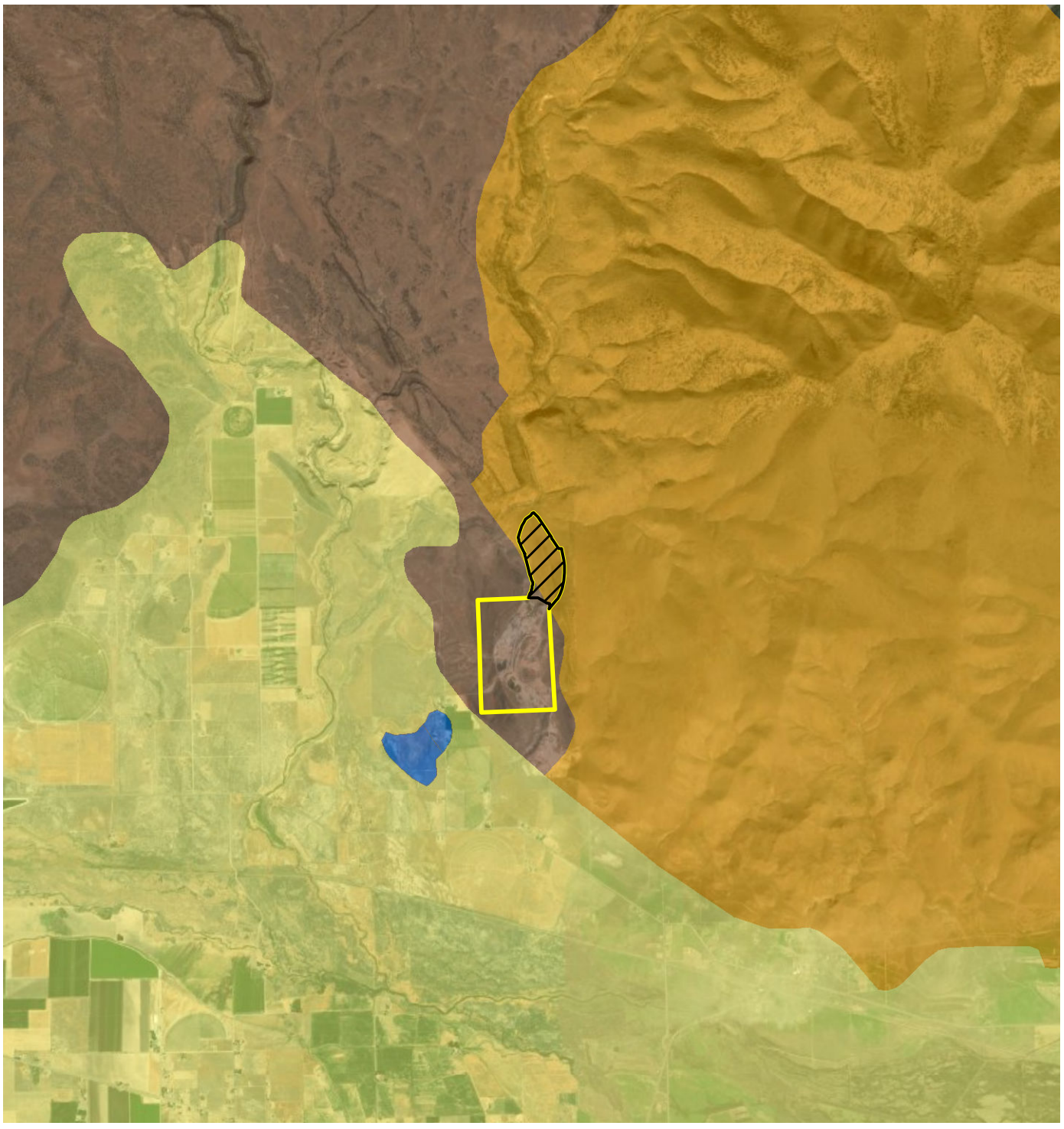
The Honey Lake fault is located about 7 miles southwest of the Project site. The Warm Springs Valley fault is mapped about 13 miles south of the site. The State's fault location maps do not show the Warm Springs Valley fault projecting north of Honey Lake; however, lineations mapped from aerial photographs of the region and observed faulting within the existing quarry area and north through the quarry expansion area with a trend that is coincident with the Warm Springs fault.

The quarry site is not within a special studies zone associated with the Alquist-Priolo Earthquake Fault Zoning Act (AP). Thermal wells and springs exist in the Wendel and Susanville areas; however, there are no known thermal wells or springs on the Project site or adjacent lands.

According to the Natural Resource Conservation Services (NRCS) Web Soil Survey, soils at the Project site are comprised on Devada-Rock outcrop association (2 to 50 percent slopes; non-irrigated land capability class 7e; no specified irrigated land capability classification), Orhood very stony sandy loam (5 to 15 percent slopes; non-irrigated land capability class 7s; no specified irrigated land capability classification), McConnel-Mottsville complex (2 to 9 percent slopes; non-irrigated land capability class 6e), and Fivesprings-Longcreek association (9 to 30 percent slopes; non-irrigated land capability class 7s; no specified land capability classification). These soils are listed by the NRCS as well drained to excessively drained, with no flooding or ponding concerns. Existing onsite soils are illustrated on Figure 3-7.

Biota

The proposed expansion area consists mainly of shrub communities including sagebrush, bitterbrush, and rabbitbrush that are used as forage for several bird species including sage grouse, chukar, Swainson's hawk, golden eagle, and a variety of other nongame birds and mammals. The area is also located within mule deer and winter range of the Horse Lake deer herd as well as resident and wintering pronghorn antelope herds. The proposed quarry expansion area contains several dirt roads as well as a small excavation in the center of the expansion area.



Proposed Expansion Area

Project Site

Q: Quaternary alluvium and marine deposits (Pliocene to Holocene)

Qv: Quaternary volcanic flow rocks, unit 1 (Cascade volcanic field) (Quaternary)

Tv: Tertiary volcanic flow rocks, unit 17 (Cascade Range)

Water

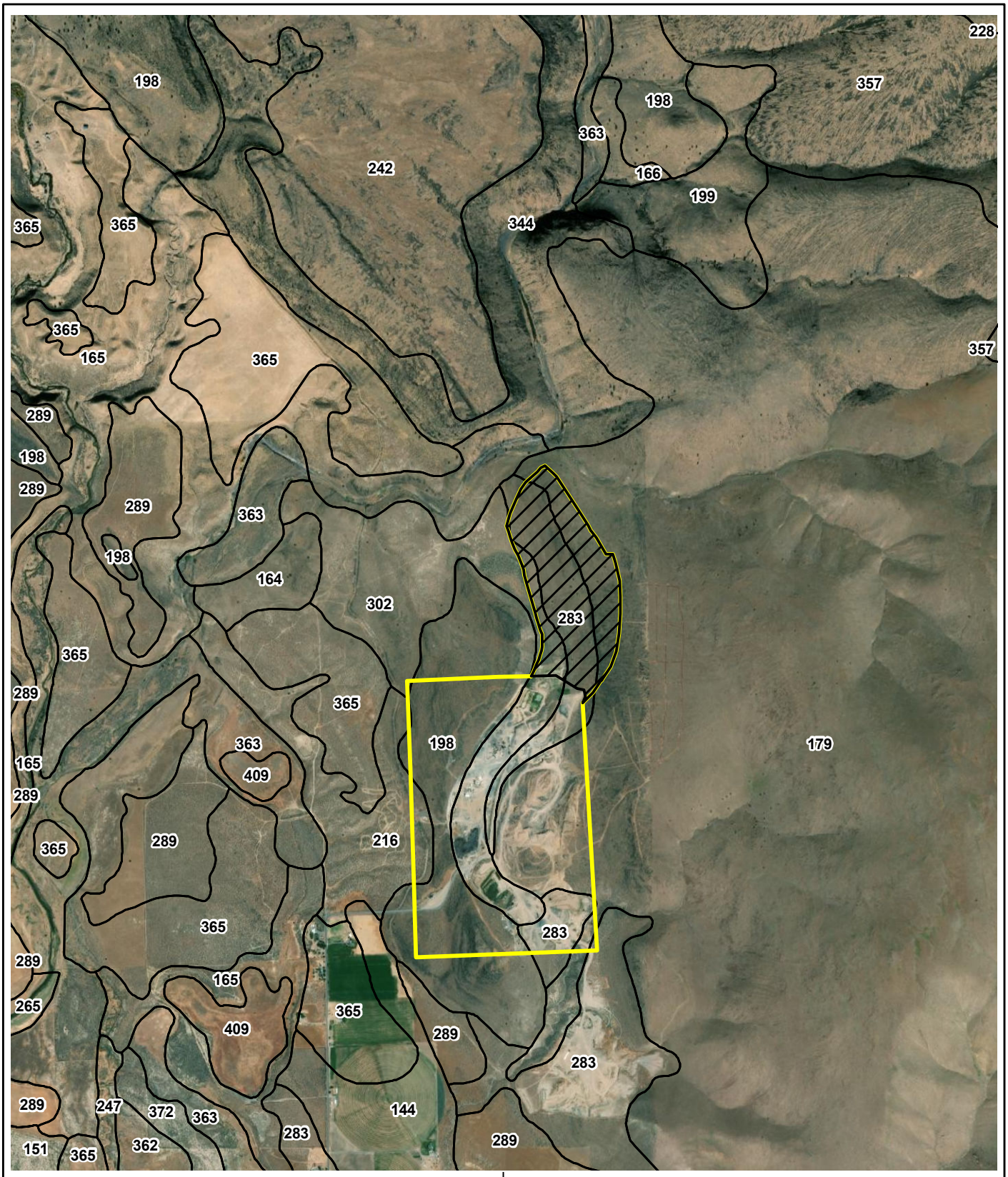
VESTRA

0 0.5 1 2 Miles

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH; USGS 2014

FIGURE 3-6
GEOLOGY
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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Proposed Expansion Area

Project Site

Soil Map Unit

0 1,000 2,000 4,000 Feet

VESTRA

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH; USGS 2014

FIGURE 3-7
SOILS
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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The dominant habitat type identified through the California Wildlife Habitat Relationships (CWHR) classification is sagebrush (Mayer and Laudenslayer 1988). Sagebrush habitat is usually large, open, and often discontinuous and stands are usually dominated by big sagebrush (*Artemisia tridentata*). This habitat occurs over a range of middle and high elevations.

Sagebrush is often mixed with other similar shrub species, such as rabbitbrush (*Chrysothamnus* spp.), horsebrush (*Tetradymia* spp.), and bitterbrush (*Purshia* spp.). In some places, stands may have an understory of perennial grasses and forbs.

Special-status species identified by California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS), and CWHR database searches and literature review were evaluated for their potential to occur within the Project area. No special-status plant or wildlife species were identified within the proposed expansion area during field surveys. Potential for occurrence was based on habitat requirements and proximity to known recorded occurrences of a species.

The potentially occurring species that were generated through desktop review were assessed based on the actual observed habitat types onsite. The assessment found that the following species have the potential to occur and require further discussion.

- Golden eagle (*Aquila chrysaetos*)
- Northern harrier (*Circus cyaneus*)
- Swainson's hawk (*Buteo swainsoni*)
- Greater sage-grouse (*Centrocercus urophasianus*)
- Burrowing owl (*Athene cunicularia*)
- Long-eared owl (*Asio otus*)
- Short-eared owl (*Asio flammeus*)
- Loggerhead shrike (*Lanius ludovicianus*)
- Gray wolf (*Canis lupus*)
- American badger (*Taxidea taxus*)
- Pallid bat *(Antrozous pallidus)*
- Townsend's big-eared bat *(Corynorhinus townsendii)*
- Pygmy rabbit (*Brachylagus idahoensis*)
- White-tailed jackrabbit (*Lepus townsendii townsendii*
- Ornate dalea (*Dalea ornata*)
- Spiny milkwort (*Polygala subspinosa*)
- Susanville beardtongue (*Penstemon sudans*)

Archaeological and Historical Resources

An archaeological study conducted in 1980 included in the 1981 EIR prepared for the Project site (ECO, 1980) noted that the site is located in an area which was likely used by members of two bordering tribes: The Northeastern Maidu and the Northern Paiute. The site is also near the Nobles' Road Trail established in 1852 and passing just south of Shaffer Mountain. The 1980 study found no cultural or historical resources located within the existing mining area.

An additional archaeological survey was completed for the 78.6-acre expansion area in September 2020. One cultural resource and two isolated finds were identified within the proposed expansion area (refer to Section 4.6, *Cultural and Tribal Cultural Resources*).

Surrounding Land Use

The site is surrounded by open grazing lands, generally zoned U-C (Upland Conservation District), and designated in the *Standish-Litchfield Area Plan* as "Extensive Agriculture." Immediately adjacent to and south of the site, a smaller aggregate mine is located on Bureau of Land Management (BLM)-administered land. Other BLM land is located to the east and south and the Wells Ranch is located directly to the north.

Land use adjacent to the current operation boundaries are defined by the *Lassen County General Plan Land* as "Agricultural Residential" to the west, "Extensive Agriculture" to the north, and "Open Space" to the south and the east. Zoning designations adjacent to the current operations is O-S (Open Space District) to the south and east, U-P-A-C (Upland Conservation/Agricultural Preserve Combining District) to the north, and A-2-B-20-A (Agricultural Residential 20-Acre Building Site, Agricultural Combining District) to the west.

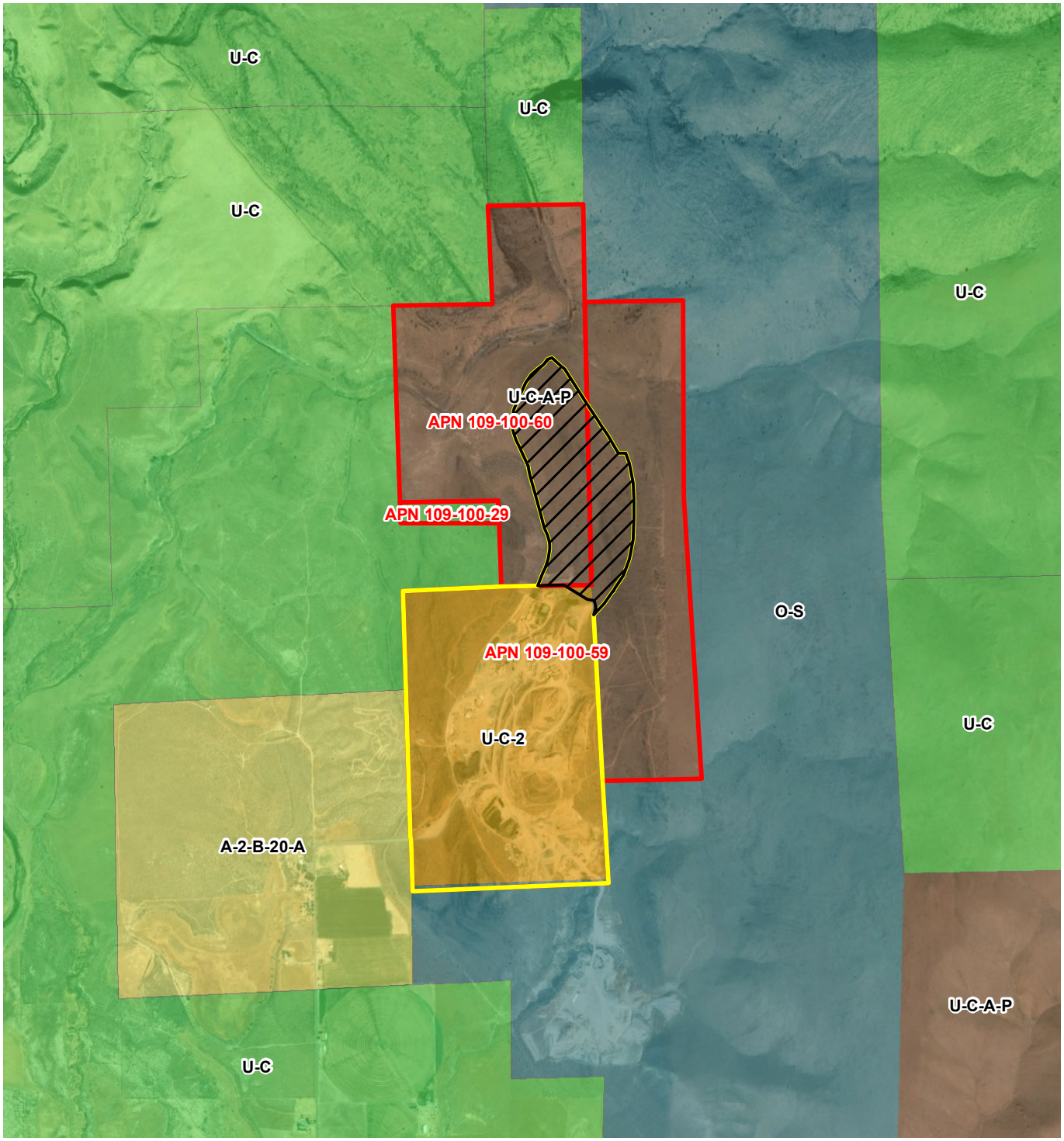
The General Plan land use designations for properties adjacent to the proposed expansion area are "Extensive Agricultural" to the west, "Open Space" to the north and east, and "Mountain Resort/Belfast Initiative Area" to the north and west. The zoning designations for the adjacent parcels are U-P (Upland Conservation District) to the west and O-S (Open Space) to the south, east, and north. Refer to Figure 3-8 and Figure 3-9 for a depiction existing zoning and General Plan land uses.

Twelve residences are located within one mile of the existing quarry. The nearest residence occurs approximately 470 feet from the west property line of the existing quarry and was constructed in approximately 2007. The nearest residence to the proposed expansion area (the same home) is approximately 4,500 feet to the south. Nearby residences are illustrated on Figure 3-10 and adjacent property ownership is illustrated on Figure 3-11.

Existing General Plan and Zoning

The proposed Project site is located in Lassen County and within the area covered by the *Standish-Litchfield Area Plan*. The Standish-Litchfield planning area extends from the north shore of Honey Lake to the toe slopes of Shaffer Mountain. The portion of the Project site currently used for mining and processing operations is zoned U-C-2 (Upland Conservation/Resource Management District).

The two expansion parcels (APN 109-100-59 and APN 109-100-60) are designated as "Extensive Agriculture" by the *Lassen County General Plan*. APN 109-100-59 is zoned U-C-2 (Upland Conservation/Resource Management District), and APN 109-100-60 is zoned U-C-A-P (Upland Conservation/Agricultural Preserve Combining District). Current zoning and General Plan land use are illustrated on Figures 3-8 and 3-9, respectively.



Project Site

Proposed Expansion

Approximate Parcel Boundary

A-2-B-20-A (Agricultural Residential District/Building Site Combining District/Agricultural Combining Districts)

O-S (Open Space District)

U-C (Upland Conservation District)

U-C-2 (Upland Conservation/Resource Management District)

U-C-A-P (Upland Conservation District/Agricultural Preserve Combining District)

N

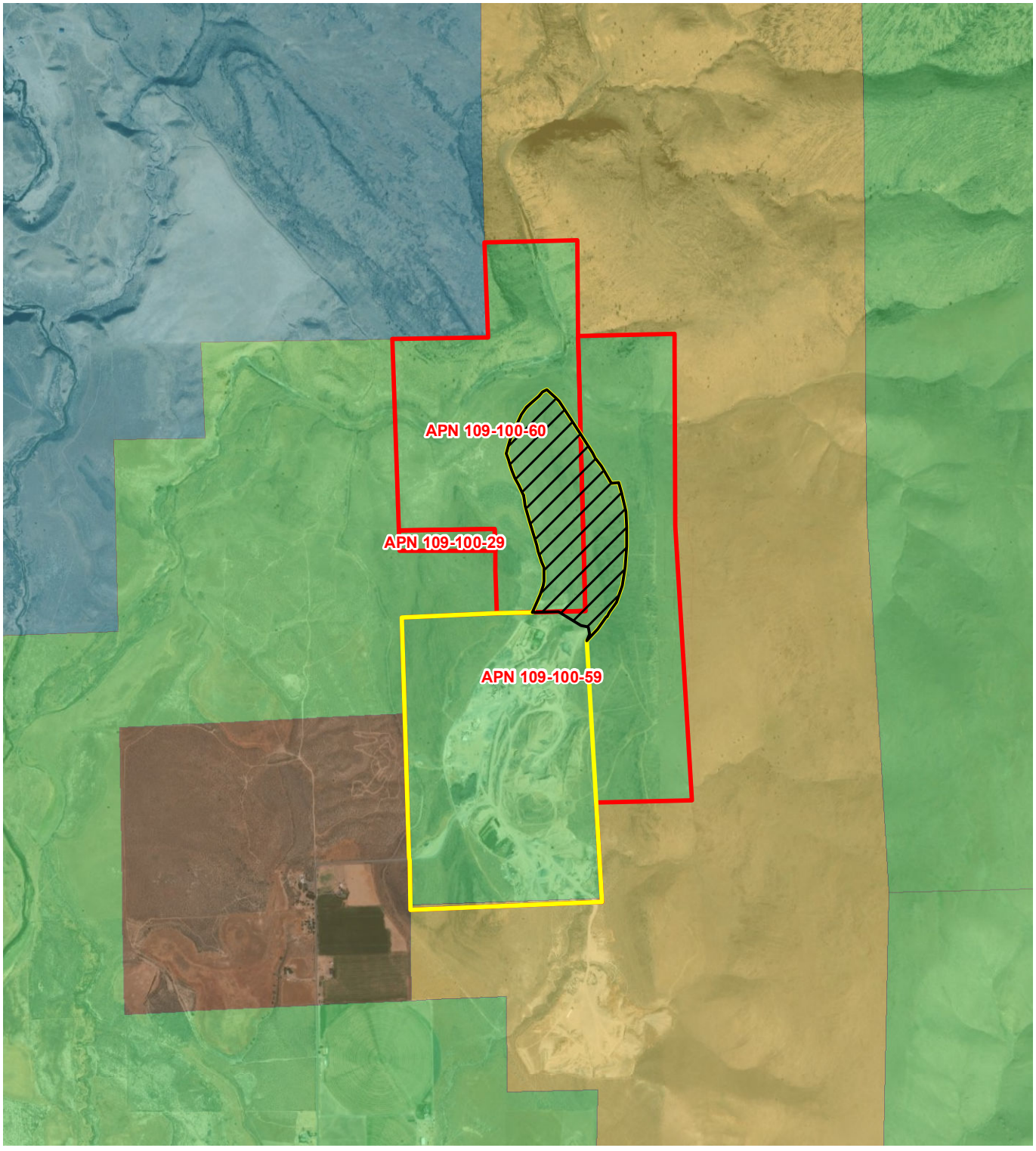
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0 1,000 2,000 4,000 Feet

SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH; LASSEN COUNTY 2018

FIGURE 3-8
ZONING
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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Project Site

Proposed Expansion Area

Approximate Parcel Boundary

Agricultural Residential

Extensive Agriculture

Mountain Resort ("Belfast Initiative Area")

Open Space (Public Lands)

N

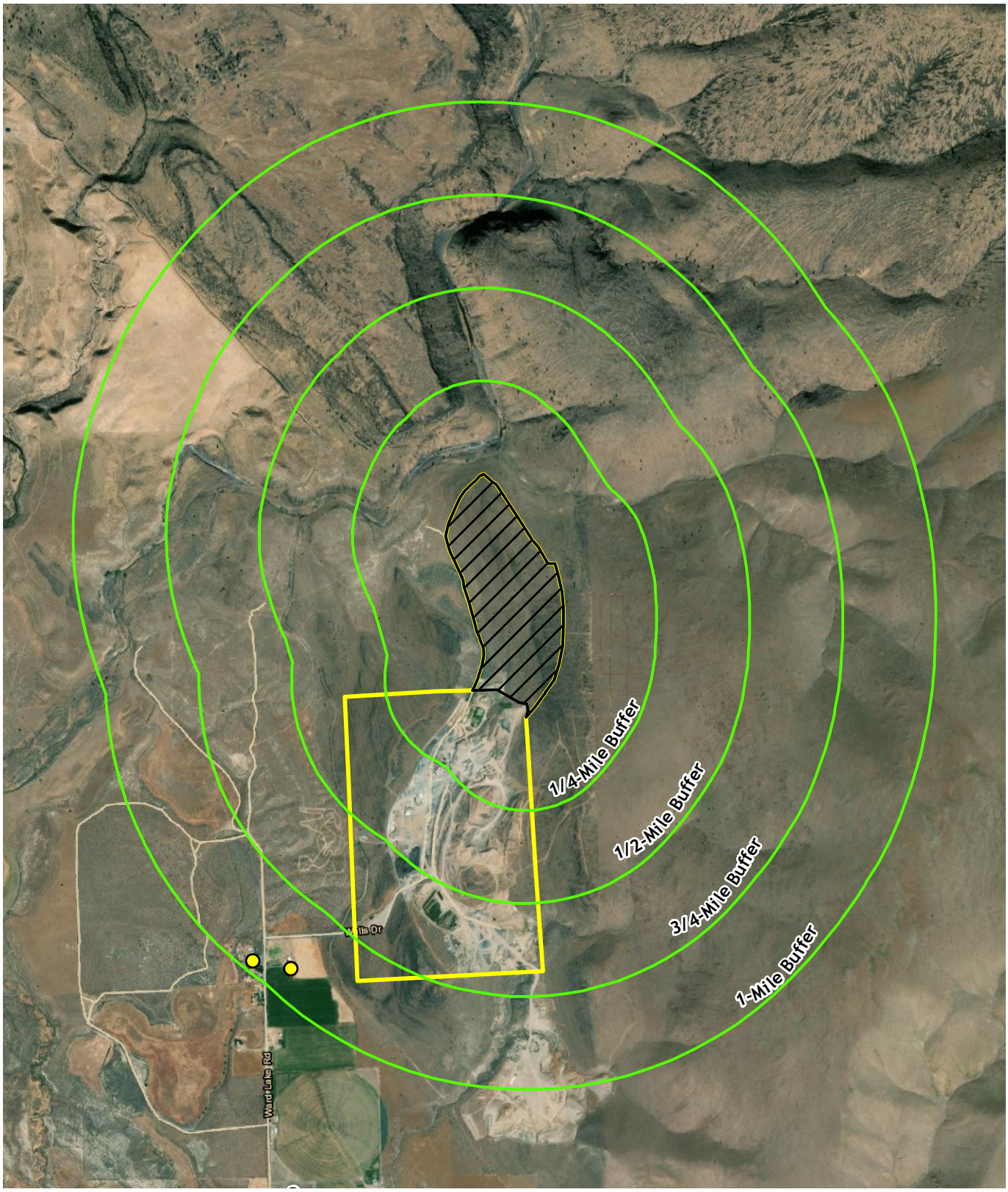
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0 1,000 2,000 4,000 Feet

SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH; LASSEN COUNTY 2014

FIGURE 3-9
GENERAL PLAN LAND USE
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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VESTRA

SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH

FIGURE 3-10
NEARBY RESIDENCES
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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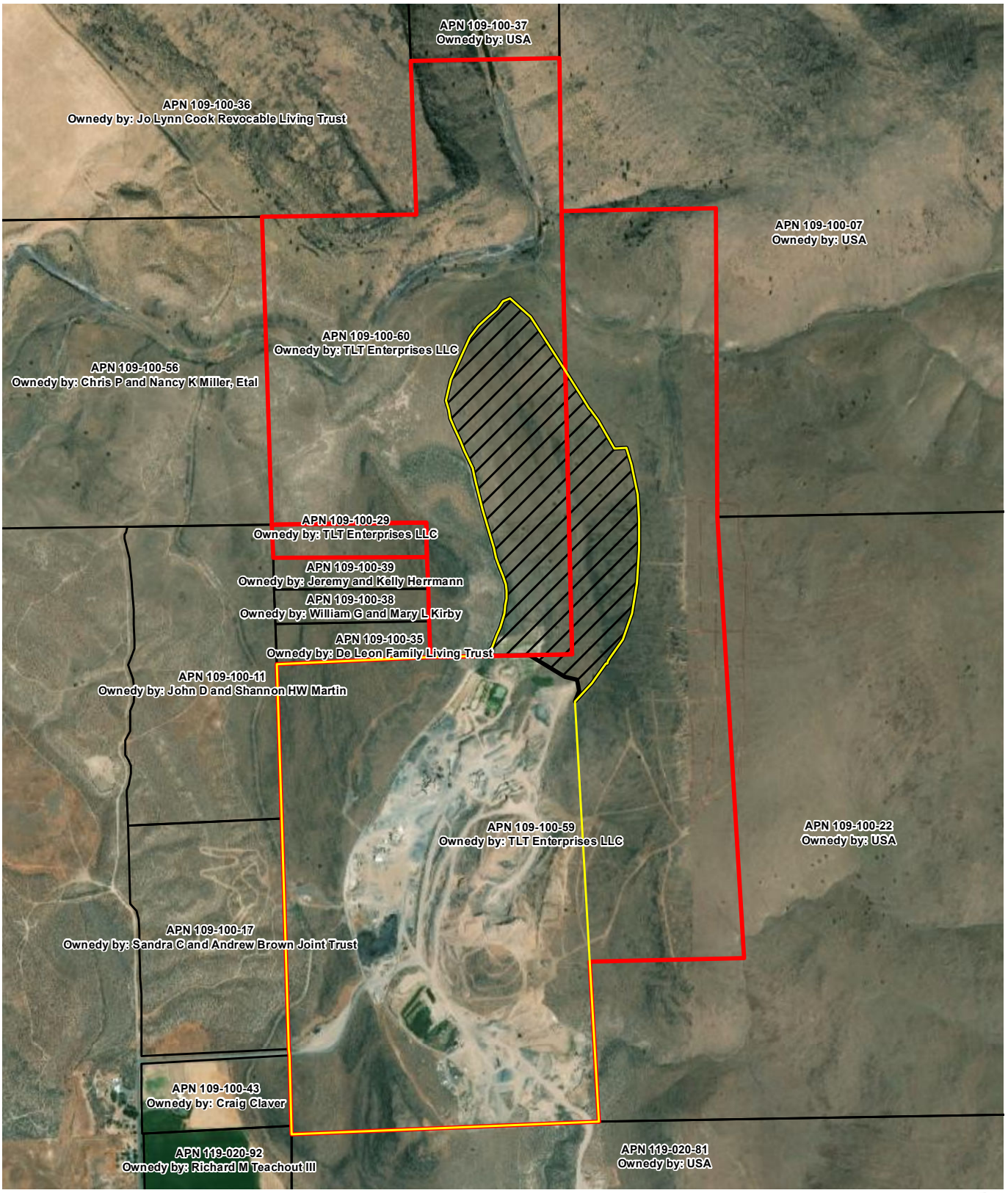


FIGURE 3-11
ADJACENT LAND OWNERS
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH; CNDDB AUGUST 2020

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3.4 Existing Baseline Operations

The mining operation currently operates under Lassen County Use Permit No. 2018-003 and Reclamation Plan No. 2018-001, adopted in May 2019; Lassen County Use Permit No. 96056, adopted in September 1997; and Reclamation Plan No. 94032, adopted in July 1994.

The surface mining operation is presently permitted for the mining of rock, crushing, screening, washing, material stockpiling, fuel storage; operation of a cement plant (12,000-cubic-yard annual limit) and asphalt plant; and the use of settling ponds, scales, an office, and a truck shop.

Grading, excavating, and blasting are prohibited onsite between January 1st and March 31st, except in a state of emergency as declared by the Local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville. The detonation of explosives is prohibited between the hours of 6:00 p.m. and 7:00 a.m. year-round.

Materials produced at the site include asphalt, concrete, various sizes of crushed rock, and crushed base rock which are used as construction materials. The materials at the site have been evaluated both by an independent testing laboratory and the California Department of Transportation (Caltrans) with test results indicating superior material not commonly found in the region. The quality of the resources and choice location to the existing and potential market aggregates and paving materials were the determining factors in choosing the site for the planned operations in 1981.

Existing Hours of Operation

The current use permit allows for six days a week, 24-hour operations, with the exception of January 1st to March 31st when no 24-hour operations may occur. The quarry typically operates 10 hours per day, five days a week, with maximum operations of 24 hours per day, six days a week.

Existing Mining Area

The mining area of the current operation is 160 acres. Approximately 138 acres of the mining area are currently disturbed.

Existing Site Life

Under Lassen County Use Permit Amendment No. 2018-003 and Reclamation Plan Amendment No. 2018-001, the end date of mining for the operation is 2030.

Existing Volume Removal

The Ward Lake Quarry is permitted to remove 100,000 tons of material per year. The actual amount removed varies by year and product demand. In order to respond to emergency projects, the annual removal volume could exceed 100,000 tons.

Existing Equipment and Truck Volume

Equipment onsite includes a hot mix asphalt plant, lime slurry mix plant, a concrete plant, crushing plant, wash plant, sand plant, and generators. Off-road equipment including loaders, excavators, haul trucks, and a dozer are used for mining operations as well. Truck volumes for the operation are limited by Condition #8 of Use Permit No. 2018-003 as follows:

8. *Haul trucks (loaded or empty) associated with the mining operation shall not exceed a daily average of 26 round trips (26 arriving and 26 departing) throughout the calendar year and shall not exceed a daily maximum of 275 round trips (275 arriving and 275 departing), with a maximum of 173 total trips occurring between the hours of 10:00 p.m. and 7:00 a.m., excluding personal employee vehicles and light-duty trucks assigned to employees.*

Existing Truck Distribution

Truck traffic to and from the site is currently distributed with 60 percent of truck traveling to and from the site using Center Road West of Ward Lake Road and 40 percent of trucks using Center Road east of Ward Lake Road for travel to and from the site. During 24-hour operations, trucks are routed to not pass through the community of Litchfield on Center Road at night during 24-hour operations of the Project. Truck traffic traveling to and from the site does not use Center Road east of Ward Lake Road between the hours of 6:00 p.m. and 7:00 a.m. During these hours, all trucks head east on Highway 395, turn west on Center Road from Ward Lake Road, then turn south on Leavitt Lane to access Highway 395. Trucks traveling to the site from Highway 395 east of Litchfield turn north onto Leavitt Lane and then east on Center Road to access the Project site. No Jake brakes are permitted during nighttime hours.

Resolution No. 97-067 Operating Conditions

On September 23, 1997, Board of Supervisors Resolution No. 97-067 was adopted to approve Use Permit No. 96056 and certify the Final Environmental Impact Report. The resolution contained conditions of approval for the current mining operation:

13. *The following reclamation shall be required and, when different or in addition to the provisions of the approved reclamation plan, said reclamation plan shall be amended by application:*

    Reclamation of graded areas. The intent of the Reclamation Plan shall be to recreate to the extent possible a viable, self-sustaining plant community similar to that which existed prior to mining as follows:

    Sand and Gravel Excavation Areas: These areas shall be regraded to maximum slopes of 2H:1V, shall be resoiled with adequate growth medium to support vegetation including fines from the crusher and stockpiled topsoil and shall be vegetated with native species including sage, bitterbrush, and rabbit brush. The success of revegetation in these areas shall be monitored by qualified personnel with reports submitted to the County Community Development Department at least once per year for five years. The final approved species list and planting density must be approved by the County in consultation with the Department of Fish and Game.

    Rock Quarry Area: This area shall be regraded to a maximum overall slope of 2H;1V and shall be benched with minimum 10 foot wide benches at vertical intervals appropriate for the type of material, but

not greater than 15 feet. The benches shall be sloped to drain toward the hillside, shall be resoiled with adequate growth medium to support vegetation including fines from the crusher and stockpiled topsoil and revegetated using native range grasses shrubs, and trees if they can be supported.

The operator shall institute a test plot program on the first available rock face bench to determine the best species mix and planting scheme for subsequent benches. The test plots shall be set up and monitored by qualified personnel with reports submitted to the County Community Development Department at least once per year for five years. The final approved species list and planting density must be approved by the County in consultation with the Department of Fish and Game.

Timing/Phasing of Reclamation: Reclamation of sub-areas shall take place in a phased manner where possible as excavation is completed.

Protection of Replanted Areas: Replanted areas shall be protected by fencing or other approved method intended to exclude livestock and deer until vegetation is established Perimeter livestock fencing shall be provided and shall be four wires maximum, bottom wire smooth and no closer than 18 inches to the ground with total fence height not to exceed 42 inches. More site-specific deer proof fencing shall also be provided directly around replanting areas.

14. *The approved reclamation plan for the project, and any future amendments thereto, is hereby incorporated into this use permit. Adherence to the provision of the approved reclamation plan, and any County-approved amendments thereto, is hereby made a condition of approval.*

15. *Topsoil (the top surface layer supporting vegetation) shall be scraped and salvaged concurrent with mining, stockpiled and protected from erosion, and shall be re-applied to disrupted surfaces, to promote revegetation and slope stability upon reclamation.*

16. *At a minimum, wet suppression shall be used to control dust at all times from excavation, processing activities on haul roads.*

17. *The disturbed portion of the site, including quarry highwall benches, shall be revegetated with native and/or compatible species per the approved reclamation plan.*

18. *Onsite fuel tanks shall be placed and kept in impermeable containment structures capable of holding at least 110 percent of the tank capacity pursuant to the County's aboveground fuel storage standards.*

19. *The operator will participate in the County's mine permit administration and monitoring program by submitting annual fees pursuant to County Code Section 9.60.110.*

20. *If any historic or pre-historic artifacts are discovered, work in the immediate vicinity shall stop, the lead agency shall be notified, and a qualified archaeologist brought in at the operators expense to assess the resource(s) and recommend mitigation.*

21. *Except in a state of emergency as declared by the local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville, no grading, excavating, or blasting on the site shall be allowed between January 1st and March 31st annually.*

22. *Hours of operation, including truck traffic to and from the site on Ward Lake Road shall be limited to 6:00 am. to 7:00 p.m. Monday through Saturday.*

23. *In the event that the ready-mix concrete plant is allowed and installed onsite, the applicant shall paint that portion of the concrete plant visible from Ward Lake Road and Center Road (A27) as determined by the County, to blend with surrounding background colors.*

24. *Ready-mix concrete production shall be limited to 12,000 cubic yards per year.*

25. *The operator shall contract with a California Air Resources Board certified private contractor for an annual compliance test at the Ward Lake operation to determine compliance with APCD permit. The test shall be conducted during facility operations before January 1 every year and the results submitted to APCD for review.*

26. *Explosives shall be handled by a licensed operator, and shall be stored in an ATF-inspected and approved magazine.*

27. *No explosives shall be detonated between the hours of 6:00 p.m. and 7:00 a.m.*

28. *The operation shall not exceed the noise standards for industrial activities as described in the Lassen County Noise Element as follows:*

> *Noise produced by industrial uses shall not exceed 70 dB Ldn/CNEL at the nearest property line. (1989 Noise Element, page 21, #9)*

The standards of Table II (1989 Noise Element page 19) are also applicable.

29. *The operator shall at the lead agency's request, measure the noise levels in the vicinity of operating equipment, at the nearest property line and at the nearest residential property line and submit the result to the lead agency for review. Measurements shall be taken by a qualified acoustical analyst.*

30. *The paved access to the site from Ward Lake Road shall serve as the only truck access to and from the site.*

31. *The operation (except the access road) shall be conducted within the following described area:*

> *Township 30N, Range 14E. MDB & M:*
> *Section 32: SE ¼ of the SE ¼ of the NE ¼;*
> *E ½ of the NE ¼ of the SE ¼*
> *NE ¼ of the SE ¼ of the SE ¼*
> *Section 33: SW ¼ of the NW ¼:*
> *W ½ of the SW ¼*

32. *The location of equipment, quarry, sand and gravel pits, maintenance areas, etc. shall be as shown in the site maps incorporated into the approved reclamation plan as such plan may be amended from time to time with County approval.*

33. The operator shall identify the boundaries of the approved mine activity area and flag the corners so that the boundaries are readily visible to County and State officials authorized to inspect the site.

34. The applicant shall provide the necessary funding to the County Road Department to install speed limit signs on Ward Lake Road, upon determination by the County Engineer, applying accepted traffic safety considerations, that speed limit signs would be beneficial in reducing truck speeds and increasing safety on Ward Lake Road. The applicant shall further provide the County funding to install a stop sign at the intersection of the project access road and Ward Lake Road upon similar determination by the County Engineer that such a sign would be beneficial. The applicant's obligations herein shall be valid for a period not to exceed two years from the date of project approval.

35. In the event that the approval of this use permit is legally challenged on grounds including, but not limited to, CEQA compliance and/or general plan consistency or adequacy, the County will promptly notify the applicant of any claim, action, or proceeding, and the County will cooperate fully in the defense of the matter. Once notified that a claim, action, or proceeding has been filed to attack, set aside, void or annul an approval by the Planning Commission or the Board of Supervisors concerning this use permit, the applicant agrees to defend, indemnify, and hold harmless the County and its agents, officers, and employees.

Resolution No. 2018-003 Operating Condition

Conditions of approval pursuant to Use Permit Amendment No. 2018-003 follow:

9. All requirements and conditions of the previously approved Use Permit No. 96056 and Reclamation Plan No. 94032 remain applicable, excepting the changes addressed in Use Permit Amendment No. 2018-003 and Reclamation Plan Amendment No. 2018-001.

10. No nighttime operations (7:00 p.m. to 6:00 a.m.) shall be conducted during the period of January 31st through March 31st of each year.

11. No grading, blasting, or excavating shall be allowed onsite between the hours of 6:00 p.m. and 7:00 a.m., year-round.

12. Start-up of onsite generators shall be restricted to between the hours of 7:00 a.m. and 10:00 p.m.

13. Within 60 days of issuance of authorization to operate, all lighting on site shall be downward facing and fully shielded. All lighting shall be directed internally into the site and berm site areas to minimize impact.

14. Haul trucks shall only use low beams when passing along Ward Lake Road during nighttime operations.

15. Haul trucks associated with the mining operation shall not use Center Road (A-27) east of Ward Lake Road between the hours of 10:00 p.m. and 7:00 a.m.; during these hours all trucks must turn west onto Center Road from Ward Lake Road to avoid the community of Litchfield.

16. Haul trucks (loaded or empty) associated with the mining operation shall not exceed a daily average of 26 round trips (26 arriving and 26 departing) throughout the calendar year and shall not exceed a daily maximum of 275 round trips (275 arriving and 275 departing), with a maximum of 173 total trips occurring between the hours of 10:00 p.m. and 7:00 a.m., excluding personal employee vehicles and light-duty trucks assigned to employees.

17. *Scale log data for Ward Lake Pit (CA Mine ID #91-18-0008) shall be provided to Lassen County by the mine operator by July 1, annually.*

18. *Use of "Jake brake" (engine brake) shall be prohibited along the mine access road and Ward Lake Road. Within 60 days of issuance of authorization to operate, the mine operator shall post "No Use of Jake Brake" signs on the access road and at the Center Road and Ward Lake Road intersection, in coordination with the Lassen County Department of Public Works.*

19. *Within 60 days of issuance of authorization to operate, the mine operator shall post advisory "Reduced Speed to 25 MPH" signs on the access road and Ward Lake Road (one northbound and one southbound, at minimum), in coordination with the Lassen County Department of Public Works.*

20. *Within 60 days of issuance of authorization to operate, the mine operator shall post "Wildlife Crossing" signs along Ward Lake Road and Center Road, in coordination with the Lassen County Department of Public Works.*

21. *The mine operator (TLT Enterprises/Hat Creek Construction) shall conduct driver education events, annually at minimum, to increase driver awareness to reduce impacts to wildlife and local residents, and shall give notice the Planning and Building Services Department prior to the date of each event.*

22. *The mine operator shall give written notice to the Lassen County Department of Planning and Building Services and all residents of Ward Lake Road at least 72 hours prior to commencing a non-emergency project, requiring nighttime operations, that will last 5 or more days and/or was awarded by way of formal bid process.*

23. *The operator shall assist Lassen County Road Department with the installation of an eastbound left-hand turn lane on Center Road onto Ward Lake Road, within 30 months of project approval (timeline as established by the Director of Public Works), by providing the necessary asphalt materials.*

24. *The operator shall assist the Lassen County Road Department with the repair of and/or asphalt concrete overlay of the Lassen County maintained portion of Ward Lake Road, within 30 months of project approval (timeline as established by the Director of Public Works), by providing the necessary asphalt materials.*

25. *Within 60 days of project approval, the operator shall submit a $200,000.00 surety bond, payable to Lassen County, as financial assurance for the completion of the above road maintenance assistance. Upon completion of all required assistance, the surety bond shall be released back to the operator. If the above road maintenance is to be completed in phases, the Director of Public Works may authorize incremental release of said bond, as phased work is completed.*

26. *Prior to issuance of an authorization to operate by Lassen County, the operator shall install a berm or barrier to shield residences in the project vicinity from noise produced by the asphalt plant generator. The berm or barrier shall extend to a height even with the generator enclosure. The opening of the generator enclosure shall be oriented to the north.*

Permitted Mine Area – Reclamation Plan No. 94032 and No. 2018-001

As permitted, revegetation of the current mine area will include the following:

- The processing area will be seeded with a mix of sagebrush (*Artemisia tridentate*) at two pounds of pure live seed (PLS) per acre, rabbitbrush (*Ericameria nauseosa*) at four pounds of PLS per acre, bitterbrush (*Purshia tridentate*) pure seed at one pound per acre, bluebunch wheatgrass (*Elymus spicatus*)at three pounds of PLS per acre.

- The existing quarry area will be seeded with a mix of sagebrush (Artemisia tridentate) at one and a half pounds of PLS per acre, rabbitbrush (*Ericameria nauseosa*) at three pounds of PLS per acre, bluebunch wheatgrass (*Elymus spicatus*) at three pounds of PLS per acre, bottlebrush squirreltail (*Elymus elymoides*) at three pounds of PLS per acre, green ephedra (*Ephedra viridis*) at one pound of PLS per acre, and bitterbrush (*Purshia tridentate*) plugs at twenty-six plugs per acre.

3.5 Proposed Use Permit and Reclamation Plan Amendments

The proposed Project includes modifications to existing permitted operations at the Ward Lake Quarry. The following changes are proposed to the quarry's existing baseline operations:

- Expansion of approximately 78.6 acres, with an associated additional volume of 5,000,000 tons of material.
- Extension of life of the mine from 2030 to 2050.
- Increase of maximum volume extracted per year to 200,000 tons.

The requirements and conditions of the previously approved Use Permit No. 2018-003 remain applicable with exception of any proposed changes associated approval of the proposed Project as a result of this DSEIR.

Proposed Hours of Operation

The mine operates Monday through Saturday, between the hours of 6:00 a.m. and 7:00 p.m., with 24-hour operations carried out on an as-needed basis. In accordance with current operating conditions no nighttime operations (7:00 p.m. to 6:00 a.m.) are conducted during the period of January 31st through March 31st of each year. No grading, blasting, or excavating are conducted between the hours of 6:00 p.m. and 7:00 a.m. year-round, and start-up of onsite generators is restricted to between the hours of 7:00 a.m. and 10:00 p.m. The proposed Project does not include changes to the existing hours of operation.

Proposed Mining Area

The proposed Project would allow the expansion of the site to 78.6 acres north of current operations (refer to Figure 3-2). Processing will continue to occur onsite at its current location. Quarrying will continue as current operations into the expansion area. Portions of the current quarry area will be reclaimed.

The expansion will be operated in the same way as the current mine area. It is an open pit mine for basalt rock and sand and gravel deposits. Rock is crushed and the rock and sand are sorted and stockpiled. The materials are either transported for use offsite or used onsite for the production of asphalt concrete or ready-mix concrete. As permitted, there is an occasional need to import supplemental aggregates for the concrete production. These are the same procedures as permitted for the current operation. A portable crusher may be moved closer to the active quarry face in the expansion areas as the mine face moves farther north. This is to make the process more efficient overall. The processing plant will remain where it is located and perform as previously permitted. Rock will be removed beginning at the south near the current operation and moving to the north.

Proposed Site Life

The life of the Ward Lake Quarry is currently permitted to 2030. The proposed Project will extend the site's life by 20 years to 2050.

Proposed Volume Removal

As previously stated above, the proposed quarry expansion is approximately 78.6 acres to the north of the existing quarry. This expansion has an estimated volume of 5,000,000 tons of material. The overall maximum volume of material permitted per year is proposed to increase from 100,000 tons to 200,000 tons. The actual amount removed varies by year and product demand. In an effort to reduce the movement of material from the expansion area, a portable crusher may be moved into the flat area on the western side of the proposed expansion area.

Proposed Equipment and Truck Volume

The proposed Project does not include additional equipment than what is currently used for the existing operation. The existing off-road equipment will be operated in the proposed expansion area. The processing area of the operation will remain in the same location.

The proposed Project includes an increase in crushing operations from 100,000 tons per year to 200,000 tons per year. The proposed Project will also require additional operating hours of existing off-road equipment to support the increase in aggregate production. The annual operating hours of the majority of off-road equipment will increase by 50 percent. The proposed Project will not change the hot mix asphalt plant, the lime slurry mix plant, the concrete plant or portable plant production or operations.

The proposed Project will not result in an increase in average or maximum daily truck volumes generated by existing operations. Truck volumes were limited by Condition #8 of Use Permit 2018-003 to include an average of 26 round-trip (26 arriving, 26 departing) truck trips per day during the 305-day operating period. Average truck volumes would remain the same with the proposed Project and not exceed the maximum allowed truck volume of 275 round-trip truck trips per day (275 arriving, 275 departing). Additionally, truck distribution will not change from existing operations.

Proposed Reclamation Plan Amendment

The primary objectives of the reclamation plan amendment are to 1) establish a new vegetative cover that provides future fire protection; 2) stabilize finished mined surfaces and prevent erosion; and 3) revegetate with plant species adapted to this locale. Refer to Appendix B, *Mining and Reclamation Plan Amendment*.

The final slope of the proposed expansion area will be 1:1 (H:V). Mine faces will be shaped to have a 50-foot highwall and 12-foot benches at a 1:1 (H:V) slope. The quarry wall will be composed of hard rock and will not require stabilization. The area is composed of hard rock and highwalls will be graded at an inclination as to meet the minimum factor of safety (FOS). Benches will be constructed to drain to the margins of the highwall and/or to centralized collection areas that capture and convey drainage to the bottom of the cut slope.

The quarry floor and benches in the 78.6-acre expansion area will be seeded with a mix of sagebrush (Artemisia tridentate) at two pounds of PLS per acre, rabbitbrush (*Ericameria nauseosa*) at four pounds of PLS per acre, bitterbrush (*Purshia tridentate*) one pound of pure seed per acre and blue bunch wheat grass(*Elymus spicatus*) at three pounds per acre.

Seed will be ordered from a reputable supplier that collected or grew out seed from a source as close to the project site as possible. Seed will be properly labeled as genus, species, subspecies, variety, and source and will be handled and packed in a manner that ensures the purity and viability of the materials. Weed seed will not exceed 0.5 percent of the PLS and inert material. Seeding rates will be given in pounds of PLS per acre. The seed mix will be measured and packaged by the seed supplier. Seeds will be broadcast using a tractor-mounted seeder and then tracked in with machinery. Plugs will be hand planted. Seeding will take place in the fall prior to the first rain. Hand planting will be conducted in the spring as the soil temperatures warm.

3.6 Project Objectives

The Project applicant has identified the following objectives:

- Provide a local construction material supply to serve local and regional market demands.
- Provide a local source of materials for emergency jobs (during federal, State, or County declared emergencies) and other construction jobs requiring nighttime work.
- Extend the life of the quarry to extract additional superior materials from the site.
- Contribute to the improvement of the Lassen County economy by expanding an existing project that increases sales taxes.
- Expand an existing quarry operation without the need for either a County General Plan or Zone Amendment.

3.7 Required Approvals

Lassen County is considered the Lead Agency under CEQA and is responsible for reviewing and certifying the adequacy of this DSEIR. Responsible agencies are those agencies that have discretionary approval over one or more actions involved with the development of the proposed Project site. Trustee agencies are state agencies having discretionary approval or jurisdiction by

law over natural resources affected by the project. Prior to development of the proposed Project, a number of discretionary permits and approvals must be obtained, from local and State agencies, as listed below. This DSEIR and Final SEIR will be relied on by the County and other responsible agencies when determining whether to issue discretionary approvals to implement the project. To implement the proposed Project, the mine operator will need to obtain, at a minimum, the following discretionary permits/approvals.

- Conditional Use Permit Amendment, Lassen County Planning Commission and Board of Supervisors for the proposed operational changes.
- Reclamation Plan Amendment , Lassen County Planning Commission and Board of Supervisors and Department of Conservation, Division of Mine Reclamation (DMR).
- Permits for Operation, Lassen County Air Pollution Control District (APCD).

4.0 ENVIRONMENTAL SETTING, IMPACT ANALYSIS, AND MITIGATION MEASURES

4.1 Introduction

Chapter 4, *Environmental Setting, Impact Analysis, and Mitigation Measures*, contains 14 topical sections that evaluate the direct and indirect environmental impacts of the proposed Project. Cumulative impacts are discussed and evaluated in Chapter 5, *Other CEQA Considerations*. The chapter is organized as follows:

- Aesthetics and Visual Resources (Section 4.2)
- Agriculture and Forestry Resources (Section 4.3)
- Air Quality (Section 4.4)
- Biological Resources (Section 4.5)
- Cultural and Tribal Cultural Resources (Section 4.6)
- Energy (Section 4.7)
- Geology and Soils (Section 4.8)
- Greenhouse Gas Emissions (Section 4.9)
- Hazards and Hazardous Materials (Section 4.10)
- Hydrology and Water Quality (Section 4.11)
- Land Use and Planning (Section 4.12)
- Noise (Section 4.13)
- Transportation (Section 4.14)
- Wildfire (Section 4.15)

The following sections describe the format of the environmental analysis, the thresholds of significance, and the methodology of determining the significance of impacts.

4.1.1 Format of the Environmental Analysis

Each topical section of this DSEIR is organized into the following subsections:

- *Environmental Setting.* The environmental settings present the existing environmental conditions, in accordance with CEQA Guidelines §15125. The subsection describes the baseline conditions against which the environmental impacts associated with the proposed project and the potential future development of the property are assessed.

- *Regulatory Setting.* The regulatory settings describe the laws, regulations, and policies that affect the resource or the assessment of impacts on the specific resource. The regulatory setting subsection establishes the regulatory framework for the analysis of each resource. This subsection is divided into federal, State, and Local regulations.

- *Previous CEQA Review.* The previous CEQA review presents the impacts and mitigation measures contained in the three previous EIRs prepared for mining operations at the Project site.

- *Threshold of Significance.* Thresholds of significance describe the criteria used to determine the significance of impacts. The thresholds and criteria for determining the significance of impacts for analysis are derived from the Environmental Checklist in Appendix G of the CEQA Guidelines (§§15000 to 15387) and other resource-specific sources as described in each subsection.

- *Impact Analysis.* The impact analysis presents thresholds of significance used and discusses potential effects of the proposed project on the existing environmental conditions (in accordance with CEQA Guidelines §§15126.2(a) and 15143).

- *Mitigation Measures.* Mitigation measures provide measures to reduce potentially significant effects associated with the proposed project to the extent feasible (in accordance with CEQA Guidelines §§15002(a)(3), 15021(a)(2), and 15091(a)(l)).

- *Level of Significance after Mitigation.* This subsection describes whether mitigation measures feasibly would or would not substantially reduce or avoid an impact. This subsection is presented in accordance with CEQA Guidelines §§15091(a)(1), 15092(b)(2)A), and 15126.2(b), which require identification of impacts capable of avoidance or mitigation, as well as those that cannot be avoided.

4.1.2 Impact Significance Conclusions

This DSEIR evaluates whether the proposed Project and alternatives would cause a change in the environment. Conclusions reached are based on information in the record, including scientific and factual data as well as professional knowledge and judgment. Consistent with CEQA and the CEQA Guidelines, significance conclusions are characterized as one of the following:

- *No Impact.* This signifies that a project or an alternative would not cause any change in the environment relative to the applicable significance criterion; under these circumstances, no mitigation measures would be required or may be imposed, and the project or alternative could not cause or contribute to any cumulative effect.

- *Less Than Significant Impact.* This signifies that a project or an alternative could cause an adverse change in the environment, but not one that would be substantial, relative to the applicable significance criterion. Under these circumstances, no mitigation measures would be required or may be imposed. The analysis considers whether the project or alternative could cause or contribute to a potential cumulative effect.

- *Less Than Significant with Mitigation Incorporated.* This signifies that a project or an alternative could cause an adverse change in the environment that would be substantial relative to the applicable significance criterion, but that the implementation of one or more feasible mitigation measures would reduce the significance of the impact below the established threshold. The analysis considers whether the project or alternative could cause or contribute to a potential cumulative effect.

- *Significant and Unavoidable.* This signifies that a project or an alternative could cause a substantial adverse change in the environment relative to the applicable significance

criterion; however, either no feasible mitigation measures are available, or, even with implementation of feasible mitigation measures, the significance of the impact would remain above the established threshold. The analysis considers whether the project or alternative could cause or contribute to a potential cumulative effect.

- *Cumulatively Considerable*. This signifies that a project-specific or alternative-specific contribution to a significant cumulative effect would be considerable when viewed in connection with the incremental impacts of past projects, the impacts of other current projects, and the impacts of reasonably foreseeable probable future projects (as defined in CEQA Guidelines §15130).

For each impact identified as significant, the DSEIR provides mitigation measures to reduce, eliminate, or avoid the adverse effect. The effectiveness of recommended mitigation measure has been evaluated by analyzing the impact remaining after the implementation of the measure. In some cases, the implementation of more than one mitigation measure may be needed to reduce the significance of an impact below an established threshold. Whether the mitigation would reduce the impact to a less than significant level successfully is stated in the DSEIR.

4.2 Aesthetics and Visual Resources

The physical expansion of the site and extending the life of the mining operations are substantial changes proposed that will require revision of the previous EIR due to the involvement of potentially new significant environmental effects pertaining to aesthetics and visual resources which could lead to a substantial increase in the severity of previously identified significant effects under CEQA Guidelines §15162.

This section provides a description of existing visual conditions in the Project area, summarizes the previous CEQA analyses of the visual impacts of the current operation at the Project site, and describes the changes to those conditions that would result from the Project. This section also includes Project-related impacts. The analysis is based, in part, on information contained in the *Viewshed Technical Summary, Ward Lake Quarry, Lassen County, California* (VESTRA, 2020) (refer to Appendix C).

4.2.1 Environmental Setting

The Project site is located at the base of the southwestern slope of Shaffer Mountain at an elevation of approximately 4,300 feet above mean sea level (msl). The site lies on the east side of Ward Lake Road, approximately 1 mile north of Center Road (A27). The existing visual character of the site is that of brush and disturbed mining lands with moderate to steep topography. The Bureau of Land Management owns an additional 46-acre quarry (Section 4 Pit) directly south of the Project site. Section 4 Pit is also operated by Hat Creek Construction & Materials, Inc. Much of the Project site is obstructed from short- and long-distance views by a low ridge bordering the northwest side of the asphalt plant, concrete plant, and pond area at an elevation of 4,280 feet above msl. Another ridge at elevation 4,360 shields the site from the southwest to some degree.

The character of the area surrounding the Project site is rural residential with homes on large, agricultural-sized parcels. A total of eight homes are located on Ward Lake Road just south of the Project site. These homes are considered "sensitive receptors" and are shown on Figure 3-10.

The Project is located approximately 4 miles east of the California Correctional Center (CCC). The community of Litchfield is located 3 miles to the southeast and is shielded from the Project site by topography. The City of Susanville is located approximately 14 miles to the west. The community of Litchfield contains numerous residences along Center Road (A27) which becomes Highway 395 in the center of town. Highway 395 is not a designated scenic highway.

Within the immediate Project vicinity, the only source of nighttime lighting is from residences located on Ward Lake Road. At night, light from homes in the community of Litchfield, located approximately 3 miles southeast of the Project site, is also visible. In the larger project area, a major existing source of nighttime lighting includes the CCC, located approximately 4 miles west of the Project site. The CCC uses exterior lighting that is bright and visible from a large area.

The facility was approved for nighttime operations in 2019 and currently uses artificial lighting in the morning and evening to meet the 6:00 a.m. to 7:00 p.m. operating window. The current condition of the proposed expansion area is undeveloped open space with sparse vegetation composed of low sage. The lack of vegetation is considered part of the current visual quality of the site.

4.2.2 Regulatory Setting

The following is a description of federal, State, and local environmental laws and policies that are relevant to the CEQA review process for the proposed expansion area.

Federal

National Scenic Byways Program
The National Scenic Byways Program is part of the U.S. Department of Transportation, Federal Highway Administration (FHWA). Established in Title 23, Section 162 of the United States Code, the program is a grass-roots collaborative effort established to help recognize, preserve, and enhance selected roads throughout the United States. FHWA's May 18, 1995, interim policy sets forth the procedures for the designation by the U.S. Secretary of Transportation of certain roads as National Scenic Byways or All-American Roads based on their archaeological, cultural, historic, natural, recreational, and scenic qualities. There are 150 such designated byways in 46 states. There are no federally designated byways in the Project vicinity.

State

California Scenic Highway Program
California's Scenic Highway Program was created by the legislature in 1963. Its purpose is to protect and enhance the natural scenic beauty of California highways and adjacent corridors, through special conservation treatment. The State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Sections 260 through 263. Caltrans has compiled a list of State highways that are designated as scenic and county highways that are eligible for designation as scenic. There are no State-designated scenic highways in the Project vicinity.

Local

Lassen County General Plan
There are no specific General Plan policies that relate to aesthetics. The *Standish-Litchfield Area Plan* identifies scenic corridors. The proposed Project is not in a scenic corridor identified in the Area Plan.

Lassen County Code
Section 18.108.155, *Lighting*, of the Lassen County Code contains the following policy related to aesthetics that would apply to the proposed project:

> *"Unless otherwise provided in this title, the following lighting requirements shall apply: All lighting, exterior and interior, shall be designed and located so as to confine direct lighting to the premises. A light source shall not shine upon or illuminate directly on any surface other than the area required to be lighted. No lighting shall be of the type or in a location such that constitutes a hazard to vehicle traffic, either on private property or on abutting streets."*

4.2.3 Previous CEQA Reviews

1981 EIR

Visual impacts of the initial mining operation at the site (excavation, crushing, stockpiling, and hauling of materials as well as the operation of asphalt concrete batch plant) were analyzed in the 1981 EIR. The EIR determined that increased traffic and the proposed plant activities (even though not directly adjacent to occupied lands) would have and indirect long-term effect on the existent environmental setting (aesthetics) which could not be circumvented. Crusher and hot plant operations are functional rather than decorative. Visual impacts were determined to be significant and unavoidable. The following mitigation was included in the 1981 EIR to reduce the visual impacts of the project:

> *"Aesthetic mitigation is limited to the physical location of the proposed project. An outcropping (ridge) of rock exists between County Road 308 (Ward Lake Road) and the fairly level area behind it designated for the plant sites which will, in part, limit some of the direct view of the operations. Areas designated as materials sources are visible from the valley floor in some sections. Mitigation of these areas would consist of the implementation of the reclamation plan calling for reshaping and reseeding of excavated areas on a continuing basis. The ridge between County Road 308 and the plant site is not a part of the materials source and would not be disturbed by the applicant."*

1997 EIR

Visual impacts of the previous spatial expansion (which included the addition of the concrete batch plant and increase in height of the exposed rock quarry face) were evaluated in the 1997 EIR. The 1997 EIR determined that impacts to long-distance views, including those from Center Road (A27), would be less than significant. In addition, impacts to mid-range views, including those approximately 2 miles from the site along Center Road (A27) and Ward Lake Road, were determined to be less than significant. The EIR determined that views from homes and residential properties closest to the entrance to the quarry off of Ward Lake Road would be significant due to the close proximity of the quarry to viewers which would cause the quarry to dominate views. Short-term impacts were determined to be significant and unavoidable and long-term impacts were determined to be mitigable upon reclamation. Mitigation measures for impacts to aesthetics and visual resources in the 1997 EIR included:

- *Reclamation measures recommended in Vegetation/Wildlife chapter (measure 1a).*

- *Reclamation of graded areas: The intent of the Reclamation Plan shall be to recreate to the extent possible a viable, self-sustaining plant community similar to that which existed prior to mining.*

- *Sand and Gravel Excavation Areas: These areas shall be regraded to maximum slopes of 2H:1V, shall be resoiled with adequate growth medium to support vegetation including fines from the crusher and stockpiled topsoil and shall be vegetated with native species including sage, bitterbrush, and rabbit brush. The success of revegetation in these areas shall be monitored by qualified personnel with reports submitted to the County Community Development Department at least once per year for five years. The final approved species list and planting density must be approved by the County in consultation with the Department of Fish and Game.*

- *Rock Quarry Area: This area shall be regraded to a maximum overall slope of 2H;1V and shall be benched with minimum 10 foot wide benches at vertical intervals appropriate for the type of material, but not greater than 15 feet. The benches shall be sloped to drain toward the hillside, shall be resoiled with adequate growth medium to support vegetation including fines from the crusher and stockpiled topsoil and revegetated using native range greases, shrubs, and trees if they can be supported.*

- *The operator shall institute a test plot program on the first available rock face bench to determine the best species mix and planting scheme for subsequent benches. The test plots shall be set up and monitored by qualified personnel with reports submitted to the County Community Development Department at least once per year for five years. The final approved species list and planting density must be approved by the County in consultation with the Department of Fish and Game.*

- *Timing/Phasing of Reclamation: Reclamation of sub-areas shall take place in a phased manner where possible as excavation is completed.*

- *Protection of Replanted Areas: Replanted areas shall be protected by fencing intended to exclude livestock and deer until vegetation is established. Perimeter livestock fencing shall be provided and shall be four wires maximum, bottom wire smooth and no closer than 18 inches to the ground with total fence height not to exceed 42 inches. More site-specific deer proof fencing shall also be provided directly around replanting areas.*

- *Paint concrete plant to blend with surrounding background color.*

2019 EIR

The 2019 EIR analyzed the impact to visual resources from the extension of quarry operating hours to 24 hours per day and the impact of resultant nighttime truck traffic. The 2019 EIR found that the Project would alter the visual character of the site through the use of nighttime lighting during 24-hour operations; and also, that the 24-hour operations would result in an increase in nighttime truck traffic on Project-area roads. The Project would result in increased nighttime traffic headlight use on roadways in the Project area, specifically Ward Lake Road and Center Road (A27). Homes along Ward Lake Road are as close as 60 feet from the roadway. Headlight use would not impact large-scale nighttime views, but would have the potential to significantly degrade the existing visual quality of areas close to the roadways at night.

The County found that impacts to aesthetics and visual resources, after implementation of mitigation measures, would be significant and unavoidable to residences along Ward Lake Road. The following mitigation measures were required:

- *Direct lighting internally into the site and berm site areas to minimize impact when possible.*
- *Install fully shielded (pointing downward) lighting fixtures.*
- *Use only low beams on trucks in residential areas during nighttime operations.*

4.2.4 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus

on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to *Aesthetic and Visual Resources* have been derived from Appendix G of the CEQA Guidelines:

- *Have a substantial adverse effect on a scenic visa.*
- *Substantially damage scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.*
- *In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings.*
- *Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.*

4.2.5 Methodology

The visual impacts of the existing operation at the Project site have been analyzed in previous EIRs. The Project elements that will affect aesthetic and visual resources at the Project site include the physical expansion of site operations which would result in vegetation removal, ground disturbance, changes in topography, and equipment use on an additional 78.6 acres. A viewshed analysis was completed to analyze the impacts to scenic vistas and resources from the expansion of the site. The visual simulation analysis evaluated the impacts to the visual resources based on site topography and a north-south observation location, representing each end of the proposed expansion area.

The shape of a terrain surface affects which portions of the surface area can be seen from any given point. To assess the visual components of the proposed Project, Geographic Information Systems (GIS) was used to evaluate visibility across the project area from various locations. GIS is a collection of computer hardware, software, and geographic data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. ArcGIS is a Geographic Information System package developed by Environmental Systems Research Institute (ESRI).

A viewshed identifies the locations in a given area that can be seen from one or more observation points. The elevation data used to perform viewshed analyses are raster-based data. Raster data is data in which a surface is divided into a grid and each cell in the grid contains an elevation value. The resolution of raster data is the distance, in surface units, of the sides of each cell in the grid. An example of this is the elevation data provided by the U.S. Geological Survey (USGS) for use in GIS. These data sets are commonly provided at either a 10-meter or 30-meter resolution. Viewshed analysis provides a value that indicates how many observer points can be seen from each location. If you have only one observer point, each cell from which the observer point can be seen is given a value of one. All cells from which the observer point cannot be seen are given a value of zero. Observer points can be points or linear features.

The product of the viewshed analyses of was the creation of 10-meter-resolution raster data layers showing visibility from two locations in the proposed mining area. This is from the proposed

mining area outward (rather than from the outside looking inward toward the proposed mining area).

4.2.6 Impact Analysis

24-hour operation of the plant will continue and is considered a baseline condition. The increased nighttime traffic will continue and is considered a baseline condition. Current operations of the plant and processing area will continue. Portions of the current quarry area will be reclaimed as the new area is mined.

The following includes an analysis of environmental parameters related to *Aesthetics and Visual Resources* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the conclusions that either no impacts, less than significant impacts, or less than significant impacts with mitigation could occur. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Aesthetics and Visual Resources*.

Areas of No Project Impact

As required by CEQA Guidelines §15082, the County issued a Notice of Preparation (NOP) on April 28, 2021 that summarized the proposed Project, stated its intention to prepare an EIR, and requested comments regarding the scope and content of the EIR from responsible and trustee agencies. In the course of the County's initial evaluation, certain impacts of the proposed Project were found to not to be significant because of the inability of a project of this scope to create such impacts or the absence of project characteristics producing effects of this type. The effects determined not to be significant are not required to be included in primary analysis sections of the DSEIR. As such, the following impacts either are not applicable to the proposed Project or are not reasonably foreseeable and are not addressed further within this section:

- *Substantially damage scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.*

  A significant impact would occur if the proposed Project would result in the removal or substantial adverse change of one or more features that contribute to the valued visual character or image of the neighborhood, community, or localized area, including, but not limited to, landmarks (designated), historic resources, trees, and rock outcroppings.

  The proposed Project is not located in an area that is designated as scenic highway, although the project is visible from portions of Highway 395 for a distance of approximately 2 miles, Highway 395 is not a designated scenic highway. The Project does not impact a designated landmark, historic resource, trees, or rock outcroppings of valued visual character. Therefore, no impact to scenic resources would occur.

Project Impacts

Impact 4.2-1: Have a substantial adverse effect on a scenic vista.

As noted above under Subsection 4.2.2, *Regulatory Setting*, the area in the vicinity of the mine site is not identified as an area of scenic vistas. There are two active mines currently operating adjacent to the proposed expansion. These include the existing Ward Lake Quarry and smaller aggregate mine located on BLM-administered land immediately south of Ward Lake Quarry. The currently disturbed area of Ward Lake Quarry is 138 acres. The disturbed acreage of the BLM mine is approximately 50 acres.

Based on the simulation conducted, the proposed quarry expansion area will be visible from the same locations visible due to current operations. A significant impact would occur if the project would substantially obstruct, interrupt, or detract from a valued focal and/or panoramic vista from a public road, a trail within an adopted county or state trail system, a scenic vista or highway, or a recreational area. No designated scenic highways or rivers are located in the vicinity of the proposed Project.

The resulting data is illustrated on Figures 4-1 and 4-2. As is currently the case with the current site activities, the mine expansion is visible from areas to the west but is protected from eastern view by the ridge. The total linear feet from the viewshed analysis, where the proposed mining area is visible from Highway 395 within five miles of the proposed project area, is shown in Table 4-1. This is not anticipated to increase with implementation of the proposed quarry expansion.

Table 4-1
VIEWSHED STATISTICS

Observation Location	Linear Feet of Highway 395 within 5 Miles of Project
North Observation Point	10,702
South Observation Point	5,974

Source: VESTRA, 2020.

The existing mining area of the quarry is visible from Highway 395 for a total of up to 2 miles. The expansion area would not be visible from additional areas. Highway 395 is not a designated scenic highway. The site does not obstruct, interrupt, or detract from a valued focal point or panoramic vista, trail, or recreation area. Impacts are less than significant in this regard.

Impact 4.2-2: In non-urbanized areas, substantially degrade the existing visual character or quality of the public views of the site and its surroundings.

A significant impact would occur if the proposed Project would introduce features that would detract from or contrast with the existing visual character and/or quality of a neighborhood, community, or localized area by conflicting with important visual elements or the quality of the area (such as theme, style, setbacks, density, size, massing, coverage, scale, color, architecture, building materials, etc.). Implementation of the proposed Project will alter the visual character of the site by physical disturbance of an additional 78.6 acres. The Project site currently has lighting fixtures that are used during the periods of 24-hour operation. This will not be expanded as the processing area will not change.

The proposed Project area is estimated to be visible from approximately 55,000 acres, which is not a changeover baseline conditions. Figures 4-1 and 4-2 depicted the estimated areas where the proposed Project will be visible. Much of the surrounding land with visual impacts by the proposed Project is owned and administered by the federal government or State of California for the purpose of resource use; therefore, impacts to a large number of residences is limited.

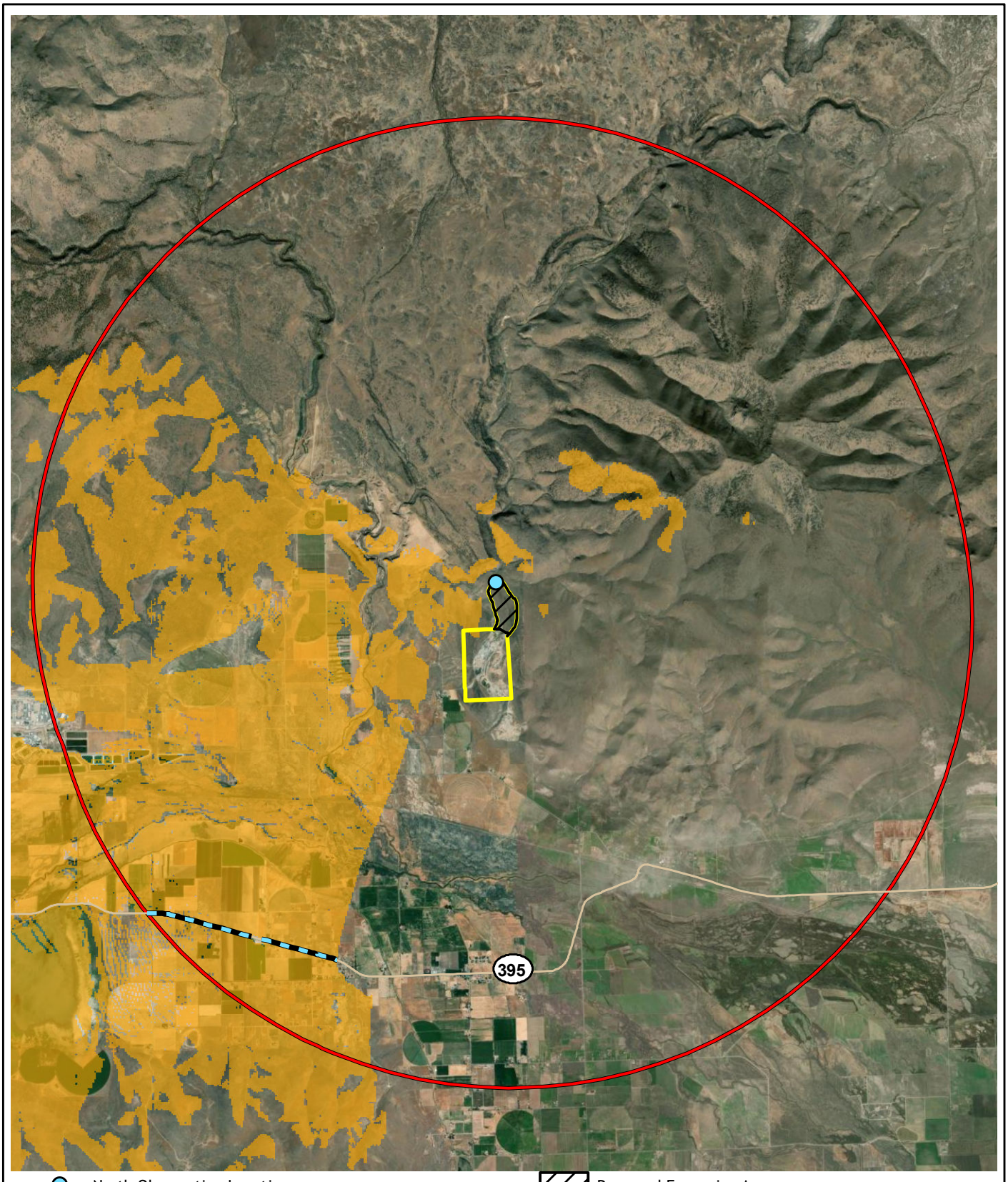
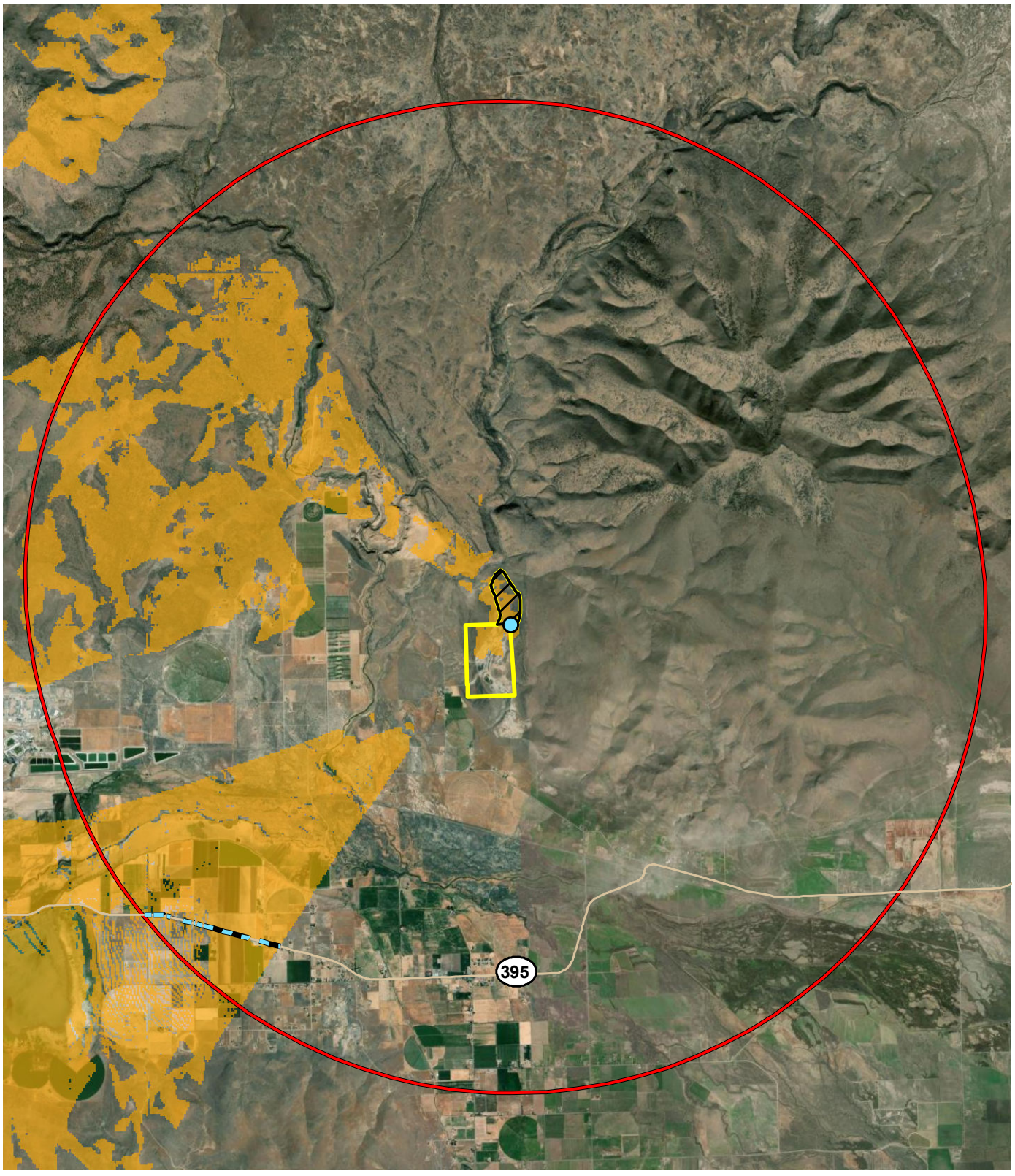


FIGURE 4-1
VISUAL PROJECTION WITHIN 5 MILES OF NORTH OBSERVATION LOCATION
WARD LAKE QUARRY
SUSANVILLE, CALIFORNIA

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH

P:\GIS\71305\WardLakeExpansion2020\Figures\2021_EIR\71305_NorthObservationLocation.mxd



South Observation Location

Segment of Highway Visible from South Observation Location

Highway

Project Site

Proposed Expansion Area

5-Mile Buffer Around Proposed Expansion Area

Viewshed Area Visible from South Observation Location

VESTRA

0 0.75 1.5 3 Miles

N

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH

FIGURE 4-2
VISUAL PROJECTION WITHIN 5 MILES OF SOUTH OBSERVATION LOCATION
WARD LAKE QUARRY
SUSANVILLE, CALIFORNIA

P:\GIS\71305\WardLakeExpansion2020\Figures\2021_EIR\71305_SouthObservationLocation.mxd

The towns of Litchfield and Standish are shielded from the mine by topographic features. The visual analysis determined that the proposed Project would result in impacts to lands to the west of the site. The majority of the parcels affected are large-tract agricultural properties. Therefore, less than significant impacts would occur in this regard.

Impact 4.2-3: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

The existing quarry operation is permitted to operate for 24-hour periods as needed. Light and glare impacts have been previously analyzed in the 2019 EIR. This represents the baseline condition and will not be modified with implementation of the proposed Project. No additional sources of lighting are planned or anticipated in the expansion area. The proposed Project will not create a substantial new source of light or glare. Less than significant impacts would occur in this regard.

4.2.7 Mitigation Measures

No mitigation measures are required.

4.2.8 Level of Significance after Mitigation

No mitigation measures are required. Impacts would be less than significant.

4.3 Agriculture and Forestry Resources

The expansion of the mining area of the operation to include an additional 78.6 acres and increase in the life of the mine to 2050 are substantial changes proposed in the Project that will require major revisions of the previous EIR due to the involvement of potentially new significant environmental effects pertaining to agriculture and forestry resources under CEQA Guidelines §15162. An analysis of impacts to agriculture and forestry resources was not included in the 2019 EIR since the previous project did not include a change in the mining area.

The purpose of this section is to determine the extent to which the proposed Project contributes to the physical deterioration of agriculture or forestry resources. This section describes the agricultural resources within the project study area, and the applicable regulations that govern those resources. The analysis includes a discussion of the potential agricultural productivity of the onsite soils and the potential impacts the proposed Project may have on the continued use of surrounding properties for agricultural production.

4.3.1 Environmental Setting

The *Lassen County General Plan* designation for the project site is "Extensive Agriculture." Surrounding properties are designated as "Extensive Agriculture", "Open Space", "Agricultural Residential", and "Mountain Resort."

The dominant habitat type identified through the California Wildlife Habitat Relationships (CWHR) classification is sagebrush (Mayer and Laudenslayer, 1988). Sagebrush habitat is usually large, open, and often discontinuous and stands are usually dominated by big sagebrush (*Artemisia tridentata*). This habitat occurs over a range of middle and high elevations. Sagebrush is often mixed with other similar shrub species, such as rabbitbrush (*Chrysothamnus* spp.), horsebrush (*Tetradymia* spp.), and bitterbrush (*Purshia* spp.). In some places, stands may have an understory of perennial grasses and forbs. The expansion will remove an additional 78.6 acres of this habitat type.

The site is not covered by a Williamson Act contract. In addition, the proposed Project is not zoned as forestland, timberland, or timberland production.

4.3.2 Regulatory Setting

The following is a description of federal, State, and local environmental laws and policies that are relevant to the CEQA review process.

Federal

Farmland Protection Policy Act (7 U.S.C. §4201)
The purpose of the Farmland Protection Policy Act (FPPA) is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. It additionally directs Federal programs to be compatible with State and local policies for the protection of farmlands. Congress passed the Agriculture and Food Act of 1981 (Public Law 97-98) containing the FPPA—Subtitle I of Title XV, §1539-1549. The final rules and regulations were published in the Federal Register on June 17, 1994.

The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to non-agricultural uses. It assures that, to the extent possible, Federal programs are administered to be compatible with State, local units of government, and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every two years. The FPPA does not authorize the Federal Government to regulate the use of private or non-Federal land or, in any way, affect the property rights of owners.

For the purpose of FPPA, farmland includes Prime Farmland, Unique Farmland, and Farmland of Statewide or Local Importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land. Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to non-agricultural use and are completed by a Federal agency or with assistance from a Federal agency.

United States Department of Agriculture, Natural Resources Conservation Service
The U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), maps soils and farmland and provides science-based soil information. The NRCS manages the Farmland Protection Program, which provides funds to conserve productive farmland.

State

California Farmland Mapping and Monitoring Program
The Farmland Mapping and Monitoring Program (FMMP), which monitors the conversion of the State's farmland to and from agricultural use, relies on information from the NRCS soils surveys, NRCS land inventory and monitoring criteria, and land use and water availability. Topography, climate, soil quality, and available irrigation water all factor into the FMMP farmland classifications.

The FMMP was established by the California Department of Conservation (DOC), under the Division of Land Resource Protection. Important Farmland Maps are compiled by the FMMP pursuant to §65570 of the California Government Code. The FMMP is an informational service only and does not constitute state regulation of local land use decisions. Under the FMMP, "Important Farmland Categories" were established based on soils characteristics that have significant agricultural production values. Categories mapped by the FMMP are as follow:

- *Prime Farmland*. Prime Farmland is land that has been used for irrigated agricultural production and meets the physical and chemical criteria for Prime Farmland as determined by the USDA, NRCS. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

- *Farmland of Statewide Importance*. Farmland of Statewide Importance is similar to Prime Farmland but generally includes steeper slopes or less ability to store soil moisture. In order to be classified as Farmland of Statewide Importance, the land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

- *Unique Farmland*. Unique Farmland is farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include non-irrigated orchards or vineyards. Land must have been cropped at some time during the four years prior to the mapping date.

- *Farmland of Local Importance*. Farmland of Local Importance is land important to the local economy as determined by the County Board of Supervisors and a local advisory committee. This land includes dryland grain producing lands and farmlands that are presently irrigated but do not meet the soil characteristics of Prime Farmland or Farmland of Statewide Importance.

- *Grazing Land*. Grazing Land is land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres.

- *Urban and Built-up Land*. Urban and Built-Up Land is land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

- *Other Land*. Other Land is land not included in any other mapping category. Common examples include low-density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry, or aquaculture facilities; strip mines; borrow pits; and water bodies smaller than forty acres.

- *Water*. This category includes perennial water bodies with an extent of at least 40 acres.

California Land Conservation Act

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is promulgated in California Government Code §51200-51297.4, and therefore is applicable only to specific land parcels within the State of California. The Williamson Act enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space uses in return for reduced property tax assessments. Private land within locally designated agricultural preserve areas is eligible for enrollment under Williamson Act contracts. The Williamson Act program is administered by the CDC, in conjunction with local governments, which administer the individual contract arrangements with landowners. The landowner commits the parcel to a 10-year period wherein no conversion out of agricultural use is permitted. Each year, the contract automatically renews unless a notice of non-renewal or cancellation is filed. In return, the land is taxed at a rate based on the actual use of the land for agricultural purposes, as opposed to its unrestricted market value. An application for immediate cancellation can also be requested by the landowner, provided that the proposed immediate cancellation application is consistent with the cancellation criteria stated in the California Land Conservation Act and those adopted by the affected county or city. Non-renewal

or immediate cancellation does not change the zoning of the property. Participation in the Williamson Act program is dependent on county adoption and implementation of the program and is voluntary for landowners.

The Williamson Act states that a board or council by resolution shall adopt rules governing the administration of agricultural preserves. The rules of each agricultural preserve specify the uses allowed. Generally, any commercial agricultural use will be permitted within any agricultural preserve. In addition, local governments may identify compatible uses permitted with a use permit.

California Government Code §51238 states that, unless otherwise decided by a local board or council, the erection, construction, alteration, or maintenance of electric and communication facilities, as well as other facilities, are determined to be compatible uses within any agricultural preserve. Also, §51238 states that board of supervisors may impose conditions on lands or land uses to be placed within preserves to permit and encourage compatible uses in conformity with §51238.1.

Further, California Government Code §51238.1 allows a board or council to allow as compatible any use that without conditions or mitigations would otherwise be considered incompatible; however, this may occur only if that use meets the following conditions:

- The use will not significantly compromise the long-term productive agricultural capability of the subject contracted parcel or parcels on other contracted lands in agricultural preserves.

- The use will not significantly displace or impair current or reasonably foreseeable agricultural operations on the subject contracted parcel or parcels or on other contracted lands in agricultural preserves. Uses that significantly displace agricultural operations on the subject contracted parcel or parcels may be deemed compatible if they relate directly to the production of commercial agricultural products on the subject contracted parcel or parcels or neighboring lands, including activities such as harvesting, processing, or shipping.

- The use will not result in the significant removal of adjacent contracted land from agricultural or open-space use.

The proposed Project site is not under a Williamson Land Use contract.

Farmland Security Zone Contract
The CDC passed the Farmland Security Zone legislation (Govt. Code §51296) in 1998. The Farmland Security Zone allows counties to establish an additional program for farmlands to enter into contracts with the State. This legislation allows landowners whose land is under a Williamson Act contract to petition to the county board of supervisors to annul the Williamson Act contract for a Farmland Security Zone Contract. A Farmland Security Zone Contract is a 20-year contract that allows the property owner to receive 35 percent more in tax savings than a Williamson Act contract. Both of these contracts require that lands be within an established Agricultural Preserve. Agricultural lands that are not in a preserve face the greatest threat of conversion, as they are assessed higher property taxes due to their proximity to urbanization. The proposed Project site is not under a Farmland Security Zone contract or within an agricultural preserve.

Forest Land and Timberland
Public Resources Code §12220(g) defines Forest Land as "*land that can support 10% native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.*"

Public Resources Code §4526 defines timberland as "*land, other than land owned by the federal government, which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products, including Christmas trees.*"

Government Code §51104(g) defines Timberland Production Zone (TPZ) as "*an area which has been zoned pursuant to [Government Code] §§51112 or 51113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses, as defined in subdivision (h).*"

Local

Lassen County General Plan
The following General Plan objectives and policies are pertinent to the agricultural resources evaluation for the proposed Project:

GOAL A-1: Conservation of productive agricultural lands and lands having substantial physical potential for productive agricultural use, and the protection of such lands from unwarranted intrusion of incompatible land uses and conversion to uses which may obstruct or constrain agricultural use and value.

- Policy AG-1: The County recognizes that land having the physical characteristics (e.g., soil) for production of agricultural crops and livestock is a resource of significant value which needs to be protected for its economic value, its contribution to the character of the community, and its environmental and scenic values.

- Policy AG-2: Agriculture and livestock management, and related activities consistent with the zoning regulations established by the County, are considered by the County to be compatible activities in areas identified as "open space". Exceptions to this policy may be made in cases where the Board of Supervisors or the Planning Commission determines, in consideration of specific resource issues and management objectives in specified areas, that certain agricultural activities are not compatible and should be excluded. The recognition and consideration of the open space character and values of agricultural and rangeland areas shall not be construed to be contrary to resource production and management practices (including agriculture and livestock grazing) which may be allowed by the County subject to the adopted zoning of those areas and the lawful exercise of the County's land use authority.

- Policy AG-3: Residential development in agricultural areas shall be discouraged because it disrupts the surrounding productive activity of ranches and agricultural operations. Future residential development, with the exception of building permits on an individual basis, should be relegated to the expansion of existing communities and residential areas, including areas designated as "residential" by the County in the General Plan or an area plan even though those areas may not yet be developed.

- PolicyAG-4: In order to support the existing and future economic value and viability of agricultural lands, including grazing lands, such lands should remain in relatively large units. Except in limited circumstances pursuant to the County's zoning ordinance (e.g., segregation of homesites, use permits, etc.), County zoning and subdivision regulations shall protect agricultural lands by not allowing isolated subdivisions intended primarily for residential use to be developed in areas which are not specifically designated in the General Plan or an area plan for a community development land use (e.g., rural residential) and zoned accordingly.

- Policy AG-5: In order to minimize the disruption and displacement of agricultural operations and lands by non-agricultural development, non-agricultural development in agricultural areas should be directed to: sites where soils do not have significant potential for productive agricultural use; sites least likely to impact productive agricultural uses in the vicinity; sites where, or which are adjacent to where, similar non-agricultural uses already exist; and sites where adequate community services are or will be available.

GOAL A-2: Maintain area plan policies and related land use and resource management decisions which support the agricultural policies of the Agriculture Element.

- Policy AG-6: The policies of area plans relating to agricultural resources are recognized as complimentary to and supportive of the Agriculture Element as they may apply to the land and resources of each particular planning area.

GOAL A-3: Maintain an orderly process and review criteria for the consideration of project proposals which may result in the conversion of agricultural lands to uses which are not primarily agricultural or directly related to agriculture, consistent with related policies of the General Plan which are intended to protect agricultural resources and land uses.

- Policy AG-7: In order to minimize the disruption and displacement of agricultural operations and lands by non-agricultural development, non-agricultural development in agricultural areas should be directed to: sites where soils do not have significant potential for productive agricultural use; sites least likely to impact productive agricultural uses in the vicinity; sites where, or which are adjacent to where, similar non-agricultural uses already exist; and sites where adequate community services are or will be available.

- Policy AG-8: The County recognizes that some agricultural areas may, in the future, be more specifically identified and evaluated for alternative land uses. If it can be demonstrated with findings by the Board of Supervisors that there is adequate justification to consider the conversion of agricultural land, those lands may be considered for a General Plan amendment to redesignate them for a specific nonagricultural land use. The conversion of agricultural lands, including rangeland, to non-agricultural uses may be allowed if and when such proposed conversions are supported by findings based on substantial evidence, and consideration of related policies established by local agricultural industry organizations, which demonstrate consistency with all of the provisions listed below. (Note: Some types of land uses may be specifically exempted by the General Plan or an area plan from full consistency with these agricultural conversion findings, e.g., certain industrial uses.)

a) The conversion is justified by a factor of significant benefit to the community (e.g., facilitating orderly expansion of a community, facilitating construction of a public facility, providing significant employment-generating opportunities, etc.);
b) There is a substantial limitation to alternative non-agricultural sites for the proposed land use;
c) Conversion will not have a significant adverse impact on agricultural land use, agricultural water supplies, significant wildlife habitat, or other natural resource based uses on adjacent lands;
d) Adequate community services to support the proposed use are or will be available at the proposed site; and
e) The proposed use is or will be supported by an appropriate land use designation and the establishment of a corresponding zoning district.

- Policy AG-9: When considering proposals for agricultural land conversions and/or associated mitigation measures, the County will recognize that the cumulative impacts from land conversions places an increased burden on the remaining agricultural land to provide environmental quality, wildlife habitat and open space values and may threaten the viability of the remaining agricultural land; therefore, the County will support measures to help minimize the impacts of that burden.

- Policy AG-10: The County shall not expect or require that agricultural lands bear the burden of fulfilling open space requirements for residential and other forms of community development proposed in or adjacent to agricultural areas.

- Policy AG-11: Agricultural production and product processing facilities are encouraged by the County and, unlike most general industrial uses, are considered to be related to agricultural uses and, therefore, may be considered for location in areas designated for intensive or extensive agricultural use without being considered as a "conversion" of agricultural land and without all of the required findings set forth in this section for conversions. However, the siting of agricultural production facilities in these areas, when allowed, shall be supported by information and findings which demonstrate that the facility will not substantially interfere with agricultural or other natural resource-based uses on adjacent lands.

- Policy AG-12: Subject to case-by-case review (including review for compatibility with surrounding agricultural uses), and in compliance with relevant area plan, zoning, permitting and environmental review requirements, the development and operation of the following land uses will typically be deemed to be consistent with the Extensive and Intensive Agriculture land use designations and will not require zoning to an "Industrial" zoning district, nor will they be interpreted by the County to constitute an "agricultural conversion" pursuant to this General Plan:

  a) processing plants for the production of agricultural products;
  b) processing plants for the production of natural resource products where the location of the resource is fundamental to the location of processing and packaging facilities (e.g., water bottled at the source, etc.);

c) mines, the extraction of minerals, and the ancillary processing of mineral materials generated on-site, including the production of asphalt, ready-mix concrete, and similar products;
d) sawmills and related timber processing operations;
e) geothermal and natural gas wells, hydroelectric projects, and ancillary facilities for the production of energy; and
f) uses of similar character as may be determined by the Board of Supervisors.

- Policy AG-13: The operation of a minor non-agricultural activity by the owner of agricultural land on lands designated for agriculture, when such use is clearly subordinate to and does not reduce, constrain, or interfere with agricultural operations on the property or in the vicinity, shall not be interpreted by the County as a "conversion" of agricultural land pursuant to the General Plan. Examples include, but are not limited to, bed-and-breakfast establishments, hunting and other small lodges, guest ranches, and home occupations.

GOAL A-4: Support for the economic viability and continuation of agricultural operations and the protection of agricultural resource lands.

- Policy AG-14: The County shall encourage the on-going review of agriculture-related land use and resource management issues by local organizations representing the agriculture industry (e.g., the Farm Bureau, the Cattlemen's Association), and shall consider their recommendations regarding related land use and resource management policies and actions.

- Policy AG-15: The County supports the consideration of innovative ways to maintain the economic viability of productive agricultural lands, subject to the unique circumstances of each area. Measures may include use of land conservation contracts (e.g., Williamson Act contracts), land banks, transfer of development rights, voluntary conservation easements, and use of buffer areas between agricultural lands and developing areas.

- Policy AG-16: Where proposed residential, commercial, or industrial development abuts lands devoted to agriculture production, the non-agricultural uses shall be required to incorporate buffer areas to mitigate potential land use conflicts as conditions of approval for subdivisions or use permits. The type and width of buffer areas shall be determined based on the character, intensity, and sensitivity of the abutting land uses.

GOAL A-5: Productive cooperation with and from Federal and state agencies which manage natural resources in Lassen County and improved consistency in resource management objectives, policies, and programs.

- Policy AG-17: The County supports grazing practices on private lands and lands managed by state and Federal agencies which support the long-term health and sustainability of rangeland resources.

- Policy AG-18: The County supports cooperative efforts between private sector interests and public agencies that incorporate economic viability while addressing environmental resource concerns such as the Eagle Lake I Pine Creek CRMP.

- Policy AG-19: The County advocates grazing policies on Federal and state lands which support the economic viability of related private livestock operations while maintaining the long-term productivity of rangeland ecosystems. Proposed changes in resource management policies regarding rangeland use need to consider and mitigate potential economic, social, and cultural impacts to Lassen County citizens and communities, and impacts to related private lands in Lassen County.

GOAL A-6: To protect and maximize the present and future productive, economic, and environmental values of the County's soil resources.

- Policy AG-20: The County recognizes the need to protect and conserve areas where soils have high resource values especially in terms of potential agricultural productivity.

- Policy AG-21: The County discourages the development of land having soils of significant agricultural value for purposes other than agriculture or land uses directly related to agriculture.

GOAL A-7: Protection of agricultural lands and lands having substantial potential for productive agricultural use from the intrusion of incompatible neighboring uses and factors which threaten to constrain or reduce agricultural productivity.

- Policy AG-22: The County shall continue to support "right to farm" provisions and shall discourage and minimize the introduction and encroachment of uses which may conflict with agricultural operations or future agricultural development.

- Policy AG-23: The County encourages strategy plans and strong measures to manage feral horses and burros on public and private rangelands and to minimize related damage to livestock and wildlife forage and water resources.

- Policy AG-24: The County supports strong measures to eliminate or prevent the spread of invasive weeds and plant species including, but not limited to, medusahead, yellow starthistle, and perennial pepperweed (whitetop), and to control the adverse effects from the excessive spreading of such species as juniper and cheatgrass.

GOAL A-8: Administrative relief in limited circumstances when the creation of a parcel is needed for a homesite or other special need related to an agricultural operation when the resulting parcel would be smaller than otherwise required in the agricultural area.

- Policy AG-25: The County may establish and administer processes to allow, under limited circumstances and with appropriate findings. the division of land in agricultural zones in order to create special parcels which would be smaller than the size of parcels generally required in the agricultural areas. Approval of such processes (e.g., "Segregation of Homesites", ancillary to an approved use permit, or other processes) shall not be

construed to be a "variance" of the County Code and may be exempted from the required findings of an "agricultural conversion". When supported by appropriate findings, such land divisions shall not be regarded as inconsistent with the intent of the agricultural land use designation.

GOAL A-9: Maintain a good regional reputation for locally-produced agricultural products.

- Policy AG-26: The County supports measures to promote and protect the quality and image of agricultural products produced in Lassen County.

GOAL A-10: Maintain a sensible appropriation and utilization of water for agricultural use in the county.

- Policy AG-27: In order to insure adequate supplies of irrigation water to areas having the highest potential for agricultural productivity, the County supports analysis and, when warranted, development of water impoundments and aqueducts to transport water resources to areas within the County which have the foremost agricultural soils.

- Policy NR-8: The County recognizes the need to protect and conserve areas where soils have high resource values, especially in terms of potential agricultural productivity.

- Policy NR-9: The County discourages the development of land having soils of significant agricultural value for purposes other than agriculture or land uses directly related to agriculture.

GOAL N-11: Healthy forest environments which will continue to provide resources for multiple uses and timber production in sustainable quantities which will benefit the local economy.

- Policy NR-31: It is recognized by the County that the timber industry has historically been and continues to be a major economic and social component of Lassen County and therefore represents a vital factor in the fundamental culture and customs of the community.

- Policy NR-33: The County supports the balancing of policies for the conservation of natural resources (including wildlife management policies) in forested areas with the need to maintain production of timber at abundant, sustainable levels as an economic resource.

- Policy NR-34: The County recognizes the critical role that timber resources on Federal lands have in the economy of Lassen County and shall continue to advocate and support Federal resource management policies and practices which make plentiful, sustainable quantities of timber available for local lumber and timber-related industries.

- Policy NR-35: The County supports the efforts of the timber industry and local citizens to forge cooperative plans and agreements to achieve diverse objectives for protecting and managing forest resources while providing for the long-term economic stability of timber-reliant industries.

- Policy NR-36: In areas having significant forest and timber resources, the County supports the formulation of resource management goals and objectives which address the long-term health and diversity of resources in these areas as well as the sustained productivity of timber products.

- Policy NR-37: The County supports management of endangered species and critical wildlife habitats in balance with other resource management needs, including the need for economic stability related to timber industries.

- Policy NR-38: The County supports successful reforestation of harvested and fire-damaged areas on private and publicly-owned timberlands.

GOAL L-16: Conservation of productive agricultural lands and lands having substantial physic.al potential for productive agricultural use, and the protection of such lands from unwarranted intrusion of incompatible land uses and conversion to uses which may significantly obstruct or constrain agricultural use and-value.

- Policy LU-35: Subject to case-by-case review (including review for compatibility with surrounding agricultural uses), and in compliance with relevant area plan, zoning, permitting and environmental review requirements, the development and operation of the following land uses will typically be deemed to be consistent with the Extensive and Intensive Agriculture land use designations and will not require zoning to an "Industrial" zoning district, nor will they be interpreted by the County to constitute an "agricultural conversion" pursuant to this General Plan:

    a) processing plants for the production of agricultural products;
    b) processing plants for the production of natural resource products where the location of the resource is fundamental to the location of processing and packaging facilities (e.g., water bottled at the source, etc.);
    c) mines, the extraction of minerals, and the ancillary processing of mineral materials generated onsite, including the production of asphalt, ready-mix concrete and similar products;
    d) sawmills and related timber processing operations;
    e) geothermal and natural gas wells, hydroelectric projects, .and ancillary facilities for the production of energy; and
    f) uses of similar character as may be determined by the Board of Supervisors.

- Policy LU-40: The County recognizes and has generally assigned General Plan land use designations for lands having high agricultural resource value as "Intensive Agriculture" or "Crop Land and Prime Grazing Land". It also recognizes the potentially important agricultural values of some of the areas designated "Extensive Agriculture" or "Grazing and Sagebrush Environment" for rangeland grazing and other agricultural purposes.

Standish-Litchfield Area Plan

The Project site is located within the boundaries of the *Standish-Litchfield Area Plan*, originally adopted in 1986. The Area Plan contains the following goals, objectives, and policies related to agricultural resources:

GOAL: Protect productive agricultural lands from conversion to less appropriate uses or conflict caused by intrusion from incompatible uses. Protect resource values of the area's rangeland and livestock production areas.

- Policy 7-A: Agricultural land in Lassen County shall be protected for its economic importance, its contribution to the character of the community and its environmental values. Agricultural lands in the Planning Area shall be designated as either intensive or extensive agriculture.

- Policy 7-B: Parcel sizes shall be retained at sufficient sizes for productive economic agricultural use.

4.3.3 Previous CEQA Reviews

The Environmental Impact Reports (EIRs) prepared for operations at the Project site in 1981 and 1997 did not include an analysis of impacts to agriculture and forestry resources. Agriculture and forestry resources were not evaluated in the 2019 EIR. The Initial Study prepared by the County for the project in 2018 determined there would be no impact to agriculture and forestry resources since the project did not change the location or type of mining.

4.3.4 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to *Agriculture and Forestry Resources* have been derived from Appendix G of the CEQA Guidelines:

- *Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.*

- *Conflict with existing zoning for agricultural use or a Williamson Act contract.*

- *Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use.*

- *Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)) or result in the loss of forest land or conversion of forest land to non-forest use.*

4.3.5 Impact Analysis

The following includes an analysis of environmental parameters related to *Agriculture and Forestry Resources* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the

conclusions that either no impacts, less than significant impacts, or less than significant impacts with mitigation could occur. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Agriculture and Forestry Resources.*

Areas of No Project Impact

As required by CEQA Guidelines §15082, the County issued a Notice of Preparation (NOP) on April 28, 2021 that summarized the proposed Project, stated its intention to prepare an EIR, and requested comments regarding the scope and content of the EIR from responsible and trustee agencies. In the course of the County's initial evaluation, certain impacts of the proposed Project were found to not to be significant because of the inability of a project of this scope to create such impacts or the absence of project characteristics producing effects of this type. The effects determined not to be significant are not required to be included in primary analysis sections of the DSEIR. As such, the following impacts either are not applicable to the proposed Project or are not reasonably foreseeable and are not addressed further within this section:

- *Conflict with existing zoning for agricultural use or a Williamson Act contract.*

  The proposed Project is not covered by a Williamson site contract. The County's General Plan allows for mining in areas designated as Extensive Agriculture. Implementation of the proposed Project would result in no impact or conflict with existing uses or a Williamson Act contract.

- *Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)) or result in the loss of forest land or conversion of forest land to non-forest use.*

  The Project area is not forested and not zoned for forestland, timberland, or timber production zone. There is no conflict or impact to forestland.

Project Impacts

Impact 4.3-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program (FMMP) of the California Resources Agency, to non-agricultural use.

According to the NRCS, Lassen County has not been surveyed for inclusion in the FMMP. Pursuant to CEQA §21060.1, in those areas of the state where lands have not been surveyed "agricultural land" means land that meets the requirements of "prime agricultural land" as defined in California Government Code Section 51201(a)(1), (2), (3), and (4) as follows:

- All land that qualifies for rating as class 1 or class 2 in the NRCS land use capability classifications.
- Land which qualifies for rating 80 through 100 in the Storie Index Rating.

- Land which supports livestock used for the production of food and fiber and which has an annual carrying capacity equivalent to at least one animal unit per acre as defined by the USDA.
- Land planted with fruit- or nut-bearing trees, vines, bushes, or crops which have a nonbearing period of less than five years and which will normally return during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than two hundred dollars ($200) per acre.

The Land Capability Classification Rating

The Land Capability Classification (LCC) indicates the suitability of soils for most kinds of crops. Groupings are made according to the limitations of the soils when used to grow crops, and the risk of damage to soils when they are used in agriculture. Soils are rated from Class 1 to Class 8, with soils having the fewest limitations receiving the highest rating (Class I). Specific subclasses are also utilized to further characterize soils. A description of each soil rating is provided in Table 4-2. The LCC also includes capability subclasses, which are soil groups within one capability class and are designated by the letters "e", "w", "s", or "c" as described in Table 4-3.

Table 4-2
LAND CAPABILITY CLASSIFICATION CLASSES

Class	Description
1	Soils have few limitations that restrict their use.
2	Soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
3	Soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.
4	Soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.
5	Soils are subject to little or no erosion but have other limitations that are impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
6	Soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
7	Soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.
8	Soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or aesthetic purposes.

Source: Natural Resources Conservation Service. 2017.

Table 4-3
LAND CAPABILITY CLASSIFICATION SUBCLASSES

Subclass	Description
e	The main problem or hazard is the risk of erosion. The susceptibility of erosion and past erosion damage are the main soil factors that affect soils in this subclass.
w	Water in or on the soil interferes with plant growth or cultivation. Poor soil drainage, wetness, a high-water table, and overflow are the factors that affect soils in this subclass.
s	The soil has limitations within the rooting zone, mainly because it is shallow, has low moisture-holding capacity, or is stony.
c	The chief limitation is climate that is very cold or very dry.

Source: Natural Resources Conservation Service. 2017.

Storie Index Rating
The Storie Index provides a numeric rating (based upon a 100-point scale) of the relative degree of suitability or value of a given soil for intensive agriculture. The rating is based upon the character of the soil profile, surface texture, steepness of the slope, drainage, alkalinity, fertility, wind and water erosion, acidity, and microrelief.

Animal-Unit Rating
An animal unit (AU) is generally one mature cow of approximately 1,000 pounds and a calf as old as six months, or their equivalent. The NRCS uses 30 pounds per day (10,950 pounds per year) air-dry weight (as-fed) of forage as the standard forage demand for a 1,000-pound cow with a calf. The range production ratings shown in Table 4-4 identify the amount of vegetation that can be expected to grow annually in a well-managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals.

Project Site Soils
Soils on the Project site are shown on Figure 3-7 and summarized in Table 4-4.

Table 4-4
PROJECT SOIL TYPES

Map Unit Symbol	Soil Name	Total Acres	% of Project Site	Land Capability Classification (LCC)	Storie Index	Range Production (pounds per acre per year)
302	Orhood, very stony sandy loam, 5-15% slope	11.2	14.3	7s	11-20	1,290
283	McConnel-Mottsville complex, 2-9% slope	40.3	51.2	6e	11-20	870
179	Devada Rock Outcrop association, 2-50% slope	27.2	34.6	7e	11-20	580

Sources: Natural Resources Conservation Service. 2017; USDA, Soil Conservation Service and Forest Service.

No portion of the proposed Project site is irrigated; therefore, the LCCs presented in Table 4-4 reflect the classification for non-irrigated soils. As indicated in Table 4-4, the project site does not include any LCC Class 1 or 2 soils or soils rated 80-100 in the Storie Index Rating. Although the Project site could be used as grazing land, based on range production as shown in Table 4-4, the Project site would not yield sufficient vegetation to support an annual carrying capacity equivalent to at least one animal unit per acre. In addition, there are no fruit or nut-bearing trees on the project site. Therefore, the Project site does not meet the definition of prime agricultural land included in California Government Code §51201; impacts would be less than significant.

Impact 4.3-2: Involve other changes in the existing environment that, due to their location or nature, could result in conversion of farmland to nonagricultural use.

The proposed Project will not result in the loss of prime farmland, unique farmland, or farmland of statewide importance, nor will the proposed Project result in the conversion of farmland to non-agricultural use. However, the proposed Project will result in the loss of approximately 78.6 acres of low capability grazing land. Refer to discussion under Impact 4.3-1, above. Impacts would be less than significant in this regard.

4.3.6 Mitigation Measures

No mitigation measures are required.

4.3.7 Level of Significance after Mitigation

No mitigation measures are required. Impacts would be less than significant.

4.4 Air Quality

This section includes a discussion of the potential air quality impacts of the proposed Project. Increasing production volume of the mine from 100,000 to 200,000 tons per year, expansion of the mine to include an additional 78.6 acres of mining area, and extension of mining for 20 years are substantial changes proposed that will require revisions of the previous EIR due to the involvement of potentially new significant environmental effects pertaining to air quality or a substantial increase in the severity of previously identified significant effects under CEQA Guidelines §15162.

This section includes a description of the air quality setting of the Project site and summarizes air quality regulations and the previous CEQA review of air quality impacts at the Project site. This section contains an analysis of the air quality impacts of the proposed Project including a discussion of human health impacts related to diesel particulate matter. The analysis is based on information contained in the *Ward Lake Pit Expansion Air Quality and Health Risk Assessment Technical Report* prepared for the Project by RCH Group in September 2021(refer to Appendix D, *Air Quality & Health Risk Assessment*).

4.4.1 Environmental Setting

The following environmental setting information was obtained from the *Ward Lake Pit Expansion Air Quality and Health Risk Assessment Technical Report* (RCH Group, 2021). The Project site is located in the Northeast Plateau Air Basin (Air Basin), which comprises Siskiyou, Modoc, and Lassen counties. The Air Basin has a climate regime that is distinct from the rest of California. The Air Basin has sharply defined seasons that follow a continental, rather than marine, pattern. Winters are cold and snowy; summers are warm and dry. The Air Basin includes part of the Klamath Mountains to the west and the Cascade Range and Modoc Plateau, plus a slice of the Great Basin along its eastern edge. The volcanic Modoc Plateau extends across the northeastern expanse, with an elevation mostly above 4,500 feet above mean sea level (msl).

The region receives little to no transported air pollution from major urban areas. As in many rural areas in California, particulates from dust and wood smoke are sometimes a problem. Only the city of Yreka experiences occasional ozone concentrations that approach "near exceedances."

Land uses such as residences, schools, children's daycare centers, hospitals, and convalescent homes are considered to be more sensitive than the general public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. California Air Resources Board (CARB) has identified the following people as most likely to be affected by air pollution: children less than 14 years of age, the elderly over 65 years of age, athletes, and those with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive population groups.

Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational uses are also considered sensitive, due to the greater exposure to ambient air quality conditions and because the presence of pollution detracts from the recreational experience.

The Project site is surrounded by open grazing lands. Immediately adjacent to and south of the site, a smaller aggregate mine is located on Bureau of Land Management (BLM) administered land. Other BLM land is located to the east and south and the Wells Ranch is located directly to the north. Six homes are located on parcels from 10 to 80 acres in size to the west and south along Ward Lake Road. The nearest residence is approximately 875 feet from the western property line of the of the existing quarry (where processing occurs) and approximately 4,500 feet from the proposed quarry expansion area. Shaffer Elementary School is located 2.4 miles to the southeast of the site.

The Lassen County Air Pollution Control District (APCD) is the local air district governing Lassen County which is part of the Northeast Plateau Air Basin. The Lassen County APCD requires permits for proposed construction, alteration or replacement of equipment or facilities which may cause the issuance of air contaminants. Ward Lake Quarry maintains a permit to operate (PTO-19-140: expiration date March 31, 2024) for onsite equipment such as a hot mix asphalt plant, a lime slurry mix plant, a concrete plant, a crushing plant, a wash plant, a sand plant, and several diesel generators (one 750 horsepower [hp] generator associated with the crushing plant, one 475 hp generator associated with the portable plant, and one 469 hp generator associated with the wash plant). The existing facility also has a daily and annual limit on the number of haul truck trips.

4.4.2 Regulatory Setting

The following is a description of federal, State, and local environmental laws and policies that are relevant to the CEQA review process for the proposed expansion area.

Federal

Federal Clean Air Act
The federal Clean Air Act (CAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The federal CAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: National Ambient Air Quality Standards (NAAQS) for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor control measures, stratospheric ozone protection, and enforcement provisions. The USEPA is responsible for administering the federal CAA. The federal CAA requires the USEPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

State

California Clean Air Act
The California CAA was first signed into law in 1988. The California CAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state's air quality goals, planning and regulatory strategies, and performance. CARB is the agency responsible for administering the California CAA. CARB established California Ambient Air Quality Standards (CAAQS) pursuant to the California Health and Safety Code (CH&SC) [§39606(b)], which are similar to the federal standards.

Ambient Air Quality Standards

Regulation of air pollutants is achieved through both NAAQS and CAAQS and emissions limits for individual sources. Regulations implementing the federal CAA and its subsequent amendments established NAAQS (national standards) for the six criteria pollutants. California has adopted more stringent CAAQS (state standards) for most of the criteria air pollutants. In addition, California has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Because of the meteorological conditions in the state, there is considerable difference between state and federal standards in California.

The ambient air quality standards are intended to protect the public health and welfare, and they incorporate an adequate margin of safety. They are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, including asthmatics, the very young, elderly, people weakened from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels somewhat above the ambient air quality standards before adverse health effects are observed.

Under amendments to the federal CAA, USEPA has classified air basins or portions thereof, as either "attainment" or "non-attainment" for each criteria pollutant, based on whether or not the national standards have been achieved. The California CAA, which is patterned after the federal CAA, also requires areas to be designated as "attainment" or "non-attainment" for the state standards. Thus, areas in California have two sets of attainment/nonattainment designations: one set with respect to the federal standards and one set with respect to the state standards. Table 4-5 shows the federal and State ambient air quality standards for different criteria pollutants and also summarizes the related health effects and principal sources for each pollutant.

Toxic Air Contaminants

Toxic Air Contaminants (TAC) are pollutants that may be expected to result in an increase in mortality or serious illness or that may pose a present or potential hazard to human health. Health effects include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. Although ambient air quality standards exist for criteria pollutants, no such standards exist for TAC. Many pollutants are identified as TAC because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TAC that are known or suspected carcinogens, the CARB has consistently found that there are no levels or thresholds below which exposure is free of risk. Individual TAC varies greatly in the risk they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. For certain TAC, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health risks, a similar factor called a Hazard Index is used to evaluate risk. In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Toxic Air Contaminant Identification and Control Act (Assembly Bill [AB] 1807) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) supplements the AB 1807 program by requiring a statewide air toxics inventory and notification of people exposed to a significant health risk and sensitive receptors.

Local

According to the Lassen County APCD, the Air Quality Index in Lassen County is classified as "good" for the majority of the year, although events such as wildfires and inversion layers in winter months can periodically degrade air quality. There are no ambient air quality monitoring stations or other facilities conducting ambient air quality monitoring of toxic contaminants in Lassen County; therefore, local ambient concentrations are not available. The only ambient air quality monitoring station located in the Northeast Plateau Air Basin is the Yreka-Foothill Drive Monitoring Station, located approximately 170 miles northwest in Yreka within Siskiyou County. Consideration of data from "regional sites" impacted by similar natural and man-made sources is an accepted practice by the USEPA; therefore, a summary of ambient air quality monitoring data collected by the Yreka-Foothill Drive Monitoring Station for ozone and $PM_{2.5}$ (PM_{10} monitoring was discontinued in 2016) is provided in Table 4-6. Although the region experiences elevated concentrations, Lassen County is in attainment/unclassified for federal and state PM_{10} and $PM_{2.5}$ standards as well as ozone.

Table 4-5
AMBIENT AIR QUALITY STANDARDS AND MAJOR POLLUTANT SOURCES

Pollutant	Averaging Time	State Standard	Federal Standard	Major Pollutant Sources
Ozone	8 hour	0.070 ppm	0.070 ppm	Formed when ROG and NOx react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/ industrial mobile equipment.
	1 hour	0.09 ppm	--	
Carbon Monoxide	8 hour	9.0 ppm	9 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.
	1 Hour	20 ppm	35 ppm	
Nitrogen Dioxide	Annual Average	0.030 ppm	0.053 ppm	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
	1 Hour	0.18 ppm	0.100 ppm	
Sulfur Dioxide	Annual Average	--	0.030 ppm	Fuel combustion, chemical plants, sulfur recovery plants and metal processing.
	24 Hour	0.04 ppm	0.14 ppm	
	1 Hour	0.25 ppm	0.075 ppm	
Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 ug/m^3	--	Dust-and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays)
	24 hour	50 ug/m^3	150 ug/m^3	
Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 ug/m^3	12 ug/m^3	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; also, formed from photochemical reactions of other pollutants, including Nox, sulfur oxides, and organics.
	24 hour	--	35 ug/m^3	
Lead	Calendar Quarter	--	1.5 ug/ m^3	Present source: lead smelters, battery manufacturing and recycling facilities. Past source: combustion of leaded gasoline.
	30 Day Average	1.5 ug/m3	--	

Note: ppm = parts per million; and □ g/m3 = micrograms per cubic meter.
Source: California Air Resources Board, *Air Quality Standards*, Accessed January 26, 2021, https://ww2.arb.ca.gov/resources/98california-ambient-air-quality-standards.

Table 4-6
AIR QUALITY DATA SUMMARY (2017 -2019)

Pollutant	Standard[a]	2017	2018	2019
Ozone				
Highest 1 Hour Average (ppm)[b]	0.090	0.053	0.089	0.069
Days over State Standard		0	0	0
Highest 8 Hour Average (ppm)[b]	0.070	0.049	**0.075**	0.059
Days over National Standard		0	**4**	0
Highest 8 Hour Average (ppm)[b]	0.070	0.049	**0.075**	0.059
Days over State Standard		0	**4**	0
Particulate Matter (PM $_{2.5}$)				
Highest 24 Hour Average (ug/m^3)[b]	35	**79**	**143**	**74**
Days over National Standard		**26**	**57**	**4**
State Annual Average (ug/m^3)[b]	12	11.1	**14.4**	5.9

Notes: Values in **bold** are in excess of at least one applicable standard.
a. Generally, State standards and National standards are not to be exceeded more than once per year.
b. ppm=parts per million; ug/m^3=micrograms per cubic meter.
c. PM_{10} is not measured every day of the year. Number of estimated days over the standard is passed on 365 days per year.

Source: California Air Resources Board, *Air Quality Trend Summaries*, https://www.arb.ca.gov/adam/trends/trends1.php

According to the *Lassen County 2012 Regional Transportation Plan*, elevated PM_{10} concentrations can be caused by sources including fugitive dust, combustion from automobiles and heating, road salt, and conifers, among others. Constituents that comprise suspended particulates include organic, sulfate, and nitrate aerosols that are formed in the air from emitted hydrocarbons, chloride, sulfur oxides, and oxides of nitrogen. Particulates reduce visibility and pose a health hazard by causing respiratory and related problems CARB further identifies motor vehicles, wood-burning stoves and fireplaces, dust from construction, landfills, and agriculture, wildfires and brush/waste burning, industrial sources, and windblown dust from open lands as major sources of PM_{10}.

Lassen County General Plan
The Natural Resources Element of the *Lassen County General Plan* includes the following applicable goal, policies, and implementation measures related to air quality:

GOAL N-22: Air quality of high standards to safeguard public health, visual quality, and the reputation of Lassen County as an area of exceptional air quality.

- Policy NR-74: The Board of Supervisors will continue to consider, adopt, and enforce feasible air quality standards which protect the quality of the County's air resources.

- Policy NR-75: The County shall consider the appropriateness and feasibility of air pollution control requirements for individual projects and may grant variances to specific requirements pursuant to established procedural guidelines.

Lassen County APCD Rule 4:18 (Fugitive Dust Emissions)
Compliance with regulatory requirements related to fugitive dust are applicable to reduce impacts to less than significant. Based on Lassen County APCD Rule 4:18 (Fugitive Dust Emissions), reasonable precautions shall be taken to prevent particulate matter from becoming airborne, including, but not limited to, the following provisions:

a. Covering open bodied trucks when used for transportation materials likely to give rise to airborne dust.
b. Installation and use of hoods, fans, and other fabric filters to enclose and vent the handling of dusty materials. Containment methods may be employed during sandblasting and other similar operations.
c. The application of asphalt, oil, water or suitable chemicals to dirt roads, material stockpiles, land clearing, excavation, grading or other surfaces which can give rise to airborne dusts.
d. The prompt removal of earth or other material from paved streets onto which earth or other material for earth moving equipment, erosion by water, or other means has been deposited.

4.4.3 Previous CEQA Reviews

1981 EIR

The 1981 *Environmental Impact Report for Operation of Aggregate Materials Source Operation of Rock Crushing Plant Operation of Asphalt Concrete Batch Plant (SCH No. 80062304),* prepared for the original operation at the site, analyzed limited air impacts of the initial mining operation – specifically, the generation of dust from asphalt operation and crushing. The EIR noted concerns that the Project would impact air quality via the generation of dust from mining and crushing and transport of site materials. In addition, odor, and emission for asphalt the fuel storage tanks were addressed. The 1981 EIR included the following mitigation measures related to air quality:

- *Treating stockpile surfaces with water.*
- *Providing wind breaks of dirt berms and placement of fine aggregates between coarse aggregate piles to screen from periling winds.*
- *Planning of plant layout to take advantage of natural topography.*
- *Careful operation and loading and hauling of equipment to prevent generation of dust.*
- *Use of conveyor covers or enclosure of the dry feed elevator.*
- *Installation of secondary control structures (baghouse dry dust and weather systems.*
- *Minimizing the distance of fall between pugmill and storage hoppers to reduce odors.*
- *Use of low-sulfur fuels.*
- *Asphalt and fuel storage tanks being closed at all times and maintained in a clean condition with care taken to avoid spills.*
- *Application for permit to operate from the APCD office.*
- *Pave the access and haul roads as well as the plant site as soon as feasible to eliminate the primary complaint of dust which results when equipment and trucks operate on unpaved areas. Actual timing of paving these areas would be governed by the volume of production and hauling warranting this improvement and subject to review and recommendations of the Planning Commission.*
- *Use of water trucks on any unpaved portions of the area is anticipated; and vehicle speed within the site controlled at 10 MPH to avoid creation of unnecessary dust.*
- *Water or dust oils would be applied to County Road 308 (Ward Lake Road) by the applicant as required to alleviate dust from truck traffic and would continue until such time as paving is required.*
- *Speed on County Road 308 from the plant access point to A-27 (Center Road) would necessarily be limited to approximately 25 MPH due to the road conditions and the short length (approximately one mile) encompassed.*

1997 EIR

The *1997 Ward Lake Expansion EIR* prepared for the previous spatial expansion and operational addition of the ready-mix concrete plant determined that air impacts of the expansion were less than significant with mitigation incorporated. Similar issues and concerns were noted on the 1997 EIR as in the 1981 EIR. The 1997 EIR noted the APCD measures included therein, which were included as conditions to the new APCD permit in 1996 and included AB 2588 *Air Toxics Assessment*, were sufficient to reduce impacts to below significant levels. The 1997 EIR included the following mitigation measures to reduce dust and other airborne pollutants:

Compliance with APCD Permit to Operate Conditions.

- *Miller's Custom Work shall apply water to all roads on the plant site which are being used during plant operation. All roads being used shall be wet at all times without exception. Additionally, stockpiles of sand, gravel, etc., should also be watered when feasible.*

- *Miller's Custom Work shall install or replace any and all metal flashing around hoppers, conveyors, or fans in order that fugitive dust resulting from operation of the plant is reduced to a level which is in compliance with District Rule 4:18. Installation or replacement of such metal flashing shall occur prior to strut of the plant in 1991 (and the concrete plant in 1996). Additionally, Miller's Custom Work shall notify the Lassen County Air Pollution Control District at the start or the first days of operation in 1991 (and the concrete plant in 1996), so that an inspection can be made of the plant sites to determine compliance with this conditions.*

- *Miller's Custom Work shall contract with a California Air Resources Board certified private contractor for an annual compliance test at the Ward Lake facility to determine compliance with Lassen County Air Pollution Control District Rule 4:3 (Grain Loading Rule -0.3 grain per cubic foot gas). This test shall be performed prior to January 1 of every year.*

Additional conditions for the concrete plant:

- *Not more than 7,000 cubic yards of concrete shall be processed annually.*
- *Aggregate charged and/or processed shall be kept sufficiently moist to prevent visible dust emissions.*
- *Dust collected by the baghouse filter shall be discharged into closed containers only.*
- *Cloth bags in the baghouse shall be cleaned and/or replaced periodically.*
- *Annual operation shall be limited to dates as recommended by the wildlife biologist in the EIR and/or as adopted by the lead agency.*

2019 EIR

The County determined 24-hour operations and increased traffic analyzed in the 2019 EIR did not include any changes that would result in impacts to air quality with the exceptions of a potential exposure of sensitive receptors to substantial pollutant concentrations and the potential to create objectionable odors affecting a substantial number of people. These impacts were determined to be less than significant. However, an analysis of the health impacts from diesel particulate matter emissions from diesel generators and haul trucks was included due to concerns raised in early consultation about the health impacts of diesel particulate matter. For this reason, a *Health Risk*

Assessment was prepared. The *Health Risk Assessment* assessed the health impacts to nearby receptors from diesel particulate matter generated by additional truck trips and operation of generators onsite. Cancer risks and non-cancer health risks were calculated to be below thresholds for significant health impact. Impacts to air quality were determined to be less than significant. Cumulative impacts to air quality were determined to be less than significant.

4.4.4 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to *Air Quality* have been derived from Appendix G of the CEQA Guidelines:

- *Conflict with or obstruct implementation of the applicable air quality plan.*
- *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.*
- *Expose sensitive receptors to substantial pollutant concentrations.*
- *Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.*

The thresholds of significance applied to assess project-level health impacts are:

- *Exposure of persons by siting a new source or a new sensitive receptor to substantial levels of TAC resulting in:*
    - *(a) a cancer risk level greater than 10 in one million.*
    - *(b) a noncancerous risk (chronic or acute) hazard index greater than 1.0. For this threshold, sensitive receptors include residential uses, schools, parks, daycare centers, nursing homes, and medical centers.*

Lassen County Rules and Regulations include general provisions and rules for APCD-issued permits, fees, prohibitions (including but not limited to nuisance, particulate matter, specific air contaminants, open burning, gasoline storage, reduction of odorous matter, fugitive dust emissions, and equipment breakdown), procedures, new source siting, and Title V permits. Operation of the Project would be implemented in compliance with the Lassen County APCD Air Quality Rules and Regulations.

Lassen County APCD has a nuisance rule which implicitly regulates pollutants other than those for which criteria standards have been adopted. Rule 4:2 states that a person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business and property. Rule 4:2 may be

interpreted to restrict ambient concentrations of pollutants, such as toxic and hazardous pollutants, until other standards are in place.

Lassen County APCD Rule 4:18 states that reasonable precautions shall be taken to prevent particulate matter from becoming airborne and allows for the application of asphalt, oil, water, or suitable chemicals to dirt roads, material stockpiles, land clearing, excavation, grading or other surfaces which can give rise to airborne dusts.

Additionally, the Lassen County APCD Rule 6:4 includes the following Best Available Control Technology (BACT) Emission thresholds: An applicant shall apply BACT to a new source or modification of an existing source, except cargo carriers, for each affected pollutant emitted, including halogenated hydrocarbons, under the following conditions:

1) A new stationary source emits more than 150 pound per day of ROG, NO_x, PM_{10}, or $PM_{2.5}$; or 550 pounds per day of CO (equivalent to 27 tons per year and 100 tons per year respectively).

2) A modification of an existing stationary source will result in a net emission increase of an affected pollutant by an amount more than any of the limits above.

3) A new source or modification subject to BACT for any pollutant subject to this section shall apply BACT for any other affected pollutant emitted from the new source or modification if the Air Pollution Control Officer should so require.

4.4.5 Impact Analysis

The existing surface mining operation (100,000 tons per year annual limit) is presently permitted for the mining of rock, crushing, screening, washing, material stockpiling, fuel storage; operation of a cement plant (12,000 cubic-yard annual limit) and asphalt plant (400,000 tons per year); and the use of settling ponds, scales, an office, and a truck shop. Grading, excavating, and blasting are prohibited onsite between January 1st and March 31st annually, except in a state of emergency. Currently permitted operations at the project site allow the applicant to provide materials for emergency projects and construction projects that require continuous 24-hour operations. In order to respond to emergency projects, the annual removal volume of the mine presently could exceed 100,000 tons. The majority of operations occur from April through October. In addition, the current operation includes mining from 2020 through 2030 to allow increased extraction of materials from the site.

The Lassen County APCD is the local air district governing Lassen County which is part of the Northeast Plateau Air Basin. The Lassen County APCD requires permits for proposed construction, alteration or replacement of equipment or facilities which may cause the issuance of air contaminants. The existing quarry maintains a permit to operate (PTO-19-140: expiration date March 31, 2024) for existing onsite equipment such as a hot mix asphalt plant, a lime slurry mix plant, a concrete plant, a crushing plant, a sand wash plant, and several diesel generators. As of the permit issuance, the facility had five diesel generators with the following upgrades or replacements planned:

- One 750 horsepower (hp) diesel generator associated with the asphalt plant, which has been switched to line power.
- One 750 hp diesel generator associated with the aggregate plant, which will be switched to line power by January of 2022.
- One 755 hp diesel generator associated with the aggregate plant, which will be updated with Air District approved Tier 4 engine8 or switched to line power by January of 2023.
- One 475 hp diesel generator associated with the lime plant, which will be updated with Air District approved Tier 4 engine or switched to line power by January of 2024.
- One 470 hp diesel generator associated with the wash plant, which will be updated with Air District approved Tier 4 engine or switched to line power by January of 2025.

The proposed Project includes increasing the crushing operations (from 100,000 to 200,000 tons per year) and expansion of the mine to include an additional 78.6 acres of mining area. The typical and maximum daily operations are not expected to change as a result of the proposed Project. However, the annual number of crushing operation hours may be greater as a result of the proposed Project in order to process the greater annual; amount of aggregate. This change in hours of operation may also include the 755 hp diesel generator associated with the aggregate plant (which by January of 2023 will be an APCD approved Tier 4 engine or switched to line power). Therefore, the air quality analysis (to be conservative) included greater hours of operation for the diesel generator associated with the aggregate plant and assumed the diesel generator would not be replaced by line power. The end date of mining would be extended to 2050; an additional 20 years.

The equipment for material processing (i.e., loaders, excavators) would also increase in annual operations to match the increase in crushing operations. The annual operating hours of the majority of off-road equipment will increase by 50 percent. The proposed Project would not change the hot mix asphalt plant, the lime slurry mix plant, the concrete plant, portable plant, and diesel generator operations associated with hot mix asphalt plant and portable plant nor would the proposed project change the daily or annual haul truck trip limit. The potential air quality impacts associated with the proposed 78.6-acre quarry expansion are discussed below.

Areas of No Project Impact

As required by CEQA Guidelines §15082, the County issued a Notice of Preparation (NOP) on April 28, 2021 that summarized the proposed Project, stated its intention to prepare an EIR, and requested comments regarding the scope and content of the EIR from responsible and trustee agencies. In the course of the County's initial evaluation, certain impacts of the proposed Project were found to not to be significant because of the inability of a project of this scope to create such impacts or the absence of project characteristics producing effects of this type. The effects determined not to be significant are not required to be included in primary analysis sections of the DSEIR. As such, the following impacts either are not applicable to the proposed Project or are not reasonably foreseeable and are not addressed further within this section:

- *Conflict with or obstruct implementation of the applicable air quality plan.*

  Lassen County is in attainment/unclassified for all criteria pollutants. There are no applicable attainment plans or other local air quality plans for the Northeast Plateau Air

Basin or Lassen County APCD. Therefore, Lassen County is not subject to an air quality plan. No impact would occur in this regard.

Project Impacts

Impact 4.4-1: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.

The analysis prepared for the proposed quarry expansion focuses on pollutant emissions associated with the aggregate processing operations and supporting activities (i.e., blasting operations and diesel generators associated with crushing and wash plant and off-road equipment such as loaders, excavators, and dozers). The regulatory models used to estimate the air quality impacts are described in detail in the air quality analysis prepared for the proposed Project (refer to Appendix D, *Air Quality & Health Risk Assessment*).

The daily emissions for existing conditions are included in Table 4-7. The daily emissions for the existing conditions plus the proposed Project are included in Table 4-8. Table 4-9 shows the daily incremental emissions of the proposed Project (proposed Project minus existing conditions). The annual emissions for the proposed Project and the annual incremental emissions for the proposed Project (proposed Project minus existing condition) are included in Tables 4-10, 4-11, and 4-12 respectively. The only incremental daily emission change is related to the blasting operations due to greater blasting zone size. The daily processing rates would not change and thus, the associated daily emissions would not change. The incremental annual emissions would be greater due to the proposed Project as a result of the greater annual production rates.

Table 4-7
EXISTING CONDITIONS DAILY EMISSIONS (POUNDS)

Emission Source	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Onsite Equipment	0.94	9.23	6.13	0.03	0.22	0.21
Generator -Crushing Plant	1.34	14.8	200	123	1.75	1.75
Generator -Portable Plant	0.71	13.0	87.5	13.2	1.50	1.50
Generator -Wash Plant	0.70	12.9	86.4	13.0	1.48	1.48
Aggregate Plant	-	-	-	-	16.5	2.48
Wash Plant	-	-	-	-	4.12	0.62
Sand Plant	-	-	-	-	9.38	1.41
Unpaved Travel	-	-	-	-	22.2	3.33
Material Handling	-	-	-	-	2.33	0.35
Blasting	-	-	-	-	4.04	0.61
Haul Trucks	0.73	7.61	91.6	0.39	0.43	0.41
Total	**4.43**	**57.6**	**471**	**150**	**64.0**	**14.1**

Source: RCH Group, 2021.

Table 4-8
PROPOSED PROJECT DAILY EMISSIONS (POUNDS)

Emission Source	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Onsite Equipment	0.94	9.23	6.13	0.03	0.22	0.21
Generator -Crushing Plant	1.34	14.8	200	123	1.75	1.75
Generator -Portable Plant	0.71	13.0	87.5	13.2	1.50	1.50
Generator -Wash Plant	0.70	12.9	86.4	13.0	1.48	1.48
Aggregate Plant	-	-	-	-	16.5	2.48
Wash Plant	-	-	-	-	4.12	0.62
Sand Plant	-	-	-	-	9.38	1.41
Unpaved Travel	-	-	-	-	22.2	3.33
Material Handling	-	-	-	-	2.33	0.35
Blasting	-	-	-	-	7.42	1.11
Haul Trucks	0.73	7.61	91.6	0.39	0.43	0.41
Total	**4.43**	**57.6**	**471**	**150**	**67.3**	**14.6**

Source: RCH Group, 2021.

Table 4-9
DAILY INCREMENT EMISSIONS (POUNDS)

Emission Source	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Existing Condition	4.43	57.6	471	150	64.0	14.1
Proposed Project	4.43	57.6	471	150	67.3	14.6
Project Increment[1]	**0.52**	**5.71**	**77.1**	**47.6**	**12.3**	**2.42**
Significance Threshold	150	550	150	-	150	150
Significant (Yes/No)	**No**	**No**	**No**	**-**	**No**	**No**

1. Incremental daily emission change is only related to the blasting operations due to greater blasting zone size.

Source: RCH Group, 2021.

Table 4-10
EXISTING CONDITIONS ANNUAL EMISSIONS (TONS)

Emission Source	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Onsite Equipment	0.03	0.34	0.23	0.00	0.01	0.01
Generator -Crushing Plant	0.18	2.01	27.2	16.8	0.24	0.24
Generator -Portable Plant	0.10	1.78	11.9	1.80	0.20	0.20
Generator -Wash Plant	0.10	1.76	11.8	1.78	0.20	0.20
Aggregate Plant	-	-	-	-	0.23	0.03
Wash Plant	-	-	-	-	0.07	0.01
Sand Plant	-	-	-	-	0.07	0.01
Unpaved Travel	-	-	-	-	1.33	0.20
Material Handling	-	-	-	-	0.14	0.02
Blasting	-	-	-	-	0.01	0.00
Haul Trucks	0.01	0.11	1.35	0.01	0.01	0.01
Total	**0.42**	**6.00**	**52.5**	**20.4**	**2.51**	**0.94**

Source: RCH Group, 2021.

Table 4-11
PROPOSED PROJECT ANNUAL EMISSIONS (TONS)

Emission Source	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Onsite Equipment	0.06	0.61	0.39	<0.01	0.01	0.01
Generator -Crushing Plant	0.23	2.50	33.9	20.9	0.30	0.30
Generator -Portable Plant	0.10	1.78	11.9	1.80	0.20	0.20
Generator -Wash Plant	0.10	1.76	11.8	1.78	0.20	0.20
Aggregate Plant					0.47	0.07
Wash Plant					0.07	0.01
Sand Plant					0.07	0.01
Unpaved Travel					2.00	0.30
Material Handling					0.21	0.03
Blasting					0.03	0.00
Haul Trucks	0.01	0.11	1.35	0.01	0.01	0.01
Total	**0.49**	**6.76**	**59.3**	**24.5**	**3.55**	**1.15**

Source: RCH Group, 2021.

Table 4-12
ANNUAL INCREMENT EMISSIONS (POUNDS)

Emission Source	ROG	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Existing Condition	0.42	6.00	52.5	20.4	2.51	0.94
Proposed Project	0.49	6.76	59.3	24.5	3.55	1.15
Project Increment	**0.07**	**0.77**	**6.80**	**4.10**	**1.04**	**0.21**
Significance Threshold	27	100	27	--	27	27
Significant (Yes/No)	**No**	**No**	**No**	**--**	**No**	**No**

Source: RCH Group 2021.

Lassen County is currently in attainment or unclassified for all criteria air pollutants. The Lassen County APCD has Best Available Control Technology (BACT) emission thresholds for the criteria pollutants ROG, NO_x, PM_{10}, $PM_{2.5}$, and CO which apply to the operation of the existing quarry and the proposed quarry expansion. The additional daily emissions of ROG, CO, NO_x, PM_{10}, and $PM_{2.5}$ generated by the Project are less than the significance thresholds of the Lassen County APCD. The annual emissions of ROG, CO, NO_x, PM_{10}, and $PM_{2.5}$ are less than the significant thresholds.

The *Ward Lake Pit Expansion Air Quality and Health Risk Assessment Technical Report* (RCH Group, 2021) includes reasonable precautions to prevent particulate matter from becoming airborne consistent with Lassen County APCD Rule 4:18. These precautions are included as Mitigation Measure 4.4-1. Implementation of these measures will ensure the proposed Project is in compliance with Lassen County APCD rules and regulations and would reduce impacts of the Project to less than significant levels.

The Northeast Plateau Air Basin and Lassen County are currently in attainment or unclassified for all criteria pollutants. Therefore, the proposed quarry expansion will not contribute to a cumulatively considerable air quality impact regarding a pollutant for which the air basin is currently in non-attainment. As noted above, the incremental daily emissions of ROG, CO, NO_x, PM_{10}, and $PM_{2.5}$ are less than the significance thresholds. The incremental annual emissions of ROG, CO, NO_x, PM_{10}, and $PM_{2.5}$ are less than the significance thresholds. The incremental change in emissions is solely related to the Project elements associated with the aggregate plant and supporting activities (generator, unpaved travel, material handling, and blasting). The proposed

Project would not result in a violation of air quality standards. Cumulative air quality impacts will be less than significant.

Impact 4.4-2: Expose sensitive receptors to substantial pollutant concentrations.

A Health Risk Assessment (HRA) was included in the *Ward Lake Pit Expansion Air Quality and Health Risk Assessment Technical Report* (RCH Group, 2021) to address health impacts on existing residences and schools from diesel generators and off-road equipment associated with the aggregate extraction and processing and resultant diesel particulate matter (DPM) emissions from the Project. The proposed Project would constitute an emission source of DPM due to operations associated with generators, off-road equipment, and haul trucks. Studies have demonstrated that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic health risk.

Health effects from carcinogenic air toxics are usually described in terms of individual cancer risk. Individual cancer risk is the likelihood that a person exposed to air toxic concentrations over a 70-year lifetime will contract cancer, based on the use of standard risk-assessment methodology. The maximally exposed individual represents the worst–case risk estimate, based on a theoretical person continuously exposed for a lifetime at the point of highest compound concentration in the air. This is a highly conservative assumption since most people do not remain at home all day and on average residents change residences every 11 to 12 years. In addition, this assumption assumes that residents are experiencing outdoor concentrations for the entire exposure period.

The HRA includes an analysis of the incremental cancer risks to sensitive receptors in the vicinity of the proposed Project, using emission rates (in pounds per hour) from USEPA AP-42, *Compilation of Air Pollutant Emission Factors*, and vender specifications. DPM emission rates were input into the USEPA's AERMOD atmospheric dispersion model to calculate the ambient air concentrations at receptors in the Project vicinity. The HRA is intended to provide a worst–case estimate of the increased exposure by employing a standard emission estimation program, an accepted pollutant dispersion model, approved toxicity factors, and conservative exposure parameters.

In accordance with OEHHA *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments,* the HRA was accomplished by applying the highest estimated concentrations of TAC at the receptors analyzed to the established cancer potency factors and acceptable reference concentrations for non-cancer health effects. Increased cancer risks were calculated using the modeled DPM concentrations and OEHHA-recommended methodologies for both a child exposure (third trimester through 2 years of age) and adult exposure. The cancer risk calculations were based on applying the OEHHA-recommended age sensitivity factors and breathing rates, as well as fraction of time at home and an exposure duration of 30 years, to the DPM concentration exposures. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing air pollutants. The supporting methodology and assumptions used in the HRA are provided in Appendix D, *Air Quality & Health Risk Assessment*.

These conservative methodologies overestimate both non-carcinogenic and carcinogenic health risk, possibly by an order of magnitude or more. Therefore, for carcinogenic risks, the actual probabilities of cancer formation in the populations of concern due to exposure to carcinogenic pollutants are likely to be lower than the risks derived using the HRA methodology. The

extrapolation of toxicity data in animals to humans, the estimation of concentration prediction methods within dispersion models; and the variability in lifestyles, fitness and other confounding factors of the human population also contribute to the overestimation of health impacts. Therefore, the results of this HRA are highly overstated.

The following describes the HRA results associated with existing receptors due to existing condition and proposed Project activities. The maximum cancer risk from existing condition emissions for a residential-adult receptor would be 0.17 per million and for a residential-child receptor would be 1.35 per million. The maximum cancer risk from proposed Project emissions for a residential-adult receptor would be 0.52 per million and for a residential-child receptor would be 1.91 per million.

Therefore, the incremental cancer risk for a residential-adult receptor would be 0.35 per million and for a residential-child receptor would be 0.56 per million. Thus, the cancer risk due to Project operations would be below the significance threshold of 10 per million and would be a less than significant health impact. The HRA results reflect the increased DPM emissions as a result of the proposed Project (greater annual usage of off-road equipment to extract additional aggregate materials (i.e., 200,000 vs 100,000 tons) but also the location in which that materials would be extracted (i.e., within the 78.6 acres which are located further from nearby sensitive receptors) and the additional 20 years of activities.

Both acute (short-term) and chronic (long-term) adverse health impacts unrelated to cancer are measured against a hazard index (HI), which is defined as the ratio of the predicted incremental DPM exposure concentration from the proposed Project to a reference exposure level (REL) that could cause adverse health effects. The REL are published by OEHHA based on epidemiological research. The ratio (referred to as the Hazard Quotient [HQ]) of each noncarcinogenic substance that affects a certain organ system is added to produce an overall HI for that organ system. The overall HI is calculated for each organ system. The impact is considered to be significant if the overall HI for the highest-impacted organ system is greater than 1.0.

The chronic reference exposure level for DPM was established by the California OEHHA (OEHHA 2014) as 5 $\mu g/m^3$. Thus, the proposed Project-related annual concentration of DPM cannot exceed 5.0 $\mu g/m^3$; resulting in a chronic acute HI of greater than 1.0 (i.e., DPM annual concentration/5.0 $\mu g/m^3$). The chronic HI would be less than 0.01. The chronic HI would be below the significance threshold of 1 and the impact of the proposed Project would therefore be less than significant. Based on the results of the HRA, health impacts of the proposed quarry expansion would be less than significant.

Impact 4.4-3: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Though offensive odors from stationary and mobile sources rarely cause any physical harm, they still remain unpleasant and can lead to public distress, generating citizen complaints to local governments. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors. Eight homes are located on parcels from 10 to 80 acres in size to the west and south along Ward Lake Road.

The nearest residence is approximately 875 feet from the western property line of the existing quarry operations and approximately 4,500 feet from the proposed quarry expansion area. Shaffer Elementary School is located 2.4 miles to the southeast of the Project Site. There are approximately 24 residences abutting Highway 395 and Center Road. Traveling farther west along Center Road, toward the California State Correctional Center, there are approximately six additional residences.

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, there are no quantitative or formulaic methodologies to determine the presence of a significant odor impact. Rather, often air districts recommend that odor analyses strive to fully disclose all pertinent information. The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions.

Land uses and industrial operations that typically are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, solid waste transfer stations, rendering plants, dairies, and fiberglass molding. The proposed project would not fall into any of these categories. Operation of the proposed Project would result in fugitive dust and combustion emissions, which would not be expected to generate odors.

Notably, the primary wind direction is from the west and south. Therefore, the primary wind direction is from the residences towards the project site. Odor emissions are highly dispersive, especially in areas with higher average wind speeds. However, odors disperse less quickly during inversions or during calm conditions, which hamper vertical mixing and dispersion.

A majority of the proposed Project operations would occur from April through October which is not typically the season associated with inversion conditions (i.e., occur during wintertime). Inversion conditions may also result in odor impacts due to air stagnation. Given that the proposed Project would not operate during the months when inversion condition is more common, the likelihood of odor impacts due to the proposed Project would be reduced.

Lastly, based on information obtained from the Lassen County APCD, no complaints were filed related to odor issues (including the existing asphalt plant) in the past five years. Given the previous information, odor impacts associated with the location of the proposed Project would be less than significant.

4.4.6 Mitigation Measures

MM 4.4-1: The Project applicant shall ensure compliance with Lassen County APCD rules for fugitive dust emissions. Based on Lassen County APCD Rule 4:18 (Fugitive Dust Emissions), reasonable precautions shall be taken to prevent particulate matter from becoming airborne, including, but not limited to, the following provisions:

- *Cover trucks*. Covering open bodied trucks when used for transportation materials likely to give rise to airborne dust.
- *Filter and containment*. Installation and use of hoods, fans, and other fabric filters to enclose and vent the handling of dusty materials. Containment methods may be employed during sandblasting and other similar operations.

- *Dust suppression*. The application of asphalt, oil, water or suitable chemicals to dirt roads, material stockpiles, land clearing, excavation, grading or other surfaces which can give rise to airborne dusts.
- *Good housekeeping*. The prompt removal of earth or other material from paved streets onto which earth or other material for earth moving equipment, erosion by water, or other means has been deposited.

4.4.7 Level of Significance after Mitigation

Less than significant impact with mitigation incorporated.

4.5 Biological Resources

Expansion of the mining boundary of the current mining operation to include an additional 78.6 acres, increasing the life of the mine to 2050, and increasing the maximum annual volume removed from 100,000 to 200,000 tons are substantial changes proposed in the Project that will require major revisions of the previous EIR due to the involvement of potentially new significant environmental effects pertaining to biological resources or a substantial increase in the severity of previously identified significant effects under CEQA Guidelines §15162.

Expansion of the mining boundary and extension of the mine life could result in additional habitat and species impacts that were not analyzed in the 2019 EIR. As required under CEQA, setting information has been updated where necessary to reflect current conditions. The impact analysis presented is specific to the proposed Project.

4.5.1 Environmental Setting

A *Biological Resource Assessment* (BRA) was prepared for the Project in October 2020 and was updated in January 2022 by VESTRA Resources. The environmental information in this section is based off information contained in the BRA (refer to Appendix E, *Biological Resource Assessment*).

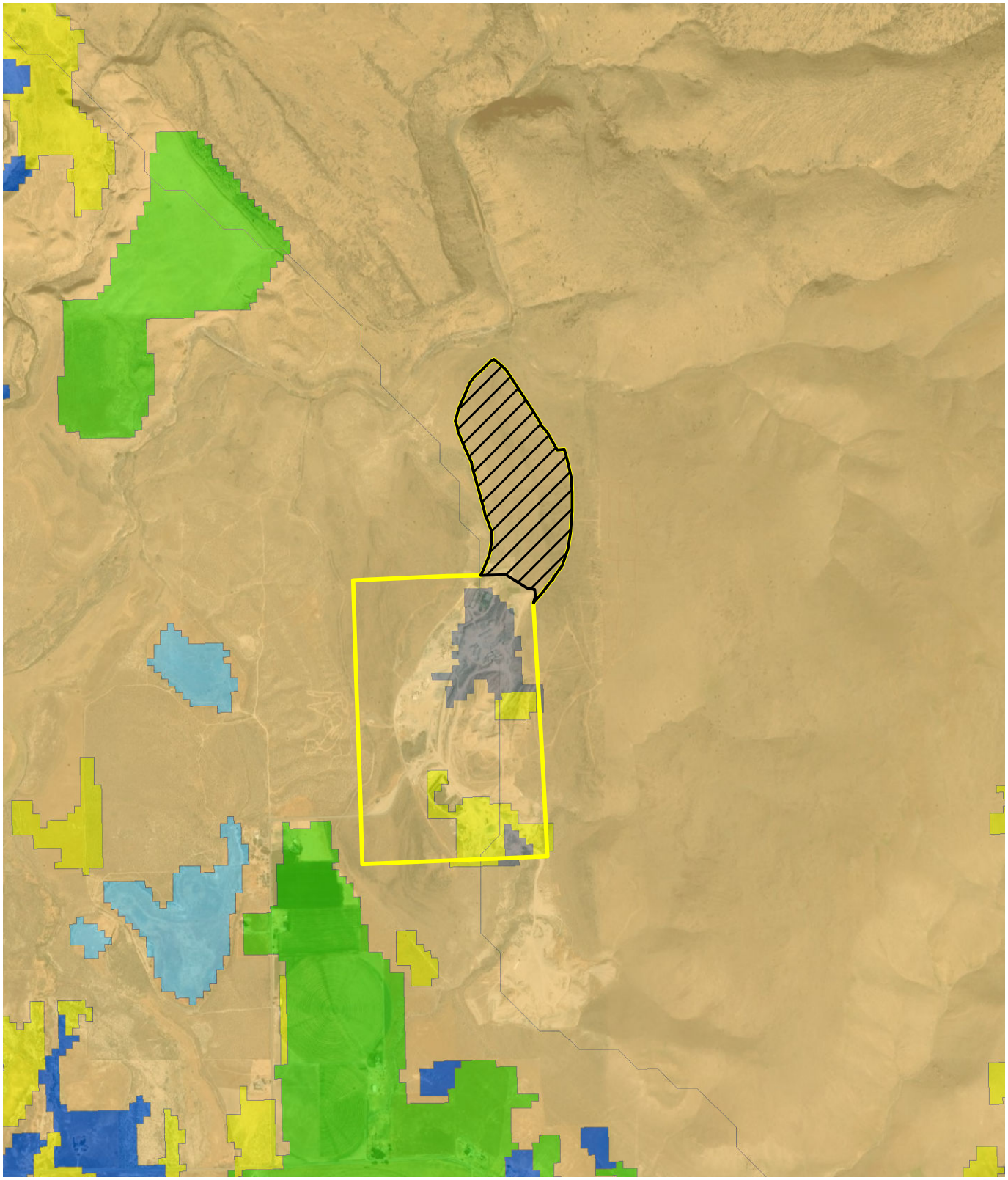
Site Vegetation

The mine site has operated since the early 1980s. Portions of the site are currently being mined or are developed for the processing of mined materials. Areas disturbed by previous mining and processing are considered barren. The remaining areas surrounding the quarry consist mainly of shrub steppe communities with interspersed areas of annual grassland. The dominant habitat type identified through the California Wildlife Habitat Relationships (CWHR) classification is sagebrush (Mayer and Laudenslayer, 1988) as shown on Figure 4-3.

Sagebrush habitat borders the quarry operations area along the western and eastern edges. The proposed expansion area supports basin big sage (*Artemisia tridentata* ssp. *tridentata*). Within the expansion area, shrubs exhibit dense cover with very little bare ground in between and in some places the canopy overlaps, leaving little opportunity for forbs and grasses. Slopes surrounding the expansion area exhibit less dense cover. This supports a mix of basin big sage and mountain big sage (*A. tridentata* ssp. *vaseyana*). Openings between shrubs here have sparse to no ground cover; in areas with some ground cover present, forbs and grasses are present.

Aquatic Habitat

There are no wetlands or streams within the Project site. Aquatic features in the existing mine boundary include several constructed ponds near the northern boundary of the existing mining area as well as near the entrance to the quarry. These ponds were constructed to retain water from gravel washing and to capture stormwater runoff from the existing mining area. Drainage occurs as sheet flow to the southwest onto a terrace and then northwest into Balls Canyon, which eventually discharges into Willow Creek. Concentrated flows are observed only during heavy rain events. Secret Creek, an intermittent drainage, is located approximately 450 feet outside of the northern boundary of the proposed quarry expansion area.



SOURCE: USDA NAIP 2016 AERIAL PHOTOGRAPH; USFS 2009

FIGURE 4-3
CWHR HABITAT TYPES
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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Special-Status Wildlife Species

An assessment of special-status species was conducted for the Project site to examine potential effects of expanding the mining area. Special-status species considered in the assessment meet one of the following criteria:

- Listed, proposed for listing, or candidates for listing as threatened or endangered under the Federal Endangered Species Act (ESA) (50 Code of Federal Regulations [CFR] Part 17.12 [listed plants], 50 CFR Part 17.11 [listed animals], 67 Federal Register [FR] 40657 [candidate species]);

- Listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (CESA) (California Department of Fish and Wildlife [CDFW], 2017a);

- Identified by the CDFW as fully protected species, including fish and wildlife that do not have State or Federal threatened or endangered status but may still be threatened with extinction (CDFW, 2017b); and

- California Species of Special Concern: vertebrate species that have been designated as "species of special concern" by the CDFW because declining population levels, limited range, and/or continuing threats have made them vulnerable to extinction (CDFW, 2017b).

Table 4-13 lists the wildlife species identified by a California Natural Diversity Database (CNDDB) search within five miles of the Project site, CWHR analysis or literature review regarding preferred habitats for these species, and an evaluation of their potential to occur within the Project area. A list of federally listed species that may occur in the Project area was obtained from the United States Fish and Wildlife Service (USFWS); these species are also addressed in Table 4-13, below.

Table 4-13
POTENTIALLY OCCURRING SPECIAL-STATUS WILDLIFE SPECIES

Common and Scientific Names	Status Fed/State	Preferred Habitats	Known and Potential Occurrence in Project Area
Invertebrates			
Carson wandering skipper *Pseudocopaeodes eunus obscurus*	FE/--	Occurs east of the Sierra Nevada at elevations less than 5,000 feet; presence of salt grass; near nectar sources; near springs or other water bodies; and possibly near geothermal activity.	No potential for occurrence due to lack of suitable habitat; habitat known nearby at Honey Lake (alkali flat that supports salt grass); alkali soils and geothermal activity not present onsite.
Monarch butterfly *Danaus plexippus*	CE/--	Migratory; overwinter in central to south CA coast; breed through summer; breed throughout CA only where milkweed is found; require diversity of blooming nectar resources during breeding and migration.	Potential for occurrence due to potential habitat for milkweed (*Asclepias* spp.)
Amphibians			

Table 4-13
POTENTIALLY OCCURRING SPECIAL-STATUS WILDLIFE SPECIES

Common and Scientific Names	Status Fed/State	Preferred Habitats	Known and Potential Occurrence in Project Area
Foothill yellow-legged frog *Rana boylii*	--/CSC	Slow-moving, gravelly streams and rivers with sunny banks in forests and chaparral	No potential for occurrence due to lack of gravelly streams or water bodies
Birds			
Tricolored blackbird *Agelaius tricolor*	--/CE	Nest near fresh water in adjacent vegetation, especially near marshes. Forage in grasslands and croplands	No potential for occurrence due to lack of suitable habitat
Golden eagle *Aquila chrysaetos*	--/CFP	Needs open terrain for hunting – grassland, desert, savannah, shrub. Nests on cliffs and in large trees	Potential for occurrence due to suitable foraging habitat
Northern harrier *Circus cyaneus*	--/CSC	Grasslands, fields, and marshes	Potential for occurrence due to suitable foraging habitat
Swainson's hawk *Buteo swainsoni*	--/CT	Large, open grasslands in riparian systems	Potential for occurrence due to some suitable foraging habitat
Greater sandhill crane *Grus canadensis tabida*	--/CT	Shortgrass plains, grain fields and open wetlands for foraging. Nests in wetlands	No potential for occurrence due to lack of suitable habitat
Greater sage-grouse *Centrocercus urophasianus*	--/CSC	Open, continuous sagebrush communities	Potential for occurrence due to suitable habitat
Burrowing owl *Athene cunicularia*	--/CSC	Open, dry grassland, desert, and shrub	None found during April 2020 survey. Potential for occurrence due to suitable habitat
Long-eared owl *Asio otus*	--/CSC	Roost in dense vegetation and forage in open grasslands or shrublands	Potential for occurrence due to suitable foraging habitat
Short-eared owl *Asio flammeus*	--/CSC	Large, open areas with low vegetation including prairie, grassland, shrubsteppe, agricultural areas	Potential for occurrence due to suitable habitat
Loggerhead shrike *Lanius ludovicianus*	--/CSC	Open areas with short vegetation and well-spaced shrubs or low trees	Potential for occurrence due to suitable habitat
Mammals			
Pallid bat *Antrozous pallidus*	--/CSC	Forages over many habitats; roosts in buildings, trees, rocky outcrops and crevices in mines and caves; also in oak and pine forested areas, usually near a source of water	Potential for occurrence due to suitable habitat
Townsend's big-eared bat *Corynorhinus townsendii*	--/CSC	Found in all but subalpine and alpine habitats. Requires mines, caves, rock piles, and lava tubes for roosting	No potential for occurrence due to lack of suitable habitat
Gray wolf *Canis lupus*	FD/CE	Highly variable	No records in project vicinity in 93 years; has been located recently in other areas of Lassen County
North American wolverine *Gulo gulo luscus*	PFT/CT	Arctic, boreal, and alpine habitats. South of the Canadian border, restricted to high mountain environments near the treeline	No potential for occurrence due to lack of suitable habitat
American badger *Taxidea taxus*	--/CSC	Dry, open stages of shrub and forest with friable soils	Potential for occurrence due to suitable habitat
Pygmy rabbit *Brachylagus idahoensis*	--/CSC	Sagebrush, bitterbrush, and pinyon-juniper	Potential for occurrence due to suitable habitat
White-tailed jackrabbit *Lepus townsendii townsendii*	--/CSC	Sagebrush, subalpine conifer, juniper, alpine dwarf-shrub, and perennial grassland	Potential for occurrence due to suitable habitat

Notes: Federally Endangered (FE), Proposed Federally Endangered (PFE); Federally Threatened (FT); Proposed Federally Threatened (PFT); California Endangered (CE); California Threatened (CT); California Fully Protected (CFP); DFG California Species of Special Concern (CSC)

Special-status wildlife species that are known to occur, or have the potential to occur, within the Project area include:

- Monarch butterfly (*Danaus plexippus*)
- Golden eagle (*Aquila chrysaetos*)
- Northern harrier (*Circus cyaneus*)
- Swainson's hawk (*Buteo swainsoni*)
- Greater sage-grouse (*Centrocercus urophasianus*)
- Burrowing owl (*Athene cunicularia*)
- Long-eared owl (*Asio otus*)
- Short-eared owl (*Asio flammeus*)
- Loggerhead shrike (*Lanius ludovicianus*)
- Gray wolf (*Canis lupus*)
- American badger (*Taxidea taxus*)
- Pallid bat *(Antrozous pallidus)*
- Pygmy rabbit (*Brachylagus idahoensis*)
- White-tailed jackrabbit (*Lepus townsendii townsendii*)

Impacts of the proposed Project to species determined to have potential to occur within the Project area are discussed under Impact 4.5-1 below, while species that were determined to be absent are not discussed further.

Special-Status Plants

Special-status plant species include plants that are:

- Designated as rare by CDFW or USFWS or are listed as threatened or endangered under the CESA or ESA;
- Proposed for designation as rare or listing as threatened or endangered;
- Designated as state or federal candidate species for listing as threatened or endangered; and/or
- Ranked as California Rare Plant Rank (CRPR) 1A, 1B, 2A, 2B, or 3.

A list of regionally occurring special-status plant species was compiled based on a review of pertinent literature, the results of the field surveys, and a review of the USFWS species list and CNDDB, and a search of California Native Plant Society (CNPS) database records for the Litchfield quadrangle.

Consultations found no records of federally or State-listed threatened or endangered plant species within five miles of the Project area. Five plants ranked 1B or 2B by the CNPS are recorded in the CNDDB within five miles of the proposed expansion area. For each special-status plant species, habitat and other ecological requirements were evaluated and compared to the habitats in the study area and immediate vicinity to assess the presence of potential habitat. The habitat assessment is provided in Table 4-14.

Table 4-14
POTENTIALLY OCCURRING SPECIAL-STATUS PLANT SPECIES

Species	CRPR Status	Flowering Period	Habitat	Potentially Occurring
Winged dock (*Rumex venosus*)	2B.3	May-June	Great Basin scrub (sandy); 1200-1800 m	No
Western seablite (*Suaeda occidentalis)*	2B.3	July-September	Great Basin scrub (alkaline, mesic); usually in wetlands; 1200-1500 m	No
Playa phacelia (*Phacelia inundata*)	1B.3	May-August	Usually in wetlands; sagebrush scrub, lower montane coniferous forest; 1350-2000 m	No
Ornate dalea (*Dalea ornata*)	2B.1	June	Pinion-Juniper woodland; 1365-1700 m	Yes
Spiny milkwort (*Polygala subspinosa*)	2B.2	May-August	Sagebrush scrub, Pinion-Juniper woodland, gravelly, rocky; 1330-1705 m	Yes
Great Basin downingia (*Downingia laeta*)	2B.2	May-July	Great Basin scrub, Pinyon-Juniper woodland; usually in wetlands; 1220-2200 m	No
Holmgren's skullcap (*Scutellaria holmgreniorum*)	3.3	May-July	Great Basin scrub, Pinyon-Juniper woodland; 1310-1735 m	Yes

Notes: 1B.2: "moderately" rare, threatened, or endangered in California and elsewhere; 1B.3: "not very" rare, threatened, or endangered in California and elsewhere; 2B.1: "seriously" rare, threatened, or endangered in California but more common elsewhere; 2B.2: "moderately" rare, threatened, or endangered in California but more common elsewhere; 2B.3: "not very" rare, threatened, or endangered in California but more common elsewhere.

Potential impacts to these plants with potential to occur at the Project site are discussed under Impact 4.5-1. Plants with no potential to occur are not discussed further. Consultations found no records of Federally or State-listed threatened or endangered plant species within five miles of the Project area.

Raptors and Migratory Birds

Raptor species (birds of prey) and migratory birds may nest in trees and other vegetation located within or in the immediate vicinity of the study area. All raptors and migratory birds, including common species and their nests, are protected from "take" under the California Fish and Game Code, Section 3503 and 3503.5, and the Federal Migratory Bird Treaty Act. Large trees onsite and in the surrounding forest provide potential nesting habitat for raptors and migratory birds.

Critical Habitat

The Project site is not located within designated critical habitat for any special-status species.

Sensitive Habitats

The California Sensitive Natural Communities List published on August 18, 2021, was reviewed due to the fact that big sage subspecies (*Artemisia tridentata* ssp.) are components of natural communities that are listed as S1, S2, and S3, and therefore warrant consideration under CEQA. None of the California Sensitive Natural Communities listed are present within the proposed expansion area. Mountain big sage (*Artemisia tridentata* ssp. *vaseyana*) and Idaho fescue (*Festuca idahoensis*) are present in the surrounding area; these would not be disturbed by proposed activities. Additionally, the current mine area will be planted with these two species during reclamation, which will increase the presence of this community in the long-term.

Mule Deer and Pronghorn Antelope Habitat

The mine site and the expansion area are identified as a Critical Winter Range for mule deer (Figure 4-4) (CDFW, 2021). The expansion area is also identified as a winter range for pronghorn antelope (Figure 4-5) (CDFW, 2020). Seasonal migration patterns of mule deer show utilization of high-elevation montane ranges in summer and use low-elevation ranges in fall and winter. Mule deer foraging habitat selection may be influenced by proximity to drinking water and presence of cover from predators. According to mule deer population studies, most activity occurs in early morning, late afternoon, and early evening. Mule deer exhibit strong site fidelity; home ranges usually are less than 1 mile in diameter (USDA Forest Service, 2006).

Critical deer winter range can include corridors essential for movement, staging areas where deer temporarily congregate, and habitats containing high quality winter forage. Shaffer Mountain is located at the southwestern corner of the critical winter range, and may provide relatively early-season foraging ground at its lower elevations and southern-facing slopes.

Pronghorn typically migrate between summer and winter ranges and may move up to 93 miles between ranges in California. Pronghorn are active yearlong. They are mostly crepuscular (active at dawn and dusk), but may be active during the day or night. Pronghorn diet is variable throughout the year; pronghorn migrate between summer and winter feeding ranges to follow seasonal forage availability. Previous population studies found that pronghorn kidding grounds are located adjacent to the Project area. In the Lassen area, pronghorn typically breed in late summer and give birth in May or June.

4.5.2 Regulatory Setting

The following is a description of federal, State, and local environmental laws and policies that are relevant to the CEQA review process for the proposed expansion area.

Federal

Federal Endangered Species Act

Section 9 of the federal Endangered Species Act of 1973 (ESA) prohibits acts that result in the "take" of threatened or endangered species. As defined by the federal ESA, "endangered" refers to any species that is in danger of extinction throughout all or a significant portion of its current range. The term "threatened" is applied to any species likely to become endangered within the foreseeable future throughout all or a significant portion of its current range. "Take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct."

Sections 7 and 10 of the federal ESA provide methods for permitting otherwise lawful actions that may result in "incidental take" of a federally listed species. Incidental take refers to take of a listed species that is incidental to, but not the primary purpose of, an otherwise lawful activity. Incidental take is permitted under Section 7 for projects on federal land or involving a federal action; Section 10 provides a process for non-federal actions. The act is administered by the USFWS for terrestrial species.

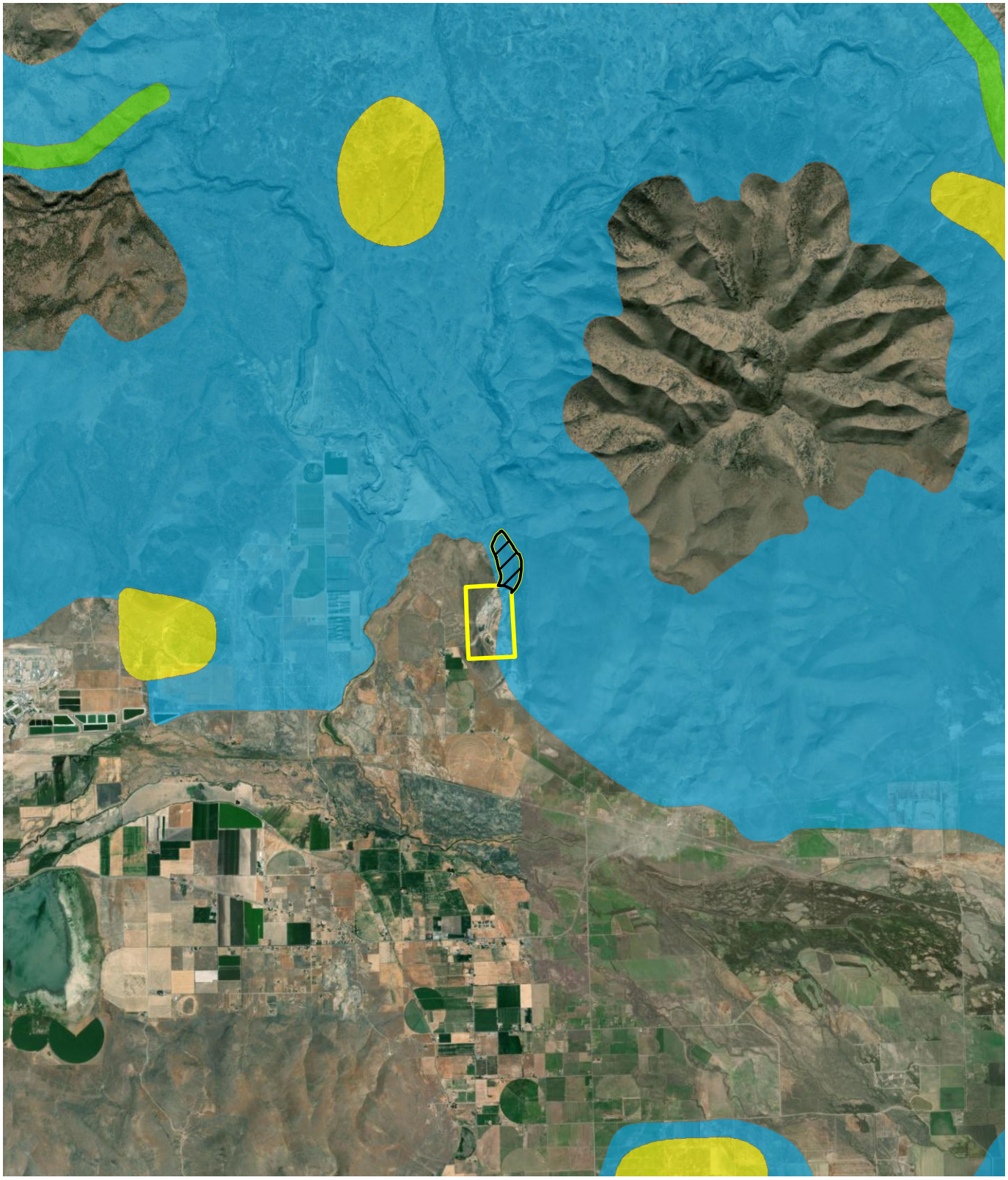


VESTRA

SOURCE: USDA NAIP 2016 AERIAL PHOTOGRAPH; USFS 2009

FIGURE 4-4
MULE DEER HABITAT
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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VESTRA

SOURCE: USDA NAIP 2016 AERIAL PHOTOGRAPH; USFS 2009

FIGURE 4-5
PRONGHORN ANTELOPE HABITAT
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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Clean Water Act
The objective of the Clean Water Act (1977, as amended) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Discharge of dredged or fill material into waters of the United States, including jurisdictional wetlands, is regulated by the Corps under Section 404 of the Clean Water Act (33 USC 1251-1376) under a permitting process. Applicants for Section 404 permits are also required to obtain water quality certification or waiver through the local Regional Water Quality Control Board under Section 401 of the Clean Water Act (33 USC 1341).

Corps regulations implementing Section 404 define waters of the United States to include intrastate waters, including lakes, rivers, streams, wetlands, and natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce. Wetlands are defined for regulatory purposes as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3; 40 CFR 230.3). To comply with the Corps policy of no net loss of wetlands, discharge into wetlands must be avoided and minimized to the extent practicable. For unavoidable impacts, compensatory mitigation is typically required to replace the loss of wetland functions in the watershed.

Because the Project will not result in impacts on waters of the United States, which would require authorization under Section 404, an Army Corps 404 permit and Section 401 water quality certification will not be required.

Migratory Bird Treaty Act
Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21).

State

California Endangered Species Act
The California Endangered Species Act (CESA) lists species of plants and animals as threatened or endangered. Projects that may have adverse effects on State-listed species require formal consultation with CDFW. "Take" of protected species incidental to otherwise lawful activities may be authorized under Section 2081 of the California Fish and Game Code. Authorization from the CDFW is in the form of an Incidental Take Permit which can identify measures to minimize take. CDFW Species of Special Concern are considered under the CESA. Species of Special Concern have the potential to occur within the Project area.

Streambed Alteration Agreement
A Lake or Streambed Alteration Agreement (Sections 1600-1616 of the California Fish and Game Code) requires an entity to notify CDFW prior to commencing any activity that may substantially obstruct the natural flow or use any material from a river, stream, or lake, or deposit or dispose of debris where it may pass into any river, stream, or lake. The notification requirement applies to any ephemeral or perennial river, stream, or lake in California. The Project will not occur within any river, stream, or lake and is not subject to a Lake or Streambed Alteration Agreement.

Birds of Prey
Under Section 3503.5 of the California Fish and Game Code, it is unlawful to take, possess, or destroy any birds in the orders of Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird, except as otherwise provided by this code or any regulation adopted pursuant thereto.

Migratory Birds
The California Fish and Game Code Section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA.

Fully Protected Species
California statutes also accord "fully protected" status to a number of specifically identified birds, mammals, reptiles, amphibians, and fish. These species cannot be "taken," even with an incidental take permit (California Fish and Game Code, Sections 3505, 3511, 4700, 5050, and 5515). Other than golden eagle, no "fully protected species" are expected to occur in the study area.

California Native Plant Protection Act
The California Native Plant Protection Act (California Fish and Game Code Section 1900-1913) prohibits the taking, possessing, or sale within the State of any plants with a state designation of rare, threatened, or endangered, as defined by the CDFW. An exception to this prohibition allows landowners, under specified circumstances, to take listed plant species, provided that the owners first notify the CDFW and give the agency at least 10 days to retrieve (and presumably replant) the plants before they are plowed under or otherwise destroyed. Fish and Game Code Section 1913 exempts from the "take" prohibition "the removal of endangered or rare native plants from a channel, lateral ditch, building site, or road, or other right-of-way."

State CEQA Guidelines
Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines §15380(d) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the FESA and the Section of the California Fish and Game Code dealing with rare or endangered plants and animals. Section 15380(d) allows a public agency to undertake a review to determine if a significant effect on species that have not yet been listed by either the USFWS or the CDFW (e.g., candidate species, species of concern) would occur. Thus, CEQA provides an agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

Local

Lassen County General Plan Land Use Element
The *Lassen County General Plan* was adopted in September 1999. The General Plan contains a Land Use Element, Natural Resources Element, Agriculture Element, Wildlife Element, Open Space Element, Circulation Element, and Safety and Seismic Safety Element. The General Plan Land Use Element and Wildlife Element contain the following goals and policies related to biological resources:

GOAL L-22: Protection and enhancement of important wildlife habitats to support healthy, abundant, and diverse wildlife populations.

- Policy LU-49: The County supports the management and enhancement of wildlife resources in ways that enhance the health and abundance of wildlife populations and the diversity of species and their habitats and which, at the same time, balance management policies and program objectives with the range of social and economic needs for which the County is also responsible.

GOAL N-7: To maintain diverse and healthy vegetation communities in order to sustain natural and economic benefits, including watershed, soil stabilization, wildlife, fisheries, timberland, grazing, and scenic values.

- Policy NR25: The County recognizes that there are vegetation communities that warrant special consideration and protection, and that these areas may be regarded as important or significant vegetation communities or areas of special biological importance. These areas include, but are not limited to, bitterbrush plant communities, wetlands, and riparian areas.

- Policy NR26: In order to avoid or reduce the extent of potential adverse impact to important vegetation communities which may result from projects and land use decisions within its jurisdiction, the County shall consider the potential extent of such impacts in the course of project review.

- Policy NR27: Projects subject to County approval which will result in significant disturbance of a site's vegetative cover shall be required to prepare and implement an effective plan to revegetate disturbed, undeveloped areas of the site.

    - Implementation Measure NR-J: Pursuant to the California Environmental Quality Act, the County shall review the potential for impacts of proposed projects on vegetation resources and shall require appropriate mitigation measures to avoid, reduce, or compensate for the extent of significant adverse impacts. Such mitigation measures may include the clustering of housing and development to conserve natural vegetation and the implementation of revegetation plans. Plans and revegetation measures shall also include provisions to avoid the introduction of noxious weeds.

GOAL N-8: Protection of rare and endangered plant species balanced with the need to sustain productive, multiple land uses when possible.

- Policy NR28: The County recognizes the need to identify and provide reasonable measures for the protection of rare and endangered plant species in the consideration of projects and land use decisions.

    - Implementation Measure NR-K: Pursuant to the California Environmental Quality Act, the County shall consider the impacts of proposed projects on rare and endangered plant resources and shall require necessary mitigation measures to avoid, reduce, or compensate for the extent of significant disturbance.

GOAL N-9: Control invasive weeds and plant species.

- Policy NR29: The County supports strong measures to eliminate or prevent the spread of invasive and noxious weeds and plant species including, but not limited to, medusahead, yellow starthistle, and perennial pepperweed (whitetop), and to control the adverse effects from the excessive spreading of such species as juniper and cheatgrass.

GOAL N-13: To improve and diversify the County's industrial base by encouraging development of mineral resources in ways which avoid or minimize unacceptable levels of land use conflict and significant environmental damage.

- Policy NR47: In the consideration of proposed mining activities, the County shall balance goals of protecting and managing wildlife, vegetation, and other resources with the economic and social need to diversify the County's industrial base.

GOAL N-16: To prevent significant long-term environmental damage and damage of other natural resource values in areas which have been or which may be disturbed by mineral extraction.

- Policy NR58: Reclamation plans shall include a monitoring program to ensure successful compliance with reclamation criteria. Reclamation plans that include revegetation shall be monitored to ensure that planted vegetation successfully satisfies the objectives of the reclamation plan.

- Policy NR59: An adequate performance guarantee shall be required of a type and in an amount acceptable to the County to cover the costs of reclamation should the permittee fail to complete successful reclamation of a mined site. Performance guarantees shall be determined based on reclamation cost estimates prepared by a qualified professional.

GOAL O-3: To protect vital natural habitats and special natural resource areas.

- Policy OS-8: The County recognizes that some areas which are designated and zoned for development, including but not limited to rural residential lands and areas indicated for planned development, have natural resource and open space values which need to be addressed in the consideration of land use and development decisions and proposed development projects.

    - Implementation Measure OS-D: When the resource value of wildlife habitat on lands proposed for development necessitates additional protection measures, the County may utilize a "Natural Habitat Combining District" to include specific provisions for special building site area requirements, building exclusions areas, retention of habitat in designated areas, requirements for special review and approval of site development plans prior to issuance of development and building permits, and other provisions which, in the County's judgement, are necessary to allow development while providing appropriate levels of protection for the identified habitat.

    - Implementation Measure OS-E: The County will participate with resource management agencies, including the California Department of Fish and Game, the

U.S. Forest Service, and the Bureau of Land Management, in considering the scientifically documented need to protect specified open space resources, wildlife and plant species, and natural habitats, and in supporting effective and socially equitable measures to address those needs.

GOAL W-1: To protect and enhance the overall health of wildlife habitats and special resource areas to maintain healthy, abundant, and diverse wildlife populations.

- Policy WE-1: The County supports the management of wildlife resources in ways that enhance the health and abundance of wildlife populations and the diversity of species and their habitats and which, at the same time, balance management policies and program objectives with the range of social and economic needs for which the County is also responsible.

- Policy WE-2: The County supports the cooperative identification of "areas of significant wildlife value" or similar designations for areas where it is demonstrated by sound biological science and the habitat values are of significant importance to the health and/or survival of one or more species of wildlife. The county may apply a special designation to these areas, and/or agree to support specific resource management objectives, polices, and voluntary programs to protect wildlife resources within these areas.

- Policy WE-5: Prior to the imposition of substantial wildlife-related mitigation measures by the County, the County shall review evidence demonstrating that the proposed action or project could otherwise have potentially significant adverse impacts to wildlife and that the proposed measures will, in fact, help to accomplish practical and necessary mitigation objectives.

- Policy WE-6: Funding for wildlife habitat programs (e.g., wildlife mitigation funds), should be directed to protect and enhance wildlife resources in the county, especially when funds are generated in Lassen County.

GOAL W-2: Protection of rare, threatened, and endangered wildlife species with an ecosystem approach to habitat management which also supports multiple land uses.

- Policy WE-10: Through local coordination, the County encourages programs and actions to remove and avoid the listing of additional wildlife species as threatened or endangered by the state or Federal government. When listings are proposed, sound biology needs to be applied to the preparation of habitat management plans and/or recovery plans, and the related social and economic impacts of such plans and related measures need to be considered and mitigated.

GOAL W-5: Protect and enhance important upland habitat areas which include bitterbrush, mountain mahogany and aspen.

- Policy WE-17: The County supports cooperative efforts to protect and enhance the wildlife habitat values of upland vegetation communities of bitterbrush, mountain mahogany and aspen.

1986 Standish-Litchfield Area Plan

The *Standish-Litchfield Area Plan* was adopted in 1986 and was intended to guide decisions regarding land use for an approximate 20-year timeframe. The Area Plan contains three categories: Environmental Safety, Natural and Cultural Resources, and Community Development. The Area Plan contains the following goals, objectives, and policies related to biological resources:

GOAL: Recognize and protect wildlife and fishery resources by maintaining a policy for compatible relationships among habitats, parks, and residential development. Protect critical habitats from intrusion by incompatible uses.

GOAL: Protect the Planning Area's rare and endangered plants and animals.

GOAL: Provide for maximum feasible retention of natural vegetation in order to ensure watershed, wildlife, fishery, timberland, and scenic values to the area.

- Policy 9-A: Lassen County shall conserve and enhance the wildlife and fisheries of the area. Generally, those lands identified as significant wildlife areas by the Department of Fish and Game, with the exception of the "Belfast Initiative Area" shall be designated for Intensive or Extensive Agriculture, Conservation or Open Space.

Lassen County Code

Chapter 9.60 of the *Lassen County Code* (Surface Mining and Reclamation Plan Regulations) including performance standards for reclamation plans, findings for approval of mining operations in the County, requirements for annual inspections, and penalties for non-compliance with the use permit and/or reclamation plan. Section 9.60.090 of the *Lassen County Code* requires the following findings to be made prior to approving a reclamation plan:

a. That the reclamation plan complies with Sections 2772, 2773, and 2773.1 of SMARA and any other applicable provisions;
b. That the reclamation plan complies with applicable requirements of State regulations; (14 Cal. Admin., Sec. 3500 et seq.);
c. That the reclamation plan and potential use of reclaimed land pursuant to the plan are consistent with County Code Chapter 9.60 and the County's general plan and any applicable resource plan or element;
d. That, through the reclamation plan, all significant adverse impacts on lands to be reclaimed as a result of the surface mining operations are mitigated to the maximum extent feasible;
e. That the land and/or resources, such as water bodies, to be reclaimed will be restored to a condition that is compatible with and blends in with the surrounding natural environment, topography, and other resources, or that suitable off-site development will compensate for related disturbances to resource values;
f. That the reclamation plan will restore the mined lands to a usable condition which is readily adaptable for alternative land uses consistent with the general plan and applicable resource plan;
g. That a written response to the State Geologist has been prepared, describing the disposition of major issues raised by the State Geologist. Where the County's position is at variance with the recommendations and objections raised by the State Geologist, said response shall address, in detail, why specific comments and suggestions were not accepted. (SMARA, Sec. 2772(d)) (Ord. 509 § 2, 1992).

4.5.3 Previous CEQA Reviews

1981 EIR

The 1981 EIR assessed potential project impacts to non-game birds, mammals, and reptiles likely to occur in the habitat within the project site. Potential effects to pronghorn and mule deer were found to be significant though mitigable due to the animals' seasonal migration patterns. Topographical changes within the project quarry areas were also found to be significant and mitigable. Long-term impacts to wildlife due to levels of noise, disturbance, and activity within the project area and upon access roads were found to be significant and not mitigable. The following measures related to pronghorn and mule deer were included in the 1981 EIR:

a. *Limits on operations from December 1st to March 31st annually. Proposed project operations are governed by weather conditions with an anticipated working season of April through November. Minimal activity could occur on mild winter days. Mitigation of the impact on wildlife was primarily relegated to climatic conditions wherein the effects of cold weather prompt wildlife to move down into lower elevations and coincidentally brings about the winter suspension of the plant operations.*

b. *Improving wildlife foraging habitat. Cooperation and assistance from both the California Department of Fish and Game (CA Department of Fish and Wildlife [CDFW]) and the Soil Conservation Service (Natural Resources Conservation Service [NRCS]) would be sought in order to determine the most suitable range grasses to be used in the reseeding process to allow for return of the land to suitable grazing and for efficient erosion control in quarry areas and along roadways.*

1997 EIR

The 1997 EIR prepared for addition of the ready-mix concrete plant, increase in height of the quarry face, and expansion of the season of operation from 7 months to year-round focused on potential effects on deer and antelope herds. The 1997 EIR for the expansion of the Ward Lake Pit focused on potential effects on deer and antelope herds. The Project area is on the edge of CDFW-designated critical winter-range habitat for mule deer (Figure 4-4) and winter-range habitat for pronghorn antelope (Figure 4-5). Mule deer numbers have increased since the 1997 EIR.

The 1997 EIR also addressed effects to Swainson's hawk and golden eagle. Potential effects of the Project on Swainson's hawks and golden eagles were discounted because the Project only involved the removal of 40 acres of foraging habitat, but no nesting habitat removal. Impacts to deer and antelope herds were determined to be significant and mitigable in the 1997 EIR. In addition, impacts to other wildlife species including Swainson's hawk, golden eagle, and small game and nongame species was determined to be significant and mitigable as well. The 1997 EIR contained the following mitigation measures for biological resources:

a. *Reclamation of graded areas. The intent of the Reclamation Plan shall be to recreate to the extent possible a viable, self-sustaining plant community similar to that which existed prior to mining.*

   Sand and Gravel Excavation Areas: These areas shall be regraded to maximum slopes of 2H:1V, shall be resoiled with adequate growth medium to support vegetation including fines from the crusher and stockpiled topsoil and shall be revegetated with native species including sage, bitterbrush, and rabbit brush. The success of revegetation in these areas shall be monitored by qualified personnel with reports submitted

to the County Community Development Department at least once per year for five years. The final approved species list and planting density must be approved by the County in Consultation with the Department of Fish and Game.

Rock Quarry Area: This area shall be regraded to a maximum overall slope of 2H:1V and shall be benched with minimum 10 foot wide benches at vertical intervals appropriate for the type of material, but not greater than 15 feet. The benches shall be sloped to drain toward the hillside, shall be resoiled with adequate growth medium to support vegetation including fines from the crusher and stockpiled topsoil and revegetated using native range grasses, shrubs, and trees if they can be supported. The operator shall institute a test plot program on the first available rock face bench to determine the best species mix and planting scheme for subsequent benches. The test plots shall be set up and monitored by qualified personnel with reports submitted to the County Community Development Department at least once every year for five years. The final approved species list and planting density must be approved by the County in consultation with the Department of Fish and Game.

Timing/Phasing of Reclamation: Reclamation of sub-areas shall take place in a phased manner where possible as excavation is completed.

Protection of Replanted Areas: Replanted areas shall be protected by fencing intended to exclude livestock and deer until vegetation is established. Perimeter livestock fencing shall be provided and shall be four wires maximum, bottom wire smooth and no closer than 19 inches to the ground with total fence height not to exceed 42 inches. More site-specific deer proof fencing shall be provided directly around replanting areas.

b. Limits on Operations from December 1st to March 31st. No grading or equipment use on the site shall be allowed between December 1st and March 31st annually.

The seasonal restriction of operations was recommended by CDFW and included in the 1997 EIR, citing the critical period for pronghorn and mule deer populations in the area; pronghorn and mule deer seasonally migrate to habitat in lower elevations during the late winter and early spring due to reduced food availability at high elevations. In 1997 the Lassen County Planning Commission recommended that the Lassen County Board of Supervisors amend the season of restricted operations due to economic infeasibility of a four month closure. Economic losses said to potentially result from the four month annual closure would impact the mine as well as the surrounding community; a disruption of mining operations would lead to a loss of employee payroll, place a higher demand on social services in the community, and reduce availability of mined materials in the surrounding area. The Lassen County Board of Supervisors approved an alternative measure as stated in the Conditions of Approval for Use Permit No. 96056:

Except in a state of emergency, as declared by the local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville, no grading, excavating, or blasting on the site shall be allowed between January 1st and March 31st annually.

Recognizing that this would result in significant adverse unavoidable impacts to deer and antelope, the County adopted a Statement of Overriding Considerations with respect to these impacts.

2019 EIR

The 2019 EIR analyzed impacts to biological resources from allowing 24-hour mining operations, extending the life of the mine from 2020 to 2030 and allowing annual site production in excess of the permitted 100,000 tons during declared emergencies. The EIR focused on impacts to biologic resources from nighttime operations as well impacts from increased nighttime truck traffic on area roadways.

Project-level and cumulative impacts of onsite nighttime operation and traffic were determined to have a less than significant impact on any special-status species in the area. No mitigation measures were required for this impact. Impacts of nighttime operations to pronghorn antelope, mule deer and nocturnal foragers from additional noise and light levels and increased traffic impacts were determined to be significant and mitigable. The 2019 EIR contained the following mitigation measures for biological resources:

a) *Operator shall continue limits on operations from January 1st to March 31st. Impacts can be lessened through continuing seasonal operating restrictions included in the Condition of Approval for Use Permit No. 96056: Except in a state of emergency, as declared by the local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville, no grading, excavating, or blasting on the site shall be allowed between January 1st and March 31st annually.*

b) *Operator shall conduct no nighttime operations (7:00 p.m. to 6:00 a.m.) during the period of January 1st to March 31st. Applying the existing operational restrict to the proposed nighttime operations would eliminate additional disturbance/displacement of pronghorn antelope and mule deer utilizing the winter habitat during the winter months.*

c) *Year-round nighttime restrictions. No grading, blasting, or excavating shall be allowed onsite between the hours of 6:00 p.m. and 7:00 a.m.*

d) *Lighting fixture design. To minimize the effects of lighting of artificial light on wildlife, lighting fixtures associated with nighttime project work shall be downward facing and fully shielded. Lighting equipment should be designed and installed to minimize light pollution.*

e) *Noise reduction barriers. Adverse effects from noise may be reduced through installation of noise berms constructed around the project area where heavy machinery is in use. Barriers can eliminate or minimize the impacts of vibrations that may result from nighttime operations.*

f) *No "jake brake" usage. This option can significantly reduce the noise impacts from the increased traffic volume. "No use of jake brake" signs shall be posted on the access road and at the Center Road (A27) and Ward Lake Road intersection.*

g) *Wildlife crossing signage on roadways. This option would educate drivers about the potential for wildlife encounters on roads during the nighttime hours. Signage will be permanent. This measure can prevent direct mortalities to nocturnal wildlife. Signs will be added along Center Road and Ward Lake Road with County approval.*

h) *Reduce traffic speed on roadways. This mitigation would reduce the speed limit in order to minimize traffic impacts to wildlife. "Reduce speed to 25 MPH" signs would reduce the speed limit on Ward Lake Road during nighttime hours, granting a longer reaction time should any wildlife be encountered on a roadway.*

i) Driver education. Hat Creek Construction will conduct education events to increase driver awareness to avoid wildlife vehicle impacts.

The 2019 EIR stated that the addition of periods of 24-hour operations would result in additional disturbance to pronghorn antelope and mule deer by extending onsite operational noise to nighttime hours and introducing nighttime lighting. 24-hour operations could have a significant impact if these operations were to occur in the period from December to March. To minimize potential impacts on antelope and deer, nighttime operations are prohibited from January 1st to March 31st. Nighttime operations between April 1st and December 31st could result in potential encounters on roadways with pronghorn antelope and mule deer during dawn and dusk. Impacts to the above biological resources after implementation of the above measures were found to be less than significant for Project-level and cumulative impacts.

Impacts related to extending the life of the mine by an additional 10 years, from 2020 to 2030 were determined to be significant and unavoidable. Extension of the life of the mine for 10 years would extend the significant impact of the operation to pronghorn or mule deer. The 2019 EIR concluded that no additional impacts to pronghorn or mule deer would occur; however, it would extend impacts that have been determined to be significant and unavoidable. Extending the life of the mine would also prolong the amount of time before the site can be reclaimed back to habitat for these species. Project-level and cumulative impacts related to extending the life of the mine were found to be significant and unavoidable. The County adopted a Statement of Overriding Considerations with respect to these impacts.

4.5.4 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to *Biological Resources* have been derived from Appendix G of the CEQA Guidelines:

- *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service (USFWS).*

- *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or USFWS.*

- *Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.*

- *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.*

- *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*

- *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.*

4.5.5 Impact Analysis

The following includes an analysis of environmental parameters related to *Biological Resources* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the conclusions that either no impacts, less than significant impacts, or less than significant impacts with mitigation could occur. Significant, unavoidable impacts are also identified. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Biological Resources*.

Areas of No Project Impact

As required by CEQA Guidelines §15082, the County issued a Notice of Preparation (NOP) on April 28, 2021 that summarized the proposed Project, stated its intention to prepare an EIR, and requested comments regarding the scope and content of the EIR from responsible and trustee agencies. In the course of the County's initial evaluation, certain impacts of the proposed Project were found to not to be significant because of the inability of a project of this scope to create such impacts or the absence of project characteristics producing effects of this type. The effects determined not to be significant are not required to be included in primary analysis sections of the DSEIR. As such, the following impacts either are not applicable to the proposed Project or are not reasonably foreseeable and are not addressed further within this section:

- *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or USFWS.*

  Based on the BRA (Appendix E) the proposed quarry expansion area does not include sensitive natural communities.

- *Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.*

  Based on the BRA (Appendix E) the proposed quarry expansion area does not include any wetlands or other potential waters of the U.S. or State; therefore, the proposed Project will not result in impacts to riparian areas, or result in removal, filling, or hydrological interruption of wetlands or potentially jurisdictional waters.

- *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*

  As discussed above under the Regulatory subsection, the *Lassen County General Plan* and *Standish-Litchfield Area Plan* address the need to preserve unique and important plant communities as well as aquatic, fish, and wildlife habitats, for their biological resource and ecological values. The proposed Project would not conflict with any local policies or ordinances protecting biological resources or a tree a preservation policy or ordinance.

- *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.*

  There are no habitat conservation plans, natural community conservation plans, or related documents for the area for which the proposed Project could conflict.

Project Impacts

Impact 4.5-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service (USFWS).

The BRA prepared for the proposed quarry expansion identified 14 special-status wildlife species as having the potential to occur within the Project area. Three special-status plant species could also potentially be present. Potential effects to these species as well as raptors and migratory birds protected by federal and State regulations are discussed below.

Special-Status Wildlife Species

Golden Eagle *(Aquila chrysaetos)* – California Fully Protected
The golden eagle is listed by the State of California as Fully Protected, which prohibits take or possession of the species. Golden eagles are short-distance migrants, particularly in the western United States. This species is a year-round resident throughout California; limited migration occurs to the Central Valley during the winter. These birds typically hunt over the open terrain of grasslands, deserts, savannah, shrub, and early successional forests. They nest on cliffs of variable heights and in large trees in open habitats where perches on rock ledges, trees, or other tall objects provide good vantage for hunting. Common prey for golden eagles includes small mammals, birds, and reptiles. They sometimes take advantage of carrion, in such cases they can outcompete other scavengers for carcasses. Threats to this species include loss of foraging areas, loss of nesting habitat, pesticide poisoning, and collision with man-made structures such as wind turbines.

The site was assessed for potential nesting habitat as described in the USFWS *"Protocol for Golden Eagle Occupancy and Reproduction Assessment"*. No golden eagles were observed onsite. No trees occur onsite that could provide nesting habitat for golden eagles. Golden eagles have been observed (per CNDDB) within five miles of the site, and there is foraging habitat within the expansion area as the sagebrush onsite is inhabited by prey species. The proposed quarry expansion would result in the loss of 78.6 acres of sagebrush foraging habitat for the golden eagle.

Northern Harrier *(Circus cyaneus)* – State Species of Special Concern
The northern harrier is listed by the State of California as a Species of Special Concern. This species is a common winter resident and occurs in greater numbers in California during migration and winter, as many populations travel farther north to breed. Some populations remain in California and the historic breeding range extended from the Modoc Plateau south to San Diego. Breeding in California has greatly declined due to loss of suitable wetland habitats. Although most suitable habitat has been destroyed or degraded, the Central Valley still supports the majority of nesting in California. Northern harriers inhabit a variety of open habitats that provide vegetative cover including grasslands, coastal ponds/sloughs, coastal marshes, coastal wetlands, salt marshes, and sagebrush areas.

According to CNDDB, there are no known occurrences within five miles of the proposed expansion area. However, northern harriers may nest in sagebrush flats several miles from water, and there is potential nesting and foraging habitat within the 78.6-acre expansion area.

Swainson's Hawk *(Buteo swainsoni)* – State Threatened
The Swainson's hawk was listed as a threatened species in 1983. This species breeds in the western United States and Canada and winters in isolated areas in California, Mexico, and Central and South America, though only a small number have been documented to overwinter in California. Historically found throughout California except in the Sierra Nevada, North Coast Ranges and Klamath Mountains, loss of suitable habitat has now restricted breeding areas to the Great Basin and the Central Valley. Nesting Swainson's hawks require large open areas of grassland for foraging adjacent to riparian forests or corridors, juniper-sage flats, or oak savannah for nesting. The main cause of the decline of this species in California is the significant loss and degradation of open areas, such as agricultural lands and grasslands, due to urban development.

There are no records of Swainson's hawks within the Project area in the CNDDB, but there are three records of nesting hawks within five miles of the Project area. All of these records are located in irrigated farmland. There is no irrigated agricultural habitat or other suitable nesting habitat for Swainson's hawk within the project area; however, there is potential foraging habitat within the 78.6-acre expansion area as the sagebrush onsite is inhabited by prey species.

Greater Sage-Grouse *(Centrocercus urophasianus)* – State Species of Special Concern
The greater sage-grouse is listed by the State of California as a Species of Special Concern. The species was considered for listing under the ESA as Endangered or Threatened in 2015, but the USFWS found that listing was not warranted. This species is a permanent resident in northeastern California and ranges from the Oregon border along the east side of the Cascade Range and Sierra Nevada to northern Inyo County. Lassen and Mono Counties have the most stable populations in California. Greater sage-grouse inhabit open areas with a combination of sagebrush, perennial grassland, and wet meadow; large, continuous tracts of sagebrush habitat are required for courtship displays. Declining population numbers are due mostly to habitat loss, impacts of non-native invasive species, and overgrazing.

There are no records of greater sage-grouse within five miles of the project area in the CNDDB; the closest record is 58 miles to the north. No leks or signs of sage grouse activity were located in the proposed project area during the field surveys; however, potential breeding and nesting habitat exists in the open sagebrush areas of the Project area.

Burrowing Owl *(Athene cunicularia)* – State Species of Special Concern
The burrowing owl is listed by the State of California as a Species of Special Concern. This species is a permanent resident in the Central Valley and southern California.These birds inhabit northeastern California during the summer breeding season. Burrowing owl habitat typically consists of open grasslands and shrublands with perches for hunting and burrows for nesting.

Nesting usually occurs in vacant mammal burrows but, where burrows are scarce, these owls may use human structures or dig their own burrows in soft soil. This species exhibits strong site fidelity. These owls forage at all hours of the day and night. Populations are still stable but have been declining, mostly due to habitat loss from agriculture and development and poisoning of ground squirrels.

A protocol-level survey for burrowing owls was completed in 2020. The survey followed the *Burrowing Owl Survey Protocol and Mitigation Guidelines,* published by the California Burrowing Owl Consortium, and covered the 78.6-acre quarry expansion area and a 500-foot buffer around the expansion area. The results of the survey are documented in the *Burrowing Owl Survey, Ward Lake Quarry, Lassen County, California* (VESTRA, 2020a), included in Appendix E.

A desktop pre-survey review of the CNDDB showed that there are two documented occurrences of the burrowing owl in Lassen County; the nearest is approximately ten miles east of the project area. There are no previous records of the species in CNDDB within 5 miles of the expansion area.

A pedestrian transect survey of the 78.6-acre expansion area and 500-foot buffer was completed by VESTRA on March 31, 2020, to determine the presence of burrows. The survey began at 1:30 p.m. and concluded at 4:30 p.m. Transect spacing was selected to achieve full visual coverage of the ground within any potential burrowing habitat onsite. Habitat quality factors that were considered included topography and soil depth that could potentially support burrows. Transect spacing depended on vegetation density, slope, and the occurrence of large rock outcroppings. Tracks, feathers, pellets, and other sign items that may indicate a burrow were considered during the survey.

No burrows were observed during the survey that appeared to be able to accommodate an animal the size of a burrowing owl. However, the expansion area contains suitable nesting and foraging habitat for burrowing owls.

Long-Eared Owl *(Asio otus)* – State Species of Special Concern
The long-eared owl is listed by the State of California as a Species of Special Concern. This species is a permanent resident throughout California, except the Central Valley and southern California. Long-eared owls roost and nest in dense vegetation, typically live oak thickets and other dense tree stands, especially in riparian areas. These owls hunt in open grasslands and shrublands. This species does not build their own nests; nesting usually occurs in old bird and squirrel nests. These are nocturnal owls that forage during nighttime hours. Resident populations have been slowly declining since the 1940s due mainly to habitat loss and fragmentation.

There are no records of long-eared owls within five miles of the project area in the CNDDB. There are currently no known nesting sites located in or near the project area, and there is no suitable dense nesting vegetation for the long-eared owl in the area. However, there is suitable foraging habitat for the species within the expansion area.

Short-Eared Owl *(Asio flammeus)* – State Species of Special Concern
The short-eared owl is listed by the State of California as a Species of Special Concern. This species is a permanent resident in northeastern California and a widespread winter migrant in the Central Valley and western Sierra Nevada. Short-eared owls roost on the ground in dense, low vegetation, typically tall grasses, brush, or wetlands. Nests are made on dry ground concealed in vegetation. These owls hunt in open areas including annual and perennial grasslands, shrublands, marshes, and agricultural fields; grasslands are most preferred. Short-eared owls are active mostly at twilight and nighttime hours, but are often active during the day in the breeding season. There is not a lot of available data on short-eared owl populations, but populations appear to be declining over most of the range because of habitat loss and fragmentation, and overgrazing. There are no records of

short-eared owls within five miles of the Project area in the CNDDB. There are currently no known nesting sites located in or near the Project area, and there is not enough suitable grassland within the area for nesting. However, there is some suitable foraging habitat within the open shrubland of the Project area and surrounding areas.

Loggerhead Shrike *(Lanius ludovicianus)* – State Species of Special Concern
The loggerhead shrike is listed by the State of California as a Species of Special Concern. This species is a permanent resident and winter migrant in lowland and foothill areas throughout California. This species typically inhabits open areas with scattered shrubs, trees, and perches, including agricultural fields, pastures, orchards, scrublands, and riparian areas. These birds roost and nest in shrubs or small trees. Loggerhead shrikes are diurnally active. Populations in the Pacific states have remained fairly stable, but numbers have declined elsewhere in their range. Declines are likely due to increased use of pesticides.

There are no records of loggerhead shrikes within five miles of the project area in the CNDDB. There are currently no known nest occurrences located in or near the Project area, and it is not likely that loggerhead shrike would nest in the project site. However, there is potentially suitable foraging habitat for the loggerhead shrike within the open shrubland of the Project area and surrounding areas.

Monarch Butterfly *(Danaus plexippus)* - Federal Candidate Endangered
Monarch butterflies have several life forms that make up their life history: egg, caterpillar (larvae), chrysalis, and adult stage. This species is migratory, with a well-known migratory path that can extend as far as 3,000 miles. Monarch butterflies in Western North America overwinter in California, with most occurring along the central coast from Santa Cruz south to San Diego, California. An estimated 4.5 million monarchs overwintered on the California coast in the 1980's, while in 2020, the population of overwintering monarchs was estimated at less than 2,000 individuals. Monarchs rely on their host plant species, milkweed (*Asclepias* spp.). These plants can grow in a variety of habitats. There is potential for milkweed to occur in grassy openings within shrubland. There is little open grassland in the proposed quarry expansion area; however, there is potential for recruitment following vegetation removal.

Lassen County is in the "Priority 2" restoration zone for western monarchs in California. Restoration objectives focus on identifying and protecting existing native milkweed and nectar plants, and planting pesticide-free native milkweed and nectar plants. Monarchs are likely to be present in the general Project area from May 16th to September 30th (USFWS, 2021).

Gray Wolf *(Canis lupus)* - Federally Endangered; California Endangered
The gray wolf was listed as endangered on March 9, 1978 (USDI FWS, 1978). Gray wolves are habitat generalists and can potentially occur in a wide range of habitats including temperate forest, mountains, tundra, taiga, and grasslands, so long as there is suitable prey. Prey species primarily include ungulates, such as moose, caribou, deer, and elk, but they will also take smaller prey such as beaver and small mammals, and will readily scavenge.

This species is highly territorial and defends territories in packs. Territory size is a function of prey density and can range from 25 to 1,500 square miles. Both male and female wolves disperse at equal rate and equal distances, sometimes more than 600 miles. Gray wolves once ranged throughout the northern hemisphere, but widespread trapping and extermination efforts severely

reduced their distribution and caused dramatic population declines. Current threats to the gray wolf include continued conflict with humans, primarily resulting from livestock depredation, and habitat loss, degradation, and fragmentation due to land development.

The last recorded observation of gray wolf in the project vicinity was in 1924 near Litchfield, California. However, the wolf has a large home range and range expansion is documented and could result in wolves reinhabiting the area at some point. CDFW has collected evidence (GPS tracking collar and remote trail camera images in 2016) that suggests that a small number of wolves have traveled into Lassen County (CDFW, 2017).

Due to the small project footprint relative to the large home range size of the gray wolf, the proposed project will not alter an amount of habitat significant enough to have any impact on the species. Further, gray wolves are highly mobile and capable of avoiding project-related disturbance. Therefore, the proposed quarry expansion will have no effect on the gray wolf.

American Badger *(Taxidea taxus)* – State Species of Special Concern

The American badger is listed by the State of California as a Species of Special Concern. These animals are permanent residents throughout most of California, except for the far northern North Coast area. Suitable habitat for this species is characterized by herbaceous, shrub, and open stages of most habitats with dry, friable soils. Dry, friable soils, often sandy, are required because badgers eat mostly fossorial (i.e., occurring underground) rodents, and they also take cover and reproduce in burrows. Badgers are active both day and night, and they may undergo periods of torpor in the winter. Populations are considered to be fairly stable but have declined due to historical trapping, conversion of habitat to intensive agriculture, and rodent poisoning.

There are no records of American badgers within five miles of the project area in the CNDDB; however, there is suitable habitat within the open shrubland of the project area and surrounding areas. No American badgers, signs of badgers, or burrows were observed during the site surveys. Due to sensitivity to noise, badgers in surrounding areas would likely avoid the project area due to a close proximity to ongoing operations in the current mining area. No direct impacts to American badgers are anticipated.

Pygmy Rabbit *(Brachylagus idahoensis)* – State Species of Special Concern

The pygmy rabbit is listed by the State of California as a Species of Special Concern. In California, this species is uncommon in the Great Basin areas of Modoc, Lassen, and Mono Counties. These rabbits can be found in sagebrush, bitterbrush, and pinyon-juniper habitats, and they prefer big sagebrush because it makes up the majority of their winter diet. Pygmy rabbits dig burrows for food storage and reproduction. This species is crepuscular and sometimes active during the day. Populations exhibit patchy distributions and are extremely varied across the species range. Because the species is dependent on big sagebrush, it is vulnerable to habitat loss and fragmentation from habitat conversion and fire.

There are no CNDDB records of these rabbits within five miles of the project area, and no pygmy rabbits were observed during site surveys. However, there is suitable foraging habitat for this species, so they could potentially occur. The proposed quarry expansion would result in the loss of 78.6 acres of sagebrush foraging habitat for the species.

White-Tailed Jackrabbit *(Lepus townsendii townsendii)* – State Species of Special Concern
The white-tailed jackrabbit is listed by the State of California as a Species of Special Concern. This species is an uncommon, permanent resident of northeastern California and the upper eastern slopes of the Sierra Nevada. These rabbits prefer open areas with scattered shrubs, including sagebrush, subalpine conifer, juniper, alpine dwarf-shrub, and perennial grassland, but are also found in wet meadow habitat and early successional stages of conifer forests. These animals move seasonally from higher to lower elevations in winter. Sagebrush is an important part of the winter diet. This species is primarily nocturnal and sometimes crepuscular. There is little available data on the status of populations in California, but evidence indicates sharp declines. It is thought that white-tailed jackrabbits may now be absent from large tracts of its previous range. Overgrazing is thought to be the main cause of habitat fragmentation.

There are no CNDDB records of these rabbits within five miles of the Project area; however, there is suitable foraging habitat for this species, so they could potentially occur. The proposed quarryexpansion would result in the loss of 78.6 acres of sagebrush foraging habitat for this species.

Pallid Bat *(Antrozous pallidus)* – State Species of Special Concern
The pallid bat is listed by the State of California as a Species of Special Concern. These are crevice-roosting bats of arid and semi-arid regions across much of the American West. They are a locally common species of low elevations. This species is not known to migrate long distances and they likely hibernate close to summer roosts. They are found in a variety of habitats including grasslands, shrublands, and woodlands, but are most common in open, dry regions with rocky outcroppings or sparsely vegetated grasslands. Water must be available close by to all sites. They typically will use three different types of roosts: a day roost which can be a warm, horizontal opening such as in attics, shutters, or crevices; the night roost is in the open, but with foliage nearby; and the hibernation roost, which is often in buildings, caves, or cracks in rocks. These bats are very sensitive to roosting site disturbance.

There are no records of pallid bats within five miles of the Project area in the CNDDB, and no bats or sign of bats were observed in rock outcroppings during the site survey. However, there is suitable foraging habitat within the open shrubland of the Project area and surrounding areas, and rock outcroppings in the proposed quarry expansion area could provide roosting habitat.

Special-Status Plants

Spiny Milkwort *(Polygala subspinosa)* – CRPR 2B.2
Spiny milkwort is a perennial herb native to California. It grows in gravelly or rocky soils found in desert scrub and volcanic mesas from 1350 to 2285 meters in elevation. This species is ranked by CDFW as 2B.2, i.e., moderately rare, threatened, or endangered in California but more common elsewhere.

Spiny milkwort (*Polygala subspinosa*) was observed due east of the current mining operations in 2019. The plant was observed growing on a southwest-facing, steep, rocky slope growing among other vegetation including perennial grasses and annual forbs.

Spiny milkwort was not detected in the expansion area during the field surveys; however, the species has the potential to occur within the project area due to the gravelly and rocky soils that

exist in the proposed quarry expansion area. A botanical survey for this species in accordance with CDFW protocols will be conducted prior to vegetation removal activities within the expansion area to determine the presence of this species. If detected, measures contained below will be implemented.

Ornate Dalea *(Dalea ornata)* – CRPR 2B.1
Ornate dalea is a perennial forb that is native to California and commonly grows on open, rocky hillsides at elevations between 1365 and 1700 meters. All seven of the reported occurrences of ornate dalea in CNDDB are north of the expansion area, with the closest being ±3.5 miles to the northwest. The occurrences were in rocky clay flats with areas of vertisol clay soil. The Project site has potentially suitable habitat for ornate dalea, and there is potential for the species to be present.

Holmgren's Skullcap (*Scutellaria holmgreniorum*) – CRPR 3.3
Holmgren's skullcap is a perennial forb that occurs in Great Basin habitats in California and Nevada, where it can be found on volcanic clay soils at elevations between 1310 and 1735 meters. Holmgren's skullcap has been found to the north and west of the study area, and has a moderate to high potential to be present on the site. The taxon is closely related to the more widespread *Scutellaria nana*. Common-garden experiments suggest that the two taxa are not distinct; however, field observations have supported differentiation of the taxa. Given its taxonomic uncertainty, *S. holmgreniorum* was reassigned from CRPR 4.3 to CRPR 3.3 in February 2013.

Potential Effects to Special-Status Species and their Habitats
As documented above and in the BRA (Appendix E), the project could directly and indirectly affect special-status species, nesting birds and raptors, and habitats for these species. Potential effects are discussed below.

Direct Effects to Special-Status Birds and Nesting Birds
The project site has potentially suitable nesting habitat for northern harrier and burrowing owl, and potential foraging habitat for golden eagle, Swainson's hawk, long-eared owl, short-eared owl, and loggerhead shrike. Other bird species could also nest and forage in the Project site.

There is a potential for direct mortality or injury to birds to occur if nests are present in the expansion area during vegetation removal and ground-disturbing activities. Mitigation Measure 4.5-1 requires pre-construction surveys to be completed if ground-disturbing activities/vegetation removal occur during the nesting season. Mitigation Measure 4.5-1 acknowledges specific survey protocols and avoidance measures for the burrowing owl in accordance with CDFW requirements. Potential effects due to loss of nesting and foraging habitat are addressed below.

Direct Effects to Other Special-Status Wildlife Species
There is a potential for monarch butterflies, pygmy rabbits, white-tailed jackrabbits, and pallid bats to forage and/or breed in the project area. There is a potential for direct mortality or injury to these species if they are present in the expansion area during vegetation removal and ground-disturbing activities.

Mitigation Measure 4.5-2 requires that throughout the life of the mine, if milkweed, the host plant for monarch butterfly, is observed onsite during the breeding/pupae development season (generally May 16th to September 30th), the plant should be inspected for caterpillars. If developing

monarch caterpillars are present, the plant would need to be avoided until butterflies have emerged and the plant is no longer in use by the butterflies.

Mitigation Measure 4.5-3 requires that prior to new ground disturbance and annually thereafter, field surveys must be conducted to determine the presence of pygmy rabbits, white-tailed jackrabbits, and other special-status wildlife species that may be present onsite. If special-status animal species are identified within the expansion area, a qualified biologist, in consultation with CDFW, will recommend measures to avoid/minimize impacts.

Mitigation Measure 4.5-4 requires that a qualified biologist conduct pre-construction surveys in rock outcrops and other areas that could provide suitable roosting habitat for pallid bat. Additional measures are included in the event a maternity roost is detected.

Indirect Effects

Indirect effects are those that are caused by or will result from the proposed action and are expected to occur later in time. Effects could be both short- and/or long-term in nature. Material extraction and possible use of a portable crusher will result in increased noise in the expansion area as well as the surrounding areas. The increase in processing at the site will require increased use of the primary crusher (estimated 33 percent annual increase in use). The proposed Project will also extend the life of the mine to 2050, which will increase the duration of impacts from the existing mining operation. The proposed Project will result in an increase in human presence within the area for a 30-year period, which could potentially result in increased disturbance or stress to special-status and non-status wildlife species. Increased human presence, noise and vibration from equipment operation, and light within the Project area could result in displacement of wildlife from the site and surrounding areas for the duration of the proposed Project.

As described in Subsection 4.5.3, *Previous CEQA Review*, previously adopted mitigation measures and conditions of approval would apply to activities in the proposed quarry expansion area, including limiting mining activities from January 1st to March 31st each year, limiting activities during nighttime hours, and requiring lighting to be downward facing and fully shielded. These operating conditions will decrease the lighting and noise impacts within the expansion area and reduce the indirect impacts of the proposed Project.

Effects to Special-Status Plant Species

The Project site contains suitable habitat for ornate dalea, Holmgren's skullcap, and spiny milkwort. Although some botanical survey work has been conducted on and adjacent to the study area, there is a potential for these and/or other special-status plants to be present in the quarry expansion area, and additional survey is warranted.

Mitigation Measure 4.5-5 requires that prior to new ground disturbance and annually thereafter, a botanical survey must be conducted during the blooming season when special-status plants would be identifiable. If special-status plant species are identified within the quarry expansion area, measures included in Mitigation Measure 4.5-5 would be implemented to avoid or reduce impacts to the plant populations.

To further minimize/avoid the potential for direct effects on special-status species, Mitigation Measure 4.5-6 is included to require all personnel participating in earth-disturbing activities, and their supervisors, to receive training by a qualified biologist regarding special-status species and sensitive habits that could be present in the Project area.

Effects to Sagebrush Scrub Habitat
As described above, the project would result in the loss of 78.6 acres of sagebrush scrub habitat that provides suitable foraging and breeding habitat for numerous bird species and mammals. Potential effects on mule deer and pronghorn antelope are discussed under Impact 4.5-2 below.

Animal populations that utilize sagebrush shrub habitat would likely no longer utilize the site and surrounding sagebrush habitat. In order to minimize impacts due to the loss of wildlife habitat, Mitigation Measure 4.5-7 limits site disturbance in the expansion area to no more than two 5-acre increments while concurrently reclaiming the first 5-acre increment. After the initial excavation of two 5-acre increments, disturbance shall not exceed 5-acres at any given time and requires that reclamation of the quarry expansion area be completed concurrently with mining operations in accordance with the Reclamation Plan Amendment. Reclamation, including seeding, must commence within two years following completion of mining in each five-acre area in order to minimize the total area disturbed at any given time and to allow for restoration of the cover and food source for mammals concurrently with mining operations.

The Reclamation Plan Amendment includes a proposed plant palette and success standards for revegetation of the site, with the overall goal of returning the site to a condition similar to pre-mining conditions:

- Shrub and grass species will achieve 5 percent cover in year 1, 10 percent by year 2, and 18 percent in years 3 to 5. If survival drops below these numbers, plants will be replaced the following fall;

- Minimum species richness of at least two native perennial shrub species and one perennial grass species will be established in three years over the reclaimed expansion area;

- Average basal density of 3 perennial plants will be established within three years as quantified within 1-meter plots;

- Invasive exotic species will not compose greater than 10 percent of the cover in any year.

In order to ensure that the success standards are met, the Reclamation Plan Amendment requires an annual vegetation survey and monitoring report to be completed. The revegetation areas must be maintained in good condition through regular monitoring to detect problems before they affect the attainment of performance criteria.

In addition, Mitigation Measure 4.5-8 requires that remaining areas of the mine parcel remain undisturbed for the duration of mining in order to minimize the loss of foraging habitat in the area. This includes portions of Lassen County Assessor's Parcel Numbers (APN) 109-110-059 and 109-100-060. Based on the large regional expanse of suitable habitats in the area, the loss of sagebrush scrub habitat would be less than significant with implementation of Mitigation Measure 4.5-7 and Mitigation Measure 4.5-8.

Impact 4.5-2: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

The proposed Project is located within the CDFW-designated critical winter-range habitat for mule deer (see Figure 4-4) and winter-range habitat for pronghorn antelope (see Figure 4-5). The Project area falls within Deer Hunt Zone X5a, which is a zone within the greater Deer Assessment Unit (DAU) 2- Northeastern California. In 1996, the population for DAU 2 was estimated to be 25,000; in 2017, the estimated population was 29,289 (CDFG et al. 1998; CDFW 2017). More specific to the Project location, the mule deer population within Hunt Zone X5a has increased, with an estimated 544 animals in 2013 and 942 in 2017.

The Project is within Pronghorn Hunt Zone 4-Lassen. The population of pronghorn in northeastern California is not well studied. The estimated population size of pronghorn in northeastern California ranged between approximately 1,800 and 3,000 individuals for the period between 1956 and 1970 and then grew to almost 6,000 animals between 1971 and 1978, with the largest numbers of animals found in the Likely Table, Clear Lake and Lassen herds. By 1992, the population had grown to an estimated 8,000 animals before undergoing a decline of nearly 50 percent after the winter of 1992/1993. The population continued to decline over the next 10 years and has not been able to recover over the past 20 years (Hudgens et al., 2016).

A Deer Impact Analysis was conducted for the 1997 EIR. According to the analysis, the mule deer in the Project area are seasonal migrants that summer at higher elevations, probably on Shaffer Mountain, where fawns are born. Deer descend to lower elevations in fall and early winter, where they remain until spring. On the winter range, deer feed mainly on sagebrush and bitterbrush.

According to the East Lassen Deer Herd Plan prepared by the CDFW in 1982, the area around Shaffer Mountain is identified as "critical" winter range where deer are concentrated during severe winters. The location of the Project site at the southwest base of Shaffer Mountain is important because the snow melts rapidly in this area and produces the first green vegetation in late winter and early spring. This early "green-up" is particularly important to wintering deer by providing their first opportunity to reverse the pattern of winter malnutrition and caloric deficit.

Pronghorn antelope are less predictable in their seasonal movements than are mule deer. Pronghorn do not have a pronounced elevational change between summer and winter. However, many of the concerns regarding winter range and forage availability are similar for the two species.

Potential impacts to mule deer and antelope from the proposed quarry expansion include direct habitat loss and displacement due to human disturbance, as further described below.

Habitat Loss

As stated under Impact 4.5-1 above, the proposed quarry expansion includes spatial expansion of the existing mining boundary that would physically disturb and reduce an additional 78.6 acres of important winter habitat and important vegetation for mule deer and pronghorn antelope. As discussed in the Deer Impact Analysis prepared for the 1997 EIR, loss of vegetation would be non-significant with an appropriate reclamation plan including re-planting with bitterbrush, sagebrush, and native grasses, all from local sources, and protection from grazing and browsing

by both wildlife and livestock until the plants are well established, as well as monitoring to ensure compliance.

As required by Mitigation Measure 4.5-7, in order to minimize impacts from the loss of wildlife habitat, site disturbance in the expansion area is limited to no more than two 5-acre increments while concurrently reclaiming the first 5-acre increment. After the initial excavation of two 5-acre increments, disturbance shall not exceed 5-acres at any given time. Reclamation in the expansion area must be completed concurrently with mining operations in accordance with the adopted Reclamation Plan Amendment. Reclamation, including seeding must commence within two years following completion of mining in each five-acre area in order to minimize the total area disturbed at any given time and allow for restoration and seeding of the cover and food source concurrently with mining operations.

The Reclamation Plan Amendment includes a proposed plant palette and success standards for revegetation of the site, with the overall goal of returning the site to a condition similar to pre-mining conditions. The seed mix proposed for reclamation in the expansion area is similar to the seed mix approved by CDFW for the existing quarry. In addition, Mitigation Measure 4.5-8 requires that remaining areas of the mine parcel remain undisturbed for the duration of mining in order to minimize the loss of foraging habitat in the area. Impacts on deer and antelope related to temporary habitat loss will be less than significant with implementation of Mitigation Measure 4.5-7 and Mitigation Measure 4.5-8.

Displacement
Expansion of the mining area by an additional 78.6 acres will increase the area over which light and noise impacts will occur, causing additional displacement of mule deer and American pronghorn due to noise and human activity. As discussed in the 1997 Deer Impact Analysis, human activity in the Project area would displace animals escaping mid-winter snow as well as taking advantage of late-winter and early spring plant phonology or the spring green-up due to noise and activity at the site. The proposed Project will result in these impacts occurring over a larger area than the current mining operation and for a longer duration (until 2050).

The proposed Project will continue to comply with the conditions of approval for Use Permit Amendment No. 2018-003 limiting mining activities from January 1st to March 31st each year, limiting activities occurring during nighttime hours, and requiring lighting to be downward facing and fully-shielded. These operating conditions will decrease the lighting and noise impacts within the expansion area.

However, as discussed in previous CEQA review for the proposed Project, a seasonal closure from at least December through March was determined to be necessary to reduce the impacts due to displacement from noise and human activity to a less than significant level. The proposed Project will result in additional disturbance to pronghorn and mule deer. Human disturbance during a time of particular nutritional stress may effectively remove a portion of their winter range (Kucera, 1996). Because there are several hundred deer potentially affected and impacts will last for an additional 30 years (until 2050), this would be a significant environmental impact.

Adherence to the existing conditions of approval (Mitigation Measure 4.5-9 and Mitigation Measure 4.5-10) will reduce displacement impacts to American pronghorn and mule deer; however, this impact will remain significant and unavoidable.

The following mitigation measures are proposed for the significant Project impacts to special-status species as well as pronghorn and mule deer:

MM 4.5-1: To avoid impacts on burrowing owls and other nesting birds, including raptors protected under State and federal regulations, the following shall be implemented (removal of raptor nests at any time of year is prohibited unless appropriate permits are obtained).

a. Burrowing owls. A qualified biologist shall conduct preconstruction surveys for burrowing owls in accordance with the *Staff Report on Burrowing Owl Mitigation* prepared by the California Department of Fish and Game (CDFW) (March 7, 2012). Upon completion, survey results shall be provided to Lassen County.

Where physical or visual access is available, survey coverage shall extend 500 feet around the project site where suitable habitat for burrowing owls is present. A minimum of four field surveys shall be conducted: at least one between February 15th and April 15th; and a minimum of three surveys, at least three weeks apart, between April 15th and July 15th, with at least one survey after June 15th. Survey methods and survey reports shall be in accordance with the CDFW Staff Report and be provided to Lassen County. If no active burrows are observed, the site shall be reinspected by a qualified biologist no more than one week prior to initiation of construction to ensure that owls are not present.

If an active burrow is observed in the project site, the County shall consult with CDFW regarding establishing a non-disturbance buffer around the burrow, or implementing passive relocation methods to exclude the owls from the site prior to commencement of construction. No burrowing owls shall be excluded from occupied burrows until a burrowing owl exclusion and relocation plan is approved by CDFW. Following owl exclusion and burrow demolition, the site shall be monitored by a qualified biologist to ensure burrowing owls do not reoccupy the site prior to construction.

In the event of loss of burrowing owl nests, a mitigation and monitoring plan shall be prepared by a qualified biologist to identify methods to offset the loss at a minimum 1:1 ratio (e.g., establishing a permanent conservation easement to provide for burrowing owl nesting, foraging, wintering, and dispersal, including completing habitat enhancements within the conservation easement area as necessary. The mitigation and monitoring plan shall be approved by CDFW prior to commencement of construction.

b. For all other bird species, if vegetation removal or ground disturbance activities occur between February 1st and August 31st, a pre-construction nesting survey shall be conducted by a qualified biologist to identify active nests in and adjacent to the work area. Surveys shall begin prior to sunrise and continue until vegetation and nests have been sufficiently observed. The survey shall consider acoustic impacts and line-of-sight disturbances occurring as a result of the project in order to determine a sufficient survey radius to avoid nesting birds. At a minimum, the survey report shall include a description of the area surveyed, date and time of the survey, ambient conditions, bird species observed in the area, a description of any active nests observed, any evidence of breeding

behaviors (e.g., courtship, carrying nest materials or food, etc.), and a description of any outstanding conditions that may have impacted the survey results (e.g., weather conditions, excess noise, the presence of predators, etc.). The survey shall be conducted no more than one week prior to the initiation of construction and the survey report shall be provided to Lassen County. If construction activities are delayed or suspended for more than one week after the pre-construction survey, the site shall be resurveyed.

If active nests are found, appropriate actions shall be implemented to ensure compliance with the Migratory Bird Treaty Act and California Fish and Game Code. Compliance measures may include, but are not limited to, exclusion buffers, sound-attenuation measures, seasonal work closures based on the known biology and life history of the species identified in the survey, as well as ongoing monitoring by biologists.

MM 4.5-2: Throughout the life of the mine, if milkweed (*Asclepias* spp.*)* is observed onsite during the breeding season/pupae development season (spring-summer) for the monarch butterfly, the plant shall be inspected for caterpillars by a qualified biologist. If developing monarch caterpillars are present, the plant shall be avoided until butterflies have emerged and the plant is no longer in use.

MM 4.5-3: Prior to new ground disturbance and annually thereafter, a pre-construction survey shall be conducted by a qualified biologist to determine the presence of pygmy rabbits, white-tailed jackrabbits, and other special-status wildlife species that may be present onsite. Survey reports shall be provided to Lassen County. If special-status animal species are identified within the project site, a qualified biologist, in consultation with the California Department of Fish and Wildlife, shall recommend avoidance measures for protection of the species.

MM 4.5-4: Prior to new ground disturbance, a qualified biologist shall conduct a survey in areas that contain rock outcrops or other potentially suitable roosting habitat for pallid bats. Survey reports shall be provided to Lassen County. If an active maternity roost is present, a qualified biologist, in consultation with the California Department of Fish and Wildlife, shall establish a suitable buffer zone to ensure that active bat nurseries are not adversely affected. If non-breeding bats are found in rock outcrops within the disturbance footprint, the individuals shall be safely evicted under the direction of a qualified biologist.

MM 4.5-5: Prior to new ground disturbance and annually thereafter, a botanical survey shall be conducted during the blooming season when special-status plants known to occur in the region would be identifiable. Survey reports shall be provided to Lassen County. If special-status plants are present, a suitable buffer zone(s) shall be determined by a qualified biologist in consultation with the California Department of Fish and Wildlife (CDFW) and exclusionary fencing shall be placed prior to commencement of earth-disturbing activities.

If avoidance is not possible, CDFW shall be contacted to determine a satisfactory method of mitigation. Mitigation shall be undertaken concurrently with or in advance of the earth-disturbing activities.

MM 4.5-6: All construction personnel participating in earth-disturbing activities and their supervisors shall receive training by a qualified biologist regarding protective measures for special-status plant and animal species and sensitive habitats that could exist in the study area. When new personnel are hired, proof that newly hired personnel have received mandatory training shall be provided to Lassen County before starting work. At a minimum, the training shall include the following:

a. A review of the special-status species that could occur in the project site, the locations where the species could occur, the laws and regulations that protect these species, and the consequences of noncompliance with those laws and regulations.
b. Procedures to be implemented in the event that these species are encountered during construction.
c. A review of sensitive habitats that occur in the study area and the location of the sensitive habitats.
d. A review of applicable mitigation measures, standard construction measures, best management practices, and resource-agency permit conditions that apply to the protection of special-status species and sensitive habitats.

MM 4.5-7: To minimize impacts from the loss of wildlife habitat, site disturbance in the expansion area shall not exceed two 5-acre increments while concurrently reclaiming the first 5-acre increment. After the initial excavation of two 5-acre increments, disturbance shall not exceed 5-acres at any given time. Reclamation in the expansion area shall be completed concurrently with mining operations in accordance with the adopted Reclamation Plan Amendment. Reclamation, including seeding, must commence within two years following completion of mining in each five-acre area in order to minimize the total area disturbed at any given time and to allow for restoration of the vegetative cover.

MM 4.5-8: To ensure no additional foraging habitat loss, all remaining areas of the mine parcels shall remain undisturbed for the duration of mining. This includes the remaining portions of Lassen County Assessor's Parcel Number (APN) 109-100-059 and APN 109-100-060 (i.e., all portions of the parcels outside of the reclamation boundary for the current mine operation (as of 2021) and the proposed 2021 mine expansion boundary).

MM 4.5-9: *Limits on Operation*. The operator shall continue limits on operations from January 1st to March 31st. Impacts can be lessened through continuing seasonal operating restrictions included in the Condition of Approval for Use Permit No. 96056: *Except in a state of emergency, as declared by the local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville, no grading, excavating, or blasting on the site shall be allowed between January 1st and March 31st annually.*

MM 4.5-10: *Operating Conditions of Use Permit No. 2018-003*. The operator shall continue the Conditions of Approval for Use Permit Amendment No. 2018-003. Impacts can be lessened with the seasonal operating restrictions and light and noise reductions included in the Conditions of Approval for Use Permit Amendment No. 2018-003.

4.5.7 Level of Significance after Mitigation

Compliance with the operational conditions included in Subsection 4.5.3, *Previous CEQA Review*, and implementation of Mitigation Measure 4.5-1 through Mitigation Measure 4.5-8 ensures that the project's impacts to special-status species and their habitats are less than significant.

In order to mitigate potential impacts associated with displacement of mule deer and pronghorn antelope due to noise and human activity to a less than significant level, a seasonal closure from at least December through March of each year was determined to be necessary. The Lassen County Board of Supervisors has determined that economic losses from the four-month annual closure would impact the mine as well as the surrounding community; a disruption of mining operations would lead to a loss of employee payroll, place a higher demand on social services in the community, and reduce availability of mined materials in the surrounding area. An increased closure season of all operations onsite has been determined to be economically infeasible.

Adherence to the existing conditions of approval (refer to Mitigation Measure 4.5-9 and Mitigation Measure 4.5-10) will reduce displacement impacts to mule deer and pronghorn antelope; however, no additional mitigation measures are available, and this impact will remain significant and unavoidable.

4.6 Cultural and Tribal Cultural Resources

Expansion of the mining boundary to include an additional 78.6 acres is a substantial change that will require major revisions of the previous EIR due to the involvement of potentially new significant environmental effects pertaining to cultural resources and tribal cultural resources or a substantial increase in the severity of previously identified significant effects under CEQA Guidelines §15162.

Impacts to cultural resources for activities occurring within the currently permitted mine boundary were evaluated in three previous EIRs. The proposed Project would result in the expansion of the current mining operation to include an additional 78.6 acres. The expansion area has not been evaluated in previous EIRs.

This section provides a summary of the cultural resource setting of the Project site, previous CEQA review, cultural resource and tribal cultural resource regulations, and a discussion of the potential cultural resource and tribal cultural resource impacts of the proposed Project. The primary source of information in this section is derived from the *Archaeological Survey Report, Ward Mine Expansion Project* (ALTA, 2021).

Information contained in the *Archaeological Survey Report, Ward Mine Expansion Project*, related on the specific location of prehistoric and historic sites is confidential and exempt from the Freedom of Information Act (FOIA) and the California Public Records Act (CPRA); therefore, site specific cultural resource investigations are not included as an appendix to this environmental document. Professionally qualified individuals, as determined by the California Office of Historic Preservation, may contact the Lassen County Department of Planning and Building Services directly in order to inquire about its availability.

4.6.1 Environmental Setting

The Project area is situated on the west facing slopes of Shaffer Mountain within the Balls Canyon watershed. Elevations within the Project area range from about 4,190 to 4,560 feet above mean sea level (msl). No water sources are located nearby. During the historic-period the bottomlands of the Susanville River were converted extensively to agriculture and pasture. The foothill areas of the Project area were used for grazing cattle as evidenced by dirt roads, cattle trails, water reservoirs, and livestock fencing.

The Project area is situated at the southern end of the Modoc Plateau geologic province. The Modoc Plateau is a volcanic tableland that lies at the southern end of the Cascade Range of Mountains in Northeastern California. The Modoc Plateau constitutes the southernmost extension of a large volcanic plateau that formed about 25 million years ago and expands north into eastern Oregon, Eastern Washington, and Southern Idaho (Schoenheer, 1992:11). This tableland consists of block faulted Cenozoic basalt flows, smaller rhyoltic domes, shield volcanoes, lake basins, and river drainages.

The local vegetation community consists primarily of Great Basin Sage Brush (*Artemisia tridentata*), pinyon pine, and junipers (Schoenherr, 1992). Perennial bunch grasses including wheat grass (*Agrophyron* spp.) and fescues (*Festucac* spp.*)* were noted within the Project area.

Prehistory

Over half a century of archaeological investigations in the Southern Cascade and Sierra Nevada has revealed a record of hunter-gatherer occupation spanning over 12,000 years (Baumhoff, 1957; Elsasser, 1960, 1978; Elston, 1971, 1982, 1986; Elston et al., 1977, 1994, 1995; Heizer and Elsasser, 1953; Moratto, 1984; Kowta, 1988; Prichard et al., 1966; Ritter, 1968, 1970; Olsen and Riddell, 1963). The cultural chronology of the Project area is best described as part of the overall cultural chronology for the Southern Cascade Range (Baumhoff,1957; Delacorte, 1997; and Kowta, 1988).

The earliest documented evidence of occupation in the region began about 11,000 to 8,000 years BP, referred to as the Western Pluvial Lakes Tradition (Kowta, 1988). Early Holocene +(7,000 BP) archaeological sites tend to be situated along the margins of large pluvial lakes, indicating non-intensive or temporary occupation suggesting a nomadic settlement system with an emphasis on hunting of large terrestrial mammals and waterfowl. A diagnostic artifact of this time is the "crescent stone" that is associated with lacustrine adaptation and exploitation, possibly water fowling (Kowta, 1988).

During the Post-Mazama Period (7,000 to 5,000 BP) the climate shifted to warmer conditions giving way to a new adaptation known as the Great Basin Archaic Tradition, a lifeway that lasted well over 3,000 years. This period is characterized by a focus on seed processing (milling slabs and handstone) and big game hunting (atlatl), mostly at high elevation (Kowta, 1988). Diagnostic artifact types of this period include Northern Side-Notched and Pinto projectile points, which have been documented at Bucks Lake (Kowta, 1988).Northern Side-notched points may serve as an ethnic marker for a northern populations that was distinct from adjacent southern groups who relied on Gatecliff and other typically Great Basin projectile point types (Delacorte, 1997b:168-171; Layton, 1985; O'Connell, 1975).

The Early Archaic Period (ca. 5,000 to 3,500 years BP) show populations increased dramatically as suggested by the frequency of sites in conifer and oak woodland zones. This time period is known locally as the Martis Tradition, a wide-spread adaptation present along the western Sierra and Southern Cascade Range (Elston, 1971, 1979; Elston et al., 1977; Riddell and Pritchard, 1971; Johnson, 1980). A characteristic feature of this tradition is the prevalence of stone tools from locally available tool stone, primarily basalt (Kowta, 1988). Projectile points (contracting stem and corner notch) are found in high ratios to milling slabs and handstone, suggesting an emphasis on hunting. Gatecliff Split-stem and Humboldt Concave Base projectile points offer the primary diagnostic artifacts for this period (Delacorte et. al., 1997). Associated assemblage constituents include plentiful flake tools, bifacial knives, heavy core implements, and a wide array of ground stone milling tools.

The Middle Archaic Period (3,500 to 1,300 BP) demonstrates a fluorescence of sites and a dramatic increase in archaeological site visibility in the region. Extensive habitations, midden, grave lots, and house-structures tend to characterize this period indicating an increase in settlement size, duration of settlement, and increases in obsidian procurement and intensive biface reduction. Projectile points typical of this period include Martis series projectile points of the northern Sierra Nevada, and Elko Series projectile points of the Great Basin.

The Late Archaic Period (1,300 to 600 BP) is marked by major changes in land-use. The elaboration of archaeological assemblages noted in the Middle Archaic Period abruptly cease at approximately 1,000 BP as obsidian production falls off, archaeological visibility is lower, and cultural accumulations become more focused on specific subsistence pursuits. The beginning of the Late Archaic Period is marked in technological shifts associated with the advent of bow-and-arrow (Bettinger and Taylor, 1974; Delacorte et. al., 1997). The advent of bow-and-arrow technologies marks a shift to expedient flake-based tools and smaller residential settlements (Delacorte et. al., 1995, 1997). Rose Spring and Gunther Barb series are diagnostic of this period. Higher frequencies of milling equipment in Late Archaic assemblages suggest increased reliance on seed resources (Delacorte et. al., 1995), despite a diet breadth focused on both vegetal and animal resources (Basgall and McGuire, 1988). Flaked-stone assemblages reveal a shift from the highly curated and worked bifaces of ground stone accumulations dating to this period suggest a fundamental reorganization of settlement-subsistence adaptation focused on intensive exploitation or epos root and other plant resources (McGuire, 2000:30). This shift co-occurs with a dramatic fall off of obsidian biface production and increased use of local tool stone. These changes suggest a decreased foraging mobility and territoriality as indicated by semi-permanent lowland settlements with well-built house structures, cache pits, and other domestic facilities. In the Sierra Nevada intensified use of local plant resources is indicated by the introduction of shallow bedrock mortar and stone hullers (Elston et. al., 1994).

During the Terminal Prehistoric (600 BP-Historic-era) prehistoric components tend to be comparatively smaller, more ephemeral in nature, and usually represented by isolated ground stone concentrations or hearths with limited debris scatters. The Desert Side-notched and Cottonwood Triangular series are dominant projectile point types. Milling equipment tends to occur at higher ratios during these periods and is dominated by large, unshaped blocks with more ephemeral surface wear. Reduction trajectories for obsidian shift from biface reduction to a core/flake technology. The size and relative frequency of obsidian bifaces decrease. In general, this pattern has been interpreted as a response to increased territorial circumscription, which limited access to tool stone material sources, and increasing inter-group competition and conflict (McGuire 2000:32).

Ethnography

The Maidu inhabited the region of the Sierra Nevada foothills and Southern Cascades prior to Euro-American intrusion (Riddell, 1978:370-386). They are represented locally by the Mechoopda Band of Konkow Indians (Dixon, 1905). Primary sources of ethnographic information include Dixon (1905), Powers (1877), Kroeber (1925). In this section, the past tense is sometimes used when referring to native peoples because this is a historical study. This convention is not intended to suggest that Maidu people only existed in the past. To the contrary, many Maiduian groups have strong cultural and social identities today.

Linguistically, the Madiu are divided into three groups: the Northeastern, Northwestern and Southern. Maidu were never a single consolidated tribe, but instead were represented by numerous politically independent bands and tribelets. Each tribelet consisted of one or more villages and a number of camps with the tribelet's territory. The central village was usually the most populous and the residence of the community leader who served as the primary advisor and spokesman (Kroeber, 1925:397). Individual villages were autonomous and self-sufficient, not politically bound under any strict control of the community leader. The Maidu, like many neighboring groups,

followed a yearly gathering cycle traveling seasonally from winter villages on the river into the Sierra foothills to hunt and gather. They primarily subsisted on freshwater fish, acorns, and terrestrial game (Riddell, 1978:370-386). Any member of a community could procure food from the territory fishing, hunting, and gathering areas were held in common. Within the common lands certain families could claim fishing holes as their own and permission was required for other tribal members to use these areas (Dixon, 1905:224-227).

Local History

The Gold Rush (1848-9) brought a wave of immigrants to California. The Nobles Emigrant trail, a branch of the California Trail, was situated north of present day Susanville. Between 1841 and 1869, more than 200,000 emigrants traversed the California Trail. In 1854, Isaac Roop and Company built a trading post along the Nobles Emigrant trail. Susanville was named after Susan Roop, daughter of Isaac Roop. The area was originally called Rooptown, until 1857 when the present name was adopted (Purdy, 2005). The area's unique location, on the crest of the Sierra Nevada, and having dense timber and lush farmlands along the headwaters of the Susan River made the area an ideal location for settlement and the town quickly developed. Lassen County was officially recognized in 1864 with Susanville as the county seat. Fire was a persistent problem for the town. In 1893, the entire business district was leveled by fire and residents endured several more blazes until 1900, when the Susanville was incorporated as a means to provide fire protection. As a fire preventive measure the city passed a controversial ordinance in 1902 that prohibited the construction of wooden buildings in the town's business district. In 1913, the arrival of the Fernley & Lassen Railroad ushered in a new era of commerce that forever changed the community. The establishment of the lumber mills associated with the Lassen Lumber & Box Company and the Fruit Growers Supply Company provided an economic boom. The local economy declined as the lumber industry faded in the late 1950's and 1960's (Purdy, 2005). Susanville experienced an economic resurgence in 1963 when the California Correctional Facility Center was constructed.

Cultural Resources within Expansion Area

The *Archaeological Survey Report Ward Mine Expansion Project* (ALTA, 2021) was prepared to identify any archaeological, historical, or cultural resources located in the expansion area. The ASR included records search, historic map review, literature review, an archaeological field survey, and Native American communications.

The records search conducted at the Northeast Information Center of the California Office of Historic Resources Information System identified three previously identified historic-era or prehistoric cultural resources documented within the ¼ mile search radius of the expansion area. Historic maps of the Project site were also reviewed. A General Land Office Plat map dating to 1879 shows the Project area as unimproved land. A point labeled "House" on the 1879 GLO map was situated within the subject parcel in Section 19, adjacent (west) of the Project area. No historical maps were available for the 60-year period between 1893 and 1954. Topographic maps dating to 1954 through 1968 do not depict any infrastructure on the parcel. Available ethnographic literature was reviewed to identify cultural resources in the Project vicinity, and there are no ethnographic resources documented within 2 miles of the Project area.

The archaeological field survey identified two isolated finds and one cultural resource (ALTA_PRE-01) within the expansion area. Isolated finds are artifacts that occur as a single item and are not clearly associated with a cultural resource. Isolated finds do not merit formal recordation and are not considered cultural resources. Two isolated finds (1 prehistoric and 1 historic) were noted within the Project area. Table 4-15 provides a summary of isolated finds.

Table 4-15
SUMMARY OF CULTURAL RESOURCES

Isolate Name	Description	Era
PRE-ISO-01	Metate fragment	Prehistoric
HIS-ISO-01	Solder dot/ beer cans (n-7)	Historic

Source: ALTA, 2021.

The cultural resource identified within the expansion area (ALTA_PRE-01) is a prehistoric resource consisting of a sparse scatter of lithics including flake and tool fragment artifacts. The resource spans 48 m (southwest-northeast) by 64 m (northwest-southeast) and is situated adjacent (east) to a modern access road which forms the western boundary of the expansion area. The site may extend west outside of the expansion area. The resource area is located within a flat sagebrush dominated basin approximately 270 meters southeast of Balls Canyon Creek. No diagnostic artifacts were located. Mostly tool fragments were observed. One pecking stone and a likely grinding stone was noted at the site. Obsidian, chert, and metavolcanic flakes were present at a frequency of less than one artifact per square meter. Vegetation in the area consists of sage and various grasses, including native bunch grass.

Tribal Cultural Resources

Assembly Bill 52, which went into effect in July 2015, is an amendment to CEQA §5097.94 of the Public Resources Code. AB 52 established a proactive consultation process with all California Native American tribes identified by the Native American Heritage Commission (NAHC) with cultural ties to an area. This process is implemented on projects that file a notice of preparation for an EIR or notice of intent to adopt a negative or mitigated negative declaration. Under AB52, the Lead Agency is required to consult with tribes at tribal request. The bill further created a new class of resources under CEQA known as tribal cultural resources.

Non-AB 52 Consultation

ALTA archaeologist Kevin Dalton contacted the NAHC on March 27, 2020, to request a review of the Sacred Lands file for information on Native American cultural resources in the study area and to request a list of Native American contacts in this area. The NAHC replied on March 30, 2020, indicating that no Sacred Sites are known within the project area. The NHAC provided a list of Native American contacts that have knowledge or concerns about cultural resources in the project area. On April 9, 2020, letters were sent to all tribes listed by the NAHC. As of December 5, 2020, no response has been received from any of the groups consulted as part of this outreach effort. Follow up phone calls and messages were left with each tribe on April 15, 2020. No response has been received to date.

AB 52 Consultation

On April 28, 2021, the County initiated environmental review under CEQA for the proposed Project. The County sent a certified project notification letter to Darrel Cruz, Director of the Washoe Tribal Historic Preservation Office, a California Native American Tribe that is

traditionally and culturally affiliated with the geographic area of the proposed Project, on May 5, 2021, pursuant to PRC §21080.3.1, notifying that the Project was under review and to provide the Tribe 30 days from the receipt of the letter to request consultation on the proposed Project in writing. The letter included a brief description of the proposed Project, Project location, and a request for any information about tribal cultural resources in the Project area vicinity. No responses were received requesting initiation of consultation under the provisions of AB 52.

4.6.2 Regulatory Setting

The following is a description of State and local environmental laws and policies that are relevant to the CEQA review process for the proposed expansion area.

State

California Environmental Quality Act
Under CEQA, public agencies must consider the effects of their actions on both historical resources and unique archaeological resources. Pursuant to PRC §21084.1, a "project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." Section 21083.2 requires agencies to determine whether proposed projects would have effects on unique archaeological resources.

"Historical resource" is a term with a defined statutory meaning (PRC §21084.1). Under CEQA Guidelines §15064.5(a), historical resources include the following:

- A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR (PRC §5024.1).

- A resource included in a local register of historical resources, as defined in PRC § 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC §5024.1(g), will be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

- Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource will be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the California Register of Historical Resources (PRC §5024.1), including the following:

    a) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
    b) Is associated with the lives of persons important in our past;
    c) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

d) Has yielded, or may be likely to yield, information important in prehistory or history.

The fact that a resource is not listed in, or determined to be eligible for listing in the CRHR, not included in a local register of historical resources (pursuant to PRC §5020.1(k)), or identified in a historical resources survey (meeting the criteria in PRC §5024.1(g)) does not preclude a lead agency from determining that the resource may be an historical resource as defined in PRC §§5020.1(j) or 5024.1.

Historical resources are usually 45 years old or older and must meet at least one of the criteria for listing in the CRHR, described above (such as association with historical events, important people, or architectural significance), in addition to maintaining a sufficient level of integrity.

Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be historical resources for purposes of CEQA unless a preponderance of evidence indicates otherwise (PRC §5024.1 and California Code of Regulations (CCR), Title 14, §4850). Unless a resource listed in a survey has been demolished, lost substantial integrity, or there is a preponderance of evidence indicating that it is otherwise not eligible for listing, a lead agency should consider the resource to be potentially eligible for the CRHR.

CEQA also requires lead agencies to determine if a proposed project would have a significant effect on unique archaeological resources. If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC §21084.1 and CEQA Guidelines §15064.5 would apply. If an archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site may meet the threshold of PRC §21083.2 regarding unique archaeological resources. A unique archaeological resource is an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria.

"Unique archaeological resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person."

The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (14 CCR §15064[c][4]).

If the project would result in a significant impact to a historical resource or unique archaeological resource, treatment options under PRC §21083.2 include activities that preserve such resources in

place in an undisturbed state. Other acceptable methods of mitigation under §21083.2 include excavation and curation or study in place without excavation and curation (if the study finds that the artifacts would not meet one or more of the criteria for defining a unique archaeological resource).

Section 7050.5(b) of the California Health and Safety Code specifies protocol when human remains are discovered, as follows:

> *"In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with Section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of Section 27492 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner and cause of death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the Public Resources Code."*

CEQA §15064.5(e) requires that excavation activities stop whenever human remains are uncovered and that the county coroner be called in to assess the remains. If the county coroner determines that the remains are those of Native Americans, the Native American Heritage Commission (NAHC) must be contacted within 24 hours. At that time, the lead agency must consult with the appropriate Native Americans, if any, as timely identified by the NAHC. Section 15064.5 directs the lead agency (or applicant), under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains.

In addition to the mitigation provisions pertaining to accidental discovery of human remains, the CEQA Guidelines also require that a lead agency make provisions for the accidental discovery of historical or archaeological resources, generally. Pursuant to §15064.5(f), these provisions should include "an immediate evaluation of the find by a qualified archaeologist. If the find is determined to be an historical or unique archaeological resource, contingency funding, and a time allotment sufficient to allow for implementation of avoidance measures or appropriate mitigation should be available. Work could continue on other parts of the building site while historical or unique archaeological resource mitigation takes place."

California Native American Heritage Commission

The NAHC is the primary State agency responsible for identifying and cataloging Native American cultural resources. It works to prevent irreparable damage to designated sacred sites and interference with expressions of Native American human remains found outside of a dedicated cemetery, who can then make recommendations on the treatment and disposition of the remains. The NAHC is also responsible for mediating disputes that may arise during the disposition of any remains. The guidelines also establish the NAHC to identify the most likely descendent of any remains and to mediate disputes regarding the disposition.

California Public Resources Code

The California PRC, §5097.5, prohibits the excavation or removal of any "vertebrate paleontological site, or any other archaeological, paleontological, or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction of such

lands." Public lands are defined as lands owned by or under the jurisdiction of the State, or any city, county, district, authority, or public corporation. Any unauthorized disturbance or removal of archaeological, historic, or paleontological materials or sites located on public lands is considered a misdemeanor.

California Health and Safety Code

Section 7050.5 of the Health and Safety Code makes it a misdemeanor to intentionally disturb, mutilate, or remove interred human remains. It also requires that if human remains are discovered outside of a dedicated cemetery, any excavation or disturbance of the site stop until the county coroner makes a report. Under this section, if the county coroner determines the remains to be Native American, the coroner must contact the NAHC within 24 hours. Additionally, §7050.5 of the California Health and Safety Code, §5097.98 of the California PRC, §15064.5(d) of the CEQA Guidelines outlines the procedures to be used if Native American human remains are unexpectedly found on non-federal land. The guidelines protect the remains from accidental or deliberate destruction or disturbance, and establish procedures to appropriately and sensitively address such a discovery.

California Public Records Act

Section 6253 and 6254.10 of the California Code authorize State agencies to exclude archaeological site information from public disclosure under the CPRA. In addition, the CPRA (Government Code §6250 et seq.) and California's open meeting law (The Brown Act, Government Code §56950 et seq.) protect the confidentiality of Native American cultural place information. The CPRA (as amended, 2005) contains two exemptions that aid in the protection of records relating to Native American cultural places by permitting any State or local agency to deny a CPRA request and withhold from public disclosure:

- Records of Native American graves, cemeteries, and sacred places and records of Native American places, features, and objects described in §5097.9 and §5097.993 of the Public Resources Code maintained by, or in the possession of, the Native American Heritage Commission, another state agency, or local agency (GC §6254(r)); and

- Records that relate to archaeological site information and reports maintained by, or in the possession of, the Department of Parks and Recreation, the State Historical Resources Commission, the State Lands Commission, another state agency, or local agency, including the records that the agency obtains through a consultation process between a California Native American tribe and a state or local agency (GC §6254.10).

Likewise, the Information Centers of the CHRIS maintained by the OHP prohibit public dissemination of records search and site location information. In compliance with these requirements, and those of the Code of Ethics for the Society of California Archaeology and the Register of Professional Archaeologists, the locations of cultural resources are considered restricted information with high restricted distribution and are not publicly accessible.

Assembly Bill 52

In September of 2014, the California Legislature passed AB 52, which added provisions to the PRC regarding the evaluation of impacts on tribal cultural resources under CEQA, and consultation requirements with California Native American tribes. In particular, AB 52 now requires lead agencies to analyze project impacts on "tribal cultural resources" separately from

archaeological resources (PRC §21074; §21083.09). The Bill defines "tribal cultural resources" in a new section of the PRC §21074. AB 52 also requires lead agencies to engage in additional consultation procedures with respect to California Native American tribes (PRC §21080.3.1, §21080.3.2, §21082.3). Specifically, PRC §21084.3 states:

a) Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.

b) If the lead agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in the consultation process provided in Section 21080.3.2, the following are examples of mitigation measures that, if feasible, may be considered to avoid or minimize the significant adverse impacts:

1) Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

2) Treating the resource with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

a) Protecting the cultural character and integrity of the resource.
b) Protecting the traditional use of the resource.
c) Protecting the confidentiality of the resource.

3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

4) Protecting the resource.

AB 52 required the Office of Planning and Research to update Appendix G of the CEQA Guidelines to provide sample questions regarding impacts on tribal cultural resources (PRC §21083.09).

Local

Standish-Litchfield Area Plan
The *Standish-Litchfield Area Plan* contains the following policy related to cultural resources:

- Policy 12-A: The County shall within its authority, preserve and protect the cultural resources of the Planning Area.

4.6.3 Previous CEQA Reviews

Previous CEQA review of cultural resources completed for the existing mining area at the project site are summarized below. The 1981 and 1997 EIRs prepared for the existing operation did not contain an analysis of tribal cultural resources as this resource was not previously required and was added to the CEQA Guidelines in 2016.

1981 EIR

An archaeological reconnaissance and evaluation of the Project area included within the present project boundary was conducted by Trygve Sletteland of Eco, Redding, and was included with the 1981 EIR. No new historical sites were discovered during the survey; however, reference was made to two known sites which are approximately one mile from the project. The archaeologist recommended that the applicants "proposed land use be given archaeology clearance since no cultural resources were identified during an archaeological survey of their project area. A review of the Register of Historic Places revealed no known historic places within the project area. The State Parks and Recreation Booklet "California Historical Landmarks", was also reviewed and showed no landmarks within the site. In response to an inquiry addressed to the Lassen County Historical Society, a letter was received indicated no known sources of cultural importance present. A letter was also addressed to Susanville Indian Rancheria requesting any information regarding possible cultural resources located in the project area to which no reply was received. If anything of importance, historically or archaeologically should be discovered in the course of set-up, operation, excavation, or processing of materials (should the project be approved), the proper authorities would be notified.

1997 EIR

The 1996 Initial Environmental Study concluded that impacts to cultural resources on the site or in the surrounding area would be less than significant, supported by the 1980 Sletteland study as well as the July 22, 1996 letter from the Northeastern Center of the California Historical Resources Information Center which agreed with the report's conclusion. The Information Center did not call for work stoppage if any cultural resources are uncovered during operations. Project impacts and cumulative impacts were determined to be less than significant. The following mitigation measure was included in the EIR to ensure that impacts to the uncovering of resources will not result in significant impacts by requiring their protection:

> *"Work stop if cultural resources uncovered. If cultural resources or human remains are uncovered during site operations, work shall stop immediately. The Lassen County Community Development Department shall be contacted and a qualified archaeologist shall be called in to assess the resources and recommend appropriate mitigation which shall be implemented prior to additional work."*

2019 EIR

The Initial Study prepared for the 2019 EIR determined that 24-hour operations, increase in production during emergencies, and extension of the life of the mine would result in no impacts to cultural resources. The 2019 project did not include a change to the location or type of mining or total site production. The existing permitted location and type of mining were analyzed under the previous EIRs prepared for the operation. The project was determined to have no impact to cultural resources and cultural resource impacts were not further evaluated in the 2019 EIR.

4.6.4 Thresholds of Significance

Following PRC §§ 21083.2 and 21084.1, and § 15064.5 and Appendix G of the CEQA Guidelines, historical resource impacts are considered to be significant if the project would result in a positive response to any of the following questions:

- *Would the project cause a substantial adverse change in the significance of a Historical Resource pursuant to CEQA Guidelines Section 15064.5?*

- *Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?*

- *Would the project disturb any human remains, including those interred outside of dedicated cemeteries?*

CEQA Guidelines §15064.5 defines substantial adverse change as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource is materially impaired. CEQA Guidelines §15064.5(b)(2) defines materially impaired for purposes of the definition of substantial adverse change as follows:

The significance of an historical resource is materially impaired when a project:

a) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or

b) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to §5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of §5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

c) Demolishes or materially alters in an adverse manner those physical characteristics of a Historical Resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

CEQA requires that if a project would result in an effect that may cause a substantial adverse change in the significance of a historical resource or would cause significant effects on a unique archaeological resource, then alternative plans or mitigation measures must be considered. Therefore, prior to assessing effects or developing mitigation measures, the significance of cultural resources must first be determined. The steps that are normally taken in a cultural resources investigation for CEQA compliance are as follows:

- Identify potential historical resources and unique archaeological resources;
- Evaluate the significance of the potential historical resources; and
- Evaluate the effects of the project on eligible (significant) historical resources and unique archaeological resources.

The following significance thresholds related to tribal cultural resources have been derived from PRC §21084.2:

- *Cause a substantial adverse change in the significance of a Tribal Cultural Resource, defined in Public Resources Code Section 21074 as either a site, feature, place, or cultural landscape that is geographically*

defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

- *Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k).*

- *A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.*

AB 52 established that a substantial adverse change to a tribal cultural resouce has a significant effect on the environment. In assessing substantial adverse change, Lassen County must determine whether or not the project will adversely affect the qualities of the resource that convey its significance. The qualities are expressed through integrity. Integrity of a resource is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association [California Code of Regulations [CCR] Title 14, §4852(c)].

Impacts are significant if the resource is demolished or destroyed or if the characteristics that made the resource eligible are materially impaired [CCR Title 14, §15064.5(a)]. Accordingly, impacts to a tribal cultural resource would likely be significant if the project negatively affects the qualities of integrity that made it significant in the first place. In making this determination, Lassen County need only address the aspects of integrity that are important to the significance of tribal cultural resources.

4.6.5 Impact Analysis

The following includes an analysis of environmental parameters related to *Cultural and Tribal Cultural Resources* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the conclusions that either no impacts, less than significant impacts, or less than significant impacts with mitigation could occur. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Cultural and Tribal Cultural Resources*.

Project Impacts

Impact 4.6-1: The Project would cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to §15064.5.

Significant cultural resources, as buildings, sites, structures, objects, and districts significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, must meet the criteria described in Subsection 4.6.2, *Regulatory Setting*, above. If no eligible resources are identified within the project area, then the subject project is not considered to have a significant impact on cultural resources. In addition, State regulations require that measures be taken to protect any resources that are uncovered during construction, and compliance with CEQA Guidelines §15064.5(f) requires that construction activities halt if potentially significant resources are discovered until the resources can be assessed by a qualified person.

The proposed Project could potentially result in a significant impact if it caused a substantial adverse change in the significance of an archaeological resource. The archaeological field survey identified one cultural resource within the expansion area and two isolated finds. Isolated finds do not merit formal recordation and are not considered cultural resources. The cultural resource identified within the expansion area is a prehistoric resource consisting of sparse scatter of lithics including flake and tool fragment artifacts. This resource is considered potentially eligible for the CRHR.

Mining activities within the expansion area could result in a substantial adverse change to the cultural resource identified within the expansion area (ALTA_PRE-01), resulting in a significant impact. In addition, mining in the expansion area could result in the adverse change in the significance of currently undiscovered cultural or archaeological resources, resulting in a significant impact. To minimize potential impacts to prehistoric and historic resources Mitigation Measure 4.6-1 and Mitigation Measure 4.6-2 are required. With implementation Mitigation Measure 4.6-1 and Mitigation Measure 4.6-2, impacts to cultural resources would be less than significant.

Impact 4.6-2: The Project would disturb human remains, including those interred outside of formal cemeteries.

Buried human remains could be inadvertently unearthed during excavation activities, which could result in damage to these human remains. The project would comply with to California Health and Safety Code §7050.5 and §5097.98 of the PRC (as amended by Assembly Bill 2641) should human remains be encountered. Pursuant to the codes, all work in the immediate vicinity of the burial must cease, and any necessary steps to ensure the integrity of the immediate area must be taken, as required by Mitigation Measure 4.6-3. Impacts would therefore be less than significant.

Impact 4.6-3: Cause a substantial adverse change in the significance of a tribal cultural resource.

ALTA archaeologist Kevin Dalton contacted the NAHC on March 27, 2020, to request a review of the Sacred Lands file for information on Native American cultural resources in the study area and to request a list of Native American contacts in this area. The NAHC replied on March 30, 2020, indicating that no Sacred Sites are known within the project area. The NAHC provided a list of Native American contacts that have knowledge or concerns about cultural resources in the Project area. On April 9, 2020, letters were sent to all tribes listed by the NAHC. To date, no response has been received from any of the groups consulted as part of this outreach effort.

Pursuant to PRC §21080.3.1, on May 5, 2021 the County notified the Washoe Tribe, a California Native American Tribe that is traditionally and culturally affiliated with the geographic area, that the Project was under review. No responses were received requesting initiation of consultation under the provisions of AB 52.

No tribal cultural resources were identified within or immediately adjacent to the project area and, therefore, the proposed Project would not result in a significant impact to known TCRs. Impacts to unknown tribal cultural resources that may be discovered during Project construction would be less than significant with the incorporation of Mitigation Measure 4.6-1 through 4.6-3.

4.6.6 Mitigation Measures

The following mitigation measures would reduce potential impacts to less than significant levels:

MM 4.6-1: Prior to ground disturbing activities with the expansion area, a non-disturbance area for WARD-PRE-01 shall be defined and marked by a qualified archaeologist. Once the non-disturbance area is delineated, one the following options shall be implemented by the project proponent:

- *Resource Avoidance.* The project shall be redesigned to avoid all ground disturbances within the established non-disturbance area and long-term access restrictions shall be established (fencing or deed restrictions) to preclude disturbance to the resource.

- *Evaluation and Data Recovery.* WARD-PRE-01 shall be evaluated for eligibility for inclusion in the CRHR by a qualified archaeologist. The results of the evaluation shall be submitted to Lassen County. If the evaluation is negative (i.e., not historically significant), no further mitigation is required. If the property is found to be an historical resource and data recovery through excavation is the only feasible mitigation, a data recovery plan, which makes provisions for adequately recovering the scientifically consequential information from and about the historical resource, shall be prepared and adopted prior to any excavation being undertaking. The study shall be deposited with the California Historical Resources' Regional Information Center.

MM 4.6-2: *Inadvertent Discovery of Cultural Resources*. If subsurface deposits believed to be cultural or human in origin are discovered during construction, then all work must halt within a 50-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeology, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. If the professional archaeologist determines that the find does not represent a cultural resource, then work may resume immediately, and no agency notifications are required. If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, then he or she shall immediately notify the County, which shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be eligible for inclusion in the NRHP or CRHR. Work cannot resume within the no-work radius until the County, through consultation as appropriate, determines that the site either: 1) is not eligible for the NRHP or CRHR; or 2) that the treatment measures have been completed to its satisfaction.

MM 4.6-3: *Unanticipated Discovery of Human Remains.* In the evert of the discovery of human remains, or remains that are potentially human, the contractor shall ensure reasonable protection measures are taken to protect the discovery from disturbance (Assembly Bill [AB] 2641). The archaeologist shall notify the Lassen County Coroner (as per §7050.5 of the Health and Safety Code). The provisions of §7050.5 of the California Health and Safety Code, §5097.98 of the California PRC, and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the project

(§5097.98 of the PRC). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, then the NAHC can mediate (§5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (§5097.98 of the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work cannot resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

4.6.7 Level of Significance after Mitigation

Less than significant impact with mitigation incorporated.

4.7 Energy

This section of the DSEIR describes the existing energy consumption at the Project site, includes a summary of applicable energy regulations, a summary of the previous CEQA review of energy impacts of operations at the Project site, and evaluates the potential impacts that could occur as a result of the proposed expansion related to energy.

Expansion of the mining boundary of the current mining operation to include an additional 78.6 acres, increasing annual production from 100,000 to 200,000 tons per year and increasing the life of the mine to 2050 are substantial changes proposed in the Project that will require major revisions of the previous EIR due to the involvement of potentially new significant environmental effects pertaining to energy resources or lead to a substantial increase in the severity of previously identified significant effects under CEQA Guidelines §15162.

4.7.1 Environmental Setting

State of California
Transportation accounted for nearly 39.3 percent of California's total energy consumption in 2019 (US EIA, 2021). In 2019, California consumed 15.4 billion gallons of gasoline and 3.1 billion gallons of diesel fuel (BOE, 2020). Petroleum-based fuels currently account for more than 90 percent of California's transportation fuel use. However, the State is now developing strategies to reduce petroleum use. Over the last decade, California has implemented several policies, rules, and regulations to improve vehicle efficiency, increase the development and use of alternative fuels, reduce air pollutants and greenhouse gases (GHGs) from the transportation sector, and reduce vehicle miles travelled. The California Energy Commission (CEC) has also developed plans and policies to expand the infrastructure of alternative fuel refueling stations to encourage the use and reliability of alternatively fueled vehicles.

Electricity is quantified using kilowatts (kW) and kilowatt-hour (kWh). A kW is a measure of 1,000 watts of electrical power and a kWh is a measure of electrical energy equivalent to a power consumption of 1,000 watts for 1 hour. The kWh is commonly used as a billing unit for energy delivered to consumers by electric utilities. Electricity and natural gas in California are generally consumed by stationary users such as residences and commercial and industrial facilities, whereas petroleum consumption is generally accounted for by transportation-related energy use. Californians consumed 29,510 gigawatt hours (GWh) of electricity in 2020 (CEC, 2021). Natural gas energy usage is typically quantified using the British Thermal Unit (Btu). Total natural gas usage in California was approximately 1.23 trillion Btu's in 2020.

Lassen County
Retail and non-retail diesel fuel consumption in Lassen County for 2019 was approximately 2,040,000 gallons (CEC, 2021).

The electricity consumption attributable to non-residential land uses in Lassen County from 2016 to 2020 is shown in Table 4-16, *Non-Residential Electricity Consumption in Lassen County 2016-2020*. As indicated, the demand has remained relatively constant, with no substantial increase, even as the population has increased.

Table 4-16 NON-RESIDENTIAL ELECTRICITY CONSUMPTION IN LASSEN COUNTY 2016-2020	
Year	**Nonresidential Electricity Consumption (in millions of kilowatt hours)**
2016	322.4977
2017	283.5326
2018	274.4072
2019	264.0367
2020	265.2748
Source: California Energy Consumption Data Management System. *Electricity and Natural Gas Consumption by County*. [Online]: http://ecdms.energy.ca.gov/. Accessed: November 5, 2021.	

The natural gas consumption attributable to nonresidential land uses in Lassen County from 2016 to 2020 is shown in Table 4-17, *Non-Residential Natural Gas Consumption in Lassen County 2016-2020*. Similar to electricity consumption, the demand has remained relatively constant, with no substantial increase, even with an increase in population.

Table 4-17 NON-RESIDENTIAL NATURAL GAS CONSUMPTION IN LASSEN COUNTY 2016-2020	
Year	**Nonresidential Natural Gas Consumption (in million British Thermal Units)**
2016	1,083,104
2017	1,147,145
2018	1,092,882
2019	1,122,411
2020	1,112,566
Source: California Energy Consumption Data Management System. *Electricity and Natural Gas Consumption by County*. [Online]: http://ecdms.energy.ca.gov/. Accessed: November 5, 2021.	

Current Mine Operations

Electrical service to the existing quarry is provided by Plumas Sierra Rural Electric Cooperative (PSREC). The energy resources providing the majority of power for the PSREC include large hydroelectric (30.3%), natural gas (25.4%), and unspecified power (39.6%). Unspecified power is electricity that has been purchased through open market transactions and is not traceable to a specific generation source. Renewable resources including geothermal and eligible hydroelectric make up 4.6 % of the power mix (PSREC, 2020). Annual electricity demand of the quarry (based on records from September 2020 to August 2021) is approximately 490,000 kilowatt-hours (kWh). Onsite energy demand is limited to electricity and diesel fuels. Electricity is used to power the asphalt plant, lime plant, and concrete plant.

Diesel fuel is used to operate mobile equipment as well as generators used to run the crushing plant, portable plant, and wash plant. Off-road equipment used at the current operation includes four off-highway trucks (376 horsepower) that operate on average 350 hours per year, two excavators (337 horsepower) that operate 450 hours per year, five front-end loaders (84 horsepower) that operate 480 hours per year, and one dozer (365 horsepower) operating 500 hours per year to move materials. The existing operation is estimated to require 385,520 gallons of diesel fuel per year (RCH Group, 2021).

The existing operation also requires the use of diesel fuel for material haul trucks and gasoline or diesel fuel for delivery and employee trips. The mine generates a maximum of 40 employee trips per day and 10 supplier truck trips each day. The material haul truck trips for the operation area limited by Condition of Approval # 8 of the existing use permit. The condition limits the number of haul trucks associated with the mining operation to a daily average of 26 round trips (26 arriving and 26 departing) throughout the calendar year with a daily maximum of 275 round trips (275 arriving and 275 departing). The number of haul trips would not change with implementation of the proposed Project.

4.7.2 Regulatory Setting

The following is a description of State and local environmental laws and policies that are relevant to the CEQA review process for the proposed expansion area.

State

Public Resources Code (PRC) §21100(b)(3) and CEQA Guidelines §15126.4 require EIRs to describe, where relevant, the wasteful, inefficient, and unnecessary consumption of energy caused by a project. In 1975, largely in response to the oil crisis of the 1970s, the California legislature adopted Assembly Bill (AB) 1575, which created the California Energy Commission (CEC). The statutory mission of the CEC is to forecast future energy needs, license thermal power plants of 50 megawatts or larger, develop energy technologies and renewable energy resources, plan for and direct state responses to energy emergencies, and – perhaps most importantly – promote energy efficiency through the adoption and enforcement of appliance and building energy efficiency standards. AB 1575 also amended PRC §21100(b)(3) to require EIRs to consider the wasteful, inefficient, and unnecessary consumption of energy caused by a project.

California's Energy Efficiency Standards for Residential and Non-Residential Buildings
Title 24, California's energy efficiency standards for residential and non-residential buildings, was established by the CEC in 1978 in response to a legislative mandate to create uniform building codes to reduce California's energy consumption, and provide energy efficiency standards for residential and non-residential buildings. California's energy efficiency standards are updated on an approximate three-year cycle. On January 1, 2020, the 2019 Title 24 standards became effective with more stringent requirements. The 2019 standards are expected to substantially reduce the growth in electricity and natural gas use. Additional savings result from the application of the standards on building alterations. For example, requirements for cool roofs, lighting, and air distribution ducts are expected to save additional electricity. These savings are cumulative, doubling as years go by.

California Green Building Standards
The California Green Building Standards Code (California CCR, Title 24, Part 11), commonly referred to as the CAL Green Code, is a statewide mandatory construction code that was developed and adopted by the California Building Standards Commission and the California Department of Housing and Community Development. The CAL Green standards require new residential and commercial buildings to comply with mandatory measures under the topics of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. CAL Green also provides voluntary tiers and measures that local governments may adopt which encourage or require additional measures in

the five green building topics. The most recent update to the CAL Green Code was adopted in 2019 and went into effect January 1, 2020.

Local

Lassen County General Plan
The *Lassen County General Plan* contains the following goals, policies and implementation measures related to energy resources:

GOAL N-17: Conservative management of Lassen County's energy resources so that those resources can be developed and utilized for benefit of County residents with high degree of efficiency and productivity.

- Policy NR-6: The County advocates, and encourages Federal and state agencies to conduct to or help fund resource assessments and other studies to evaluate the availability of energy resources, and to facilitate efficient and well-designed projects which can capitalize on those resources with acceptable levels of environmental impact and compatibility with other land uses and resource values.

- Policy NR-62: In the course of adopting policies pertaining to energy resources in other County planning elements and area plans, the County may consider additional and more specific policies and measures to manage those resources.

- Policy NR-63: The Energy Element of the Lassen County General Plan shall provide specific policies and measures pertaining to the conservation and management of energy resources, as well as the siting and development standards of projects proposing to utilize those resources.

4.7.3 Previous CEQA Reviews

2019 EIR

Energy consumption was not directly reviewed in the previous 1981 and 1997 EIR documents. The 2019 EIR included an analysis of the energy impacts of existing operation. As described in the 2019 EIR, some project work was transferred from daytime to nighttime use and there was a slight increase in generator fuel consumption for nighttime lighting. The fuel consumption increase was for a very small duration of 2 to 4 times per year and did not result in any long term operational fuel consumption. The extension of the project resulted in a continued fuel use for vehicles and for generators. However, this results in fewer vehicle trips for local construction Projects. New trucks were purchased by Hat Creek Construction & Materials, Inc., to meet the new emission guidelines. Hat Creek also made improvements of adding reclaimed asphalt pavement (RAP) to the mixes of asphalt to be more energy and resource efficient. It was determined that there were no negative impacts on local or regional energy supplies from this project. There was an overall decrease in energy demand due to the decrease in miles from the local of final use. The project met compliance with local energy standards. The project uses diesel for onsite fuel and there is no transportation alternative for product delivery and energy usage is not expected to increase at any time. The Planning Commission found impacts related to energy consumption and cumulative impacts to energy consumption to be less than significant.

4.7.4 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. According to Public Resources Code §21100(b)(3) and Appendix G of the CEQA Guidelines, the proposed Project would have a significant impact related to *Energy*, if it would:

- *Result in wasteful, inefficient, and unnecessary consumption of energy resources during project construction or operations.*

- *Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.*

4.7.5 Impact Analysis

The increase in annual production of the mine (from 100,000 to 200,000) tons per year will increase the energy use of the existing operation. The increase in production will require increased equipment use. In addition, the proposed Project will extend the life of the mine an additional 20 years, requiring energy consumption for a longer period of time. At the end of the life of the mine, the mining area will be reclaimed, and the energy requirements will cease.

The proposed Project will result in an increase in crushing operations as well as an increase in annual hours of operation for off-road equipment to support the increase in annual production. The annual operating hours for the majority of the off-road equipment will increase by 50 percent. On average, the loaders will operate 1,200 hours per year, the excavators will operate 675 hours per year, onsite haul trucks will operate 525 hours per year and the dozer will operate 750 hour per year. Operation of the primary crusher, currently powered by diesel generators, will increase approximately 33 percent on an annual basis to produce the increased aggregate volume.

Increased equipment use will result in an increase in diesel fuel consumption. Current operations require an estimated 385,520 gallons of diesel fuel each year. Assuming equipment will continue to be operated by generators, the proposed Project will require an additional 41,027 gallons of diesel fuel each year (RCH Group, 2021). The diesel fuel required by the proposed Project will decrease as generators are removed or replaced with Tier 4 (most efficient) generators. The quarry currently uses four diesel generators with the following upgrades or replacements planned:

- One 750 hp diesel generator associated with the aggregate plant, which will be switched to line power by January of 2022.
- One 755 hp diesel generator associated with the aggregate plant, which will be updated with Air District approved Tier 4 engine or switched to line power by January of 2023.
- One 475 hp diesel generator associated with the lime plant, which will be updated with Air District approved Tier 4 engine or switched to line power by January of 2024.

One 470 hp diesel generator associated with the wash plant, which will be updated with Lassen County APCD approved Tier 4 engine or switched to line power by January of 2025.The proposed Project will not result in an increase in material haul truck trips, therefore the transportation energy

requirements will not increase above existing conditions. Hat Creek Construction & Materials, Inc., fleet is in a change-out period for trucks and has upgraded to more energy efficient vehicles and has a scheduled goal of phasing out and replacing generator engines that operate the plant facilities with new and more energy efficient engines by 2025. One of the generators associated with the aggregate plant will be switched to line power by January 2022 and additional equipment will be connected to line power as feasible depending on power availability at the Project site.

The following includes an analysis of environmental parameters related to *Energy* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the conclusions that either no impacts, less than significant impacts, or less than significant impacts with mitigation could occur. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Energy*.

Project Impacts

Impact 4.7-1: Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.

The proposed Project will increase the annual energy requirements for mining operations and extend the energy needs of the Project for an additional 20 years. Similar to existing conditions, the proposed quarry expansion would consume energy the fuel consumed by off-road vehicles and equipment. The increase in energy will be proportionate to the increased volume of material produced from the mine. Electrical consumption would be similar to the existing mine operations and would not require an increased demand compared to existing conditions.

Fossil fuels used for off-road vehicles and other energy-consuming equipment would be used during mine operations. Fuel energy consumed during construction would be limited to an additional 20 years would not represent a significant demand on energy resources.

As discussed in Section 4.4, *Air Quality*, the proposed Project includes mitigation measures that would require implementation of measures to reduce air pollutant emissions. These reduction measures would include or result in increased energy efficiency when feasible. Implementation of energy conservation measures would also serve to increase the Project's overall energy conservation and reduce energy consumption.

Project equipment would also be required to comply with the latest U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB) engine emissions standards. These emissions standards require highly efficient combustion systems that maximize fuel efficiency and reduce unnecessary fuel consumption. The mine operator is in the process of making improvements to the mixes of asphalt to be more energy and resource efficient, such as using recycle concrete and asphalt materials when producing new asphalt mixes. In addition, the operator's existing truck fleet is in a change-out period to more energy efficient vehicles and has a scheduled goal of phasing out and replacing generators with new and more energy efficient engines by 2025. Due to increasing transportation costs and fuel prices, the mine operator has a strong financial incentive to avoid wasteful, inefficient, and unnecessary consumption of energy during the life of the mine.

The proposed Project will result in an increase in crushing operations as well as an increase in annual hours of operation for off-road equipment to support the increase in annual production. The annual operating hours for the majority of the off-road equipment will increase by 50 percent. On average, the loaders will operate 1,200 hours per year, the excavators will operate 675 hours per year, onsite haul trucks will operate 525 hours per year and the dozer will operate 750 hour per year.

Increased equipment use will result in an increase in diesel fuel consumption. Current operations require an estimated 385,520 gallons of diesel fuel each year. The proposed Project's diesel fuel consumption is estimated to be 41,027 gallons, which would increase fuel use in the County by two percent. A two percent increase in county-wide diesel fuel consumption is not anticipated to trigger the need for additional capacity.

The proposed 78.6-acre quarry expansion does not include an increase in truck or employee traffic trips beyond existing conditions. It should be noted that, given the diverse location and distances of projects that could be served by the proposed Project, alternative transportation modes (e.g., rail lines) are generally unavailable or infeasible. Construction projects requiring materials from sources such as the proposed Project will continue to occur with or without the proposed expansion. As a result, the proposed expansion would continue to facilitate reduced vehicle miles traveled and fuel consumption by extending the life of a regional material source that serves local projects.

Following reclamation of the site after mining ends in 2050, the proposed Project will no longer consume diesel fuel or require electrical service. As such, implementation of the proposed Project would have a nominal effect on the local and regional energy supplies. There are no unusual project characteristics that would necessitate the use of off-road equipment that would be less energy-efficient than at comparable quarry sites in the region or State. Therefore, it is expected that fuel consumption associated with the proposed Project would not be any more inefficient, wasteful, or unnecessary than other similar projects of this nature. A less than significant impact would occur in this regard.

Impact 4.7-2: Conflict or obstruct a state or local plan for renewable energy or energy standards.

As discussed above in Impact 4.7-1, implementation of the proposed Project would not cause inefficient, wasteful, or unnecessary energy use, and impacts would be less than significant. Lassen County does not have a stand-alone Climate Action Plan but includes policies for energy resources within the *Lassen County General Plan* Energy Element. The objective of the Energy Element is to promote energy efficiency and the reduction of energy waste. The project does not conflict with or obstruct these goals or policies. Chapter 12.17 (Energy Conservation) of the *Lassen County Building Code* specifically requires compliance with Title 24. The project does not include construction of additional buildings at the Project site. Therefore, implementation of the proposed Project would not conflict with policies of the *Lassen County General Plan* or obstruct their implementation.

The mine operator will also be making improvements to the mixes of asphalt to be more energy and resource efficient, such as using reclaimed asphalt pavement (RAP) in mixes. Current and proposed operations recycle concrete and asphalt and uses the recycled materials in with the new

asphalt materials. Using RAP in mixes requires approximately 16% less energy consumption compared to a virgin hot mix asphalt mixture through re use of asphalt concrete.

As discussed above, renewable resources including geothermal and eligible hydroelectric make up 4.6% of the power mix (PSREC, 2020). Because the proposed quarry expansion will obtain all of its electricity from PSREC, or another supplier that must comply with the California Renewable Portfolio Standard, a substantial portion of the energy used by the proposed Project would be generated from renewable sources. It is also important to note that during the period in which the Project would operate, mining equipment and energy sources could change because of factors such as the availability of alternative equipment technologies and regulatory requirements, thus further reducing energy demand over the life of the proposed Project.

Additionally, the proposed Project is located at the site of an existing quarry and aggregate processing facility with convenient access to a Highway 395 and other regional roadways, providing efficient transportation options for delivering product to throughout Lassen County. By siting the Project at this location, in and around which long-term demand for aggregate is anticipated, and with easy access to major roadways, energy used to transport aggregate materials to end use locations would be less because of shorter haul distances as compared to energy use for transport of aggregate from more distant sources. As a result, the proposed expansion would continue to facilitate reduced vehicle miles traveled and fuel consumption by extending the life of a regional material source that serves local projects.

Based upon the above, the proposed Project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Impacts would be less than significant.

4.7.6 Mitigation Measures

No mitigation measures are required.

4.7.7 Level of Significance after Mitigation

No mitigation measures are required. Impacts would be less than significant.

4.8 Geology and Soils

Expansion of the mining boundary to include an additional 78.6 acres is a substantial change that will require major revisions of the previous EIR due to the involvement of potentially new significant environmental effects pertaining to geology and soils or a substantial increase in the severity of previously identified significant effects under CEQA Guidelines §15162.

This section provides a summary of the geology and soils setting and regulations, summarizes the previous CEQA review of geology and soil impacts of current mining operation, describes the changes to those conditions that will result from the proposed Project, and includes a discussion of the geology and soil impacts of the proposed Project. Some of the information in this section was obtained from the *Preliminary Geotechnical Report Ward Lake Quarry Expansion* (Bajada, 2020) (refer to Appendix F).

4.8.1 Environmental Setting

Regional Geology

The Ward Lake Quarry is located in Litchfield in Lassen County, California. The site lies on the southwest side of Shaffer Mountain at an elevation of approximately 4,500 feet above mean sea level (msl).

The Project site is located on the margin of the Cascade Range and the Basin and Range geologic/geomorphic provinces of California. The Cascade Range province extends from the northern end of the Sierra Nevada north to the Canadian border. In the Project vicinity, the Cascade Range province is bounded to the west by the Klamath Mountain province, to the east by the Basin and Range province, to the south by the Sierra Nevada province, and to the north by the Cascade Range extending through Oregon and Washington.

The Cascade Range province consists of a north-northwest-trending, relatively linear belt of active and dormant strata and shield volcanoes. The regional geologic conditions are dominated by andesitic, rhyolitic, and andesitic volcanic rocks mantled with surficial deposits consisting of pyroclastic rocks, lahar deposits, alluvium, and local lacustrine sediments (Hinds, 1952).

The Basin and Range province is characterized by interior drainage with lakes and playas, and the typical horst and graben structure (subparallel, fault-bounded ranges separated by down-dropped basins). In these basins, moderate to extensive thicknesses of lacustrine (lake) and alluvial deposits are present.

Site Geology

The site is underlain by Quaternary-age terrace deposits and Pleistocene-age volcanic rocks (Grose et al., 2013; Lydon et al., 1960). The terrace deposits are near-shore emergent lacustrine deposits associated with the ancestral Lake Lahontan, which covered most of the project region (Grose et al., 2013). The volcanic rocks consist of interlayered basalt, andesite, and rhyolite tuff and flows labeled the Andesite Flows and Pyroclastics of Litchfield (Grose et al., 2013). Surface geology is illustrated on Figure 3-6.

As described in the *Preliminary Geotechnical Report Ward Lake Quarry Expansion* (Bajada, 2020), volcanic rock within the expansion area was observed to consist of basalt, andesite, and lessor amounts of rhyolite. The basalt was observed within the existing quarry to be weak to hard, highly to slightly weathered, slightly to highly fractured, with clast shapes ranging from angular and prismatic to platy. The andesite and rhyolite were observed to be very weak to weak, completely to moderately weathered, and were largely soil-like with cobble to boulder size spheroidally shaped clasts of weak andesite incorporated into the soil matrix. Thus, the andesite and rhyolite are considered block-inmatrix, or bimrock, layers. The volcanic rock materials were not fully penetrated by explorations and are thought to extend deeper than the anticipated quarry excavations.

Onsite Soils

According to the Natural Resource Conservation Services (NRCS) Web Soil Survey, soils at the Project site are comprised on Devada-Rock outcrop association (2 to 50 percent slopes; non-irrigated land capability class 7e; no specified irrigated land capability classification), Orhood very stony sandy loam (5 to 15 percent slopes; non-irrigated land capability class 7s; no specified irrigated land capability classification), McConnel-Mottsville complex (2 to 9 percent slopes; non-irrigated land capability class 6e), and Fivesprings-Longcreek association (9 to 30 percent slopes; non-irrigated land capability class 7s; no specified land capability classification). These soils are listed by the NRCS as well drained to excessively drained, with no flooding or ponding concerns. Soils are shown on Figure 3-7.

Based on the geotechnical observations at the existing quarry site, rock materials associated with naturally occurring asbestos (NOA) are not present within the proposed quarry expansion area (Bajada, 2020).

Seismicity

The Holocene-active Honey Lake and Warm Springs Valley faults have been mapped in the region, with the Project site being north of the mapped trend of the Warm Springs Valley fault. Both the Honey Lake and Warm Springs faults exhibit right-lateral displacement and are significant faults within the Walker Lane fault zone (Wills, 1990). The Honey Lake fault is about 35 miles long and capable of generating a MW 7.0 earthquake (USGS, 2020b). The Warm Springs Valley fault is about 24 miles long and capable of generating a MW 6.8 earthquake (USGS, 2020b). The Honey Lake fault is located about 7 miles southwest of the Project site. The Warm Springs Valley fault is mapped about 13 miles south of the site. The State's fault location maps do not show the Warm Springs Valley fault projecting north of Honey Lake; however, lineations mapped from aerial photographs of the region and observed faulting within the existing quarry area north through the quarry area with a trend that is coincident with the Warm Springs fault.

The quarry site is not within a special studies zone associated with the Alquist-Priolo Earthquake Fault Zoning Act (AP). Thermal wells and springs exist in the Wendel and Susanville areas; however, there are no known thermal wells or springs on the Project site or adjacent lands.

4.8.2 Regulatory Setting

The following is a description of federal, State, and local environmental laws and policies related to geology and soils that are relevant to the CEQA review process for the proposed expansion area.

Federal

Federal Earthquake Hazards Reduction Act
Passed by Congress in 1977, the Federal Earthquake Hazards Reduction Act is intended to reduce the risks to life and property from future earthquakes. The Act established the National Earthquake Hazards Reduction Program (NEHRP). The goals of NEHRP are to educate and improve the knowledge base for predicting seismic hazards, improve land use practices and building codes, and to reduce earthquake hazards through improved design and construction techniques.

State

Alquist-Priolo Earthquake Fault Zoning Act
The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 (originally enacted as the Alquist-Priolo Special Studies Zones Act and renamed in 1994) and is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The main purpose of the law is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The law only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Alquist-Priolo Act requires the State Geologist to establish regulatory zones known as "Earthquake Fault Zones" around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities counties, and state agencies for this use in planning efforts. Local agencies must regulate most development projects within the zones. Projects include all land divisions and most structures for human occupancy. There are no Earthquake Fault Zones subject to the Alquist-Priolo Earthquake Fault Zoning Act within the project site. Faults close to the project area are discussed in section 4.8.5 below.

Surface Mining and Reclamation Act of 1975
The principal legislation addressing mineral resources in California is the State Surface Mining and Reclamation Act of 1975 (SMARA) (Public Resources Code 2710-2719), which was enacted in response to land use conflicts between urban growth and essential mineral production. The stated purpose of SMARA is to provide a comprehensive surface mining and reclamation policy that will encourage the production and conservation of mineral resources while ensuring that adverse environmental effects of mining are prevented or minimized; that mined lands are reclaimed and residual hazards to public health and safety are eliminated; and that consideration is given to recreation, watershed, wildlife, aesthetics, and other related values.

Local

Lassen County General Plan
The *Lassen County General Plan* contains the following goals, policies, and implementation measures regarding soil resources and geologic hazards:

GOAL N-2: To protect and maximize the present and future productive, economic, and environmental values of the County's soil resources.

- Policy NR-8: The County recognizes the need to protect and conserve areas where soils have high resource values, especially in terms of potential agricultural productivity.

- Policy NR-9: The County discourages the development of land having soils of significant agricultural value for purposes other than agriculture or land uses directly related to agriculture.

- Policy NR-10: The County shall exercise an appropriate degree of regulation designed to minimize soil erosion, including the administration of standards for grading and site clearance related to development projects.

- Policy NR-11: The County encourages State and Federal programs and projects designed to reduce soil erosion and to repair areas damaged by erosion.

- Policy NR-12: The County encourages sound soil management and erosion prevention and control programs and projects, including the use of windbreaks, minimum tillage practices, grazing management, and riparian area rehabilitation.

- Policy OS-19: The County shall consider documented evidence of geologic hazards, including but not limited to Alquist-Priolo Earthquake Fault Zones, in review of proposed development projects or proposed land use designations and zoning which would facilitate residential and community development, and shall determine how the safety of the public may be advanced by the use of open space provisions relative to those hazards.

4.8.3 Previous CEQA Reviews

1981 EIR

The 1981 EIR determined that there would be significant environmental effects that cannot be avoided due to the characteristics of rock quarry/crusher operations, changes in existing topography cannot be alleviated. Mitigation measures required by the 1981 EIR to minimize significant effects are as follows:

- *Topographical changes within the designated source areas which will result from excavation of rock would be reshaped and steep slopes reduced to a maximum of 2:1.*
- *Reshaping and reseeding of excavated areas would be implemented on a continuing basis as removal of materials as proceeds and is based upon an average area to be disturbed.*
- *Department of Fish and Game and Soil Conservation Service will be sought in order to determine the most suitable range grasses for efficient erosion control.*
- *Blasting required will be done by individuals with State licenses.*
- *Crushing operations will have no contaminants that would require disposal. Waste aggregate will be spread evenly over excavated areas before reseeding takes place.*
- *Steep slopes will be reduced.*

1997 EIR

The 1997 EIR states that changes in surface geology and topography are significant avoidable impacts as well as significant avoidable cumulative impacts. Mitigation measures related to reclamation practices were found to mitigate these cumulative and project impacts to less than significant levels (Summary Table 3-10 of the 1997 EIR). It is also stated on page 4-3 of the 1997 EIR that mining has been designated in the Area Plan as acceptable industrial land use therefore no significant cumulative impacts would result from the expansion of the mining operation relative to land use policies. Page 13-3 states:

> *"While the topography of the site will change permanently there is no direct geologic hazard associated with this change. These mitigation measures are expected to reduce the impacts to geologic features on the site by concurrently mitigating the indirect impacts of the mining operation on scenic views and wildlife."*

The implementation of mitigation measures related to reclamation practices (measure 1a) contained in the 1997 EIR as well as mitigation measures from the 1996 initial study were expected to mitigate impacts. Project impacts and cumulative impacts were less than significant after mitigation.

2019 EIR

Lassen County determined the in the 2019 EIR that geologic resources (identified through the Initial Study) will have no impact, and the project description did not involve any new significant effects or any increase in the severity of previously determined impacts associated with geology and soils.

4.8.4 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to *Geology and Soils* have been derived from Appendix G of the CEQA Guidelines:

- *Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving:*

    i. *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault.*
    ii. *Strong seismic ground shaking.*
    iii. *Seismic-related ground failure, including liquefaction.*
    iv. *Landslides.*

- *Result in substantial soil erosion or the loss of topsoil.*

- *Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse.*

- *Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.*

- *Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.*

- *Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.*

4.8.5 Impact Analysis

The proposed Project does not include changes to mining or reclamation methods within the existing mining area of the project site. Therefore, the analysis of geology and soil impacts focuses on the impacts within the proposed 78.6-acre expansion area. Mining in the expansion area will occur as described in the Reclamation Plan Amendment and in accordance with the recommendations contained in the *Preliminary Geotechnical Report Ward Lake Quarry Expansion* (Bajada, 2020) prepared for the proposed quarry expansion area (refer to Appendix F).

The following includes an analysis of environmental parameters related to *Geology and Soils* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the conclusions that either no impacts, less than significant impacts, or less than significant impacts with mitigation could occur. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Geology and Soils*.

Areas of No Project Impact

As required by CEQA Guidelines §15082, the County issued a Notice of Preparation (NOP) on April 28, 2021 that summarized the proposed Project, stated its intention to prepare an EIR, and requested comments regarding the scope and content of the EIR from responsible and trustee agencies. In the course of the County's initial evaluation, certain impacts of the proposed Project were found to not to be significant because of the inability of a project of this scope to create such impacts or the absence of project characteristics producing effects of this type. The effects determined not to be significant are not required to be included in primary analysis sections of the DSEIR. As such, the following impacts either are not applicable to the proposed Project or are not reasonably foreseeable and are not addressed further within this section:

- *Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.*

  As previously described above under Subsection 4.8.1, *Environmental Setting*, soils at the Project site are comprised on Devada-Rock outcrop association (2 to 50 percent slopes; non-irrigated land capability class 7e; no specified irrigated land capability classification), Orhood very stony sandy loam (5 to 15 percent slopes; non-irrigated land capability class

7s; no specified irrigated land capability classification), McConnel-Mottsville complex (2 to 9 percent slopes; non-irrigated land capability class 6e), and Fivesprings-Longcreek association (9 to 30 percent slopes; non-irrigated land capability class 7s; no specified land capability classification). These soils are listed by the NRCS as well drained to excessively drained, with no flooding or ponding concerns. The proposed quarry expansion area does not contain expansive soils as defined in Table 18-1 B under the Uniform Building Code of 1994. The risks of injury, loss of life or property would not be considered substantial, and no impact would occur in this regard.

- *Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.*

  The proposed quarry expansion does not include the use of any septic tanks or alternative wastewater disposal systems. No impact would occur in this regard.

Project Impacts

Impact 4.8-1: Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

Active faults are defined by the Alquist-Priolo Act as faults that exhibit evidence of surface rupture occurring within the last 11,000 years (SMGB, 1972). The Project site is located about 7 miles from the closest State-mapped Holocene-active fault. However, as shown on Plate 9, it appears that possible northerly extension of the Holocene-active Warm Springs Valley fault might project through the quarry area (Bajada, 2020). The Warm Springs Valley fault is zoned as Holocene-active approximately 13.6 miles south of the project site; however, the State has not zoned northern extensions of the fault as meeting the Alquist-Priolo Act criteria for an active fault (Wills, 1990).

The Warm Springs fault is part of the Honey Lake fault zone that forms the eastern margin of the Northern Walker Lane, a seismogenic zone that extends from the Surprise Valley westward to the Mohawk Valley. It is thought that the Northern Walker Lane accommodates up to about 5 millimeters of slip per year (mm/yr) and that the Honey Lake fault system experiences about 2 mm/yr (Gold et al., 2013). The Warm Springs Valley fault has even less deformation and is thought to have a slip rate of 0.2mm/yr during the latest Quaternary period (Gold et al., 2013). The Honey Lake fault has had numerous major earthquakes since about 7,000 years ago and it has an estimated recurrence interval of 730 to 990 years (Turner et al., 2008). The Warm Springs Valley fault, exhibiting relatively less deformation, likely has a longer recurrence interval.

There could be a risk of fault rupture across the Project site from the Warm Valley Springs fault (Bajada, 2020). Based on a moment magnitude of 6.8 or less that could occur along the Warm Springs Valley fault, it is estimated that a maximum ground displacement of about 2.5 feet could occur during an earthquake (Wells & Coppersmith, 1994). However, the State evaluated the fault and estimated that the fault strands projecting into the quarry area exhibited insufficient evidence

of recency of movement that they were not zoned as active (Wills, 1990). The potential risk of loss, injury, or death are relatively low, especially with a relatively long recurrence interval for that fault. The risk might be rockfall triggered by ground shaking but with properly designed slopes and benches, this risk should be reduced to a negligible level. Mining in the proposed quarry expansion area will be conducted in accordance with the recommendations contained in the *Preliminary Geotechnical Report Ward Lake Quarry Expansion* (Bajada, 2020) (refer to Appendix F). Impacts are considered less than significant in this regard.

ii. Strong seismic ground shaking?

As referenced in Subsection 4.8.1, *Environmental Setting*, the Warm Valley Springs fault is mapped about 13 miles south of the site and may extend through the site. Aerial photographs of the region observed faulting within the existing quarry area and north through the proposed quarry expansion area with a trend that is coincident with the Warm Springs fault.

Probabilistic evaluations of horizontal strong ground motion that could affect the site were performed using attenuation evaluation methods provided by the U.S. Geological Survey (USGS, 2020a). The evaluations were performed using an estimated shear wave velocity in the upper 100 feet of the profile of 537 meters per second. Evaluations were performed for upper-bound (UBE) and design-basis (DBE) probabilistic exposures (refer to Table 4-18, below). The UBE corresponds to horizontal ground accelerations having a 10 percent probability of exceedance in a 100-year exposure period, with a statistical return period of 949 years. The DBE corresponds to horizontal ground accelerations having a 10 percent probability of exceedance in a 50-year, exposure period, with a statistical return period of 475 years. It should be noted that although the seismic hazard models used for this study predict the probability of exceedance for various levels of acceleration in a given exposure period, the models are not able to account for the effect that the passage of time since past earthquakes has on future earthquake probability. Thus, while time may affect the incipient risk of earthquakes occurring, the UBE and DBE values are based on any 100-year and 50-year exposure period, respectively, regardless of how recently earthquakes have occurred.

The results of these evaluations are presented in Table 4-18. The existing quarry and proposed quarry expansion area are not within a special studies zone associated with the Alquist-Priolo Earthquake Fault Zoning Act (AP). The impact related to risk of loss, injury, or death due to strong seismic shaking would be less than significant.

Table 4-18
PROBABILISTIC GROUND MOTION DATA

Earthquake Level	Probabilistic Estimate Exposure Period (years)	Probability of Exceedance (%)	Return Period (Years)	Estimated Peak Horizontal Ground Acceleration
Upper-Bound Ground-Motion	100	10	949	0.296
Design-Basis Ground-Motion	50	10	475	0.215

Source: Bajada, 2020.

iii. Seismic-related ground failure, including liquefaction?

Liquefaction is described as the sudden loss of soil shear strength due to a rapid increase of soil pore water pressures caused by cyclic loading from a seismic event. Liquefied soils act more like

a fluid than a solid when shaken during an earthquake. For liquefaction to occur granular solid, high groundwater table and a low density in the granular soils underlying the site need to be present. If those factors are present, there is a potential that soils could liquefy during a seismic event. Most materials located within the proposed quarry expansion area consist of volcanic rock materials and terrace deposits. The volcanic rock materials are not subject to liquefaction. The terrace deposits are thought to contain appreciable fines and groundwater is anticipated to be located at depths below 50 feet (Bajada, 2020). Terrace deposits are considered to have a low potential for liquefaction susceptibility. Impacts are considered less than significant in this regard.

iv. Landslides?

Landslides are a movement of rock, earth, or debris down a sloped section of land affecting the natural stability of the land. Landslides are caused by unstable slopes. Unstable slopes are caused by earthquakes, rain, volcanoes, and other factors. Areas that are prone to landslides include areas of old or existing landslides, base of slopes, in drainage hollows, at the base or top of steep cut slopes, The California Department of Conservation has created landslide maps throughout California and this mine expansion area is not within any of the mapped landslide areas. Soils in this expansion area are not prone to landslides and the chances of a landslide are very low, and no existing, past, or incipient landslides were observed within the proposed quarry expansion area.

The *Preliminary Geotechnical Report Ward Lake Quarry Expansion* (Bajada, 2020) includes maximum recommend slope inclinations, slope heights, as well as bench recommendations for the expansion area. As discussed in the Reclamation Plan Amendment, the final slope of the proposed expansion area will be 1:1 (H:V). Mine faces will be shaped to have a 50-foot highwall and 12-foot benches at a 1:1(H:V) slope. The quarry wall will be composed of hard rock and will not require stabilization. The area is composed of hard rock and highwalls will be graded at an inclination as to meet the minimum factor of safety (Bajada, 2020). Benches will be constructed to drain to the margins of the highwall and/or to centralized collection areas that capture and convey drainage to the bottom of the cut slope. Mining at the project site will be conducted per the recommendations contained in the *Preliminary Geotechnical Report Ward Lake Quarry Expansion* (Bajada, 2020) prepared for the expansion area (refer to Appendix F), which will minimize the risk of landslides on cut faces. Impacts are considered less than significant in this regard.

Impact 4.8-2: Result in substantial soil erosion or the loss of topsoil?

The proposed Project has the potential to cause localized erosion through actions such as excavation, vegetation clearing and disturbing upland areas. Standard soil erosion protocols are currently practiced at the current mining area will be applied to operations in the expansion area. The erosion control protocols included in the Reclamation Plan Amendment include:

- Use of berms, water bares, or rolling dips
- Diverting run-on from stockpile areas
- Planting vegetation/installing stabilizers as necessary
- Retention of all stormwater runoff within quarry to settling ponds.

As described in the Reclamation Plan Amendment, the topsoil stockpiles will be protected from wind and water erosion by planting with an erosion control mix, as well as keeping the stockpiles in low profile with moderate slopes. Best Management Practices (BMPs) for the control of dust

included in the Reclamation Plan Amendment will also reduce erosion at the site. These include keeping stockpile and work surfaces moist, providing earthen wind breaks, and placing fine aggregate stockpiles between coarse aggregate piles to screen from wind. Additional BMPs to be implemented during and after reclamation activities are included in the Reclamation Plan Amendment: These include:

- Mulches
- Vegetative cover
- Straw wattles
- Water bars/rolling dips
- Rock-lined ditches.

The mining protocols and BMPs included in the Reclamation Plan Amendment will minimize soil erosion and loss of topsoil at the site. This impact will be less than significant.

Impact 4.8-3: Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

Liquefaction is described as the sudden loss of soil shear strength due to a rapid increase of soil pore water pressures caused by cyclic loading from a seismic event. In simple terms, it means that a liquefied soil acts more like a fluid than a solid when shaken during an earthquake. For liquefaction to occur, the following are needed:

- Granular soils (sand, silty sand, sandy silt, and some gravels);
- A high groundwater table; and
- A low density in the granular soils underlying the site.

If those criteria are present, then there is a potential that the soils could liquefy during a seismic event. The adverse effects of liquefaction include local and regional ground settlement, ground cracking and expulsion of water and sand, the partial or complete loss of bearing and confining forces used to support loads, amplification of seismic shaking, and lateral spreading. In general, the effects of liquefaction on the proposed Project could include:

- Lateral spreading;
- Vertical settlement; and/or
- The soils surrounding lifelines can lose their strength and those lifelines can become damaged or severed.

Lateral spreading is defined as lateral earth movement of liquefied soils, or soil riding on a liquefied soil layer, downslope toward an unsupported slope face, such as a creek bank, or an inclined slope face. In general, lateral spreading has been observed on low to moderate gradient slopes but has been noted on slopes inclined as flat as one degree.

Most materials located within the proposed quarry area consist of volcanic rock materials and terrace deposits. The volcanic rock materials are not subject to liquefaction. The terrace deposits are thought to contain appreciable fines and groundwater is anticipated to be located at depths below 50 feet, per the exploratory holes advanced with the air-percussion drill rig (see Appendix

F). Thus, terrace deposits are considered to have a low potential for liquefaction susceptibility or lateral spreading. Impacts are considered less than significant in this regard.

Impact 4.8-4: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

The proposed quarry expansion would result in a significant impact to paleontological resource if it would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. There are no known paleontological resources or unique geologic features present in the proposed quarry expansion area. According to the mine operator no paleontological resources have been encountered during mining operations. However, there is a chance that unknown paleontological resources may exist below the ground surface and could be encountered during mining and reclamation activities. Project implementation would result in a significant impact if paleontological resources were directly or indirectly destroyed during activities at the Project site. Implementation of Mitigation Measure 4.8-1 would reduce impacts to less than significant levels.

4.8.6 Mitigation Measures

The following mitigation measure is included for potentially significant impacts to unique paleontological resources.

MM 4.8-1: *Avoid and Minimize Impacts to Paleontological Resources*. Should any potentially unique paleontological resources (fossils) be encountered during development activities, work shall be suspended, and the County shall be immediately notified. At that time, the County will coordinate any necessary investigation of the discovery with a qualified paleontologist. The mine operator shall be required to implement mitigation necessary for the protection of paleontological resources. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures.

4.8.7 Level of Significance after Mitigation

Less than significant impact with mitigation incorporated.

4.9 Greenhouse Gas Emissions

Expansion of the mining boundary of the current operation, increasing the life of the mine to 2050, and increasing the annual production volume of the mine from 100,000 tons to 200,000 tons are substantial changes proposed in the Project that will require major revision of the previous EIR due to the involvement of potentially new significant environmental effects pertaining to greenhouse gas (GHG) emissions or a substantial increase in the severity of previously identified significant effects under CEQA Guidelines §15162.

Impacts related to GHG emissions of the existing mining operation were evaluated in the 2019 EIR. This section provides a summary of the GHG setting and regulations, summarizes the previous CEQA review of greenhouse gas impacts of current mining operation, describes the changes to those conditions that will result from the proposed Project, and includes a discussion of the GHG impacts of implementing the proposed Use Permit and Reclamation Plan. Much of the information in this section is based on the Greenhouse Gas Analysis contained in the *Ward Lake Pit Expansion Air Quality and Health Risk Assessment Technical Report* prepared by RCH Group September 9, 2021 (refer to Appendix D).

4.9.1 Environmental Setting

"Global warming" and "global climate change" are the terms used to describe the increase in the average temperature of the earth's near-surface air and oceans since the mid-20th century and its projected continuation. Warming of the climate system is now considered to be unequivocal, with global surface temperature increasing approximately 1.33 degrees Fahrenheit (°F) over the last 100 years. Continued warming is projected to increase global average temperature between 2 and 11°F over the next 100 years.

Natural processes and human actions have been identified as the causes of this warming. The International Panel on Climate Change (IPCC) concludes that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward (IPCC, 2014). After 1950, however, increasing GHG concentrations resulting from human activity such as fossil fuel burning, and deforestation have been responsible for most of the observed temperature increase. These basic conclusions have been endorsed by more than 45 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. Since 2007, no scientific body of national or international standing has maintained a dissenting opinion.

Increases in GHG concentrations in the earth's atmosphere are thought to be the main cause of human-induced climate change. The IPCC is now 95 percent certain that humans are the main cause of current global warming (IPCC, 2014). GHG naturally trap heat by impeding the exit of solar radiation that has hit the earth and is reflected back into space. Some GHG occur naturally and are necessary for keeping the earth's surface inhabitable. However, increases in the concentrations of these gases in the atmosphere during the last 100 years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect, and resulting in the increase of global average temperature.

Gases that trap heat in the atmosphere are referred to as GHG because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse does. The accumulation of GHG has been implicated as the driving force for global climate change. The primary GHG are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), ozone, and water vapor.

While the presence of the primary GHG in the atmosphere are naturally occurring, CO_2, CH_4, and N_2O are also emitted from human activities, accelerating the rate at which these compounds occur within earth's atmosphere. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas methane results from off-gassing associated with agricultural practices, coal mines, and landfills. Other GHG include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, and are generated in certain industrial processes.

CO_2 is the reference gas for climate change because it is the predominant GHG emitted. The effect that each of the aforementioned gases can have on global warming is a combination of the mass of their emissions and their global warming potential (GWP). GWP indicates, on a pound-for-pound basis, how much a gas is predicted to contribute to global warming relative to how much warming would be predicted to be caused by the same mass of CO_2. CH4 and N_2O are substantially more potent GHG than CO_2, with GWP of 28 and 265 times that of CO_2, respectively (IPCC, 2014).

In emissions inventories, GHG emissions are typically reported in terms of pounds or metric tons (MT) of CO_2 equivalents (CO_2e). CO_2e are calculated as the product of the mass emitted of a given GHG and its specific GWP. While CH_4 and N_2O have much higher GWP than CO_2, CO_2 is emitted in such vastly higher quantities that it accounts for the majority of GHG emissions in CO_2e.

Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO_2 emissions (and thus substantial increases in atmospheric concentrations of CO_2). In pre-industrial times (c. 1860), concentrations of atmospheric CO_2 were approximately 280 parts per million (ppm). By November 2020, atmospheric CO_2 concentrations had increased to 413 ppm, 48 percent above pre-industrial concentrations (NOAA, 2021).

There is international scientific consensus that human-caused increases in GHGs have and will continue to contribute to global warming. Potential global warming impacts in California may include, but are not limited to, loss in snowpack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. Secondary effects are likely to include a global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity (CalEPA, 2006).

Greenhouse Gas Regional Emission Estimates

Worldwide emissions of GHG in 2017 were estimated at 48.4 billion metric tons of CO2e (WRI 2021). This value includes ongoing emissions from industrial and agricultural sources, but excludes emissions from land use changes.

In 2018, the United States emitted about 6,677 million metric tons of CO_2. Emissions increased from 2017 to 2018 by 3.1 percent. The increase in 2018 was largely driven by an increase in emissions from fossil fuel combustion, which was a result of multiple factors, including more electricity use due to greater heating and cooling needs due to a colder winter and hotter summer in 2018 in comparison to 2017 (U.S. EPA, 2020). GHG emissions in 2018 (after accounting for sequestration from the land sector) were 10.2 percent below 2005 levels.

In 2018, California emitted approximately 425 million metric tons of CO2e, 0.8 million metric tons of CO_2e higher than 2017 levels and six million metric tons of CO_2e below the 2020 GHG limit of 431 million metric tons of CO_2e (CARB 2020) Consistent with recent years, these reductions have occurred while California's economy has continued to grow and generate jobs. The transportation sector remains the largest source of GHG emissions in the state with 40 percent of the emissions in 2018, but saw a decrease in emissions compared to 2017 (CARB, 2020).

Emissions from the electricity sector account for 15 percent of the inventory and showed a slight increase in 2018 due to less hydropower. California in 2018 used more electricity from zero-GHG sources (for the purpose of the GHG inventory, these include hydro, solar, wind, and nuclear energy) than from GHG-emitting sources for both in-state generation and total (in-state plus imports) generation. The industrial sector has seen steady emissions in the past few years, and remains at 21 percent of the inventory (CARB, 2020).

Existing GHG Emissions

Equipment currently used for mining includes loaders, generators, a concrete batch plant, concrete trucks, service truck, man lift, belly dump, articulated dump truck, crusher, and asphalt batch plant. The current operation maintains a permit to operate (PTO-19-140: expiration date March 31, 2024) for onsite equipment such as a hot mix asphalt plant, a lime slurry mix plant, a concrete plant, a crushing plant, a wash plant, a sand plant, and several diesel generators (one 750 horsepower [hp] generator associated with the crushing plant, one 475 hp generator associated with the portable plant, and one 469 hp generator associated with the wash plant). The facility also has a daily and annual limit on the number of haul truck trips. Sources of greenhouse gas emissions generated by the current operation include the onsite mobile equipment, generators for stationary equipment, and material haul trucks. An estimate of the GHG emissions generated by the current operation is included in Table 4-19.

4.9.2 Regulatory Setting

The following is a description of State and local environmental laws and policies that are relevant to the CEQA review process for the proposed quarry expansion area.

State

Assembly Bill 32
California Assembly Bill (AB) 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction is in the process of being accomplished by enforcing a statewide cap on GHG emissions

that was phased in starting in 2012. Towards this progress, in 2018, California emitted approximately 425 million metric tons of CO_2e, six million metric tons of CO_2e below the 2020 GHG limit of 431 million metric tons of CO_2e and two million metric tons of CO_2e below the 1990 GHG limit of 427 million metric tons of CO_2e. To effectively implement the cap, CARB develops and implements regulations to reduce statewide GHG emissions from stationary sources. California has taken these measures, because no project individually could have a major impact (either positively or negatively) on the global concentration of GHG.

AB 32 required CARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclosed how it arrived at the cap; instituted a schedule to meet the emissions cap; and developed tracking, reporting, and enforcement mechanisms to ensure that the state reduced GHG emissions enough to meet the cap. AB 32 also included guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers were not unfairly affected by the reductions. Using these criteria to reduce statewide GHG emissions to 1990 levels by 2020 represented an approximate 25 to 30 percent reduction in emissions levels. However, CARB had discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as compared to other sectors that were not anticipated to significantly increase emissions.

CARB Climate Change Scoping Plan

AB 32 required CARB to develop a Scoping Plan that describes the approach California will take to reduce GHGs to achieve the goal of reducing emissions to 1990 levels by 2020. The Scoping Plan was first approved by CARB in 2008 and must be updated every five years. The initial AB 32 Scoping Plan contained the main strategies for California to reduce the GHG. The initial Scoping Plan had a range of GHG reduction actions which included direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 program implementation fee regulation to fund the program. In August 2011, the initial Scoping Plan was approved by CARB.

The 2013 Scoping Plan Update built upon the initial Scoping Plan with new strategies and recommendations. The 2013 Update identified opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The 2013 Update defined climate change priorities for the subsequent five years and set the groundwork to reach California's long-term climate goals set forth in Executive Order S-3-05. The 2013 Scoping Plan Update highlighted California progress toward meeting the near-term 2020 GHG emission reduction goals defined in the initial Scoping Plan. In the 2013 Update, nine key focus areas were identified (energy, transportation, agriculture, water, waste management, and natural/working lands, along with short-lived climate pollutants, green buildings, and the cap-and-trade program).

In May 2014, CARB approved the First Update to the Climate Change Scoping Plan (Updated Scoping Plan) which describes the progress made to meet the near-term (2020) objectives of AB 32 and defines California's climate change priorities and activities for the next several years (CARB 2014). The Updated Scoping Plan identifies the 2020 emissions limit as 431 MMT CO_2e and the 2020 business-as-usual forecast as 509 MMT CO_2e. Finally, the Updated Scoping Plan provides recommendations for establishing a mid-term emissions limit that aligns with the long-term (2050) goals of Executive Order S-3-05. The recommendations cover the energy, transportation,

agriculture, water, waste management, natural and working lands, short-lived climate pollutants, green building, and cap-and-trade sectors.

The initial Scoping Plan recommended that local governments achieve a 15-percent reduction below 2005 levels by 2020, which aligns with the State's goal of not exceeding 1990 emissions levels by 2020. However, the Updated Scoping Plan does not contain a recommended reduction level or percent for local government's municipal operations. The CARB is moving forward with a second update to the Scoping Plan. The Final Proposed 2017 Climate Change Scoping Plan update was released in November 2017. The CARB has updated the Scoping Plan twice, approving the First Update to the Climate Change Scoping Plan (Updated Scoping Plan) in May 2014, and the 2017 Scoping Plan in December 2017.

The 2017 Scoping Plan identifies progress made to meet the near-term (2020) objectives of AB 32 and defines California's climate change priorities and activities for the next several years (CARB 2017). The 2017 Scoping Plan identifies the 2020 emissions limit as 431 MMT CO_2e and the 2020 business-as-usual forecast as 509 MMT CO_2e. The 2017 Climate Change Scoping Plan provides strategies for meeting the mid-term 2030 greenhouse gas reduction target set by Senate Bill (SB) 32. The plan also identifies how the State can substantially advance toward the 2050 greenhouse gas reduction target of Executive Order S-3-05, which consists of reducing greenhouse gas emissions to 80 percent below 1990 levels. The recommendations cover the key sectors, including energy and industry; transportation; natural and working lands; waste management; and water. The recommended measures in the 2017 Scoping Plan are broad policy and regulatory initiatives that will be implemented at the State level and do not relate to the construction and operation of individual projects. The initial Scoping Plan recommended that local governments achieve a 15-percent reduction below 2005 levels by 2020, which aligns with the State's goal of not exceeding 1990 emissions levels by 2020. However, the 2017 Scoping Plan does not contain a recommended reduction level or percent for local government's municipal operations.

Executive Order B-30-15

On April 29, 2015, Executive Order No. B-30-15 was issued to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The new plan, outlined in SB 32, involves increasing renewable energy use, putting more electric cars on the road, improving energy efficiency, and curbing emissions from key industries. It is designed so State agencies do not fall behind the pace of reductions necessary to reach the existing 2050 reduction goal. Executive Order No. B-30-15 orders "All State agencies with jurisdiction over sources of GHG emissions shall implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 targets." The Executive Order also states that "CARB shall update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent." On November 30, 2017, the Second Update to the Climate Change Scoping Plan was approved by the CARB.

4.9.3 Previous CEQA Reviews

The environmental documents prepared in 1981 and 1997 for mining operations were prepared prior to implementation of greenhouse gas emission regulations and did not include analysis related to greenhouse gas emissions.

2019 EIR

The GHG impacts of the current mining operation were analyzed in the 2019 EIR. The County determined in the Initial Study for the current operation that there was a less than significant impact to GHG emissions, directly or indirectly, that may significantly impact the environment. No changes were proposed to the permitted production of the asphalt or concrete plants, and therefore the total amount of GHG produced by the plant remains unchanged.

The EIR included an analysis of potential truck emissions completed by Lassen County using significance thresholds from the Bay Area Air Quality Management District (BAAQMD), which resulted in values below the CEQA thresholds of significance for GHG. The additional analysis including the calculated emissions from the asphalt plant and concrete plant, support the assessment and conclusion that the 2019 project would have a less than significant impact to GHG emissions, directly or indirectly, on the environment. The analysis in the 2019 EIR determined the project was not in violation of any State or federal standards. The transportation of materials from facilities further away would result in higher emissions per ton of material produced due to the increased emissions from miles traveled by truck. The project was determined not to result in a cumulative impact that would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Project-level and cumulative impacts to greenhouse gas emissions were determined to be less than significant. No mitigation measures were required.

4.9.4 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to *Greenhouse Gases* have been derived from Appendix G of the CEQA Guidelines:

- *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.*
- *Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.*

At this time, neither the Lassen County APCD or the County itself has adopted numerical thresholds of significance for GHG emissions that would apply to the proposed Project. Additionally, neither Lassen County APCD or Lassen County have an adopted regional-specific plan for reducing GHG emissions. Lassen County recommends that all projects subject to CEQA review be considered in the context of GHG emissions and climate change impacts, and that CEQA documents include a quantification of GHG emissions from all project sources, as well as minimize and mitigate GHG emissions as feasible.

In light of the lack of established GHG emissions thresholds that would apply to the proposed Project, CEQA allows lead agencies to identify thresholds of significance applicable to a project that are supported by substantial evidence. Substantial evidence is defined in the CEQA statute to

mean "facts, reasonable assumption predicated on facts, and expert opinion supported by facts" (14 CCR 15384(b)). Substantial evidence can be in the form of technical studies, agency staff reports or opinions, expert opinions supported by facts, and prior CEQA assessments and planning documents. Therefore, to establish additional context in which to consider the order of magnitude of the proposed Project's GHG emissions, this analysis accounts for the following considerations by other government agencies and associations about what levels of GHG emissions constitute a cumulatively considerable incremental contribution to climate change:

- Sacramento Metropolitan Air Quality Management District (SMAQMD) established thresholds, including 1,100 metric tons of CO2e per year for the construction or operational phase of land use development projects, or 10,000 direct metric tons of CO_2e per year from stationary source projects (SMAQMD, 2018).

- Placer County Air Pollution Control District (PCAPCD) recommends a tiered approach to determine if a project's GHG emissions would result in a significant impact. First, project GHG emissions are compared to the de minimis level of 1,100 metric tons of CO_2e per year. If a project does not exceed this threshold, it does not have significant GHG emissions. If the project exceeds the de minimis level and does not exceed the 10,000 metric tons of CO_2 per year bright line threshold, then the project's GHG can be compared to the efficiency thresholds. These thresholds are 4.5 metric tons of CO_2e per-capita for residential projects in an urban area, and 5.5 metric tons of CO_2e per-capita for residential projects in a rural area. For nonresidential development, the thresholds are 26.5 metric tons of CO_2e per 1,000 square feet for projects in urban areas, and 27.3 metric tons of CO_2e per 1,000 square feet for projects in rural areas. The PCAPCD bright-line GHG threshold of 10,000 metric tons of CO_2e per year is also applied to land use project's construction and operational phases. Generally, GHG emissions from a project that exceed 10,000 metric tons of CO_2e per year would be deemed to have a cumulatively considerable contribution to global climate change (PCAPCD, 2017).

- Bay Area Air Quality Management District (BAAQMD) has adopted 1,100 metric tons of CO_2e per year as a project-level bright-line GHG significance threshold that would apply to operational emissions from mixed land-use development projects, a threshold of 10,000 metric tons of CO_2e per year as the significance threshold for operational GHG emissions from stationary source projects, and an efficiency threshold of 4.6 metric tons of CO_2e per service population per year (BAAQMD, 2017).

- South Coast Air Quality Management District (SCAQMD) formed a GHG CEQA Significance Threshold Working Group to work with SCAQMD staff on developing GHG CEQA significance thresholds until statewide significance thresholds or guidelines are established. The SCAQMD adopted an interim 10,000 metric tons of CO_2e per-year screening level threshold for stationary source/industrial projects for which the SCAQMD is the lead agency (SCAQMD Resolution No. 08-35, December 5, 2008).

As described, the 10,000 metric tons of CO_2e per year threshold is used by SMAQMD, PCAPCD, BAAQMD, and SCAQMD for industrial and/or stationary source GHG emissions. Since the proposed Project is an industrial project that includes stationary sources (i.e., diesel generators), the proposed Project's GHG emissions were compared to the 10,000 metric tons of CO_2e per year quantitative threshold. The substantial evidence for this GHG emissions threshold is based

on the expert opinion of various California air districts, which have applied the 10,000 metric tons of CO_2e per year threshold in numerous CEQA documents where those air districts were the lead agency.

4.9.5 Impact Analysis

Sources of greenhouse gas emissions generated by the current operation include onsite mobile equipment, generators for stationary equipment, and material haul trucks. The proposed Project will result in an increase in GHG emissions generated by the existing mining operation. The Project includes increasing crushing operations from 100,000 to 200,000 tons per year and expansion of the mine to include an additional 78.6 acres of mining area. The typical and maximum daily operations are not expected to change as a result of the proposed quarry expansion. The end date of mining would be extended to 2050; an additional 20 years. The equipment supporting for material processing (i.e., loaders, excavators) would also increase in annual operations to match the increase in crushing operations. The proposed Project would not change the hot mix asphalt plant, the lime slurry mix plant, the concrete plant, portable plant, and diesel generator operations associated with hot mix asphalt plant and portable plant nor would the proposed Project change the daily or annual haul truck trip limit.

The analysis of this impact includes two primary areas of focus. The first area of focus in this impact analysis is the quantification and disclosure of the anticipated GHG emissions that would result from operation of the proposed Project. GHGs have been quantified in order to show the extent to which the proposed Project may increase GHGs as compared to the existing environmental setting.

The second area of focus is the proposed Project's consistency with applicable statewide regulations and programs adopted to achieve state and regional reductions in GHG emissions. As described previously in this section, a numerical threshold of significance for GHG emissions has not been established by Lassen County. Rather, Lassen County has determined that the appropriate threshold of significance for this Project is current guidance of 10,000 metric tons of CO_2e per year and, in so doing, has determined that this value is consistent with applicable regulations and programs.

As previously discussed above, Lassen County does not have a stand-alone Climate Action Plan but includes policies for energy resources within the County's General Plan Energy Element. The objective of the Energy Element is to promote energy efficiency and the reduction of energy waste. The project does not conflict with or obstruct these goals or policies. Chapter 12.17 (Energy Conservation) of the *Lassen County Building Code* requires compliance with Title 24.

The following includes an analysis of environmental parameters related to *Greenhouse Gas Emissions* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the conclusions that either no impacts, less than significant impacts, or less than significant impacts with mitigation could occur. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Greenhouse Gas Emissions*.

Project Impacts

Impact 4.9-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

The *Ward Lake Pit Expansion Air Quality and Health Risk Assessment Technical Report* (RCH Group, 2021) included estimates of the existing condition and the proposed Project's estimated operational GHG emissions. The estimated annual greenhouse gas emissions are included in Table 4-19. The estimated annual incremental GHG emissions of the Project would be approximately 416 metric tons of CO_2e, which is well below the significance threshold of 10,000 metric tons of CO_2e. Therefore, the proposed Project would have a less than significant impact to GHG emissions, directly or indirectly, on the environment.

Table 4-19
ANNUAL GREENHOUSE GAS EMISSIONS (METRIC TONS)

Emission Source	Existing Condition	Proposed Project	Project Increment
Onsite Equipment	94	155	61
Generator -Crushing Plant	1,456	1,811	355
Generator -Portable Plant	914	914	-
Generator -Wash Plant	903	903	-
Haul Trucks	546	546	-
Total	**3,913**	**4,392**	416
Significance Threshold			10,000
Exceeds Threshold?			**No**

Source: RCH Group, 2021.

Impact 4.9-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Neither Lassen County APCD nor Lassen County has a currently adopted region-specific plan for reducing GHG emissions. As discussed under Impact 4.9-1 above, GHG emissions generated by the proposed Project would not surpass the significance threshold of 10,000 metric tons of CO_2e per year. In addition, the operation of the facility is a benefit to Lassen County in that the maintenance of roads and other infrastructure requiring the generation of asphalt pavement and concrete are necessary for support of a safe public transportation system within Lassen County. The generation of pavement material and concrete are required whether located at this facility or other facilities further away. The transportation of materials from facilities further away would result in higher emissions per ton of material produced due to the increased emission from miles traveled by truck. The proposed Project would not conflict with any applicable plans, polices, or regulations adopted for the purpose of reducing the emissions of greenhouse gases. Therefore, impacts would be less than significant in this regard.

4.9.6 Mitigation Measures

No mitigation measures are required.

4.9.7 Level of Significance after Mitigation

No mitigation measures are required. Impacts would be less than significant.

4.10 Hazards and Hazardous Materials

Increasing annual production, extending the life of the mine, and expanding the mining boundary by 78.6 acres will result in minor changes related to Hazards and Hazardous Materials. The proposed quarry expansion will include the same processes and hazardous materials used at the current mining operation within the expansion area and will not result in changes to hazardous materials used at the existing operation.

This section provides a brief summary of hazards and hazardous materials at the Project site, summarizes the previous CEQA review of hazards and hazardous materials impacts for current mining operations, and includes a discussion of impacts to hazards and hazardous materials of the proposed Project.

4.10.1 Environmental Setting

The current mining operation involves the transport, use, and storage and disposal of hazardous materials such as fuels, lubricants and hydraulic fluids for vehicles and equipment onsite. Hazardous materials onsite also include materials used for cement and asphalt production, and explosives used for blasting. All fuel storage tanks onsite have secondary containment structures. Explosive are handled by a licensed operator and are stored in an ATF-inspected and approved magazine onsite.

The Project site is located within a State Responsibility Area (SRA), an area where the state has financial responsibility for wild land fire protection. Based on the map of *Fire Hazard Severity Zones in the State Responsibility Area in Lassen County,* adopted by the California Department of Forestry and Fire Protection (CAL FIRE) on November 7, 2007, the site is located in a Moderate Fire Hazard Severity Zone.

4.10.2 Regulatory Setting

A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible illness; or (2) pose a substantial present or potential hazard to human health and safety, or the environment when improperly treated, stored, transported, or disposed of (22 CCR 5 662.60.10).

Hazardous waste is the subset of hazardous materials that has been abandoned, discarded, or recycled and is not properly contained, including contaminated soil or groundwater with concentrations of chemicals, infectious agents, or toxic elements sufficiently high to increase human mortality or to destroy the ecological environment. If a hazardous material is spilled and cannot be effectively picked up and used as a product, it is considered to be hazardous waste. If a hazardous material site is unused, and it is obvious there is no realistic intent to use the material, it is also considered to be a hazardous waste. Examples of hazardous materials include flammable and combustible materials, corrosives, explosives, oxidizers, poisons, materials that react violently with water, radioactive materials, and chemicals.

Various federal and State agencies exercise regulatory authority over the use, generation, transport, and disposal of hazardous substances. The primary federal agencies that are responsible for overseeing regulations and policies regarding hazardous materials are the Environmental Protection Agency (USEPA), Department of Labor Occupational Safety and Health Administration (OSHA), and the Department of Transportation (DOT).

The primary California state agency with similar authority and responsibility is the California Environmental Protection Agency (Cal-EPA), which may delegate enforcement authority to other local agencies with which it has agreements.

Several laws governing the transport, storage, and use of hazardous materials are governed by these agencies as well as oversight for contaminated sites cleanup. Federal laws and regulations, as well as specific legislation and policies, related to hazards and hazardous materials are summarized below.

Federal

Code of Federal Regulations

Federal regulations applicable to hazardous substances are contained primarily in the Code of Federal Regulations (CFR) Titles 29 (Labor), 40 (Protection of Environment), and 49 (Transportation). The applicable CFR titles include standards and provisions for the protection of workers, the natural and environment, and the general public from the effects associated with the use, storage, and transport of hazardous materials.

Resource Conservation and Recovery Act

The 1976 Federal Resource Conservation and Recovery Act (RCRA) and the 1984 RCRA Amendments regulate the treatment, storage, and disposal of hazardous and non-hazardous wastes. The legislation mandated that hazardous wastes be tracked from the point of generation to their ultimate fate in the environment. This includes detailed tracking of hazardous materials during transport and permitting of hazardous material handling facilities.

The 1984 RCRA amendments provided the framework for a regulatory program designed to prevent releases from underground storage tanks (USTs). The program establishes tank and leak detection standards, including spill and overflow protection devices for new tanks. The tanks must also meet performance standards to ensure that the stored material will not corrode the tanks. Owners and operators of USTs had until December 1998 to meet the new tank standards. As of 2001, an estimated 85 percent of USTs were in compliance with the required standards.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) introduced active federal involvement to emergency response, site remediation, and spill prevention, most notably the Superfund program. CERCLA was intended to be comprehensive in encompassing both the prevention of, and response to, uncontrolled hazardous substances releases. CERCLA deals with environmental response, providing mechanisms for reacting to emergencies and to chronic hazardous material releases. In addition to establishing procedures to prevent and remedy problems, it establishes a system for compensating appropriate individuals and assigning appropriate liability.

State

The primary state agencies that are responsible for overseeing regulations and policies regarding hazardous materials are the California Office of Emergency Services (Cal-OES), California Environmental Protection Agency (Cal-EPA), CalRecycle (formerly the California Integrated Waste Management Board (IWMB), Department of Toxic Substances Control (DTSC), California Department of Transportation (Caltrans), California Highway Patrol (CHP), California Regional Water Quality Control Boards (RWQCB), and the California Air Resources Board (CARB). Several laws governing the generation, transport, and disposal of hazardous materials are administered by these agencies. State laws and regulations that are applicable to hazards and hazardous materials are presented below.

Hazardous Materials Management

The California Environmental Protection Agency (Cal-EPA) has established regulations governing the use of hazardous materials in the state. Within Cal-EPA, the Department of Toxic Substance Control (DTSC) has primary hazardous materials regulatory responsibility, but can delegate enforcement responsibilities to local jurisdictions that enter into agreements with DTSC, for the generation, transport, and disposal of hazardous materials under the authority of the Hazardous Waste Control Law (HWCL). State regulations applicable to hazardous materials are contained primarily in Title 22 of the CCR. Title 26 of the CCR is a compilation of those chapters or titles of the CCR that are applicable to hazardous materials management.

Also, within the "umbrella" of Cal-EPA, CalRecycle (formerly the California Integrated Waste Management Board (IWMB)) is responsible for protecting the public's health and safety and the environment through management of the solid waste generated in California. Solid waste regulations are generally enforced through local enforcement agencies (usually county agencies). CalRecycle works in partnership with local government, industry, and the public to reduce waste disposal and ensure environmentally safe landfills. Solid waste management provisions are outlined in the Public Resources Code (PRC), Division 30.

The CHP and the California Department of Transportation (Caltrans) are the enforcement agencies for hazardous materials transportation regulations. The California Department of Industrial Relations, Division of Occupational Safety and Health Administration (Cal/OSHA) standards are more stringent than federal OSHA regulations. Cal/OSHA assumes primary responsibility for developing and enforcing workplace safety regulations in Title 8 of the CCR.

Cal-OES is the state office responsible for establishing emergency response and spill notification plans related to hazardous materials accidents. In addition, Cal-OES regulates businesses by requiring specific businesses to prepare an inventory of hazardous materials, and to prepare risk management plans through the California Accidental Release Prevention Program (Title 19 of the CCR).

The RWQCB regulate surface and groundwater quality according to the provisions of the California Porter-Cologne Water Quality Act, the Toxic Pits Cleanup Act, Underground Tank Law, and federal Clean Water Act. Generally, all petroleum-related sites are handled by the RWQCBs and all underground tank sites are managed by County environmental management agencies. The Project site is located within the jurisdiction of the Lahontan RWQCB (Region 6). The RWQCB can delegate responsibilities, such as underground tank permitting and monitoring, to local jurisdictions, such as Lassen County.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program
In January 1996, Cal-EPA adopted regulations implementing a "Unified Hazardous Waste and Hazardous Materials Management Regulatory Program" (Unified Program). The six elements of the Unified Program are as follows: 1) hazardous waste generators and hazardous waste onsite treatment; 2) underground storage tanks; 3) aboveground storage tanks; 4) hazardous material release response plans and inventories 5) risk management and prevention programs; and 6) Unified Fire Code hazardous materials management plans and inventories. The Unified Program is implemented at the local level by a local agency — the Certified Unified Program Agency (CUPA). The CUPA is responsible for consolidating administration of the six program elements within its jurisdiction. The Lassen County Environmental Health Department is the designated CUPA in the County.

Emergency Response to Hazardous Materials Incidents
To coordinate emergency services provided by local, state, and federal agencies, California has developed an Emergency Response Plan pursuant to the Emergency Services Act. The Plan is administered by the state Office of Emergency Services. Local agencies are required to develop area plans for an organized response to releases of hazardous materials that are dependent on Business Plans submitted by handlers of hazardous materials and waste within that agency's area. Pursuant to California Health and Safety Code, Section 25503(a) and CCR Section 2729, any business handling hazardous material must establish and implement a Hazardous Materials Business Plan. These Business Plans are then submitted to the local administering agency.

California Health and Safety Code
Cal-EPA has established rules governing the use of hazardous materials and the management of hazardous wastes. Many of these regulations are embodied in the California Health and Safety Code. The code includes regulations that govern safe drinking water, substances control, land reuse and revitalization, remediation, restoration, and methamphetamine contaminated cleanups.

California Code of Regulations Title 22 and Title 26
The California Code of Regulations (CCR) Title 22 provides state regulations for hazardous materials, and CCR Title 26 provides regulation of hazardous materials management. In 1996, Cal/EPA established the "Unified Hazardous Waste and Hazardous Materials Management Regulatory Program" (Unified Program) which consolidated the six administrative components of hazardous waste and materials into one program.

California Department of Forestry and Fire Protection
CAL FIRE protects the people of California from fires, responds to emergencies, and protects and enhances forest, range, and watershed values providing social, economic, and environmental benefits to rural and urban citizens. The Office of the State Fire Marshal supports CAL FIRE's mission by focusing on fire prevention. It provides support through a wide variety of fire safety responsibilities including by regulating buildings in which people live, congregate, or are confined; by controlling substances and products which may, in and of themselves, or by their misuse, cause injuries, death, and destruction by fire; by providing statewide direction for fire prevention in wildland areas; by regulating hazardous liquid pipelines; by reviewing regulations and building standards; and by providing training and education in fire protection methods and responsibilities.

California Fire Code
The California Fire Code (CFC) is contained within Title 24, Chapter 9 of the California Code of Regulations. Based on the International Fire Code, the CFC is created by the California Buildings Standards Commission and regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. Similar to the International Fire Code, the CFC and CBC use a hazards classification system to determine the appropriate measures to incorporate to protect life and property.

4.10.3 Previous CEQA Reviews

1981 EIR

The Initial Study prepared in 1980 for the initial Miller's Custom Work operation determined there was no impact related to risk of upset (risk of an explosion or the release of hazardous substance in the event of accident or upset conditions). Human health impacts (creation of any health hazard or exposure of people to potential health hazard) are also listed as no impact. Hazards and Hazardous materials are not specifically discussed in the Significant Environmental Effects of the Proposed Project section of the 1981 EIR. The EIR does contain the following information under the discussion of mitigation measures proposed to minimize significant effects: Any blasting required would be done by individuals who are state licensed, crushing operations will have no contaminants to dispose of, and asphalt and fuel storage tanks would be kept closed at all times, maintained in clean condition, and care taken to avoid spillage or leakage. Any contaminants from hot plant and/or fuel tanks would be contained, removed from the site, or buried.

1997 EIR

Hazardous materials are discussed in the hydrology and water quality section of the 1997 EIR. The potential for the project to introduce hazardous materials into surface and ground water is discussed in the EIR. The 1997 EIR determined project impacts related to hazardous waste/water quality were significant due to an inadequate Spill Prevention Control and Countermeasure (SPCC) plan. The following mitigation measure relating to hazardous materials was included in the 1997 EIR to reduce impacts to less than significant:

b. The Spill Prevention and Countermeasure Plan shall be revised to meet the approval of the Regional Board including:

- *A list of hazardous materials to be used and stored onsite*
- *Plans for the washout basin*
- *Description of disposal location for water pumped from the secondary containment area*
- *A Spill Contingency Plan*
- *Provisions for an onsite Spill Cleanup Kit*
- *Provisions for employee training on spill prevention and cleanup*

2019 EIR

Hazards and hazardous material impacts of the expansion of the operation to 24 hours was discussed in the 2019 EIR. The project evaluated in the 2019 EIR did not include any changes to hazardous materials. The possible change in the risk of fire starting onsite at night during 24-hour

operations was analyzed and determined to be less than significant. Project-level and cumulative impacts related to hazards and hazardous materials were found to be less than significant. No mitigation measures were required.

4.10.4 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to *Hazards and Hazardous Materials* have been derived from Appendix G of the CEQA Guidelines:

- *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.*
- *Create a significant hazard to the public or the environmental through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.*
- *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.*
- *Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment.*
- *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the project would result in a safety hazard or excessive noise for people residing or working in the project area.*
- *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.*
- *Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized area or where residences are intermixed with wildlands.*

4.10.5 Impact Analysis

The following includes an analysis of environmental parameters related to *Hazards and Hazardous Materials* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the conclusions that either no impacts, less than significant impacts, or less than significant impacts with mitigation could occur. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Hazards and Hazardous Materials*.

Areas of No Project Impact

As required by CEQA Guidelines §15082, the County issued a Notice of Preparation (NOP) on April 28, 2021 that summarized the proposed Project, stated its intention to prepare an EIR, and requested comments regarding the scope and content of the EIR from responsible and trustee agencies. In the course of the County's initial evaluation, certain impacts of the proposed Project were found to not to be significant because of the inability of a project of this scope to create such impacts or the absence of project characteristics producing effects of this type. The effects determined not to be significant are not required to be included in primary analysis sections of the DSEIR. As such, the following impacts either are not applicable to the proposed Project or are not reasonably foreseeable and are not addressed further within this section:

- *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.*

  The proposed Project site is not located within a quarter mile of a school and will not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. No impacts would occur in this regard.

- *Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment.*

  Under Government Code Section 65962.5, both the DTSC and the SWRCB are required to maintain lists of sites known to have hazardous substances present in the environment. Both agencies maintain up-to-date lists on their websites. A search of the DTSC and SWRCB lists identified no open cases of hazardous waste violations on the Project site. Therefore, the site is not on a parcel included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (DTSC, 2021; SWRCB, 2021). As a result, implementation of the proposed Project would not create a significant hazard to the public or to the environment and would have no impact.

- *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the project would result in a safety hazard or excessive noise for people residing or working in the project area.*

  The proposed Project is not in the vicinity of an airport and will not expose workers to safety hazards or excessive noise from airports. No impact would occur in this regard.

- *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.*

  The 2019 EIR determined that the impacts of traffic from current operations related to emergency access were less than significant. Implementation of the proposed quarry expansion will not result in a change or increase the severity of these impacts. The proposed Project does not involve a use or activity that could interfere with long-term emergency responses or emergency evacuation plans for the area. No new impacts would occur in this regard.

Project Impacts

Impact 4.10-1: Create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Hazards are those physical safety factors that can cause injury or death, and while by themselves in isolation may not pose a significant safety hazard to the public, when combined with development of projects can exacerbate hazardous conditions. Hazardous materials are typically chemicals or processes that are used or generated by a project that could pose harm to people, working at the site or on adjacent areas. Many of these chemicals can cause hazardous conditions to occur should they be improperly disposed of or accidentally spilled as part of project development or operations. Hazardous materials are also those listed as hazardous pursuant to Government Code §65962.5.

The proposed Project will result in the use of hazardous materials used for the existing mining operation in the 78.6-acre expansion area. The existing mining operation involves the transport, use, and storage and disposal of hazardous materials such as fuels, lubricants and hydraulic fluids for vehicles and equipment onsite. Hazardous materials onsite also include materials used for cement and asphalt production and explosives used for blasting. All fuel storage tanks onsite have secondary containment structures. Explosive are handled by a licensed operator and are stored in an ATF-inspected and approved magazine onsite.

The Lassen County Environmental Health Department (EHD) is the administering agency and the Certified Unified Program Agency (CUPA) for Lassen County with responsibility for regulating hazardous materials handlers, hazardous waste generators, underground storage tank facilities, above ground storage tanks, and stationary sources handling regulated substances. A Hazardous Materials Business Plan (HMBP) is required of businesses in Lassen County that handle, use, generate, or store hazardous materials. The primary purpose of this plan is to provide readily available information regarding the location, type, and health risks of hazardous materials to emergency response personnel, authorized government officials, and the public. Large cases of hazardous materials contamination or violations are referred to the Lahontan Regional Water Quality Control Board (RWQCB) and the California Department of Toxic Substances Control (DTSC).

The proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. The existing quarry and aggregate processing operation utilize small amounts of fuel and lubricants and is subject to the County's HMBP program, which is regulated by the Lassen County EHD as part of the Certified Unified Program. The program requires the preparation of a document that provides an inventory of hazardous materials onsite, emergency plans and procedures in the event of an accidental release, and training for employees on safety procedures for handling hazardous materials and in the event of a release or threatened release. These plans are routine documents that are intended to disclose the presence of hazardous materials and provide information on what to do if materials are inadvertently released.

There is a business plan on file with the Lassen County EHD which conducts periodic site inspections. Blasting of quarry rock has historically occurred onsite and the frequency of blasting will slightly increase with implementation of the proposed project. Explosive and detonators are not stored onsite and are only onsite when a blast is being set up. Less than significant impacts are anticipated in this regard.

The proposed Project does not include changes to the current storage or use of hazardous materials at the mining operation. Additionally, the operation is required to have the necessary permits from Lassen County EHD for storing hazardous materials. Operations will continue to follow the applicable laws and regulations regarding hazardous material transport, as defined in Section 353 of the California Vehicle Code. Therefore, the level of risk associated with the accidental release of hazardous substances is not considered significant. Onsite operations would be required to continue to use standard operational controls and safety procedures that would avoid and minimize the potential for accidental release of such substances into the environment. Standard practices would be observed such that any materials released are appropriately contained and remediated as required by local, State, and federal law. Implementation of the proposed Project would result in less than significant impacts in this regard. Impacts are considered less than significant in this regard.

Impact 4.10-2: Expose people or structures to a significant risk of loss, injury or death involving wildland fires.

As previously described above, the Project site is located within a State Responsibility Area (SRA), an area where the state has financial responsibility for wild land fire protection and is located in a Moderate Fire Hazard Severity Zone.

Without controls, mining equipment and processes within the expansion area could increase the risk of fire if operated near vegetated areas during the dry season. Vegetation will be removed from mining areas prior to material extraction. The Mine Safety and Health Administration (MSHA) requires implementation of Fire Prevention and Control standards (30 CFR Part 36). These measures are implemented at the current operation and will be required in the expansion area as well. Therefore, the proposed Project will not expose people or structures to a significant risk or loss, injury or death involving wildland fires. Impacts are considered less than significant in this regard.

4.10.6 Mitigation Measures

No mitigation measures are required.

4.10.7 Level of Significance after Mitigation

No mitigation measures are required. Impacts would be less than significant.

4.11 Hydrology and Water Quality

Expansion of the mining boundary to include an additional 78.6 acres is a substantial change that will require major revisions of the previous EIR due to the involvement of potentially new significant environmental effects pertaining to hydrology and water quality or a substantial increase in the severity of previously identified significant effects under CEQA Guidelines §15162.

This section provides a description of the existing hydrology and water quality setting of the site and surrounding area, summarizes the previous CEQA review of hydrology and water quality impacts, and contains an analysis of the hydrology and water quality impacts associated with the proposed quarry expansion.

4.11.1 Environmental Setting

There are no existing natural streams or bodies of water within the boundaries of the proposed expansion area or current mining area. The proposed Project is not located within a 100-year floodplain. The closest bodies of water to the Project site include an unnamed tributary to Secret Creek, Secret Creek, Willow Creek, Eagle Lake Ditch located 375 feet west of the Project site, and Ward Lake located 0.5 miles southwest of the Project site. Willow Creek is approximately 1 mile west of the site and the Susan River is approximately 2 miles south of the site. Site hydrology is shown on Figure 3-5.

The Project site contains several permitted settling basins near the north end of the existing mining area as well as near the entrance to the quarry which were constructed to contain wash water and to collect stormwater runoff from the existing quarry. The quarry site is made up of mostly fractured and weathered rock; therefore, the site is pervious and a majority of stormwater infiltrates. Concentrated stormwater flows are observed only during heavy rain events. The flows within the existing mine area are contained and slowed by berms and benches and ultimately directed into the existing settling basins.

The current mining operation on the Project site does not discharge stormwater. A Notice of Non-Applicability (NONA) for the *General Permit for Storm Water Discharges Associated with Industrial Activities* (NPDES No. CAS000001) was submitted for the current mining operation in 2015. Standard soil erosion control protocols are currently practiced throughout the site include the use of berms, water bars, or rolling dips, rock check dams on roadway ditches, diverting run-on away from stockpile areas, installing stabilizers as necessary (silt fence, wattles, etc.), and directing runoff within quarry to detention ponds.

The Project site is located within the Honey Lake Valley Groundwater Basin, which has been identified as a "low priority basin" by the Department of Water Resources, signifying that it is not currently at risk for overdraft. Within this basin, *Bulletin 118* estimates the total volume of water stored in the upper 100 feet of saturated basin-fill deposits and volcanic-rock aquifers to be 10 million acre-feet. Estimates of groundwater extraction for agricultural, municipal, and industrial, and environmental wetland uses are 51,000, 15,000, and 3,800 acre-feet respectively. Deep percolation from agricultural applied water is estimated to be 14,000 acre-feet.

One onsite groundwater is used by the current operation for wet suppression of onsite dust. The applicant estimates 0 to 6 truckloads of water are currently used per day (4,000 gallons/load) during daytime operations with an average of 4 to 5 loads per day, and 0 to 4 truckloads per day during nighttime operations, with an average of 2 to 3 truckloads, for a total of approximately 38 acre-feet/year. As seen in the groundwater levels for monitored wells in the Project area, found in the Department of Water Resources (DWR) Water Data Library, there is currently no trend or pattern indicating overdraft in the basin.

4.11.2 Regulatory Setting

The following is a description of federal, State, and local environmental laws and policies that are relevant to the CEQA review process for the proposed expansion area.

Federal

Clean Water Act
The Clean Water Act (CWA) is a federal law that protects the nation's surface waters, including lakes, rivers, coastal wetlands, and "waters of the United States." The CWA specifies that discharges to waters are illegal, unless authorized by an appropriate permit. The permits regulate the discharge of dredged and fill materials, construction-related stormwater discharges, and activities that may result in discharges of pollutants to waters of the United States. If waters of the U.S. are located on a site, a project is likely to discharge to them, and if impacts on them are anticipated, the project must obtain a CWA Section 401 Water Quality Certification from the appropriate RWQCB.

National Pollutant Discharge Elimination System
The National Pollutant Discharge Elimination System (NPDES) program is administered by the EPA, which delegated oversight in California to the Regional Water Quality Control Boards. The NPDES program provides general permits and individual permits. The general permits are for construction projects that disturb more than one acre of land. The general permit requires the applicant to file a public Notice of Intent (NOI) to discharge stormwater and to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP includes a site map, description of proposed activities, demonstration of compliance with applicable ordinances and regulations, and a description of Best Management Practices (BMPs) that would be implemented to reduce erosion and discharge of construction-related pollutants.

Impaired Waterbodies
The CWA §303(d) and the California's Porter-Cologne Water Quality Control Act (described below) requires the State to establish the beneficial uses of its State waters and to adopt water quality standards to protect those beneficial uses. Section 303(d) establishes a Total Maximum Daily Load (TMDL), which is the maximum quantity of a particular contaminant that a water body can maintain without experiencing adverse effects, to guide the application of State water quality standards. Section 303(d) also requires the State to identify "impaired" streams (water bodies affected by the presence of pollutants or contaminants) and to establish the TMDL for each stream.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act acts in cooperation with the CWA to establish the State Water Resources Control Board (SWRCB). The SWRCB is divided into nine regions, each overseen by a RWQCB. The SWRCB, and thus each RWQCB, is responsible for protecting California's surface waters and groundwater supplies. The Porter-Cologne Water Quality Control Act develops Basin Plans that designate the beneficial uses of California's rivers and groundwater basins. The Basin Plans also establish narrative and numerical water quality objectives for those waters. Basin Plans are updated every three years and provide the basis of determining waste discharge requirements, taking enforcement actions, and evaluating clean water grant proposals. The Porter-Cologne Water Quality Control Act is also responsible for implementing CWA Sections 401-402 and 303(d) to SWRCB and RWQCBs.

Sustainable Groundwater Management Act

In 2014, California enacted the Sustainable Groundwater Management Act (SGMA; Water Code Section 10720 et seq.). SGMA and related amendments to California law require that all groundwater basins designated as high or medium priority in the DWR California Statewide Groundwater Elevation Monitoring (CASGEM) Program, and that are subject to critical overdraft conditions, must be managed under a new Groundwater Sustainability Plan (GSP) or a coordinated set of GSPs, by January 31, 2020. High or medium priority basins that are not subject to a critical overdraft must be regulated under one or more GSPs by 2022. Where GSPs are required, one or more local Groundwater Sustainability Agencies (GSAs) must be formed to implement applicable GSPs. A GSA has the authority to require registration of groundwater wells, measure and manage extractions, require reports, and assess fees, and to request revisions of basin boundaries, including establishing new subbasins. GSAs were required be formed for high and medium priority basins by June 2017. As described above in the Environmental Setting subsection, the Project site is located within the Honey Lake Valley Groundwater Basin, which has been identified as a "low priority basin" by the Department of Water Resources, signifying that it is not currently at risk for overdraft. Therefore, a GSA is not in affect for the Honey Lake Valley Groundwater Basin.

Local

Standish-Litchfield Area Plan

The *Standish-Litchfield Area Plan*, last amended in 1986, serves as the principal land use planning and policy document for that area of the County. Water quality policies that could be applicable to the Project are listed below.

- Policy 5.A: The supply and quality of Lassen County water resources shall be preserved and protected.

- Policy 5.B: Upon completion of the DWR study, the County shall develop additional measures to ensure and protect the groundwater supply in the Planning area.

Lassen County Groundwater Management Plan

The *Lassen County Groundwater Management Plan* (GWMP) was adopted by the Lassen County Board of Supervisors on March 13, 2007. The GWMP follows the California Water Code (CWC) Sections 107450 et. seq, by using plan components to support groundwater management objectives which in turn meet a countywide groundwater management goal. The GWMP contains the required components from Senate Bill 1938, the voluntary components from Assembly Bill 3030, and contains suggested components from the Department of Water Resources (DWR) Bulletin 118-2003.

The goal of the GWMP is to maintain or enhance groundwater quantity and quality, thereby providing a sustainable, high-quality supply for agricultural, environmental, and urban use into the future that remains protective of the health, welfare, and safety of residents. The GWMP seeks to achieve its goal through the following objectives:

- Maintain and protect historic groundwater uses;
- Minimize the long-term drawdown of groundwater levels;
- Protect groundwater quality;
- Prevent inelastic land surface subsidence from occurring as a result of groundwater pumping;
- Minimize changes to surface water flows and quality that directly affect groundwater levels or quality;
- Minimize the effect of groundwater pumping on surface water flows, quality, seeps and springs, and natural vegetation;
- Facilitate groundwater replenishment and cooperative management projects;
- Maintain springs, seeps, and riparian habitat; and
- Provide a mechanism for mutual management of interstate groundwater basins with Washoe County and the State of Nevada.

4.11.3 Previous CEQA Reviews

1981 EIR

The 1981 EIR included a discussion of the hydrology and water quality impacts of the initial Millers' Custom Work, Inc., mining operation (excavation, crushing, stockpiling, and hauling of materials as well as the operation of asphalt concrete batch plant). Hydrology and water quality impacts were determined to be potentially significant. The need for a water source for aggregate washing at the crusher site was included in the discussion of significant environmental impacts. Daily water use was anticipated to not exceed 10,000 gallons. In conjunction with a washing operation, water reclamation/discharge plans were determined to be required.

The 1981 EIR includes settling ponds for reclamation and drainage controls for wastewater discharged from gravel/aggregate washing operations in the mitigation measures discussion of the EIR. The plant would be sloped for drainage to water reclamation ponds. Hydrology and water quality impacts were determined to be less than significant with mitigation.

1997 EIR

Water quality impacts of the currently permitted operation were evaluated in the 1997 EIR. The 1997 EIR analyzed the water quality, hazardous waste, and drainage impacts of the onsite production of ready-mix concrete, increase in the height of the exposed rock quarry face, and increase in harvest volume to 1,700,00 cubic yards, and expansion of the season of operation from seven months to year round.

The 1997 EIR determined that water quality, hazardous waste, and drainage impacts of the project were potentially significant. The 1997 EIR contained the following mitigation measures to reduce hydrology/water quality impacts to a less than significant level:

Adherence to California Regional Water Quality Control Board Conditions. The applicant shall fully comply with Regional Board requirements prior to continued operation of the concrete plant, including:

a. Implement the following on site and submit plans for washout basin to the Regional Board and detailed overall mining site drainage plans which must include:

- *Segregation of process water from stormwater runoff.*
- *Pretreatment (sediment, oil/grease removal) of stormwater runoff containing pollutants prior to discharging to percolation/containment basins. Precast sand/oil interceptors may be an acceptable means for providing pretreatment of stormwater runoff.*
- *Pretreatment of stormwater runoff from areas subject to hydrocarbon deposition (fueling areas, parking areas, heavy equipment storage areas). Precast drop inlets with inverted outlet and hydrocarbon absorbent pillows may be an acceptable means for hydrocarbon removal.*
- *Provide non-percolation containment (such as lined evaporation ponds) for process water runoff.*
- *Diversion of non-impacted runoff (runoff from upland areas) around areas of industrial activities. Provide diversionary structures (earthen berms, culvers) as necessary to minimize contact with industrial activities.*

b. The SPCC Plan shall be revised to meet the approval of the Regional Board including:

- *A list of hazardous materials to be used and stored onsite*
- *Plans for the washout basin*
- *Description of the disposal location for water pumped from the secondary containment area*
- *A Spill Contingency Plan*
- *Provisions for an onsite Spill Cleanup Kit*
- *Provisions for employee training on spill prevention cleanup*

c. Dust control measures (as required in the Air Quality Chapter of the 1997 EIR) to minimize degradation of surface waters from the deposition of fugitive dust.

d. Obtain and provide evidence of proper documentation/application/approval related to the Nation Pollutant Discharge Elimination permit system.

2019 EIR

In the Initial Study prepared for current mining operation, the County determined that impacts to hydrology and water quality would not result from the project since there is no proposed change to the location, type of mining, drainage/sediment ponds or onsite structures. The current operation is subject to Conditions 4 and 5 of Resolution No. 97-067 requiring all necessary permits from the Lahontan Regional Water Quality Control Board (RWQCB) and State Water Resources Board as well as a SPCC plan approved by the RWQCB. The project could result in increased groundwater use for dust suppression onsite. However, based on worst-case scenario water use calculations conducted by the County, the maximum water use of the project will have a less than significant impact on groundwater supplies. Therefore, additional analysis beyond that contained in the EIR documents from 1981 and 1997 for currently permitted operations was not necessary and an analysis was not included in the 2019 EIR.

4.11.4 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to *Hydrology and Water Quality* have been derived from Appendix G of the CEQA Guidelines:

- *Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.*

- *Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.*

- *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through addition of impervious surfaces, in a manner which would:*

    i. Result in substantial erosion or siltation on- or off-site;
    ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or offsite;
    iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
    iv. Impede or redirect flood flows.

- *Result in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.*

- *Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.*

4.11.5 Impact Analysis

The proposed Project will alter the existing drainage pattern of the quarry expansion site as mining and reclamation activities occur, however, the proposed expansion area does not contain any natural streams or rivers. The proposed Project does not include any change to the existing sediment ponds or existing onsite structures. The proposed Project could result in a slight increase in groundwater use for dust suppression.

The following includes an analysis of environmental parameters related to *Hydrology and Water Quality* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the conclusions that either no impacts, less than significant impacts, or less than significant impacts with mitigation could occur. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Hydrology and Water Quality*.

Areas of No Project Impact

As required by CEQA Guidelines §15082, the County issued a Notice of Preparation (NOP) on April 28, 2021 that summarized the proposed Project, stated its intention to prepare an EIR, and requested comments regarding the scope and content of the EIR from responsible and trustee agencies. In the course of the County's initial evaluation, certain impacts of the proposed Project were found to not to be significant because of the inability of a project of this scope to create such impacts or the absence of project characteristics producing effects of this type. The effects determined not to be significant are not required to be included in primary analysis sections of the DSEIR. As such, the following impacts either are not applicable to the proposed Project or are not reasonably foreseeable and are not addressed further within this section:

- *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through addition of impervious surfaces, in a manner which would impede or redirect flood flows.*

  There are no rivers or streams within the Project site. The proposed Project is not located within or immediately adjacent to a designated floodplain and as a result the proposed quarry expansion will not impede or redirect flood flows. No impact would occur in this regard.

- *Result in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.*

  The Project site and the immediate surrounding area is not located within a flood hazard zone, tsunami, or seiche zone. The proposed quarry expansion will not be inundated by water from flooding, tsunami or seiche. There is no risk of release of pollutants due to inundation of the site. No impact would occur in this regard.

Project Impacts

Impact 4.11-1: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.

The proposed quarry expansion does not include additional pollutant sources or changes to the management of stormwater or wash water. Best Management Practices (BMPs) for pollution prevention are included in the Reclamation Plan. These include proper operating procedures of asphalt and concrete ready-mix plant allowing for covering of conveyors if needed. Hydrocarbons are stored per the site SPCC plan in double-walled containers.

The current mining operation retains all surface flow (stormwater) onsite. Stormwater from the expansion area will be conveyed to the existing retention ponds and additional retention ponds will be constructed to capture stormwater if needed as expansion advances. Ponds will be sized to meet the 25-year, 24-hour storm per the Industrial General Permit (IGP) and SMARA requirements. No discharge is anticipated from the expansion area.

The existing operation includes gravel/aggregate washing. Water discharged from the gravel/aggregate washing operations onsite are retained in settling ponds. The proposed Project will not result in changes to wash water management. The proposed quarry expansion is subject to Conditions 4 and 5 of Resolution No. 97-067, requiring all necessary permits from the Lahontan RWQCB and/or the State Water Resources Board be secured and a SPCC plan for fuel storage be approved by the RWQCB. Therefore, impacts to surface and groundwater quality are considered to be less than significant.

Impact 4.11-2: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

Well water is used by the current operation for wet suppression of onsite dust as described in the Setting section above. The quarry expansion could increase the groundwater use for dust suppression since the acreage of the mining area will increase by 78.6 acres. In addition, the operation of off-road equipment will increase to support the increase in annual production. The Project will result in an estimated 50 percent increase in annual operational hours of the majority of off-road equipment. Therefore, a maximum water use increase of 50 percent for dust suppression could occur (increase from 38 acre-feet per year to 57 acre-feet per year)

The Project site is located within the Honey Lake Valley Groundwater Basin, which is not currently at risk for overdraft. Estimated total water stored in the upper 100 feet of aquifer is estimated to be 10 million acre-feet. Estimates of groundwater extraction for agricultural municipal and industrial and environmental wetland uses are 51,000, 15,000, and 3,800 acre-feet respectively. Deep percolation from agricultural-applied water is estimated to be 14,000 acre-feet. As seen in the groundwater levels for monitored wells in the Project area, found in the Department of Water Resources (DWR) Water Data Library, there is currently no trend or pattern indicating overdraft in the basin. Therefore, the proposed quarry expansion will not substantially decrease groundwater supplies or interfere substantially with groundwater recharge. Impacts to groundwater supplies are considered to be less than significant.

Impact 4.11-3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through addition of impervious surfaces, in a manner which would:

i. Result in substantial erosion or siltation on- or off-site.

The proposed quarry expansion site does not include alteration of the course of a stream or river or include the addition of impervious surfaces; however, the expansion will alter the existing

drainage pattern of the mining area. Erosion control BMPs contained in the Reclamation Plan Amendment include use of berms, water bars, or rolling dips, diverting run-on from stockpile areas, planting vegetation/installing stabilizers as necessary, and retention of all stormwater runoff within quarry to settling ponds.

All stormwater within the existing mining area is retained onsite. A Notice of Non Applicability (NONA) was filed in 2015 for the current operation. Surface water within the expansion area will be directed toward the existing settling ponds, and additional ponds will be constructed as required to contain the stormwater as expansion progresses. Erosion or siltation will not be conveyed offsite by stormwater. Impacts are considered less than significant in this regard.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or offsite.

See response to item i) above. Stormwater currently does not leave the Project site. The ponds onsite are sized to contain the maximum historic precipitation events. Ponds will be added or expanded as necessary as the mining area increases to contain the maximum historic precipitation event. As a result, implementation of the proposed quarry expansion will not result in flooding on-or-offsite. Impacts are considered less than significant in this regard.

iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

The proposed expansion area is 78.6 acres. If necessary, additional retention ponds will be constructed to capture surface flow as expansion advances. Ponds will be sized to meet the 25-year, 24-hour storm per the IGP and SMARA requirements. Impacts are considered less than significant in this regard.

Impact 4.11-4: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

The Project site borders the area covered by the Lassen County GWMP and is partially within the Plan area. As discussed under the impacts above, Project water use will not result in a drawdown of ground water levels or result in degradation of water quality. The proposed Project will not conflict with or obstruct the Lassen County GWMP. The current mining operation contains all stormwater flows within the mining boundary. Stormwater within the expansion area will also be contained within the mining area of the Project and will not discharge to surface water. The proposed quarry expansion will not conflict with or obstruct the Water Quality Control Plan (WQCP) for the Lahontan Region. Impacts will be less than significant in this regard.

4.11.6 Mitigation Measures

No mitigation measures are required.

4.11.7 Level of Significance after Mitigation

No mitigation measures are required. Impacts would be less than significant.

4.12 Land Use and Planning

Expansion of the mine boundary, increasing annual production, and increasing the life of the mine to 2050 are substantial changes proposed in the Project that will require major revisions of the previous EIR due to the involvement of potentially new significant environmental effects pertaining to land use and planning or a substantial increase in the severity of previously identified significant effects under CEQA Guidelines §15162.

This section provides a description of the existing land use of the Project site and surrounding area, summarizes the previous CEQA review of land use and planning impacts of the currently permitted operation at the Project site, and describes the changes to those conditions that will result from the proposed quarry expansion.

4.12.1 Environmental Setting

The Project site is located in Lassen County and within the area covered by the *Standish-Litchfield Area Plan*. The *Standish-Litchfield Area Plan* extends from the north shore of Honey Lake to the toe slopes of Shaffer Mountain. The portion of the Project site currently used for mining and processing operations is zoned U-C-2 (Upland Conservation/Resource Management District). The proposed 78.6-acre quarry expansion area is zoned U-C-A-P (Upland Conservation District Agricultural Preserve Combining District). Lands immediately adjacent to the Project are zoned O-S (Open Space District); U-C (Upland Conservation District); and A-2-B-20-A (Agricultural Residential 20-Acre Building Site, Agricultural Combining District).

The *Standish-Litchfield Area Plan* classifies these surrounding lands as "Extensive Agriculture", "Open Space", and "Agricultural Residential." The area surrounding the site is primarily used for agriculture and open space. The nearest residence is approximately 875 feet from the western property line of the existing mining boundary and 4,500 feet from the proposed expansion area boundary. The zoning and land use designation of the site and adjoining properties are provided in Table 4-20, below.

Table 4-20
ZONING AND LAND USE OF PROJECT SITE AND ADJOINING PROPERTIES

Direction	Zoning	General Plan Land Use Designation
Project Site	U-C-2, U-C-A-P	Extensive Agriculture
North	O-S U-C	Open Space (Public Lands) Mountain Resort (Belfast Initiative Area)
East	O-S	Open Space (Public Lands)
South	O-S	Open Space (Public Lands)
West	U-C A-2-B-20-A	Extensive Agriculture Agricultural Residential

Source: Lassen County, 2021.

4.12.2 Regulatory Setting

The following is a description of local environmental laws and policies that are relevant to the CEQA review process for the proposed quarry expansion area.

Local

Lassen County General Plan

The *Lassen County General Plan* was adopted in September 1999. The General Plan contains a Land Use Element, Natural Resources Element, Agriculture Element, Wildlife Element, Open Space Element, Circulation Element, and Safety and Seismic Safety Element.

The Land Use Element of the General Plan designates the proposed general distribution and intensity of uses in the land for housing, business, industry, open space, natural resources, public facilities, waste disposal sites, and other categories of public and private uses. The Land Use Element is intended to serve as the central framework for the entire General Plan, and to correlate all land use issues into a set of coherent development policies. The following goals, policies, and implementation measures related to land use contained in the *Lassen County General Plan* are applicable to the proposed Project:

GOAL L-4: Compatibility between land use types by providing for complementary mixtures of patterns and land uses and maintain compatibility of land uses within the context of the County's land use authority and local control.

- Policy LU-6: The County recognizes general plan land use designations and consistent zoning as the appropriate and primary tools for attempting to achieve.

- Policy LU-7: The County shall consider the land use compatibility implications of proposed changes in land use, including proposed general plan amendments and rezoning, to determine the significance and acceptability of the extent to which proposed changes may affect the pattern and well-being of neighboring land uses.

GOAL L-13: Improvement, expansion and diversification of the County's industrial base and generation of related employment opportunities.

- Policy LU-32: The County encourages and will facilitate the development of new, environmentally responsible industrial projects for the economic benefit of the County.

- Policy LU-33: In considering proposals for new industrial sites, including amendments of the County General Plan and related rezoning, the County will address the compatibility of the site with established land use patterns, the adequacy of infrastructure and services, and the consistency of new sites with policies related to Lassen County General Plan Land Use Element the protection of natural resources as addressed in relevant sections of the General Plan.

- Policy LU-34: The County supports the development of industrial land uses primarily in or adjacent to areas which have been designated and developed for such uses and which have or can develop the necessary infrastructure to serve such uses, while recognizing that some types of resource-related industrial uses and processing plants may require or otherwise warrant relatively remote sites which are removed from standard industrial areas.

- Policy LU-35: Subject to case-by-case review (including review for compatibility with surrounding agricultural uses), and in compliance with relevant area plan, zoning,

permitting and environmental review requirements, the development and operation of the following land uses will typically be deemed to be consistent with the Extensive and Intensive Agriculture land use designations and will not require zoning to an "Industrial" zoning district, nor will they be interpreted by the County to constitute an "agricultural conversion" pursuant to this General Plan:

- processing plants for the production of agricultural products;
- processing plants for the production of natural resource products where the . location of the resource is fundamental to the location of processing and packaging facilities (e.g., water bottled at the source, etc.);
- mines, the extraction of minerals, and the ancillary processing of mineral materials generated onsite, including the production of asphalt, ready-mix concrete, and similar products;
- sawmills and related timber processing operations;
- geothermal and natural gas wells, hydroelectric projects, .and ancillary facilities for the production of energy; and
- uses of similar character as may be determined by the Board of Supervisors.

GOAL L-16: Conservation of productive agricultural lands and lands having substantial physic.al potential for productive agricultural use, and the protection of such lands from unwarranted intrusion of incompatible land uses and conversion to uses which may significantly obstruct or constrain agricultural use and value.

- Policy LU-40: The County recognizes and has generally assigned General Plan land use designations for lands having high agricultural resource value as "Intensive Agriculture" or "Crop Land and Prime Grazing Land". It also recognizes the potentially important agricultural values of some of the areas designated "Extensive Agriculture" or "Grazing and Sagebrush Environment" for rangeland grazing and other agricultural purposes.

GOAL L-22: Protection and enhancement of important wildlife habitats to support healthy, abundant, and diverse wildlife populations.

- Policy LU-49: The County supports the management and enhancement of wildlife resources in ways that enhance the health and abundance of wildlife populations and the diversity of species and their habitats and which, at the same time, balance management policies and program objectives with the range of social and economic needs for which the County is also responsible.

GOAL L-16: Conservation of productive agricultural lands and lands having substantial physic.al potential for productive agricultural use, and the protection of such lands from unwarranted intrusion of incompatible land uses and conversion to uses which may significantly obstruct or constrain agricultural use and value.

- Policy LU-40: The County recognizes and has generally assigned General Plan land use designations for lands having high agricultural resource value as "Intensive Agriculture" or "Crop Land and Prime Grazing Land". It also recognizes the potentially important agricultural values of some of the areas designated "Extensive Agriculture" or "Grazing and Sagebrush Environment" for rangeland grazing and other agricultural purposes.

1986 Standish-Litchfield Area Plan

The *Standish-Litchfield Area Plan* was adopted in 1986 and was intended to guide decisions regarding land use for an approximate 20-year timeframe. In the plan, it is stated, "The plan is long-range in nature and should be reviewed every five years to determine whether it still reflects community values." The Area Plan contains three categories: Environmental Safety, Natural and Cultural Resources, and Community Development. It has been more than 20 years since the Area Plan has been adopted; however, since there have not been any updates since 1986, the goals, policies, and implementation measures are still applicable to the proposed Project.

4.12.3 Previous CEQA Reviews

1981 EIR

The 1981 EIR does not include a specific analysis of the land use impacts of the initial mining operation at the site (excavation, crushing, stockpiling, and hauling of materials as well as the operation of asphalt concrete batch plant).

1997 EIR

Land use impacts of the operation prior to expansion to 24-hour operations were evaluated in the 1997 EIR. The project analyzed in the EIR included rezoning the project site parcel from U-C (Upland Conservation District) to U-C-2 (Upland Conservation/Resource Management) to allow operation of a ready-mix concrete plant upon approval of a use permit. The EIR determined that due to compatibility issues with the *Standish-Litchfield Area Plan* (the Area Plan does not allow secondary processing, such as the production of ready-mix concrete), land use impacts were determined to be potentially significant. The 1997 EIR contained the following mitigation measures to reduce land use impacts to a less than significant level:

- *Land Use Compatibility. Implementing the mitigation measures recommended for individual impacts identified in other section of the EIR will concurrently mitigate any land use impacts.*

- *Conflict with Adopted Land Use Plans and Regulations.*

    a) *Redesign the project to eliminate the proposed ready-mix concrete plant to avoid conflict with adopted area plan policies and zoning; or*

    b) *Amend the area plan goal and policy to allow production of ready-mix concrete on approved mine sites within the planning area where allowed by the zoning, and subsequently rezone the site to a zoning district that allows for such production.*

2019 EIR

Land use impacts of the existing operation were analyzed in the 2019 EIR. The expansion of operations to 24 hours and increase in production was determined to have the potential to conflict with goals, policies, and implementation measures related to land use contained in the *Lassen County General Plan* and *Standish-Litchfield Area Plan* (specifically, those related to traffic/circulation and protection of wildlife habitat). Mitigation measures included those contained in the Biological Resources section of the 2019 EIR.

Goal L-22 contained in the General Plan Land Use Element is "Protection and enhancement of important wildlife habitats to support healthy, abundant and diverse wildlife populations." With implementation of biological resource mitigation measures, the project evaluated in the 2019 EIR was found not to conflict with Goal L-22 of the *Lassen County General Plan* Land Use Element. Project-level and cumulative impacts to land use, after implementation of the mitigation measures were found to be less than significant.

4.12.4 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to *Land Use and Planning* have been derived from Appendix G of the CEQA Guidelines:

- *Physically divide an established community.*

- *Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.*

4.12.5 Impact Analysis

The proposed Project includes expansion of the existing mining operation by an additional 78.6 acres, an increase in processing volume from 100,000 tons per year to 200,000 tons per year, and extension of the life of the mine to 2050. The expansion area includes undeveloped land to the north of the existing mining boundary. The proposed quarry expansion will not physically divide an established community.

The consistency of the proposed Project with applicable goals and policies contained in the *Lassen County General Plan* and *Standish-Litchfield Area Plan* is addressed below. The discussion is limited to the applicable goals, policies, and implementation measures contained in or referenced in the Land Use Element of the *Lassen County General Plan* or related to Land Use in the *Standish-Litchfield Area Plan*. The goals and policies contained in the Lassen County Noise Element are addressed separately in Section 4.13, *Noise*.

Note that it is nearly, if not absolutely, impossible for a project to be in perfect conformity with each and every policy set forth in any given applicable plan. It is enough that the proposed project will be compatible with the objectives, policies, general land uses, and programs specified in the applicable plan. Pfeiffer v. City of Sunnyvale City Council, 200 Cal.App.4th 1552, 1563, 135 Cal. Rptr. 3d 380 (2011) (Crenshaw Subway Coal. v. L.A. Cnty. Metro. Transp. Auth. (C.D.Cal. Sep. 23, 2015, No. CV 11-9603 FMO (JCx)) 2015 U.S. Dist. LEXIS 143642, at *66.)

The following includes an analysis of environmental parameters related to *Land Use and Planning* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the conclusions that either no impacts, less than significant impacts, or less than significant impacts

with mitigation could occur. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Land Use and Planning*.

Areas of No Project Impact

As required by CEQA Guidelines §15082, the County issued a Notice of Preparation (NOP) on April 28, 2021 that summarized the proposed Project, stated its intention to prepare an EIR, and requested comments regarding the scope and content of the EIR from responsible and trustee agencies. In the course of the County's initial evaluation, certain impacts of the proposed Project were found to not to be significant because of the inability of a project of this scope to create such impacts or the absence of project characteristics producing effects of this type. The effects determined not to be significant are not required to be included in primary analysis sections of the DSEIR. As such, the following impacts either are not applicable to the proposed Project or are not reasonably foreseeable and are not addressed further within this section:

- *Physically divide an established community.*

  The proposed Project is consistent with the existing *Lassen County General Plan* designation and zoning of the site. The proposed Project does not have the potential to physically divide an established community and does not propose to divide land or rezone the parcels. Access to the site is limited. No impact would occur in this regard.

Project Impacts

Impact 4.12-1: Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

Consistency of the existing permitted operation with local traffic and circulation policies contained in the *Lassen County General Plan* and *Standish-Litchfield Area Plan* was analyzed in the 2019 EIR. Impacts were determined to be less than significant. The proposed quarry expansion does not include additional traffic or a change in the distribution of traffic from the current operation; therefore, would not conflict with local traffic or circulation policies.

The Project site land use designation is "Extensive Agriculture." The proposed quarry expansion does not include any changes in land use designation. Subject to County permit requirements and the provisions of related elements of the *Lassen County General Plan*, areas designated Extensive Agriculture may also accommodate natural resource-related production facilities, including mineral extraction and processing, including asphalt and similar plants. The current mining activities are allowed by Use Permit Amendment No. 2018-003. The proposed Project includes amendments to the Use Permit and Reclamation Plan to allow a 78.6-acre expansion area, increase in processing volume, and extension of the life of the mine.

The *Standish-Litchfield Area Plan* requires the land uses for mineral extraction should be zoned U-C (Upland Conservation District). The proposed quarry expansion area is currently zoned U-C-A-P (Upland Conservation District Agricultural Preserve Combining District). The U-P (Upland Conservation District) is intended to be applied in the mountain and upland foothill areas of the county in which forestry, mining, grazing, and noncommercial recreation are natural and desirable

uses; in which protection of the watershed lands from wildfire, erosion, pollution, and other detrimental effects is essential to the general welfare and in which land divisions will be regulated to ensure compatibility with primary uses. It is further intended that this district will be applied to land areas which are classified by the general plan as containing lands suitable for establishment as agricultural preserves. Processing of natural mineral materials is included as a use allowed by use permit in this zoning district (Lassen County Code Chapter 18.68.040(4)). As discussed above, the proposed Project includes an amendment to Use Permit No. 2018-003 to include the 78.6-acre expansion area, increase in processing volume, and extension of the life of the mine. The proposed Project will not conflict with the land use goals or policies contained in the *Lassen County General Plan* or *Standish-Litchfield Area Plan.*

Wildlife impacts are addressed in Section 4.5, *Biological Resources*, of this DSEIR. Goal L-22 contained in the *Lassen County General Plan* Land Use Element does not contain mention of a specific species or criteria for consistency; however, the Project site does contain critical winter range for pronghorn and mule deer and potential habitat for special-status species. The impacts of the proposed quarry expansion to pronghorn and mule deer and special-status species are discussed in Section 4.5, *Biological Resources*. This impact will be significant without mitigation. Implementation of Mitigation Measures 4.5-1 through 4.5-10, will ensure that the proposed Project will not conflict with the land use policies contained in the *Lassen County General Plan* or *Standish-Litchfield Area Plan*. Following implementation of these measures, the proposed Project is considered substantially consistent with the *Lassen County General Plan* and the *Standish-Litchfield Area Plan*. Impacts are considered less than significant in this regard.

4.12.6 Mitigation Measures

Implement Mitigation Measure 4.5-9 and Mitigation Measure 4.5-10 in Section 4.5, *Biological Resources*.

4.12.7 Level of Significance after Mitigation

Less than significant impact with mitigation incorporated.

4.13 Noise

Expansion of the mine boundary, extending the life of the mine and increasing the maximum annual production volume of the mine from 100,000 tons to 200,000 tons are substantial changes proposed to the currently permitted Project that will require revisions of the previous EIR due to the involvement of potentially new significant environmental effects pertaining to noise generated from the expanded operational activities.

This section provides a description of the existing noise setting within the Project area, summarizes the previous CEQA analyses of the noise impacts, and describes the changes to those conditions that will result from implementation of the proposed quarry expansion. Information about existing noise levels at the Project site is based on information contained in the *Hat Creek Materials Facility Expansion Revised Environmental Noise Analysis* prepared by j.c. brennan & associates, Inc. for the facility expansion that occurred in 2019. The noise analysis is included as Appendix H.

4.13.1 Fundamentals of Noise

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called "sound." The number of pressure variations per second is called the "frequency of sound" and is expressed as "cycles per second" or "Hertz" (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected, or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as "dBA") and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as "dB" unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool is the average, or equivalent, sound level (Leq), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The Leq is the foundation of the composite noise descriptor, Ldn, and shows very good correlation with community response to noise.

The day/night average level (Ldn) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because Ldn represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 4-21 lists several examples of the noise levels associated with common situations. Appendix A of the Noise Analysis provides a summary of acoustical terms used in this report.

Table 4-21
TYPICAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), At 80 km/hr. (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m(100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area, Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, *Technical Noise Supplement, Traffic Noise Analysis Protocol*, November 2013.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A

wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called "ambient noise level." In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Soft sites attenuate at 7.5 dB per doubling of distance because they have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees (Caltrans, 1998). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

Vibration

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, while vibration is usually associated with transmission through a structure. As with noise, vibration consists of an amplitude and frequency. A person's response to vibration will depend on their individual sensitivity as well as the amplitude and frequency of the source.

Vibration can be described in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities (inches/second). Standards pertaining to perception as well as damage to structures have been developed for vibration in terms of peak particle velocity (ppv). Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events.

4.13.2 Environmental Setting

The Project site includes the existing quarry as well as 78.6 acres of undeveloped land located immediately north of the existing quarry. The existing quarry includes a materials excavation and crushing operation, recycled asphalt and concrete crushing, and an asphalt batch plant. Operating hours are typically 6:00 a.m. to 7:00 p.m. During peak operations, the facility operates 24 hours per day and up to 550 truck trips (275 arriving and 275 departing) occur to haul material to

construction project sites. Peak periods of operations are considered limited to emergency situations to meet Caltrans contracting requirements.

Noise data for quarry operations at the Project site were included in the 2019 Noise Analysis and 2019 EIR and are representative of current existing ambient noise levels of plant operations (refer to Appendix H). Information on existing ambient noise levels included in the 2019 Noise Analysis and 2019 EIR is included below. Peak truck traffic volumes were not occurring during noise data collection.

During noise data collection on May 3rd and May 4, 2018, two shifts were operating from 6:00 a.m. to midnight. The primary noise sources associated with the existing operations include the following:

- Cement Batch Plant;
- Excavation and Crushing Operations (mobile equipment associated with the operations);
- Cement and Asphalt Batch Plants; and
- Truck Traffic to and from the Site on Area Roadways.

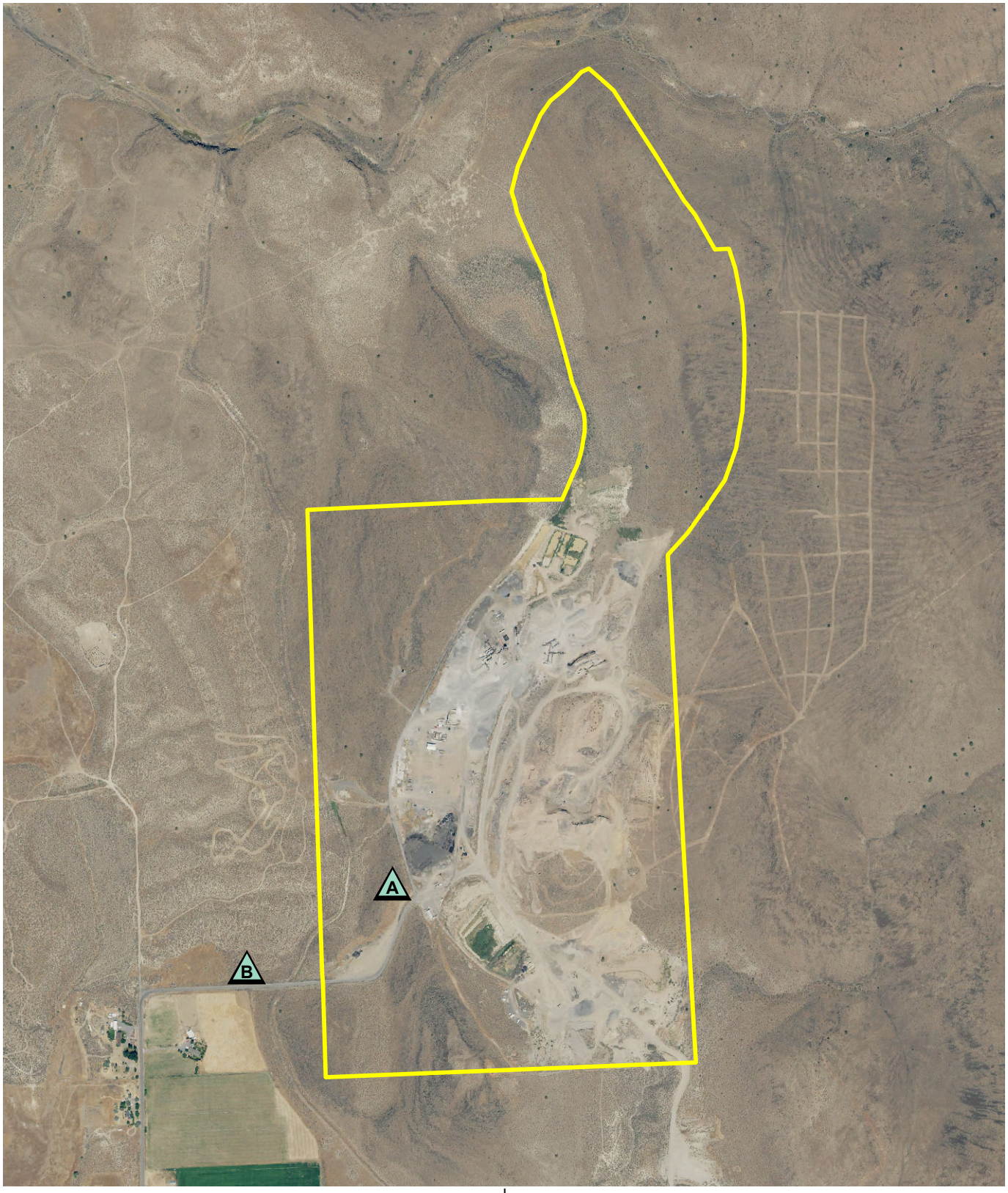
To quantify the existing ambient noise environment in the Project vicinity due to existing operations, j.c. brennan & associates, Inc., conducted continuous hourly noise level measurements for a 24-hour period at two locations. One location was on the Project site and adjacent to the entrance near the office building. The other site was adjacent to Ward Lake Road. The noise level measurements were conducted on Thursday, May 3rd, through Friday, May 4, 2018.

Noise measurement locations are shown on Figure 4-6. A summary of the noise level measurement survey results is provided in Table 4-22. Appendix H contains the *Noise Analysis* prepared for the 2019 EIR including the complete results of the continuous (24-hour) noise monitoring.

Table 4-22
EXISTING CONTINUOUS BACKGROUND NOISE MEASUREMENT DATA SUMMARY- MAY 3-4, 2018

Site	Ldn (dBA)	Average Measured Hourly Noise Levels (dBA)					
		Daytime (7:00 a.m.-10:00 p.m.)			Nighttime (10:00 p.m.-7:00 a.m.)		
		Leq	**L50**	**Lmax**	**Leq**	**L50**	**Lmax**
Site A-Entrance to the Site and approximately 215-feet from the scales and 1,160 feet from the Concrete Plant, and 1,875 feet from the crushing plant	53.5	49.4	39.0	65.8	46.5	33.1	56.3
		L2	**L8**	**L25**	**L2**	**L8**	**L25**
		47.8	45.1	41.9	40.7	38.7	35.9
Site B-35 feet from the Ward Lake Road centerline	55.6	**Leq**	**L50**	**Lmax**	**Leq**	**L50**	**Lmax**
		54.6	32.7	78.7	46.9	26.8	68.0
		L2	**L8**	**L25**	**L2**	**L8**	**L25**
		54.6	42.1	35.9	41.5	34.3	29.4

Source: j.c. brennan & associates, Inc., 2019.



X Continuous Noise Measurement Site

Project Site

N

0 500 1,000 2,000 Feet

VESTRA

SOURCE: J.C. BRENNAN & ASSOCIATES, 2018

FIGURE 4-6
NOISE MEASUREMENT LOCATIONS
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

P:\GIS\71305\WardLakeExpansion2020\Figures\2021_EIR\71305_NoiseMeasurementSites.mxd

The sound level meters were programmed to record the maximum, median, and average noise levels at each site during the survey. The maximum value, denoted Lmax, represents the highest noise level measured. The average value, denoted Leq, represents the energy average of all of the noise received by the sound level meter microphone during the monitoring period. The median value, denoted L50, represents the sound level exceeded 50 percent of the time during the monitoring period. In addition, the composite 24-hour average noise level (Ldn) was also calculated from the hourly Leq values. The calculated Ldn for each day applies a +10 dBA penalty to all noise which occurs during the nighttime period, which is defined as the hours between 10:00 p.m. and 7:00 a.m.

Existing Plant Noise Levels

No changes in plant operations have occurred since the Noise Analysis was prepared in 2019. Plant operation noise levels contained in the 2019 Noise Analysis and 2019 EIR are representative of current plant operations. The discussion of existing plant operations noise levels from the 2019 EIR is included below:

On May 3, 2018, j.c. brennan & associates, Inc., staff conducted noise measurements and observations of the Hat Creek Materials individual operations. The noise measurements were conducted with a Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter, which was equipped with 1/3 octave and 1/1 octave band filters. The equipment was calibrated prior to, and after the measurements with an LDL Model 200 acoustical calibrator to ensure accuracy of the measurement. Octave band data was collected, including the hourly average and maximum noise levels. Statistical noise levels were not collected for each individual piece of equipment. It was determined that the overall noise levels collected at Site B, as shown in Table 4-20, would provide the overall statistical noise levels or the overall operations. The results of the individual operations noise measurements are provided in Table 3 of the *Hat Creek Materials Facility Expansion Revised Environmental Noise Analysis* (refer to Appendix H).

During the noise measurements, the loader operated at the Sand Plant generated noise levels of 66.6 dB Leq and 74.8 dB Lmax at a distance of 100 feet. The cement plant (plant operations and trucks) generated noise levels of 67.7 dB Leq and 87.6 dB Lmax at a distance of 100 feet. Crushing operations (crushers and loaders) were measured to be 85.6 dB Leq and 88.7 dB Lmax at distance of 200 feet. The asphalt plant diesel generator was measured to be 85.6 dB Leq and 87.5 dB Lmax from the center of the site at a distance of 50 feet from the burner and 40 feet from the generator.

Existing Traffic Noise Levels

Traffic noise levels for the current mining operation were estimated in the *Hat Creek Materials Facility Expansion Revised Environmental Noise Analysis* completed for the 2019 EIR (refer to Appendix H). Baseline traffic remains the same as that analyzed in the 2019 EIR with an average of 32 one way truck trips per day during normal operating periods which are evenly distributed from 6:00 to 7:00 p.m. The distribution of truck trips includes 40 percent traveling east on Center Road and 60 percent traveling west on Center Road. Traffic noise levels predicted for the existing operation on an average day are included in Table 4-23.

Table 4-23 PREDICTED TRAFFIC NOISE LEVELS DURING AN AVERAGE DAY				
Roadway	**Location**	**Traffic Noise Level @ 75'***	**Distance to Noise Contours**	
			55 dBA	**60 dBA**
Traffic Noise Levels during an Average Day with 32 One-Way Truck Trips (6:00 a.m. to 7:00 p.m.)				
Ward Lake Road	Entire Length	48.3 dBA Ldn	23 feet	10 feet
Center Road (A27)	West of Ward Lake	51.4 dBA Ldn	43 feet	20 feet
Center Road (A27)	East of Ward Lake	48.7 dBA Ldn	28 feet	13 feet
Center Road (A27)	East of Cutoff Road	48.3 dBA Ldn	27 feet	12 feet
Traffic Noise Levels during an Average Day (Peak Hour Daytime Leq)				
Ward Lake Road	Entire Length	46.1 dBA Leq	19 feet	9 feet
Center Road (A27)	West of Ward Lake	52.2 dBA Leq	48 feet	22 feet
Center Road (A27)	East of Ward Lake	50.2 dBA Leq	35 feet	16 feet
Center Road (A27)	East of Cutoff Road	49.7 dBA Leq	33 feet	15-feet
Traffic Noise Levels during an Average Day (Peak Hour Nighttime Leq)				
Ward Lake Road	Entire Length	45.7 dBA Leq	18 feet	8 feet
Center Road (A27)	West of Ward Lake	48.3 dBA Leq	27 feet	12 feet
Center Road (A27)	East of Ward Lake	48.3 dBA Leq	27 feet	12 feet
Center Road (A27)	East of Cutoff Road	46.9 dBA Leq	22 feet	10 feet
Sources: j.c. brennan & associates, Inc., 2019 and FHWA RD-77-108. *- Roadway noise levels are calculated from the roadway centerline.				

During peak operational periods, additional truck trips are required to haul material. Maximum haul truck trips for the existing operation are limited by Use Permit Amendment No. 2018-003. Condition of Approval #8. This condition of approval was included to maintain traffic noise below 65 dB Ldn along area roadways during 24-hour operations. The Condition of Approval states:

> *"Haul trucks (loaded or empty) associated with the mining operation shall not exceed a daily average of 26 round trips (26 arriving and 26 departing) throughout the calendar year and shall not exceed a daily maximum of 275 round trips (275 arriving and 275 departing) with a maximum of 173 total trips occurring between the hours of 10:00 pm. and 7:00 a.m., excluding personal employee vehicles and light-duty trucks assigned to employees."*

Estimated noise levels predicted for existing peak traffic volumes (550 truck trips per day) that occur periodically at the current operation are included in Table 4-24.

Table 4-24 PREDICTED TRAFFIC NOISE LEVELS 550 TRUCK TRIPS PER DAY				
Roadway	**Location**	**Traffic Noise Level @ 75'***	**Distance to Noise Contours**	
			55 dBA	**60 dBA**
Traffic Noise Levels with 550 One-Way Truck Trips over a 24-Hour Period (Maximum of 173 Total Trips occurring between the Hours of 10:00 p.m. and 7:00 a.m.)				
Ward Lake Road	Entire Length	64.6 dBA Ldn	328 feet	152 feet
Center Road (A27)	West of Ward Lake	65.0 dBA Ldn	350 feet	162 feet
Center Road (A27)	East of Ward Lake	55.1 dBA Ldn	77 feet	36 feet
Center Road (A27)	East of Cutoff Road	53.9 dBA Ldn	64 feet	30 feet
Sources: j.c. brennan & associates, Inc., 2019 and FHWA RD-77-108. *- Roadway noise levels are calculated from the roadway centerline.				

Existing Materials Facility Noise Levels

Noise levels from the materials facility onsite operations have not changed since preparation of the 2019 EIR. The noise levels contained in the 2019 EIR are included below.

Onsite operations associated with materials facility onsite activities are generally represented by the measured hourly L50 values. During the daytime, the measured hourly background L50 noise levels due to onsite activities ranged between 27 dBA and 44 dBA at Site B, which represents the nearest residence. The average measured hourly L50 value was 33 dBA at Site B.

During the nighttime hours, the materials facility onsite operations resulted in measured background L50 noise levels ranging from 28 dBA to 45 dBA at Site B, while the plant was operating, which represents the nearest residence. (During the noise measurements, the plant operated during the nighttime hours until approximately 12:00 a.m. to 1:00 a.m.). The noisiest hours occurred during the start-up of operations between the hours of 6:00 a.m. and 8:00 a.m. Otherwise, plant operations were represented by the average measured L50 value of 33 dBA.

The noisiest operations associated with the materials facility onsite facilities are the crushing operations and the asphalt plant operations. Startup of onsite generator operations no longer occurs between the hours of 10:00 p.m. and 7:00 a.m.

Overall Measured Background Noise Levels

Background noise levels contained in the 2019 EIR are included below. Noise measurements were conducted when peak haul trips were not occurring.

The overall measured background hourly noise levels at Site B, which represents the nearest residence, ranged between 39 dBA and 61 dBA Leq. This included all background noise sources, including the roadway traffic, Materials Facility onsite operations, aircraft overflights, and neighborhood activities.

The measured 24-hour Ldn at Site B was 55.6 dBA. Maximum noise levels experienced at the nearest residences are due to truck traffic along Ward Lake Road.

4.13.3 Regulatory Setting

The following is a description of local environmental laws and policies that are relevant to the CEQA review process for the proposed expansion area.

Local

Lassen County General Plan
The *Lassen County General Plan* Noise Element includes noise level policies for land use compatibility. The following summarizes the noise policies and criteria applicable to the proposed Project:

GOAL: The overall goals of the Lassen County Noise Element are to protect the citizens of Lassen County from the harmful and annoying effects of exposure to excessive noise, and to

protect the economic base of Lassen County by preventing the encroachment of incompatible land uses within areas affected by existing noise-producing uses.

- Policy N-1: Noise created by locally regulated noise sources associated with new projects or developments shall be controlled so as not to exceed the noise level standards as set forth below as measured at any affected residentially designated lands or land use situated in either the incorporated or unincorporated areas. New residential development shall not be allowed where the ambient noise level due to locally-regulated noise sources will exceed the noise level standards as set forth in Table 4-25. These standards do not apply to residential units established in conjunction with industrial or commercial uses.

- Policy N-2: The compatibility of proposed projects with existing and future noise levels due to traffic on public roadways, railroad line operations, and aircraft in flight shall be evaluated by comparison to the current site layout.

- Policy N-3: Areas within Lassen County shall be defined as noise-impacted if exposed to existing or projected exterior noise levels exceeding either 60 dB Ldn/CNEL or the performance standards summarized in Table 4-25, below.

- Policy N-8: Noise produced by industrial uses shall not exceed 70 dB Ldn at the nearest property line.

Table 4-25
LASSEN COUNTY GENERAL PLAN NOISE LEVEL PERFORMANCE STANDARDS FOR NEW PROJECTS AND DEVELOPMENTS

Category	Cumulative No. of Minutes in Any 1-Hr Time Period	Exterior Noise Level Standard, dBA		
		Interpretation	Daytime (7:00 a.m.-10:00 p.m.)	Nighttime (10:00 p.m.-7:00 a.m.)
1	30	L50	50	40
2	15	L25	55	45
3	5	L8	60	50
4	1	L1.5	65	55
5	0	Lmax	70	60

Note: Each of the noise level standards specified above shall be reduced by 5 dBA for simple tone noise sources, noises consisting primarily of speech or music, or for recurring impulsive noises.

CEQA Guidelines define a significant impact of a project if it "increases substantially the ambient noise levels for adjoining areas."

The information summarized in Table 4-25 is based upon recommendations made in August 1992 by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been asserted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the Ldn.

Table 4-26 DETERMINATION OF A SIGNIFICANT INCREASE IN NOISE LEVELS	
Ambient Noise Level Without Project, Ldn/CNEL	**Increase Required for Significant Impact**
<60 dBA	+ 5.0 dB or more
60-65 dBA	+ 3.0 dB or more
>65 dBA	+1.5 dB or more
Source: FICON, August 1992	

Based upon the Table 4-26 criteria, an increase in the traffic noise level of 1.5 dB or more would be significant where the ambient noise level exceeds 65 dB Ldn. The rationale for the Table 4-26 criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause significant annoyance.

There are no federal, State, or local regulatory standards for ground-borne vibration. However, various criteria have been established to assist in the evaluation of vibration impacts. Caltrans has developed criteria for human and structural response to vibrational levels. The Caltrans vibration damage threshold for historic and some old buildings is 0.5 in/sec ppv for transient sources and 0.25 in/sec ppv for continuous or frequent intermittent sources. For older residential structures the vibration limit is 0.5 in/sec ppv for transient sources and 0.30 in/sec ppv for continuous or frequent intermittent sources. The acceptable vibration limits for new residential structures are 1 in/sec ppv for transient sources and 0.5 in/sec ppv for continuous or frequent intermittent sources (Caltrans, 2013). The level at which vibration becomes strongly perceptible to humans is 0.1 in/sec ppv for steady state vibrations. Continuous vibrations from traffic become readily perceptible at 0.08 in/sec ppv and begins to annoy at 0.1 in/sec ppv. Transient vibration becomes distinctly perceptible to humans at 0.24 in/sec ppv (Caltrans, 2013).

4.13.4 Previous CEQA Reviews

1981 EIR

Noise impacts of the initial mining operation at the site (excavation, crushing, stockpiling, and hauling of materials as well as the operation of asphalt concrete batch plant) were analyzed in the 1981 EIR. The EIR determined that although mitigation measures will be applied to reduce noise levels within the project area and must be within OSHA regulations for the protection of employees, noise, and emission sources not previously existent will be present if operations are commenced. This impact is listed under significant environmental effects which cannot be avoided in the EIR. Noise generated by the many moving components of crushers and hot plants when in operation cannot exceed 90 dB (decibel) level at the property lines in accordance with Federal Regulations. The following mitigation measures were contained in the 1981 EIR to address noise from the plant:

> *"General plant noise can be further reduced through application of various corrective measures. Keeping components in good repair and property adjustment, application of noise absorption materials, enclosure of known sources with noise barrier covers, use of exhaust mufflers, vibration isolation mounts, and proper lubrication are among many possible methods of reducing noise within the plants."*

1997 EIR

Noise impacts of the addition of a ready-mix concrete plant to the site, increase in height of the exposed quarry face, increase in harvest volume, and expansion of the season of operation were evaluated in the 1997 EIR. The 1997 EIR determined that increased noise related to site operations in the immediate vicinity were less than significant. The 1997 EIR also determined noise from truck traffic was less than significant. Although noise impacts were determined to be less than significant, the following mitigation measure for noise was included in the 1997EIR:

> *"At the operator's expense, project noise levels next to equipment and at property lines adjacent to residentially zoned parcels shall be monitored at the request of the lead agency by a qualified acoustical analyst with reports to the Community Development Department to ensure that County and federal noise standards are not exceeded. If noise standards are exceeded, the applicant shall take corrective action under the direction of the Lassen County community Development Department."*

2019 EIR

Noise impacts of the currently permitted operation were evaluated in the 2019 EIR. Noise impacts from material facility extended hours of operations and material haul trucks exceeding standards established in the *Lassen County General Plan* were determined to be significant. Noise increases in ambient noise levels along material haul routes were determined to be significant. The following mitigation measures for noise were included in the 2019 EIR.

1. *The operator shall restrict the start-up of onsite generator operations to between the hours of 7:00 a.m. to 10:00 p.m.*

2. *Shield the asphalt plant generator noise levels by either placing the generator behind a berm or barrier, and orient the generator opening to the north. The berm or barrier shall extend to a height even with the top of the generator.*

3. *No use of "jake" brakes leaving the Project site.*

4. *"Reduce speed" signs will be posted by the operator for trucks on the access road and Ward Lake Road and "no use of jake break" sings will be posted by the operator on the access road and at the Center Road (A2) and Ward Lake Road intersection.*

5. *Maintain traffic noise below 65 dB Ldn by reducing truck traffic during 24-hour operations to 550 one-way truck trips (275 arriving and 275 departing). The Lassen County General Plan requires discretionary approval to allow for noise levels between 60 dB Ldn and 70 dB Ldn, and as such a condition of approval to implement this measure should be added.*

Noise impacts related to facility extended hours of operations and material haul trucks exceeding Lassen County noise standards were determined to be less than significant with mitigation measures implemented. The 2019 project was found to result in traffic noise increases along the material haul routes which will result in a significant increase in noise levels in the project vicinity above those existing without the project. The Planning Commission found these impacts to noise after implementation of the above mitigation measures to be significant and unavoidable. Cumulative impacts related to noise after implementation of the above mitigation measure were also found to be significant and unavoidable.

4.13.5 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to *Noise* have been derived from Appendix G of the CEQA Guidelines:

- *Result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Specifically, exterior noise levels exceeding 60 dBA Ldn, or the performance standards contained in Table 4-25.*

- *Result in the generation of excessive groundborne vibration or groundborne noise levels. Specifically, a threshold of 0.1 in/sec p.m. is considered a safe criterion that would protect against architectural or structural damage and human annoyance.*

- *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, where the project would expose people residing or working in the project area to excessive noise levels.*

4.13.6 Impact Analysis

The proposed Project does not include a change in existing operating hours of the quarry or operating conditions contained within the current use permit for the quarry. The proposed Project will not result in a change of equipment in the plant area of the site or an increase in maximum traffic noise levels. The proposed Project will result in an increase in the annual use of the primary crusher of approximately 33 percent and an increased use of the majority of off-road equipment (approximately 50 percent) throughout the year. This will not result in a change in average hourly or maximum noise levels generated by the existing quarry. The potential for Project operations to result in noise impacts is expected to be due to operation of mining equipment, blasting, and use of a portable crusher in the 78.6-acre expansion area of the Project site.

The following includes an analysis of environmental parameters related to *Noise* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the conclusions that either no impacts, less than significant impacts, or less than significant impacts with mitigation could occur. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Noise*.

Areas of No Project Impact

As required by CEQA Guidelines §15082, the County issued a Notice of Preparation (NOP) on April 28, 2021 that summarized the proposed Project, stated its intention to prepare an EIR, and requested comments regarding the scope and content of the EIR from responsible and trustee agencies. In the course of the County's initial evaluation, certain impacts of the proposed Project were found to not to be significant because of the inability of a project of this scope to create such

impacts or the absence of project characteristics producing effects of this type. The effects determined not to be significant are not required to be included in primary analysis sections of the DSEIR. As such, the following impacts either are not applicable to the proposed Project or are not reasonably foreseeable and are not addressed further within this section:

- *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, where the project would expose people residing or working in the project area to excessive noise levels.*

  The nearest airport is the Susanville Airport which is approximately 8.2 miles to the southwest. The Project is not located within the vicinity of a private airstrip or an airport land use plan, or within two miles of a public airport or public use airport. No impacts would occur in this regard.

Project Impacts

Impact 4.13-1: Result in substantial temporary or permanent increase in ambient noise levels in excess of standards established in the Lassen County General Plan.

Plant Operations

The proposed quarry expansion does not include changes to hourly or maximum plant operational noise levels analyzed in the 2019 EIR. Noise measurements of plant operations at the quarry were conducted on Thursday May 3rd through Friday May 4th, 2018 and included in the *Hat Creek Materials Facility Expansion Environmental Noise Analysis* (refer to Appendix H). Noise measurements were conducted when the plant was operating during daytime and nighttime hours. Crushing operations at the quarry result in noise levels equal to or less than 45 dB L50 at the residential receptor closest to the project site. Start-up operations produce the loudest noise levels, and once operations occur, they were generally in the mid 30 dBA L50 range. The measured 24-hour Ldn (day/night average sound level) at the location representing the nearest residence to plant operations was 55.6 dB.

Pursuant to operating conditions contained in the use permit for the quarry, start-up operations do not occur during the nighttime hours of 10:00 p.m. to 7:00 a.m. The proposed Project does not include changes to the existing operating hours of the quarry or existing operating conditions contained in the use permit for the quarry. The proposed Project will not result in additional equipment in the plant area of the Project site or locate plant equipment closer to sensitive receptors. The proposed Project will include an annual increase in the use of the primary crusher (approximately 33 percent) and an increase in the annual hours of off-road equipment use (increase of 50 percent for the majority of off-road equipment). This will not result in a change to maximum or hourly average noise levels generated at the plant site.

To produce additional volume of materials, equipment will be operated additional days/hours each year (within current operating hours and pursuant to existing operating conditions). Operation of the crusher and off-road equipment for additional hours each day could result in a higher average noise levels over a 24-hour period. However, noise levels from increased equipment use would not exceed 55.6 dB Ldn at the nearest residential receptor (the noise level measured during worst-case 24-hour operating conditions that included crushing operations during daytime and nighttime hours).

In addition, some of the plant equipment at the Project site has been switched to electric power instead of using a generator, reducing noise levels from plant operations. One of the two generators used to power crushing operations was removed in January 2022, further reducing noise levels generated by the plant. Plant operation noise levels of the proposed Project will not exceed standards established in the *Lassen County General Plan*. Impacts are less than significant in this regard.

Expansion Area

Noise will be generated in the expansion area by excavation and hauling of materials. Noise will be similar to that generated by extraction activities occurring within the current mining area of the operation. Equipment will include articulated dump trucks and loaders and dozers. A portable crusher will also be operated in the expansion area and limited blasting will occur. The expansion area is located north of the currently permitted mining area and further from residences in the Project vicinity than the current mining boundary. The closest residence is located more than ¾ mile from the expansion area (4,500 feet). Rock will be removed beginning at the south end of the expansion area near the current operation and expand northward as mining progresses

Activities producing the highest noise levels in the expansion area will include crushing and blasting. Blasting produces a maximum noise level of 94 dB at a distance of 50 feet (FHWA, 2006). Using the reference noise level for blasting of 94 dB at a distance of 50 feet and the standard noise attenuation rate of 6 dB per doubling of distance, at a distance of 4,500 feet (closest residence) blasting in the expansion area will result in a maximum noise level of 55 dB, which is below the Lassen County daytime maximum noise level standard of 70 dB. Blasting in the expansion area will occur intermittently (3 to 7 times per year) and will not exceed the L50, L25, L8 or L1.5 daytime noise standards for Lassen County at the nearest residence The Project does not include revisions to the current operating conditions of the quarry. Blasting will not occur at night during 24 hour operations. The operator will continue to comply with Condition of Approval #3 of the Use Permit Amendment No. 2018-003 that requires that no grading, blasting, or excavating shall be allowed onsite between the hours of 6:00 p.m. and 7:00 a.m. year-round.

In an effort to reduce the movement of material from the expansion area, a portable crusher may be moved into the flat area on the western side of the proposed expansion area. Extensive data collected at portable aggregate crushing/screening operations at northern and central California aggregate facilities indicates that the typical noise generation of such facilities is approximately 80 dB Leq and 85 dB Lmax at a reference distance of 100 feet from the operating plant equipment (BAC, 2021). Assuming an attenuation rate of 7.5 dB per doubling of distance (due to soft-site absorptive ground surface, topography, and stockpiles between the expansion area and the closest residences), noise levels from the portable crusher are estimated to be 39 dB Leq/44 dB Lmax at a distance of 4,500 feet. Noise generated by activities within the expansion area will not exceed Lassen County noise standards at nearby receptors and will result in a less than significant impact.

Materials Haul Truck Operations

Existing traffic noise levels during peak operational periods of up to 550 truck haul trips per day currently exceed the 60 dB Ldn Lassen County traffic noise level standard along Ward Lake Road and Center Road west of Ward Lake Road. The worst-case traffic noise levels generated by the current operation are up to 65 dB along area roadways as shown in Table 4-24.

Noise levels up to 65 dB are conditionally acceptable and allowed by Use Permit Amendment No. 2018-003. The proposed Project will not result in a significant increase in average or maximum traffic volumes generated by the current operation. Increased production of the Project will be met by maintaining larger truck loads (i.e., greater than 24 tons), not by increasing truck volumes. The project does not include revisions to existing operating conditions of the quarry. Since the Project does not require an increase in traffic volumes, it will not result in an increase in traffic noise levels along area roadways compared to existing baseline conditions.

Mitigation Measure 4.13-1 provides that the proposed expansion will continue to comply with Condition of Approval #8 of Use Permit Amendment No. 2018-003 which limits truck trips to an average of 26 round trips (26 arriving and 26 departing) throughout the calendar year and a daily maximum of 275 round trips (275 arriving and 275 departing). Mitigation Measure 4.13-2 requires the mine operator to install pneumatic road tubes or other similar methods to ensure that annual truck counts do not exceed limitations imposed by Condition of Approval #8 of Use Permit Amendment No. 2018-003. With the incorporation of Mitigation Measure 4.13-1 and Mitigation Measure 4.13-2, the proposed quarry expansion will result in a less than significant impact related to traffic noise level increases.

Impact 4.13-2: Result in the generation of excessive groundborne vibration or groundborne noise levels.

The proposed quarry expansion will not introduce any new equipment or processes to the Project site that will increase the levels of vibration or ground born noise levels generated by current operations. Existing equipment used for material extraction at the current operation will be used in the expansion area. Equipment operated in the expansion area will be operated further from residences than equipment operated in the current mining area and will not result in increased levels of vibration at the closest residence or structure compared to existing operations.

The activity at the quarry that produces the highest level of vibration is blasting. Blasting currently occurs 3 to 7 times per year and occurs during the middle of the day. The Project will not increase blasting frequency or conditions on blasting contained in the current use permit for the quarry. Vibration levels generated by blasting depend on many factors including blast design and site-specific geology. Blast vibration can be predicted using square-root scaled distance that divides the distance from the point of interest to the blast by the square root of the largest charge weight detonated on one delay period. Based upon vibration data collected at a various northern California hard rock quarries, the highest Peak Particle Velocity (PPV) of a hard rock quarry blasting event can be up to 0.11 inches per second measured 1,400 feet from the blast (BAC, 2012).

Blasting at the Project site currently occurs more than 2,500 feet from the closest residence and blasting within the proposed expansion area will occur greater than 4,500 feet from the closest residence. Vibration levels will decrease with distance from the source and are not anticipated to exceed 0.1 in/sec PPV at the closest residence. Levels of vibration of equipment operated within the expansion area will be much lower than vibration occurring during blasting events. For reference, a large bulldozer generates 0.089 PPV (inches/second) at a distance of 25 feet and loaded trucks result in 0.076 PPV at a distance of 25 feet. Vibration levels attenuate with distance from the source and would not be perceptible at the nearest residence located 4,500 feet from the proposed expansion area. Mitigation Measure 4.13-3 provides that no grading, blasting, or excavating will be allowed between the hours of 6:00 p.m. and 7:00 a.m. year-round. With implementation of

Mitigation Measure 4.13-3, impacts related to groundborne vibration and ground born noise levels will be less than significant.

4.13.7 Mitigation Measures

The following mitigation measures would reduce impacts to less than significant levels:

MM 4.13-1: *Materials Haul Truck Operations*. To maintain traffic noise below 65 dB Ldn, the operator shall continue to comply with Condition of Approval #8 of Use Permit Amendment No. 2018-003 (Resolution No. 19-024) which limits truck trips to an average of 26 round trips (26 arriving and 26 departing) throughout the calendar year and a daily maximum of 275 round trips (275 arriving and 275 departing).

MM 4.13-2: *Material Haul Truck Counts*. Prior to commencement of mining activities within the quarry expansion area, the mine operator shall install pneumatic road tubes or other similar methods to quantify daily truck trips in an effort to ensure that annual truck counts do not exceed limitations imposed by Condition of Approval #8 of Use Permit Amendment No. 2018-003. Results of the counts shall be provided to the County on an annual basis (January 1st of each year) throughout the duration of mining activities.

MM 4.13-3: *Plant and Expansion Area Operations*. The following measures shall be implemented:

- Restrict crushing operations to the daytime hours of 7:00 a.m. to 10:00 p.m.
- The operator shall continue to limit winter operation (no grading, excavating, or blasting per Resolution No. 97-067, Condition #21).
- The operator shall limit 24-hour operations to April 1st to December 31st annually.
- The operator shall not grade or excavate between 7:00 p.m. and 7:00 a.m. or blast between 6:00 p.m. and 7:00 a.m.

4.13.8 Level of Significance after Mitigation

Impacts would be less than significant with mitigation incorporated.

4.14 Transportation

Transportation impacts of the current mining operation were analyzed in the 2019 EIR prepared for the current mining activities at the Project site. The proposed Project does not include an increase in average or maximum traffic numbers allowed by the current use permit (Use Permit Amendment No. 2018-003) or change in traffic distribution. The additional proposed production will be met by optimizing truck loads instead of increasing truck trips. The traffic study prepared for the 2019 EIR (Solaegui Engineers, 2018) is included as Appendix I, *Traffic Study*.

Traffic volumes generated by the proposed quarry expansion will not exceed traffic volumes analyzed in the 2019 SEIR. The previous SEIR focused on impacts to Level of Service (LOS) and need for turn lanes and did not include a discussion of traffic impacts related to vehicle miles traveled. CEQA Guidelines §15064.3 establishes vehicle miles traveled (VMT) as the most appropriate measure of transportation impacts, shifting away from the LOS analysis that evaluated a project's impacts on traffic conditions on nearby roadways and intersections. Lead agencies were required to comply with the Guideline regarding VMT starting July 1, 2020.

This section provides a description of roadways in the Project area, existing VMT on Project-area roadways and summarizes the previous CEQA analyses of traffic impacts in the Project area for the currently permitted operation. This section contains an analysis of Project-related transportation and traffic impacts related to VMT that was not discussed in the previous EIR.

4.14.1 Environmental Setting

Area Roadways

The Project site is located east of Ward Lake Road, north of Center Road (A27). The Project site is accessed by Ward Lake Road. Descriptions of roadways and intersections in the Project vicinity are included below.

- Center Road (A27) is a rural, two-lane roadway with one through lane in each direction in the vicinity of the site. The speed limit is posted for 35 miles per hour generally east of Ward Lake Road, 45 miles per hour west of Ward Lake Road, and 55 miles per hour farther west. Roadway improvements generally include paved shoulders with solid white edge lines and a striped centerline.

- Ward Lake Road (A27) is a rural, two-lane roadway with one through lane in each direction north of Center Road (A27). The speed limit is not posted. Roadway improvements generally include paved travel lanes with a striped centerline.

- Cutoff Road is a rural, two-lane roadway with one through lane in each direction from US-395 to north of Center Road (A27). The speed limit is not posted except for a 25 mile per hour zone on a curve. Roadway improvements generally include paved travel lanes with a striped centerline.

- Center Road (A27)/Ward Lake Road intersection is an unsignalized three-leg intersection with stop control at the north approach. The north approach contains one shared left-right turn lane. The west approach contains one shared left turn-through lane. The east approach contains one shared right turn-through lane.

- Center Road (A27)/Cutoff Road intersection is an unsignalized four-leg intersection with stop control at the north and south approaches. All approaches contain a shared left turn-through/right-turn lane.

Peak traffic hours identified by Lassen County Department of Public Works on the Project area roadway network occur from 7:00 a.m. to 8:00 a.m., 4:00p.m. to 5:00 p.m., and 9:00 a.m. to 10:00 p.m.

Vehicles miles traveled for 2017 and future predictions for VMT contained in the Lassen County Regional Transportation Plan are included in Table 4-27. Miles traveled are expected to increase the most on the State Highway System (Green Dot, 2018).

Table 4-27
LASSEN COUNTY FUTURE DAILY VEHICLE MILES TRAVELED

Jurisdiction	2017 VMT	2027 VMT	2037 VMT	Total Change (%)	Average Change (%)
Susanville City	87.47	95.34	103.21	-	-
Lassen County	554.26	604.15	654.03	-	-
State Highway System	718.40	783.06	847.71	-	-
State/Federal/Indian	28.14	30.67	33.21	-	-
Total	**1,332.30**	**1452.21**	**1572.12**	**18.0%**	**0.9%**

Source: *2017 Lassen Regional Transportation Plan*, adopted February 9, 2018.

Existing Traffic

The Project site is accessed off of Ward Lake Road. Trip distribution for haul trucks of the mining operation is approximately 60 percent on Center Road west of Ward Lake Road and 40 percent on Center Road east of Ward Lake Road during normal operations. The following conditions of approval for Use Permit Amendment No. 2018-003 are required for traffic generated by the existing operation:

7. *Haul trucks associated with the mining operation shall not use Center Road (A-27) east of Ward Lake Road between the hours of 10:00 p.m. and 7:00 a.m.; during these hours all trucks must turn west onto Center Road from Ward Lake Road to avoid the community of Litchfield.*

8. *Haul trucks (loaded or empty) associated with the mining operation shall not exceed a daily average of 26 round trips (26 arriving and 26 departing) throughout the calendar year and shall not exceed a daily maximum of 275 round trips (275 arriving and 275 departing) with a maximum of 173 total trips occurring between the hours of 10:00 p.m. and 7:00 a.m., excluding personal employee vehicles and light-duty trucks assigned to employees.*

11. *Within 60 days of issuance of authorization to operate, the mine operator shall post advisory "Reduced Speed to 25 MPH" signs on the access road and Ward Lake Road (one northbound and one southbound, at minimum), in coordination with the Lassen County Department of Public Works.*

15. *The operator shall assist Lassen County Road Department with the installation of an eastbound left-hand turn lane on Center Road onto Ward Lake Road, within 30 months of approval (timeline as established by the Director of Public Works), by providing necessary asphalt materials.*

16. *The operator shall assist the Lassen County Road Department with the repair of and/or asphalt concrete overlay of the Lassen County maintained portion of Ward Lake Road, within 30 months of project approval (timeline as established by the Director of Public Works), by providing the necessary asphalt materials.*

17. *Within 60 days of project approval, the operator shall submit a $200,000 surety bond, payable to Lassen County, as financial assurance for the completion of the above road maintenance assistance. Upon completion of all required assistance, the surety bond shall be released back to the operator. If the above maintenance is to be completed in phases, the Director of Public Works may authorize incremental release of said bond as phased work is completed.*

Traffic generated by the existing facility includes employee trips and material hauling truck trips. The majority of traffic includes haul truck trips transporting materials to construction sites. The number of truck trips generated by the facility depends on the number and size of the construction projects supplied by the operation. During peak periods, as many as 275 round trip haul truck trips occur. The facility is not operational on Sundays and no truck trips occur. Condition of Approval #8 limits the number of haul trucks associated with the mining operation to a daily average of 26 round trips (26 arriving and 26 departing) throughout the calendar year with a daily maximum of 275 round trips (275 arriving and 275 departing).

An estimate of the average daily VMT generated by the existing operation is included in Table 4-28. The daily VMT is estimated based on a daily average of 26 round trips (26 arriving and 26 departing) throughout the calendar year allowed by Use Permit No. 2018-003, and a round-trip length of 60 miles (30 miles each way) for haul trucks. The employee and supplier truck trip numbers were obtained from the 2018 traffic study prepared for the existing operation. Average daily VMT that could be generated by the existing operation is 2,630.

Table 4-28
EXISTING ESTIMATED VEHICLE MILES TRAVELED

Description	Number of Trips Per Day	Average Trip Length (miles)	VMT (Annual Daily Average)
Haul Truck	26 arriving, 26 departing	60 miles (30 miles each way)	1,560
Supplier Trucks	5 arriving, 5 departing	102 miles[1] (51 miles each way)	510
Employees	20 arriving, 20 departing	28 miles [2] (14 miles each way)	560
		Total	**2,630**

Notes:
[1]Trip length for supplier trucks was determined by assuming half the supplier trucks would be coming from Susanville and half would be coming from Reno.
[2]Trip length for employees is the distance of the operation to Susanville.

4.14.2 Regulatory Setting

Traffic analysis in the State of California is guided by policies and standards set at the State level by Caltrans and at the local level by local jurisdictions. The *Lassen County General Plan* and *Standish-Litchfield Area Plan* provide the necessary framework to guide the growth and development of the County's transportation-related infrastructure.

State

California Department of Transportation

Caltrans policies are summarized in the *Guide for the Preparation of Traffic Impact Studies* (December 2002). These guidelines identify when a traffic impact study is required, what should be included in the study, analysis scenarios, and guidance on acceptable analysis methodologies. Caltrans endeavors to maintain a target service level of between LOS C and LOS D on State highway facilities; however, this may not always be feasible, and a lower service level may be acceptable.

CEQA Guidelines §15064.3

CEQA Guidelines §15064.3 describes considerations for evaluation a project's transportation impacts. Generally, vehicle miles traveled is the most appropriate measure of transportation impacts. "vehicle miles traveled" refers to the amount and distance automobile travel attributable to a project. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Except as provided in subdivision (b)(2) regarding roadway capacity, a project's effect on automobile delay shall not constitute a significant environmental impact. Section (b) describes criteria for analyzing transportation impacts.

Local

Lassen County General Plan

The Circulation Element of the *Lassen County General Plan* contains the following policies related to circulation that are applicable to the proposed Project:

- Policy CE-6: The County shall review and, when warranted, formulate improved standards for the necessary improvement and maintenance of roads serving new development, including standards for the incremental improvement or development of public roads.

- Policy CE-10: In consideration of proposed projects which would generate a substantial number of large trucks carrying heavy loads, the County shall require special mitigation measures to ensure that those projects do not cause, or will adequately mitigate, significant deterioration of County roads.

Standish-Litchfield Area Plan

The *Standish-Litchfield Area Plan* states the following policy and implementation items related to circulation that are applicable to the Project:

- Policy 17-A: It shall be a policy of Lassen County to provide a transportation system that provides safe and efficient service for the travel needs of all citizens, the movement of goods and as a means to implement the goals and objectives of this plan.

4.14.3 Previous CEQA Reviews

1981 EIR

The 1981 *Environmental Impact Report for Operation of Aggregate Materials Source Operation of Rock Crushing Plant Operation of Asphalt Concrete Batch Plant (SCH No. 80062304)* prepared for the original operation at the site analyzed traffic impacts of the initial mining operation. The 1981 EIR stated

that it was impossible to accurately predict the amount of aggregates or asphaltic concrete which would be produced and hauled during an anticipated working season. The EIR described paving projects that could generate an estimated 105 truck trips per day. Traffic impacts were determined to be significant and unavoidable in the 1981 EIR.

The 1981 EIR determined that volumes on a previously "little-used" road and noise created by same cannot be eliminated or effectively reduced if the project was approved. Exposure to the increased traffic would require new awareness on the part of the occasional users of County Road 308 (Ward Lake Road); and, safety measures, including speed limitations, established to minimize the adverse effects of heavier usage.

The 1981 EIR included the following mitigation measures related to traffic:

- *Pave the access and haul roads as well as the plant site as soon as feasible to eliminate the primary complaint of dust which results when equipment and trucks operate on unpaved areas. Actual timing of paving these areas would be governed by the volume of production and hauling warranting this improvement and subject to review and recommendations of the Planning Commission.*

- *Use of water trucks on any unpaved portions of the area is anticipated; and vehicle speed within the site controlled at 10 mph to avoid creation of unnecessary dust.*

- *Water or dust oils would be applied to County Road 308 (Ward Lake Road) by the applicant as required to alleviate dust from truck traffic and would continue until such time as paving is required.*

- *"Stop" sign would be installed at the junction of the access road with County Road 308 by the applicant and if warranted "Truck Crossing" warning sings placed along the County Road.*

- *Speed on County Road 308 from the plant access point to A-27 (Center Road) would necessarily be limited to approximately 25 MPH due to the road conditions and the short length (approximately one mile) encompassed.*

- *Trucks hauling materials would not exceed the legal load limit allowed of 80,000 lbs. gross weight.*

1997 EIR

The 1997 Ward Lake Expansion EIR prepared for the expansion of mine boundaries and allowing year-round operations with limited winter activity, determined that traffic impacts of the expansion were less than significant. The 1997 EIR analyzed the traffic impacts of approximately 20 aggregate haul per day and determined that truck volumes would have a less than significant traffic impact. Although the 1997 EIR found traffic impacts to be less than significant, the EIR included the following mitigation measures:

a. *Safety Measures. No measures were recommended in the 1996 Initial Environmental Study for this less than significant impact. However, the 1981 EIR recommended the use of a number of measures if they become warranted as the project progresses. The County should continue to monitor the project traffic flow for safety concerns and institute any of the following or other appropriate measures if it becomes necessary:*

- *Installation of a "Stop" sign at the junction of the access road with County Road 308 by the applicant if warranted, "Truck Crossing" warning signs along County Road 308.*
- *Decrease speed limits on Ward Lake Road to 25 mph due to the road conditions and the short length encompassed (approximately one mile).*

b. Load limits. Trucks hauling materials should not exceed the legal allowable load limit of 80,000 lbs. (40 tons) gross weight.

2019 EIR

The 2019 EIR prepared for the existing operation determined traffic impacts of the expansion to 24-hour operations and increase in the volume of haul trucks during peak operations were less than significant. It was determined there would be no impact related to a substantial increase in traffic in relation to the existing traffic load and capacity of the street system or need for additional turn lanes. It was also determined the project would not exceed a level of service standard established by the County, conflict with local circulation policies, or cause cumulative impacts to traffic load and capacity or need for additional turn lanes. Mitigation measures were not required.

4.14.4 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to *Transportation* have been derived from Appendix G of the CEQA Guidelines:

- *Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.*
- *Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).*
- *Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).*
- *Result in inadequate emergency access.*

4.14.5 Impact Analysis

The following includes an analysis of environmental parameters related to *Transportation* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the conclusions that either no impacts, less than significant impacts, or less than significant impacts with mitigation could occur. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Transportation*.

Areas of No Project Impact

As required by CEQA Guidelines §15082, the County issued a Notice of Preparation (NOP) on April 28, 2021 that summarized the proposed Project, stated its intention to prepare an EIR, and requested comments regarding the scope and content of the EIR from responsible and trustee agencies. In the course of the County's initial evaluation, certain impacts of the proposed Project were found to not to be significant because of the inability of a project of this scope to create such impacts or the absence of project characteristics producing effects of this type. The effects determined not to be significant are not required to be included in primary analysis sections of the DSEIR. As such, the following impacts either are not applicable to the proposed Project or are not reasonably foreseeable and are not addressed further within this section:

- *Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.*

  The 2019 EIR determined the existing operation would not result in changes or impacts to air traffic patterns, no changes or impacts in design features, no changes in policies, plans, or programs regarding public transit, bicycle or pedestrian features, no changes or impacts to parking facilities, and no changes or impacts to rail, water, or air traffic. The proposed quarry expansion will not increase or change the distribution of current traffic generated by the existing operation. The proposed Project will continue to comply with Condition of Approval #8 for Use Permit Amendment No. 2018-003 and will not exceed a daily average of 26 haul truck round trips throughout the calendar year or the daily maximum of 275 haul truck round trips. No new impacts would occur in this regard.

- *Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).*

  Impacts of traffic from the current operation related to emergency access, existing traffic load and capacity, level of service standards established by the County, need for additional turn lanes, and consistency with local circulation policies were determined to be less than significant. Implementation of the proposed quarry expansion will not result in a change or increase the severity of these impacts. The proposed Project will continue to comply with the additional Conditions of Approval related to traffic for Use Permit No. 2018-003 for truck traffic distribution on area roadways and requiring assistance with roadway improvements. Traffic volumes generated by the proposed quarry expansion will not exceed the peak hour traffic numbers analyzed in the 2019 EIR. No new impacts would occur in this regard.

Project Impacts

Impact 4.14-1: Conflict with or be inconsistent with CEQA Guidelines §15064.3, subdivision (b).

Lassen County does not have a threshold of significance related to VMT. The California Governor's Office of Planning and Research *Technical Advisory on Evaluating Transportation Impacts in CEQA* contains recommendations regarding significance thresholds for VMT for different project types and land uses The OPR Guidance does not include thresholds specific to mining or industrial projects. For land use projects, vehicle miles traveled exceeding an applicable threshold

of significance may indicate a significant impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

Implementation of the proposed quarry expansion will not result in an increase in VMT compared to existing permitted operations. Proposed additional production will be achieved by maximizing truck loads, not increasing truck trips. The estimated VMT of existing operations is included in Table 4-28. The VMT are created by construction projects requiring materials and would occur with or without the Project. The facility tends to shorten trips and reduce VMT by providing a construction material source in the region serving local projects. Other sources of aggregate and asphalt large enough to serve the construction projects generally served by the proposed Project are located near Lake Almanor or north of Reno in Nevada. Therefore, the proposed Project results in an overall decrease in VMT for construction projects within Lassen County.

The proposed quarry expansion will not result in an increase in VMT and will not conflict with or be inconsistent with CEQA Guidelines §15064.3. Impacts are considered less than significant in this regard.

4.14.6 Mitigation Measures

No mitigation measures are required.

4.14.7 Level of Significance after Mitigation

No mitigation measures are required. Impacts would be less than significant.

4.15 Wildfire

The CEQA Guidelines were amended in 2019 to include the addition of a Wildfire section to the Appendix G Checklist. The 2019 EIR did not contain separate analysis of the current operation for wildfire impacts as this resource was not required at the time the previous EIR was prepared. This section provides a brief summary of the wildfire setting of the Project site, wildfire regulations, and discussion of the potential wildfire impacts related to the proposed quarry expansion.

4.15.1 Environmental Setting

The California Department of Forestry and Fire Protection (CAL FIRE) is required by law to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), influence how people construct buildings and protect property to reduce risk associated with wildland fires (CAL FIRE, 2007).

A Fire Hazard Severity Zone (FHSZ) is a mapped area that designates zones (based on factors such as fuel, slope, and fire weather) with varying degrees of fire hazard (i.e., moderate, high, and very high). FHSZ maps evaluate wildfire hazards, which are physical conditions that create a likelihood that an area will burn over a 30-to 50-year period. They do not take into account modifications such as fuel reduction efforts.

While FHSZs do not predict when or where a wildfire will occur, they do identify areas where wildfire hazards could be more severe and therefore are of greater concern. FHSZs are meant to help limit wildfire damage to structures through planning, prevention, and mitigation activities/requirements that reduce risk. The FHSZs serve several purposes: they are used to designate areas where California's wildland urban interface building codes apply to new buildings; they can be a factor in real estate disclosure; and local governments consider fire hazard severity in the safety elements of their general plans (California State Geoportal, 2020).

The existing quarry and proposed expansion area are located within a State Responsibility Area (SRA), an area where the state has financial responsibility for wild land fire protection. Based on the map of *Fire Hazard Severity Zones in the State Responsibility Area in Lassen County* adopted by CAL FIRE on November 7, 2007, the Project site is located in a Moderate Fire Hazard Severity Zone.

According to the *Lassen County General Plan* Safety Element, the entire county is prone to fire, either man-made or natural. Location, accessibility, local climatic conditions, topography, and vegetation type are among the factors associated with the intensity of a fire. Among the factors which can induce fire hazard potential to human safety and the environment is the degree to which fire hazard reduction measures are practiced in an area and, should a fire occur, the response time and effectiveness of the fire suppression activities. All of the populated areas of Lassen County are in high fire hazard areas of either/or timber, brush, and/or grasslands, and all of these areas are especially vulnerable during peak dry seasons (Lassen, 2020).

Topography in the vicinity of the expansion area slopes from east to west with gentle to moderate slopes. Elevations within the proposed quarry expansion area range from about 4,200 feet above mean sea level (msl) to 4,540 feet above msl. Prior to mining activities, the currently operating site was characterized by a small knob rising approximately 200 feet from the current base of

operations. The pit floor in the currently operating mine site is now flat with a less than 4 percent slope.

Areas disturbed by previous mining and processing are considered barren. The remaining areas surrounding the existing quarry consist mainly of shrub steppe communities with interspersed areas of annual grassland.

4.15.2 Regulatory Setting

The following is a description of State and local environmental laws and policies that are relevant to the CEQA review process for the proposed expansion area.

State

California Department of Forestry and Fire Protection
CAL FIRE protects the people of California from fires, responds to emergencies, and protects and enhances forest, range, and watershed values providing social, economic, and environmental benefits to rural and urban citizens. The Office of the State Fire Marshal supports CAL FIRE's mission by focusing on fire prevention. It provides support through a wide variety of fire safety responsibilities including by regulating buildings in which people live, congregate, or are confined; by controlling substances and products which may, in and of themselves, or by their misuse, cause injuries, death, and destruction by fire; by providing statewide direction for fire prevention in wildland areas; by regulating hazardous liquid pipelines; by reviewing regulations and building standards; and by providing training and education in fire protection methods and responsibilities.

California Fire Code
The California Fire Code (CFC) is contained within Title 24, Chapter 9 of the California Code of Regulations. Based on the International Fire Code, the CFC is created by the California Buildings Standards Commission and regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. Similar to the International Fire Code, the CFC and CBC use a hazards classification system to determine the appropriate measures to incorporate to protect life and property.

California Public Resources Code
California Public Resources Code Sections 4290 and 4291 are discussed in further detail as follows:

- *Public Resources Code Section 4290*. Requires minimum fire safety standards related to defensible space that are applicable to SRA lands and lands classified and designated as VHFHSZs.

- *Public Resources Code Section 4291*. Requires a reduction of fire hazards around buildings, which requires 100 feet of vegetation management around all buildings and is the primary mechanism for conducting fire prevention activities on private property within Cal Fire jurisdiction.

Fire Hazard Severity Zoning
CAL FIRE mapped Fire Hazard Severity Zones (FHSZ) in Lassen County based on fuel loading, slope, fire weather, and other relevant factors as directed by California Public Resources Code

Sections 4201–4204 and Government Code Sections 51175–51189. FHSZs are ranked from moderate to very high and are categorized for fire protection within a Federal Responsibility Area (FRA), State Responsibility Area (SRA), or Local Responsibility Area (LRA) under the jurisdiction of a federal agency, CAL FIRE, or local agency, respectively. As noted above the Project site is located within a Moderate FHSZ.

California Strategic Fire Plan

The *California Strategic Fire Plan* (2018) reflects the State's focus on (1) fire prevention and suppression activities to protect lives, property, and ecosystem services, and (2) natural resource management to maintain the state's forests as a resilient carbon sink to meet California's climate change goals and to serve as important habitat for adaptation and mitigation. The *California Strategic Fire Plan* provides a vision for a natural environment that is more fire resilient; buildings and infrastructure that are more fire resistant; and a society that is more aware of and responsive to the benefits and threats of wildland fire; all achieved through local, State, federal, tribal, and private partnerships. Plan goals include the following:

- Identify and evaluate wildland fire hazards and recognize life, property, and natural resource assets at risk, including watershed, habitat, social and other values of functioning ecosystems. Facilitate the collaborative development and sharing of all analyses and data collection across all ownerships for consistency in type and kind.
- Promote and support local land use planning processes as they relate to: (a) protection of life, property, and natural resources from risks associated with wildland fire, and (b) individual landowner objectives and responsibilities.
- Support and participate in the collaborative development and implementation of local, county, and regional plans that address fire protection and landowner objectives.
- Increase fire prevention awareness, knowledge and actions implemented by individuals and communities to reduce human loss, property damage and impacts to natural resources from wildland fires.
- Integrate fire and fuels management practices with landowner/land manager priorities across jurisdictions.
- Determine the level of resources necessary to effectively identify, plan and implement fire prevention using adaptive management strategies.
- Determine the level of fire suppression resources necessary to protect the values and assets at risk identified during planning processes.
- Implement post-fire assessments and programs for the protection of life, property, and natural resource recovery.

California Emergency Services Act

The California Emergency Services Act was adopted to establish the State's roles and responsibilities during human caused or natural emergencies that result in conditions of disaster and/or extreme peril to life, property, or resources of the State. This act is intended to protect health and safety by preserving the lives and property of the people of the state.

California Natural Disaster Assistance Act

The California Natural Disaster Assistance Act provides financial aid to local agencies to assist in the permanent restoration of public real property, other than facilities used solely for recreational purposes, when such real property has been damaged or destroyed by a natural disaster. The

California Natural Disaster Assistance Act is activated after a local declaration of emergency and the California Emergency Management Agency gives concurrence with the local declaration, or after the governor issues a proclamation of a state emergency. Once the act is activated, the local government is eligible for certain types of assistance, depending on the specific declaration or proclamation issued.

California Building Code
Chapter 7A of the California Building Code (CBC) applies to building materials, systems and/or assemblies used in the exterior design and construction of new buildings located within a WUI Fire Area. The purpose of this chapter is to establish minimum standards for the protection of life and property by increasing the ability of a building located in any FHSZ within SRAs or any WUI Fire Area to resist the intrusion of flames or burning embers projected by a vegetation fire, and to contribute to a systematic reduction in conflagration losses. New buildings located in such areas shall comply with the ignition-resistant construction standards outlined in CBC Chapter 7A.

Senate Bill 1241
Senate Bill 1241 (Kehoe, 2012) required the Office of Planning and Research, the Natural Resources Agency, and CAL FIRE to develop "amendments to the initial study checklist of the [CEQA Guidelines] for the inclusion of questions related to fire hazard impacts for projects located on lands classified as state responsibility areas, as defined in section 4102, and on lands classified as very high fire hazard severity zones, as defined in subdivision (i) of section 51177 of the Government Code." (Pub. Resources Code, §21083.01 (emphasis added).) The Agency added several questions addressing this issue. Notably, while SB 1241 required the questions to address specific locations, it did not necessarily limit the analysis to those locations, and so the Agency posed the questions for projects located within "or near" those zones. Lead agencies will be best placed to determine precisely where such analysis is needed outside of the specified zones. (California Natural Resources Agency, 2018).

Local

Lassen County General Plan
The Safety Element of the *Lassen County General Plan* Amended June 16, 2020, contains the following implementation measures pertaining to fire hazards.

- Implement a study to locate and identify areas of existing and potential fire, geologic, and health hazards.
- Require all structures and developments to strictly adhere to Public Resource Code 4291.
- Subdivision and minor land division ordinances should require that roads constructed be of sufficient width and that there would be multiple ingress and egress options for evacuation routes.
- Population centers should be encouraged to improve or install water systems with adequate storage capacities.
- Communities should be protected by fuel breaks together with fire suppression equipment backed up with an adequate water supply.
- For the purpose of faster response time of fire suppression equipment, all major and minor roads should have signs identifying their names.

Standish-Litchfield Area Plan
The *Standish-Litchfield Area Plan* contains the following implementation measures related to fire protection:

- The Building Department staff should work with the California Department of Forestry to establish and adopt specific fire safety standards for new construction.
- The latest fire hazard maps prepared by the California Department of Forestry should be kept on file by the Planning Department. The maps should be made available to the public upon request.
- The planning staff should incorporate fire hazard information and Fire Protection Master Plan policies in reports involving general plan amendments, zone changes, use permits and subdivisions.
- The County should encourage coordination and cooperation of all firefighting agencies in the Planning Area.
- If the Standish-Litchfield Fire Protection District finds it necessary to generate additional revenues for fire protection services in the Standish-Litchfield Fire Protection District, a funding mechanism for new development, through development fees, should be considered by the Fire Protection District Board of Directors and Lassen County Board of Supervisors and should be adopted by Lassen County.

4.15.3 Previous CEQA Reviews

The 2019 EIR did not contain separate analyses of the current operation for Wildfire impacts as this resource was not required at the time the previous EIR was prepared. A brief analysis of the wildfire risk of existing operations at the Project site was included in the *Hazards and Hazardous Materials* section of the 2019 EIR. The current mining operation was determined to have a less than significant impact related to the exposure of people or structures to a significant risk of loss involving wildland fires.

4.15.4 Thresholds of Significance

In accordance with CEQA Guidelines, the effects of a project are evaluated to determine whether they would result in a significant adverse impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria used to determine the significance of impacts may vary depending on the nature of the project. The following significance thresholds related to *Wildfire* have been derived from Appendix G of the CEQA Guidelines:

- *Substantially impair an adopted emergency response plan or emergency evacuation plan.*

- *Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of wildfire.*

- *Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.*

- *Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slop instability, or drainage changes.*

4.15.5 Impact Analysis

The following includes an analysis of environmental parameters related to *Wildfire* based on Appendix G of the CEQA Guidelines. The discussion not only includes the areas for which there is potential for environmental impacts but also provides justification for the conclusions that either no impacts, less than significant impacts, or less than significant impacts with mitigation could occur. The CEQA Checklist question, discussion, and environmental significance conclusions are provided below under each individual environmental parameter related to *Wildfire*.

Project Impacts

Impact 4.15-1 The Project could Substantially Impair an Adopted Emergency Response Plan or Emergency Evacuation Plan.

An emergency plan describes a comprehensive emergency management system that provides for the planned response to disaster situations associated with natural disasters, technological incidents, terrorism, and nuclear related incidents. Lassen County and the City of Susanville use the *Emergency Operations Plan* (March 2019) to respond to major emergencies and disasters. The *Emergency Operations Plan* identifies a broad range of potential hazards and a response plan for each. The Lassen County Sheriff's Department, CHP, and other cooperating law enforcement agencies have primary responsibility for evacuations. These agencies work with the County Office of Emergency Services, and with responding fire department personnel who assess fire behavior and spread, which ultimately influence evacuation decisions. As of this time CAL FIRE, Lassen County Office of Emergency Services, Lassen County Sheriff's Department, and others have not adopted a comprehensive emergency evacuation plan applicable to this area.

All evacuations in the County follow pre-planned procedures to determine the best plan for the type of emergency. The designated County emergency evacuation and law enforcement coordinator is the sheriff. The evacuation coordinator is assisted by other law enforcement and support agencies in emergency events. Law enforcement agencies, highway/street departments, and public and private transportation providers would conduct evacuation operations. Activities would include law enforcement traffic control, barricades, signal control, and intersection monitoring downstream of the evacuation area, all with the objective of avoiding or minimizing potential backups and evacuation delays.

Another factor in the evacuation process would be a managed and phased evacuation declaration. Evacuating in phases, based on vulnerability, location, or other factors, enables subsequent traffic surges on major roadway to be minimized over a longer time frame and can be planned to result in traffic levels that flow more efficiently than when mass evacuations include large evacuation areas simultaneously. Law enforcement personnel and Lassen County Office of Emergency Services staff would be responsible for ensuring that evacuations are phased appropriately, taking into consideration the vulnerability of communities when making decisions.

The existing quarry is at the end of a private access road off of Ward Lake Road. The expansion area will be accessed from the current mining operation. The proposed Project does not include an increase in peak traffic volumes generated by the existing operation. As a result, the proposed quarry expansion will not interfere with the implementation of or physically interfere with an adopted emergency response or evacuation plan. Impacts are considered less than significant in this regard.

Impact 4.15-2: Due to Slope, Prevailing Winds, and Other Factors, the Project could Exacerbate Wildfire Risks, and thereby Expose Project Occupants to Pollutant Concentrations from a Wildfire or the Uncontrolled Spread of Wildfire.

The proposed quarry expansion does not include residential developments or permanent occupied structures. Residences in the Project vicinity are located downslope of the expansion area, and on agricultural parcels surrounded by fields. There are no residences or occupied land uses upslope of the Project site which is comprised of undeveloped agricultural and open space (public lands). The proposed expansion area, including areas surrounding the site are located in a Moderate FHSZ.

Wildfire factors such as slope and vegetation will change as mining progresses and areas of the site are reclaimed. Prior to material extraction, vegetation is removed creating barren areas during active mining. After completion of mining activities, the site will be reclaimed and revegetated.

Mining has resulted in changes in onsite topography, creating a steeper slope along the eastern boundary of the mining area and flat areas on the pit floor where plant equipment is currently operated. The risk of potential ignitions resulting from mining activities onsite would be considered very low for the existing cleared areas of the site with non-combustible land cover (mine production areas, rock crushing/screening plant, washing operations, ponds). The proposed Project will continue to maintain onsite fire suppression apparatus (i.e., water trucks and fire extinguishers) to assist in a fire-related response should an incident occur onsite.

Mining activities in the expansion area will result in an increase in slopes in the eastern portion of the expansion area as mining progresses. Proposed mine faces will be shaped to have a 50-foot highwall and 12-foot benches at a 1:1 slope and more gradual on the pit floor. These steeper slopes along the eastern boundary of the expansion area could potentially result in more rapid burn upslope if wildfire were to occur onsite after reclamation. However, the proposed Project is subject to Mine Safety and Health Administration (MSHA) requirements related to the implementation of Fire Prevention and Control standards (30 CFR Part 36). These measures are implemented onsite at the existing quarry and will be required in the expansion area as well. With the continued presence of onsite fire suppression equipment and continued implementation of MSHA standards impacts would be less than significant.

Impact 4.15-3: Require the Installation or Maintenance of Associated Infrastructure (Such as Roads, Fuel Breaks, Emergency Water Sources, Power Lines or Other Utilities that may Exacerbate Fire Risk or That May Result in Temporary or Ongoing Impacts to the Environment.

The existing mining operation is developed with the required infrastructure to support the proposed quarry expansion. The proposed quarry expansion will not require installation of fire breaks or additional water sources, power lines, or other utilities; however, will include

construction of internal roads within the expansion area for mining and material hauling. The internal roads are not anticipated to exacerbate fire risk at the site since vegetation will be removed prior to road construction and use. As a result, implementation of the proposed quarry expansion would not include the construction of any infrastructure that may exacerbate fire risk or result in temporary or ongoing impacts to the environment. Impacts are considered less than significant in this regard.

Impact 4.15-4: Expose People or Structures to Significant Risks, Including Downslope or Downstream Flooding or Landslides, as a Result of Runoff, Post-Fire Slope Instability, or Drainage Changes.

Development of the proposed Project would not significantly alter existing onsite drainage patterns or impervious services compared to existing conditions. As described in Section 4.11, *Hydrology and Water Quality*, the proposed Project contains several permitted settling basins near the north end of the existing mining area which drain into intermittent channels. The quarry site is made up of mostly fractured and weathered rock; therefore, the site is pervious and a majority of stormwater infiltrates. The flows within the existing mine area are contained and slowed by berms and benches and ultimately directed into settling basins.

The current mining operation does not discharge stormwater. A Notice of Non-Applicability (NONA) for the *General Permit for Storm Water Discharges Associated with Industrial Activities* (NPDES No. CAS000001) was submitted for the current mining operation in 2015. Standard soil erosion control protocols are currently practiced throughout the site include the use of berms, water bars, or rolling dips, rock check dams on roadway ditches, diverting run-on away from stockpile areas, installing stabilizers as necessary (silt fence, wattles, etc.), and directing runoff within quarry to detention ponds. The proposed Project will continue to implement Best Management Practices (BMPs) to reduce impacts to storm water quality. In addition, during the mine's operational history there have been no significance surface failures. Therefore, the proposed Project does not pose a significant risk of landslides.

Considering these project site features and characteristics, potential future post-fire conditions are not expected to increase risks associated with runoff and erosion. Considering the project site's phased reclamation and implementation of erosion control BMPs, potential impacts associated with runoff, post-fire slope instability, or drainage changes are considered less than significant.

4.15.6 Mitigation Measures

No mitigation measures are required.

4.15.7 Level of Significant after Mitigation

No mitigation measures are required. Impacts would be less than significant.

5.0 OTHER CEQA CONSIDERATIONS

CEQA Guidelines §15126 requires that all phases of a project must be considered when evaluating the impact on the environment: planning, acquisition, development, and operation. The growth-inducing impacts, significant and unavoidable adverse impacts, and significant irreversible environmental changes of the proposed Project are discussed in this section. Cumulative impacts are also discussed in this section as required by CEQA Guidelines §15130. Significant environmental effects and the mitigation measures proposed to minimize the significant effects are summarized in Chapter 2, *Executive Summary*, of the DSEIR.

5.1 Environmental Impacts Found to Have No Impact

Section 15128 of the CEQA Guidelines requires that an EIR "contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR." Comments received during scoping have been considered in the process of identifying issue areas that should receive attention in the DSEIR. The contents of this DSEIR were also partially established based on the findings of three previous EIRs (May 1981 EIR [SCH No. 80062304]; 1997 EIR [SCH No. 1994051008]; and 2019 SEIR [SCH No. 2018022056]), including agency input received during the scoping process. Issues that were found to have no impact during the County's scoping process include the following:

- *Mineral Resources.* California's Surface Mining and Reclamation Act of 1975 (SMARA) requires the State Geologist to classify land into mineral resource zones based on the known or inferred mineral resource potential of that land. The primary goal is to ensure that important mineral resources do not become inaccessible due to uniformed land-use decisions. To this end, the California Geological Survey performs objective mineral land classification (MLC) to assist in the protection and wise development of California's mineral resources (DOC, 2019). A search of the SMARA *Mineral Lands Classification* data portal did not show any MLC related studies or maps for Lassen County or the proposed quarry expansion. There are no designated mineral deposits of regional or statewide importance within the proposed quarry expansion.

  The State of California has not designated an area of statewide or regional mineral resource significance within the proposed quarry expansion. In addition, the proposed quarry expansion is not delineated in the *Lassen County General Plan* or *Standish-Litchfield Area Plan* as a locally important mineral resource. As a result, implementation of the proposed Project will not result in the loss of availability of a mineral resource of value to the region or residents of the state or delineated locally important mineral resource. Therefore, the proposed Project will have no impact to mineral resources.

- *Population and Housing.* No new development or infrastructure is proposed as part of the quarry expansion and no additional employees are anticipated. In addition, no existing housing or people will be displaced by the proposed Project. Therefore, implementation of the proposed Project will have no impact to population and housing.

- *Public Services.* The proposed Project includes expansion of an existing mining operation. As a result, Project implementation will not increase the local population that, in turn, would require new or physically altered schools, parks, or other public facilities. Additionally, the proposed Project will not result in an impact to service ratios, response time or other performance objectives for fire or police protection which would require the construction of new or physically altered governmental facilities. Therefore, implementation of the proposed Project will have no impact to public services.

- *Utilities and Service Systems.* Implementation of proposed Project will not require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities that would result in significant environmental effects. The proposed quarry expansion will utilize the same utilities and services as the current mining operation. Additionally, the proposed Project does not include any changes that will affect solid waste at the site. Water used for dust suppression will be provided by an existing well. As discussed in Section 4.11, *Hydrology and Water Quality*, the proposed Project will not create a demand for water in excess of available groundwater supplies. Therefore, implementation of the proposed Project will not result in impacts related to utilities or service systems.

- *Recreation.* The proposed quarry expansion does not include recreational facilities and would have no foreseeable impact on existing recreational facilities; neither will the proposed Project increase the need for recreational services, as no additional employees are proposed. Therefore, implementation of the proposed Project will have no impact to recreational resources within the County.

5.2 Environmental Impacts Found to be Less Than Significant

After further study and environmental review in this DSEIR, direct and indirect impacts of the proposed Project would be less than significant or could be reduced to less than significant levels with mitigation measures for the following issue areas:

The following subject areas have been identified as having a less than significant impact:

- Aesthetics and Visual Resources (Section 4.2)
- Agriculture and Forestry Resources (Section 4.3)
- Energy (Section 4.7)
- Greenhouse Gas Emissions (Section 4.9)
- Hazards and Hazardous Materials (Section 4.10)
- Hydrology and Water Quality (Section 4.11)
- Transportation (Section 4.14)
- Wildfire (Section 4.15)

The proposed Project would result in less than significant impacts with incorporation of mitigation measures on the following subject areas:

- Air Quality (Section 4.4)

- Biological Resources (Section 4.5)
- Cultural and Tribal Cultural Resources (Section 4.6)
- Geology and Soils (Section 4.8)
- Land Use and Planning (Section 4.12)
- Noise (Section 4.13)

5.1 Growth-Inducing Impacts

Sections 15126(d) and 15126.2(d) of the CEQA Guidelines require that an EIR analyze growth inducing impacts and state that an EIR should discuss the ways in which the project could foster economic or population growth or construction of additional housing, either directly or indirectly, in the surrounding environment. CEQA Guidelines require an EIR to "discuss the ways" a project could be growth inducing and to "discuss the characteristics of some projects that may encourage…activities that could significantly affect the environment." However, the CEQA Guidelines do not require that an EIR predict (or speculate) specifically where such growth would occur, in what form it would occur, or when it would occur. The answers to such questions require speculation, which CEQA discourages; refer to CEQA Guidelines §15145.

It should be noted that growth inducing effects are not to be construed as necessarily beneficial, detrimental, or of little significance to the environment (CEQA Guidelines, §15126.2[d]). This issue is presented to provide additional information on ways in which the proposed project could contribute to significant changes in the environment beyond the direct consequences of developing the proposed land uses as described in earlier sections of this DSEIR.

The proposed Project will not result in any direct growth-inducing impacts as it entails a 76.8-acre mine expansion and an increase in annual production that will allow extension of the mining operation for an additional 20 years (until the year 2050). The proposed quarry expansion does not involve the construction of any new housing. In addition, the proposed Project will not create a substantial new permanent employment opportunity that will encourage people to move to the area for employment or result in the construction or extension of infrastructure to areas not previously served. Following completion of mining activities, the entire mine footprint will be reclaimed to open space and wildlife habitat. For these reasons, the proposed Project will not result in substantial growth inducement.

5.2 Significant and Unavoidable Adverse Impacts

Section 15126(b) of the CEQA Guidelines requires an EIR to discuss the significant impacts of a project that cannot be reduced to a less than significant level. These impacts are referred to as significant and unavoidable impacts of the project.

In Sections 4.2 through 4.15 of this DSEIR, the issue areas were analyzed to determine whether project implementation would result in a significant adverse environmental impact. Refer to those discussions for further details and analysis of the significant and unavoidable impacts identified below. Should the Lassen County approve the proposed Project, the County shall be required to cite its findings in accordance with CEQA Guidelines §15091 and prepare a Statement of Overriding Considerations in accordance with CEQA Guidelines §15093. The following impacts described below will remain significant and unavoidable after mitigation.

- *Biological Resources*. Expansion of the mining area by an additional 78.6 acres will increase the area over which light and noise impacts will occur causing additional displacement of mule deer and American pronghorn from noise and human activity. As discussed in the 1997 Deer Impact Analysis, human activity in the Project area would displace animals escaping mid-winter snow as well as taking advantage of late-winter and early spring plant phonology or the spring green-up due to noise and activity at the site. The proposed Project will result in these impacts occurring over a larger area than the current mining operation and for a longer duration (until 2050).

  The proposed Project will continue to comply with the conditions of approval for Use Permit Amendment No. 2018-003 limiting mining activities from January 1st to March 31st each year, limiting activities occurring during nighttime hours, as well as requiring lighting to be downward facing and fully-shielded. These operating conditions will decrease the lighting and noise impacts within the expansion area. However, as discussed in previous CEQA review for Use Permit Amendment No. 2018-003, a seasonal closure from at least December through March was determined to be necessary to reduce the impacts due to displacement from noise and human activity to a less than significant level. The proposed Project will result in additional disturbance to pronghorn and mule deer. Human disturbance during a time of particular nutritional stress may effectively remove a portion of their winter range (Kucera, 1996). Because several hundred deer would potentially be affected and impacts will last for an additional 30 years (until 2050), this would be a significant environmental impact.

  Adherence to Mitigation Measure 4.5-9 and Mitigation Measure 4.5-10 contained in Section 4.5, *Biological Resources* for the current operation will reduce displacement impacts to American pronghorn and mule deer; however, this impact will remain significant and unavoidable.

  No additional mitigation measures are available for this impact. This is considered significant and unavoidable. An increased closure season of all operations onsite was determined to be economically infeasible. In 1997, the Lassen County Planning Commission recommended that the Lassen County Board of Supervisors amend the season of restricted operations due to economic infeasibility of a four-month closure. Economic losses said to potentially result from the four-month annual closure would impact the mine as well as the surrounding community; a disruption of mining operations would lead to a loss of employee payroll, place a higher demand on social services in the community, and reduce availability of mined materials in the surrounding area. An increased closure season of all operations onsite has been determined to be economically infeasible.

5.3 Significant Irreversible Environmental Changes

Section 15126.2(c) of the CEQA Guidelines requires that an EIR discuss the significant irreversible environmental changes that would occur with implementation of a project and that cannot be avoided. An irreversible impact is an impact that uses nonrenewable resources during the initial and continued phases of a project. Irreversible impacts may also result from damage caused by environmental accidents associated with a project. Irretrievable commitments of resources are also required to be evaluated, in order to ensure that such consumption is justified.

Determining whether the proposed Project would result in significant irreversible impacts requires a determination of whether key resources would be degraded or destroyed with little possibility of restoration.

Implementation of the proposed Project would result in the irreversible and irretrievable commitment of nonrenewable resources including water, oil, diesel, gasoline, and other nonrenewable resources and would extract existing nonrenewable aggregate resources.

Regarding aggregate resources on the Project site, as a result of productive use the proposed quarry expansion would result in the utilization, not loss, of known mineral resources of value to the region through the extraction and sale of the aggregate resources onsite. The continued use of the mineral resources extracted as part of the proposed expansion would make available the raw materials for projects that would be of value to the region and residents of the State for the next 20 years. Because the proposed Project would continue to produce and make these mineral resources available for beneficial use within Lassen County and residents of the State for up to 20 years, this commitment is not considered adverse. In addition, the commitment of fuel for increased Project-related truck trips and extended use of equipment over this time will not commit future generations to similar uses. Mining operations at the site will cease at the end of the mine life in 2050, truck hauling will cease, equipment will be removed from the site, and reclamation will be completed.

Mine reclamation is required by the California Surface Mining and Reclamation Act (SMARA). SMARA requires mines to be reclaimed to a usable condition that is readily adaptable for a productive alternative land use. The reclaimed mine must also create no danger to public health or safety. A Reclamation Plan Amendment has been submitted as part of the application materials in compliance with SMARA regulations, and is attached as Appendix B.

The proposed revegetation plan, which is part of the Reclamation Plan Amendment, identifies the revegetation goals and actions necessary to meet the obligations outlined in SMARA. In summary, revegetation efforts would reestablish native plant habitats that currently occur within and/or adjacent to proposed areas of surface disturbance. A native plant/seed collection and propagation program would be initiated to provide plant materials for the revegetation work. Monitoring and performance standards are included to assess revegetation performance and success. Revegetation maintenance would continue until planted areas were revegetated and established consistent with proposed success criteria for each revegetation area. A test plot program is specified to determine the best methods and techniques to achieve the revegetation objectives. In summary, Project implementation would access and distribute a necessary resource to the region (aggregate materials), and would ultimately result in the reclamation of the majority of the proposed Project site to a naturalized condition. As such, the proposed Project would not result in a significant irreversible effect.

5.4 Cumulative Impacts

A cumulative impact is an effect on the environment which results from the incremental impact of the proposed Project when combined with the effects of other past, present, and reasonably foreseeable future projects. The significance of a cumulative impact may be greater than the significance of individual effects resulting from the individual actions. This section evaluates the

reasonably foreseeable potential effects of other existing activities in the area (including other planned projects) when added to the impacts of the proposed Project.

Criteria for evaluating the significance of adverse effects are also applicable to cumulative impacts. The timing and duration of each activity is an important consideration for evaluating the potential cumulative effects of activities that occur only for a limited period. In those cases, a cumulative effect may occur only when two or more of the activities are occurring simultaneously.

The CEQA Guidelines provide that "Cumulative impacts shall be discussed when they are significant," and that "the discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence..." (Section 15130[a] and [b]). This section considers the likelihood of such impacts and evaluates any significant effects. These effects, where they occur, are then evaluated for their impact in combination with other activities in the area for cumulative impact.

5.4.1 Other Projects in the Area

There are currently no known projects in the immediate Project vicinity aside from previously approved permits for the existing operation of Ward Lake Quarry. The following planned projects within Lassen County were identified from Lassen County agendas, packets, and announcements for upcoming meetings of the Planning Commission, Technical Advisory Committee, and Architectural Review Committee as well as Lassen County CEQA noticing. Items listed include those from meetings occurring April 2021 or later. Re-zoning and lot line adjustments are not included below.

- *Initial Study No. 2020-003, Use Permit Minor Amendment No. 2020-002, Reclamation Plan No. 2020-001.* Proposal for a Minor Amendment to the vested Hwy 36/Devil's Corral Mine (Resolution No. 05-01- 10) and Reclamation Plan for a 9.2-acre construction aggregate surface mine. If approved, the minor amendment would allow for mining on an existing 5.29-acre vested mine in addition to a 3.91-acre spill-over portion not included in the vested right to mine Monday through Friday 6 a.m. to 4 p.m. The applicant estimates that there is approximately 300,000 cubic yards of material (construction aggregates) to be mined. The proposed end date of the mine is 2050, however, said material could be exhausted within less than ten years from the start of mining. Reclamation is proposed to initiate after mining is complete. The area to be reclaimed is approximately 9.2 acres. The proposed use after mining is timberland and/or open space.

- *Use Permit No. 2021-004 Santos.* Proposal to construct a second dwelling unit, under 1,400 square-feet in size.

- *Parcel Map No. 2021-002 Miller.* Proposal to divide a 10-acre parcel into two parcels: Proposed Parcels 1 and 2 would each be 5 acres in size.

- *Parcel Map No. 2021-003 Ross/Stampfli.* Proposal to divide a 10-acre parcel into two parcels; the eastern and western proposed resultant parcels would each be 5 acres in size.

- *Use Permit No. 2021-002, Parcel Map No. 2021-001, Initial Study No. 2021-001, Gajj, Gondal.* Proposal to construct and operate a 30-space recreational vehicle park at Proposed Parcel A. To create the space needed for the RV park, the applicant proposes to relocate and expand an existing leach area. remove a separate existing leach area. and reroute the drainage easement existing on Parcels Band C. which were all approved through Parcel Map Application 1-01-90, recorded at Book 28, Pages 51 and 52 of the Official Records of Lassen County. CA. The applicant also proposes to reconfigure the property line common to both parcels; this will be accomplished through the parcel map application, although no additional parcels will be created (Parcels B and C will be reconfigured to create Proposed Parcels A and B). The subject parcels are zoned C-H (Highway Commercial District) and have a Commercial land use designation per the Hallelujah Junction Area Plan, 1984.

- *Use Permit No. 2020-003, Dowell.* Proposal to construct a 1,400 square-foot stick-built second dwelling unit, along with an attached 168 square-foot front porch. The subject parcel is zoned A-1 (General Agricultural District) and has either an "Intensive Agriculture" or "Extensive Agriculture" land use designation in the Lassen County General Plan, 2000. The proposed Project is exempt from the California Environmental Quality Act (CEQA) under Sections 15061(B)(3) and 15303 of the 2020 CEQA Guidelines. The subject parcel is located approximately 1.5 miles south of Nubieber at 548-343 Babcock Cinder Road, Nubieber, CA 96068.

- *UP No. 2020-007 Cunningham.* Proposal to relocate an existing "Ford" freestanding pole sign from the existing Susanville Ford Dealership to its approved expansion, the latter at 704-550 Richmond Road East, approximately three miles southeast of Susanville at the intersection of U.S. Highway 395 and California State Route 36. According to the applicant, the sign is 88 square feet in size.

- *Parcel Map No. 2019-001, Aboussleman, Stringer.* Proposal to divide a 111-acre parcel into four parcels: Proposed Parcel 1 would be 20.22 acres in size, Proposed Parcel 2 would be 21.11 acres in size, Proposed Parcel 3 would be 21.37 acres in size and Proposed Parcel 4 would be 48.08 acres in size.

- *UP No. 2020-006 J K Cunningham*. Proposal to place five signs at the approved Susanville Ford Dealership expansion at 704-550 Richmond Road East (across Richmond Road from the existing Susanville Ford dealership).

- *Use Permit No. 2020-005 Koch Living Trust.* Proposal to construct a 720-square-foot second dwelling unit. The project is located at 495-095 Highway 139, Susanville, CA 96130

- *Use Permit No. 2020-002 Long Valley Charter School, Fort Sage Unified School District*. Proposal to construct a 6,000-square-foot gymnasium/multipurpose building, three 1,152-square-foot modular buildings, a shop, a standalone restroom building, and a gravel parking lot to the rear of the property, to resurface and expand the existing paved parking lot, and to relocate the existing playground at the Long Valley Charter School site at 436-965 Susan Drive in Doyle, CA 96109.

- *Use Permit No. 2019-011 Woodcrest Real Estate Ventures*. The applicant is proposing to construct a 9,100-square-foot retail store off of Old Highway Road near Doyle. The project site includes two legal parcels. However, Technical Advisory Committee conditionally approved Merger *No.* 2019-008 on January 2, 2020, in order to merge the subject parcels. If this use permit is ultimately approved, the applicant will cause a Certificate of Merger to be recorded in the Official Records of Lassen County in order to finalize the merger.

- *Use Permit No. 2020-004, Hooper*. Proposal to construct a 50-megawatt photovoltaic solar array and a battery energy storage system (BESS) that would store 25 megawatts or 100 megawatt hours of electricity, along with related infrastructure. Such infrastructure would include a substation, a dead-end tower up to 90 feet tall, 24 130-foot tall steel gen-tie line poles to interconnect with the Plumas-Sierra Rural Electric 120-kV transmission line approximately 3 miles south of the project site, access roads, and perimeter fencing. The project has an approximate footprint of 278 acres, not including the proposed gen-tie lines. The subject parcels are located approximately nine miles northeast of Herlong off of Calneva Road, adjacent to the Nevada Border, and do not have addresses.

In addition, a search of the State Clearinghouse database was conducted for projects within Lassen County and the City of Susanville. Many of the projects in Lassen County include renewal of existing projects, scientific monitoring, or stream restoration projects. These projects are not listed unless located within a few miles of the Project site. Other projects include short term repair or construction projects. The additional projects within the County were identified from documents received by the State Clearinghouse since April 28, 2021:

- *AB 2551 Watershed Coordinator Grant - North East Subregion, Sierra Nevada Conservancy, 2021.* The Sierra Nevada Conservancy (SNC) would provide $95,000 in funding for watershed coordinator activities in Modoc and Lassen counties per Assembly Bill 2551. Grantee will conduct outreach, education, and training in forest health and fire safety. Grantee will also participate in collaborative planning with partners and stakeholders to identify new landscape forest health and wildfire resiliency projects and contribute to a collaborative demonstration project with public and private land managers.

- *Noise Element Update and Ordinance (File No. 700.01.03), Lassen County, 2021.* As required by Government Code Section 5302(f), the Lassen County Department of Planning and Building Services has prepared a draft update of the 1989 Noise Element. There have been no alterations, revisions, or updates to the Noise Element since it was adopted in 1989. Approaches to noise exposure management have occurred between 1989 and the present, and therefore the County proposes to Update the Noise Element in order to make it more accessible to the general public and to simplify and clarify the application of included policies by County staff. The County also proposes to establish a new chapter in the Lassen County Code that provides standards and regulations for noise management, that would be informally referenced as the "Noise Ordinance."

- *Hackstaff Bridges Project, California Regional Water Quality Control Board, Lahontan South Lake Tahoe Region 6 (RWQCB), 2021.* The replacement of two bridges in the same location they are currently located.

- *Seismic Monitoring Station, California Governor's Office of Emergency Services (OES), 2021.* This new station will contribute to the CA Earthquake Early Warning System (CEEWS) designed to potentially save thousands of lives during a large earthquake, prevent critical infrastructure damage and expedite recovery following a large earthquake. The network to which this sensor is connected will contribute real-time data to accurately record and warn people of strong shaking due to earthquakes in the region, and help provide records of ground motion that would be of immense scientific, engineering, and public safety value.

- *Thompson Peak Initiative Bootsole Forest & Watershed Restoration Project - SNC 1305, Sierra Nevada Conservancy.* The Sierra Nevada Conservancy would provide funding for hazardous fuels reduction treatments on the 4,233-acre project located on federal lands within the Plumas National Forest. Treatments would include ground-based mechanical thinning, hand thinning, hand piling, grapple piling, mastication, and prescribed burning of select conifers. The treatment goals are to reduce hazardous fuels and reduce risk to communities and the landscape from large and severe wildfires. Treatments would result in reduced stand density and would shift the species composition to a greater percentage of drought-tolerant, fire-resistant pine resulting in a landscape more resilient to wildfire, drought, and future climate conditions.

- *Poison Lake Curve Improvement - Seismic Survey, California Department of Transportation, District 2, 2021.* Caltrans is proposing a project to conduct survey adjacent to the roadway within the postmiles 6.5/7.1 in Lassen County on State Route 44. The survey consists of laying cable across the ground and attaching small geophones to the cable. The geophones record shock waves in the ground, which are used to determine the underlying soil layers. Shock waves are created by any combination of 3 methods: Striking a metal plate on the ground with a hammer, firing a blank shotgun shell in the bottom of a 24" deep hole that has been back filled and tamped. The purpose of the project is to gather information that will be utilized in a follow up curve improvement project.

- *Fish Advisory Signage, State Water Resources Control Board, Division of Financial Assistance, 2021.* The Project will administer a statewide program to assist Local Agencies in conspicuously posting health warnings in areas where contaminated fish or shellfish may be caught, including piers, jetties, lakes, reservoirs, & other areas where recreational/subsistence fishing is known to occur.

- *Slate Creek CIR, California Department of Transportation, District 2, 2021.* Using state funds, the California Department of Transportation (Caltrans) proposes an overlay project on SR 139 in Lassen county. The project is needed because the pavement has degraded to the point where maintenance is required to extend the service life. The purpose of the project is to preserve the roadway in a state where minimal maintenance is required, improve ride quality, and extend the service life of the existing pavement.

- *Clear Creek Fuelbreak 2021.* A vegetation fuel reduction project is being proposed on portions of Sierra Pacific Industries (SPI) properties in conjunction with CAL FIRE. The project is 315 acres, located approximately one mile west of the town of Westwood. The purpose of the proposed project is to maintain/establish a vegetation fuel reduction zone along or through portions of the landowner mentioned above.

- *Over Snow Vehicle Program-2020 Update*. The OHMVR Division previously certified an Environmental Impact Report (EIR) for the Over Snow Vehicle (OSV) Program, Program Years 2010-2020. OSV Program funds support motorized winter recreation via grooming snow trails on 26 designated trail systems in 11 national forests, maintenance of trailhead restrooms, and snow plowing access roads and parking areas. The OHMVR Division prepared an Addendum assessing the impacts of continuing Program funding after 2020. The Addendum did not find any new environmental impacts or identify the need for new mitigation.

- *2020 Digouts Service Contract*. In various counties and routes areas where the roadway has pavement in poor condition the project proposes to digout the area and replace with Hot Mix asphalt. This will be completed within the roadway prism to improve the surface until a more comprehensive project can be delivered.

- *Hackstaff Road Bridges Replacement Project*. Lassen County DPW will replace two existing Bridges on Hackstaff Road with similar structures in the same vicinity.

- *Long Valley Creek Crossing at Constantia Ranch*. The California Department of Fish and Wildlife has executed Lake and Streambed Alteration Agreement number EPIMS-LAS-13380-R1, pursuant to Section 1602 of the Fish and Game Code to SFT PROPERTY HOLDINGS I, LLC. The project is limited to reinforcement of a low water crossing across Long Valley Creek. Reinforcement will consist of installing a geogrid/nonwoven fabric combination across the road alignment to stabilize the roadway. Geogrid will be placed on top of 6-inches of base material. Ingress and egress will be keyed in with 12-inch diameter riprap material.

- *Townhill Brake Check*. Notice of Exemption for a proposed project to construct a mandatory brake check site adjacent to state route 36 in Lassen County at PM 22, two miles west of Susanville.

- *Acquire Land for Fort Sage and Rice Canyon OHV Areas*. Purchase 109.5 acres of privately owned parcels. The purpose of these purchases is to acquire private lands to sustain and manage current and future OHV use. Once the land is acquired OHV use will be managed under BLM regulations for OHV use. Currently OHV users trespass onto State and private lands to connect to BLM trails. Purchase of these parcels will solve trespass issues and will enhance the OHV area and allow for future development. This project does not include any development or ground disturbing activities. Additional environmental assessments with public scoping would take place prior to any development.

- *Encroachment Permit No. 0220-6UJ-0357 (Plumas-Sierra Rural Electric Cooperative's Elsyian Valley-Johnsonville Project*. The Plumas–Sierra Rural Electric Cooperative (PSREC) is proposing various improvements within Caltrans' right-of-way on Highway 395 in Lassen County at post mile 64. These improvements, which would provide broadband service to residents in the community of Lake Leavitt, include installation of buried fiberoptic and power cables along/under Highway 395, Installation of the buried fiber optic and power cables would be accomplished using horizontal directional drilling (HDD) and would require two bore pits, two three-inch risers, and two hand holes that would be placed flush

with the ground. The power and fiber optic cables would be installed between a depth of approximately 48" and 60" and would extend for approximately 300 lineal feet. The fiber optic and power cables would be encased in HDPE pipe that is 3" in diameter.

- *Bridge Maintenance in Lassen, Modoc, and Shasta Counties*. This project is needed as the 11 bridges in this project have experienced wear and damage as a result of traffic and the elements, thus shortening their expected life. The purpose of the project is to perform maintenance on these 11 bridges in order to extend their useful life.

- *Last Leg Cold in Place Recycling Project*. The California Department of Transportation (Caltrans), using state funds only, is proposing a Hot Mix Asphalt (HMA) pavement overlay project on State Route (SR) 139 in Lassen County from post mile (PM) 57.0 to 66.635 and on SR 139 in Modoc County from PM 0.0 to 0.12. The purpose of the project is to preserve the roadway in a state where minimal maintenance is required, improve ride quality, and extend the service life of the existing pavement. The project is needed because the pavement has degraded to a point where maintenance is required to extend its service life.

5.4.2 Cumulative Impact Analysis

The following resources were found to have no impact and are therefore excluded from the cumulative impacts evaluation:

- Population and Housing
- Mineral Resources
- Recreation
- Public Services
- Utilities and Service Systems

Aesthetics and Visual Resources

Aesthetic and visual resource impacts of the Project include mining activities in the previously undisturbed 78.6-acre expansion area. The geographic scope for cumulative visual resource impacts includes the viewsheds that will be affected by the proposed Project. These areas include the area from which mining operation in the expansion area are visible. The expansion area is visible from portions of Highway 395 and from approximately 55,000 acres to the west of the Project site. This geographic extent is appropriate as only those projects that can be viewed in the context of the proposed Project could contribute to cumulative visual effects.

Have a cumulative substantial adverse effect on a scenic vista?

As discussed in Section 4.2, *Aesthetics and Visual Resources*, the site is visible from Highway 395 for a total of up to 2 miles. Highway 395 is not a scenic highway. The site does not obstruct, interrupt, or detract from a valued focal point or panoramic vista, trail, or recreation area. Implementation of the proposed project have no impact to a scenic vista. Therefore, the proposed Project will not contribute to a cumulative impact to a scenic vista.

Substantially damage scenic resources including trees, rock outcroppings, and historic buildings within a state scenic highway?

The proposed Project is not located in an area that is designated as scenic highway. The proposed quarry expansion is visible from portions of Highway 395 for a distance of approximately 2 miles; however, Highway 395 is not a designated scenic highway. Additionally, the proposed project does not impact a designated landmark, historic resource, trees, or rock outcroppings of valued visual character. The proposed Project will not result in impacts to scenic resources within a state scenic highway; therefore, the impacts of the proposed Project are not cumulatively considerable.

Substantially degrade the existing visual character or quality of the site and its surroundings?

The towns of Litchfield and Standish are shielded from the mine by topographic features. The visual analysis determined that the proposed quarry expansion would result in impacts to lands to the west of the site. The majority of the parcels affected are large-tract agricultural properties. Project impacts are cumulatively considerable when combined with the impacts of the existing operation as well as the mine located on Bureau of Land Management (BLM) land to the south of the Project site. The proposed expansion area and current mining activities are visible from approximately the same areas. The expansion of the existing facility will be consistent with the existing visual character of the adjacent existing mining operation. As mining activities are completed areas will be reclaimed in both the existing and proposed mining areas. Implementation of the proposed Project will result in a less than significant cumulative impact to the existing character and quality of the site and surroundings.

Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

The proposed Project will not create a substantial new source of light or glare. The quarry expansion will not result in an incremental impact related to light or glare and will not contribute to a cumulative impact related to light or glare which would adversely affect day or nighttime views in the area. Therefore, impacts related to light and glare are not cumulatively considerable.

Agriculture and Forestry Resources

Agriculture and forestry impacts of the proposed Project are cumulatively considerable in combination with other project impacts to agriculture or forest resources within Lassen County. The geographic scope for cumulative agriculture and forestry resource impacts in this analysis includes the entire County.

Conflict with existing zoning for agricultural use or a Williamson Act contract?

The site is not covered by a Williamson Act contract. The *Lassen County General Plan* allows for mining in areas designated as Extensive Agriculture. The proposed Project will not contribute to a cumulative impact related to the conflict with existing zoning for agricultural use or a Williamson Act contract. Therefore, impacts related to conflicts with existing zoning or agricultural use, or a Williamson Act contract are not cumulatively considerable.

Conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production or result in the loss of forest land or conversion of forest land to non-forest use?

The Project area is not forested and not zoned for forestland, timberland, or timber production zone. The proposed quarry expansion will not impact forestland. Therefore, implementation of the proposed Project will not contribute to a cumulative impact to forestland.

Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The proposed quarry expansion area does not meet the definition of prime agricultural land included in California Government Code Section 51201. Impacts were determined to be less than significant at the project level. Therefore, implementation of the proposed Project will not contribute to a cumulative impact related to conversion of Farmland.

Involve other changes in the existing environment that, due to their location or nature, could result in conversion of farmland to nonagricultural use?

As discussed in Section 4.3, *Agriculture and Forestry Resources*, implementation of the proposed quarry expansion will result in the loss of approximately 78.6 acres of low capability grazing land. This impact is cumulatively considerable in combination with the footprint of the existing mining operation as well as other projects in the county resulting in the conversion of agricultural land to nonagricultural use.

As stated in the *Lassen County General Plan*, mines, the extraction of minerals, and the ancillary processing of mineral materials generated on site, including the production of asphalt, ready-mix concrete and similar products will typically be deemed to be consistent with the "Extensive" and "Intensive Agriculture" land use designations and will not requiring zoning to an industrial zoning district, nor will they be interpreted by the County to constitute an agricultural conversion pursuant to the *Lassen County General Plan*. Once mining is complete, the expansion area and current mining area will be reclaimed in accordance with the Reclamation Plan Amendment to open space and wildlife habitat and will be available for use as grazing. Implementation of the proposed Project would result in a cumulatively less than significant impact in this regard.

Air Quality

The geographic context for cumulative air quality impacts for the proposed Project includes the immediate area surrounding the Project site as well as the Northeast Plateau Air Basin. This represents the geographic limit for cumulative air quality since air emissions have a regional effect. Pollutant impacts are cumulatively considerable when considered with other projects in the air basin and impacts related to toxic air contaminants are cumulatively significant considered with any project requiring the combustion of diesel fuel in the immediate Project vicinity. Odors are cumulatively considerable in combination with other sources in the immediate Project vicinity.

Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard?

The Northeast Plateau Air Basin and Lassen County are currently in attainment or unclassified for all criteria pollutants. Therefore, the proposed Project will not contribute to a cumulatively considerable air quality impact regarding a pollutant for which the air basin is currently in non-attainment. Estimates of the air quality emissions generated by the proposed Project are included in Section 4.4, *Air Quality*. As noted in Section 4.3, the incremental daily emissions of ROG, CO, NO_x, PM_{10}, and $PM_{2.5}$ are less than the significance thresholds. The incremental annual emissions of ROG, CO, NO_x, PM_{10}, and $PM_{2.5}$ are less than the significance thresholds. The incremental change in emissions is solely related to the project elements associated with the aggregate plant and supporting activities (generator, unpaved travel, material handling, and blasting). The proposed Project is not expected to result in a violation of air quality standards. As required by Mitigation Measure 4.4-1 in Section 4.4, *Air Quality*, reasonable precautions will be taken to prevent particulate matter from becoming airborne. Additionally, implementation of the proposed Project will not contribute to a cumulative impact related to an air quality plan. With implementation of Mitigation Measure 4.4-1, Project operations would result in a cumulatively less than significant impact in this regard.

Expose sensitive receptors to substantial cumulative pollutant concentrations?

The only known current or future project within the vicinity of the proposed Project that could combine with the Project-related diesel particulate matter emissions to result in a cumulatively significant impact is a smaller aggregate mine located adjacent to and south of the site on BLM-administered land. The majority of any health impacts from mine operations are due to the operation of generators as haul truck emissions occur over the length of a haul route and are not near receptors for much duration. The adjacent mine does not have any concrete or asphalt plants or associated generators that would generate diesel particulate matter. Implementation of the proposed Project would result in a cumulatively less than significant impact in this regard.

Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Operation of the Project will result in fugitive dust and combustion emissions. The mine on BLM land adjacent to the Project site requires the use of heavy equipment and trucks that generate exhaust. There are no other additional sources of exhaust in the immediate Project vicinity.

The mining areas of the Ward Lake Quarry and the BLM mine where equipment is operated are more than 1,800 feet from the nearest receptors. Haul trucks will operate on the roadway within 100 feet of some receptors; however, trucks will not be near each receptor for much duration. In addition, the proposed Project does not include an increase in haul truck traffic. As discussed under Impact 4.4-4, odor emissions are highly dispersive, especially in areas with higher average wind speeds, with the primary wind direction from the west and south towards the project site.

A majority of the proposed Project operations would occur from April through October which is not typically the season associated with inversion conditions (i.e., occur during wintertime). Inversion conditions may also result in odor impacts due to air stagnation. Given that the proposed project would not operate during the months when inversion condition is more common, the likelihood of odor impacts due to the proposed project would be reduced.

Implementation of the proposed Project would result in a cumulatively less than significant impact in this regard.

Biological Resources

The geographic context for cumulative biological resource impacts is both regional and local. The geographic context for cumulative impacts includes the area immediately surrounding the Project site for direct habitat loss and displacement impacts due to human disturbance. The geographic context for cumulative impacts to pronghorn and mule deer includes the CDFW-designated critical winter-range habitat for mule deer and winter-range habitat for pronghorn antelope. As stated previously there are no known current or future projects identified in the vicinity of the Project by the County.

Have a substantial cumulative adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by DFG or U.S. Fish and Wildlife Service (USFWS)

Project impacts to special-status species are cumulatively considerable in combination with the existing mining operation at the Project site. The Ward Lake Quarry has been in operation since 1980 for rock, sand, and gravel removal and processing operations. The Project area is zoned as an upland conservation/resource management district by Lassen County, so this consistent disturbance is anticipated. These previous uses have changed the topography and vegetation of the site, thus changing available habitat within the Project area on an annual basis. The proposed quarry expansion would cause additional ground disturbance, but would enhance the brush communities, including sagebrush, bitterbrush, and rabbitbrush, on the site following conclusion of the Project and site reclamation. Both the expansion area and the existing mining area will be reclaimed. Many of the surrounding parcels are zoned as open space or upland conservation district, so reclamation of the site will create contiguous open space and wildlife habitat.

As discussed in Section 4.5, *Biological Resources*, the Project-level impacts to special-status species were determined to be less than significant with mitigation with implementation of Mitigation Measures 4.5-1 through 4.5-8. Mitigation measures include preservation of remaining habitat onsite to reserve remain wildlife habitat, avoidance of rare plant communities on the Project site, compensation of the loss of sensitive/rare plant communities, habitat enhancement, and bird nest avoidance. Coupled with the fact that there are no known current or future projects identified in the vicinity of the Project site by the County, cumulative impacts to special-status species would be less than significant in this regard.

Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

As discussed in Section 4.5, *Biological Resources*, impacts to mule deer and antelope include direct habitat loss and displacement from human disturbance. The temporary loss of 78.6 acres of habitat was determined to be less than significant at the Project-level. The loss of winter habitat resulting from the Project is cumulatively considerable in combination with the 160 acres of habitat loss from the current Ward Lake Quarry operation and additional direct habitat loss of mining activities on BLM property south of the Project site. The habitat disturbed by the existing operations and proposed expansion area will be restored in accordance with the Reclamation Plan

Amendment and habitat will be enhanced following the conclusion of mining; therefore, cumulative impacts related to direct antelope and mule deer habitat loss will be less than significant.

Displacement due to human disturbance of mule deer and antelope from important winter habitat was determined to be significant and unavoidable at the Project-level since displacement impacts occur over a larger area than direct habitat loss. This impact is cumulatively considerable in combination with the existing mining operation as well as the nearby BLM pit. The Project combined with the existing mining operations in the Project vicinity will result in a significant and unavoidable cumulative impact related to the displacement of mule deer and antelope from winter habitat.

Cultural and Tribal Cultural Resources

The geographic scope for cumulative impacts to cultural and tribal cultural resources includes past, present, and reasonably foreseeable projects as identified above in Subsection 5.4.1, *Other Projects in the Area*. This geographic limitation is appropriate as cultural resource impacts are generally localized, site specific and either individually impacted in a way that changes the significance of the resource or avoided.

The Project would cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to §15064.5?

As discussed in Section 4.6, *Cultural and Tribal Cultural Resources*, the proposed Project could result in a substantial adverse change to a potential cultural resource identified within the expansion area (ALTA_PRE-01) as well as result in the adverse change in the significant of currently undiscovered cultural or archeological resources at the Project site. Implementation of Mitigation Measure 4.6-1 and Mitigation Measure 4.6-2 would ensure that Project-level impacts are reduced to a less than significant level. Project impacts are cumulatively considerable with other projects in the region. Other projects within the region would also be expected to have mitigation measures that would reduce potential impacts on historical or archaeological resources, and would require compliance with CEQA and/or Section 106 to consider and resolve significant impacts on cultural resources. Therefore, with implementation of Mitigation Measure 4.6-1 and Mitigation Measure 4.6-2, Project impacts related to historical or archaeological resources would be cumulatively less than significant.

The Project would disturb human remains, including those interred outside of formal cemeteries?

Project-level impacts related to the disturbance of human remains are potentially significant since it is possible human remains could be encountered over the course of mining activities. Mitigation Measure 4.6-3 is included for to ensure that impacts related to the disturbance of human remains would be less than significant. Therefore, with implementation of Mitigation Measure 4.6-3, Project impacts related to the inadvertent discovery of human remains would be cumulatively less than significant.

The Project would cause a substantial adverse change in the significance of a tribal cultural resource?

No tribal cultural resources have been identified on the Project site through tribal consultation under AB 52; however, the cultural resource identified within the expansion area (ALTA_PRE-01) is potentially eligible for the CRHR and could be considered a tribal cultural resource. The Project could result in a substantial adverse change in the significance of this resource. The Project could also result in a substantial adverse change in the significance of currently undiscovered tribal cultural resources if encountered over the course of mining resulting in a significant impact. Mitigation Measures 4.6-1 and 4.6-2 included in the Section 4.6. *Cultural and Tribal Cultural Resources,* would ensure Project-level impacts are less than significant. Other projects in the region would also be expected to reduce potential impacts on tribal cultural resources through AB 52 consultation, avoidance, or mitigation. Therefore, with implementation of Mitigation Measure 4.6-1, Mitigation Measure 4.6-2, and Mitigation Measure 4.6-3, impacts to tribal cultural resources would be cumulatively less than significant.

Energy

The geographic context for cumulative impacts related to energy consumption is both local and regional. As such, for purposes of the proposed Project, the cumulative setting for energy use includes Lassen County and the incorporated City of Susanville. This geographic extent is appropriate as it represents the region where the majority of transportation fuel is consumed.

Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The extension of the mining activities onsite for a 20-year period will continue the use of diesel fuel for generators, off-road equipment, and material-hauling trucks. The energy demands of equipment will increase proportionately to the increased production of the mine. The proposed Project will not result in an increase in permitted daily or maximum haul traffic. As discussed in Section 4.7, *Energy*, the proposed Project will not result in any unusual characteristics that would result in excessive long-term operational fuel consumption. All new trucks must meet new emission control guidelines. The Hat Creek Construction fleet is in change-out period for trucks. In addition, Hat Creek will be making improvements to the mixes of asphalt to be more energy and resource efficient, such as using reclaimed asphalt pavement (RAP) in mixes. The extension of time is not anticipated to increase the use of fuel and energy in a wasteful manner. The energy requirements of the proposed Project will not have a negative impact on regional energy supplies and will not result in the need for any additional capacity. The proposed Project will have no impacts on peak and base period demand for electricity and other forms of energy.

The energy consumption impacts of the proposed Project are less than significant. The proposed Project is not anticipated to combine with other projects to create a significant impact on local and regional energy supplies resulting in a need of additional capacity. Impacts are considered cumulatively less than significant in this regard.

Conflict or obstruct a state or local plan for renewable energy or energy standards?

The proposed Project will not conflict or obstruct a state or local plan for renewable energy resources or energy standards. The proposed Project will not contribute to a cumulative impact related to conflict with a state or local plan for renewable energy or energy standards.

Geology and Soils

Development projects are analyzed on an individual basis and must comply with established requirements of Lassen County and the California Building Standards Code as they pertain to protection against known geologic hazards and potential geologic and soil-related impacts. Analysis of cumulative impacts related to geology and soils takes into consideration the projects identified above in Subsection 5.4.1, *Other Projects in the Area*. This geographic extent is appropriate as geology and soil-related impacts are generally site-specific and are determined by a particular site's soil characteristics, topography, and proposed land uses.

Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?
ii. Strong seismic ground shaking?
iii. Seismic-related ground failure, including liquefaction?
iv. Landslides?

The proposed Project will have a less than significant impact related to the exposure of people or structures to substantial adverse effects including risks of loss, injury, or death to the geologic hazards listed above. The proposed Project will not result in the creation of geologic hazards that will impact people or structures outside of the limits of the Project site. Project-level impacts were determined to be less than significant, are site specific, and will not contribute to a cumulative impact.

Result in substantial soil erosion or the loss of topsoil?

As discussed in the Section 4.8, *Geology and Soils,* the proposed quarry expansion has the potential to cause localized erosion through actions such as excavation, vegetation clearing and disturbing upland areas. Best management practices (BMPs) implemented at the project site and included in the Reclamation Plan Amendment will result in a less than significant project-level impact. In addition, stormwater runoff will not discharge from the site. The proposed Project will not contribute to a cumulative soil erosion or loss of topsoil impact.

Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?

The volcanic rock materials at the proposed Project site are not subject to liquefaction and the terrace deposits at the Project site are considered to have a low potential for liquefaction susceptibility or lateral spreading. Landslide hazards have not been identified onsite. As a result, Project-level impacts are considered less than significant. The materials of the current mining

operation adjacent to the proposed quarry expansion area are similar to that of the expansion area. Therefore, the proposed Project will not contribute to a cumulative impacts related to landslides, lateral spreading, subsidence, liquefaction, or collapse.

Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

The proposed quarry expansion area does not contain expansive soils as defined in Table 18-1 B under the Uniform Building Code of 1994. Since the Project site does not include expansive soils, the impacts of the proposed Project are not cumulatively considerable.

Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

The proposed quarry expansion does not include the use of any septic tanks or alternative wastewater disposal systems. Since the Project site does not include the use of septic tanks or alternative wastewater disposal systems, the impact of the proposed Project is not cumulatively considerable.

Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Project-level impacts to unknown paleontological resources could be significant without mitigation incorporated. The mitigation measure included in Section 4.8, *Geology and Soils*, to avoid and minimize impacts to paleontological resources reduces the Project-level impact to be less than significant. Similar mitigation measures are implemented in the existing mining area as well. Mitigation of impacts through data recovery and avoidance where preservation is infeasible would be required for all other projects as well. The implementation of the proposed Project with the incorporation of mitigation measures contained in in the DSEIR would reduce the potential cumulative impact of the proposed Project to a less than significant level. Implementation of the proposed Project would result in a cumulatively less than significant impact in this regard.

Greenhouse Gas Emissions

Generally, individual projects are insufficient by themselves to influence climate change or result in a substantial contribution to the global greenhouse gas GHG emissions inventory. GHG impacts are recognized as exclusively cumulative impacts. Emissions of GHGs have the potential to adversely affect the environment in a cumulative context. The emissions from a single project will not cause global climate change; however, GHG emissions from multiple projects throughout the world could result in a cumulative impact with respect to global climate change. The cumulative project list for this issue (climate change) comprises anthropogenic (i.e., human-made) GHG emissions sources across the globe, and no project alone would reasonably be expected to contribute to a noticeable incremental change to the global climate. However, legislation and executive orders on the subject of climate change in California have established a statewide context for developing an enforceable statewide cap on GHG emissions. Given the nature of environmental consequences from GHGs and global climate change, CEQA requires that lead agencies consider evaluating the cumulative impacts of GHGs, even relatively small (on a global basis) additions.

As a result, the extent of cumulative GHG emissions is defined as the Lassen County including the Northeast Plateau Air Basin as well as the State of California. Although GHG emissions have a global effect, this represents the geographic limit for cumulative GHG emissions since the focus of this analysis is compliance with State and regional GHG emission reduction targets.

Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The estimated annual incremental GHG emissions of the proposed Project would be approximately 61 metric tons of CO_2e, which is well below the significance threshold of 10,000 metric tons of CO_2e/year. Therefore, the proposed Project would have a less than significant impact to GHG emissions, directly or indirectly, on the environment. The incremental impacts of the proposed quarry expansion are less than significant and will not result in a significant cumulative impact.

Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Neither Lassen County APCD nor Lassen County have currently adopted a region-specific plan for reducing GHG emissions. As discussed in Section 4.9, *Greenhouse Gas Emissions*, GHG emissions generated by the proposed quarry expansion would not surpass the significance threshold of 10,000 metric tons of CO_2e per year. In addition, the operation of the facility is a benefit to Lassen County in that the maintenance of roads and other infrastructure requiring the generation of asphalt pavement and concrete are necessary for support of a safe public transportation system within Lassen County. The generation of pavement material and concrete are required whether located at this facility or other facilities further away. The transportation of materials from facilities further away would result in higher emissions per ton of material produced due to the increased emission from miles traveled by truck. As described in Section 4.9, *Greenhouse Gas Emissions*, the proposed Project would not conflict with any applicable plans, polices, or regulations adopted for the purpose of reducing the emissions of greenhouse gases. This impact would be less than significant. As a result, the proposed Project will not result in a cumulative impact that would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Implementation of the proposed Project would result in a cumulatively less than significant impact in this regard.

Hazards and Hazardous Materials

The health and safety hazards posed by most hazardous materials are typically local in nature. They generally do not combine in any cumulative sense with the hazards of other projects. Possible exceptions, however, include potential transportation of hazardous materials and waste disposal. The geographic scope for cumulative impacts to hazards and hazardous materials encompasses the projects as identified above in Subsection 5.4.1, *Other Projects in the Area*, and development within the City of Susanville and unincorporated Lassen County. For the transport of hazardous materials, the geographic scope of cumulative impacts considers local roadways that include Ward Lake Road, Center Road (A27), Leavitt Lake Road and the regional facility of Highway 395 within Lassen County. This geographic scope of analysis is appropriate because of influence of the area with wildfires, as well as the localized nature of hazardous materials impacts.

Create a cumulative a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Project-level impacts related to the transport, use or disposal of hazardous materials will be less than significant and will not be cumulatively considerable. There are no projects in the county that will combine with the proposed Project to result in a cumulative impact related to hazardous materials.

Expose people or structures to a significant cumulative risk of loss, injury or death involving wildland fires?

As discussed in Section 4.10, *Hazards and Hazardous Materials*, the Mine Safety and Health Administration (MSHA) requires implementation of Fire Prevention and Control standards (30 CFR Part 36). These measures are implemented at the current operation and will be required in the expansion area as well. The proposed Project will not expose people or structures to a significant risk or loss, injury or death involving wildland fires. The potential risk of wildfire is cumulatively considerable in combination with potential fire sources in the vicinity including the neighboring BLM mine, and neighboring agricultural and residential activities. With implementation of Fire Prevention and Control standards, the proposed quarry expansion will result in a less than significant contribution to a cumulative wildland fire impact. Implementation of the proposed Project would result in a cumulatively less than significant impact in this regard.

Hydrology and Water Quality

The geographic area considered for cumulative impacts to surface water, drainage, and flood hazards of the Deep Creek-Secret Creek watershed. This defined geographic area is appropriate as cumulative development may adversely affect downstream water quality and flood hazards. The geographic area considered for cumulative impacts to groundwater includes the entire Honey Lake Valley Groundwater Basin. This geographic extend is appropriate as the cumulative groundwater impacts are generally limited to the groundwater basin in which cumulative development would occur.

Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Project impacts to surface water are not cumulatively considerable since surface water quality impacts were determined to be less than significant and all surface water will be retained onsite. Project impacts to groundwater quality are cumulatively considerable with all projects in the Honey Lake Valley Groundwater Basin. According to a description of the Honey Lake Valley Groundwater Basin contained in *Bulletin 118*, poor quality water with high boron, arsenic, ASAR, total dissolved solids, fluoride, and nitrate levels occur between Litchfield and Honey Lake, and east of Honey Lake and north of Herlong. Some wells in the vicinity of Standish have high concentrations of arsenic. Locally, wells have high hardness, boron, fluoride, iron, ammonia, phosphorus, sulfate, manganese, sodium, calcium, chloride, and nitrate levels.

Water discharged from the gravel/aggregate washing operations onsite are retained in settling ponds. Implementation of the proposed Project will not result in changes to wash water management. The Project is subject to Conditions 4 and 5 of Resolution No. 97-067, requiring

all necessary permits from the Lahontan Regional Water Quality Control Board (RWQCB) and/or the State Water Resources Board (SWRB) be secured and Spill Prevention Control and Countermeasure (SPCC) plan for fuel storage be approved by the RWQCB. With these measures in place, the proposed Project will result in a less than significant contribution to groundwater quality impacts. Implementation of the proposed Project would result in a cumulatively less than significant impact in this regard.

Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level?

Project impacts related to depletion of groundwater were determined to be less than significant. As discussed in Section 4.11, *Hydrology and Water Quality*, within this basin, *Bulletin 118* estimates the total volume of water stored in the upper 100 feet of saturated basin-fill deposits and volcanic-rock aquifers to be 10 million acre-feet. Estimates of groundwater extraction for agricultural, municipal, and industrial, and environmental wetland uses are 51,000, 15,000, and 3,800 acre-feet, respectively. Deep percolation from agricultural-applied water is estimated to be 14,000 acre-feet. There is currently no trend or pattern indicating overdraft in the basin. No additional projects that would use a substantial amount of groundwater have been identified in the County. Implementation of the proposed Project would result in a cumulatively less than significant impact in this regard.

Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through addition of impervious surfaces in a manner which would result in substantial erosion or siltation on-or off-site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or offsite; create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or impede or re-direct flood flows?

Project impacts related to alteration of the existing drainage pattern of the site were determined to be less than significant. All stormwater will be retained onsite. There are no surface waters onsite and the proposed quarry expansion will not alter the course of a stream or river, nor include impervious surfaces. There is no 100-year flood hazard area onsite. Additional retention ponds will be constructed to capture surface flow as expansion advances and sized to meet the 25-year, 24-hour storm per the IGP and SMARA requirements. Project-level impacts were determined to be less than significant. The drainage impacts of the proposed quarry expansion would be confined to the mine footprint. Implementation of the proposed Project would result in a cumulatively less than significant impact in this regard.

In flood hazard, tsunami, or seiche zones, risk release of pollutants due to inundation?

The proposed quarry expansion is not in an area subject to inundation by seiche, tsunami, or mud flow. There is no 100-year flood hazard area onsite. The proposed Project was determined to have no impact and therefore not contribute to a cumulative impact related to the release of pollutants due to inundation from flood, tsunami, or seiche.

Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Project impacts are cumulatively considerable in combination with other projects within the Lassen County Groundwater Management Plan Area and Lahontan Region. Project-level impacts related to drawdown of ground water levels and degradation of water quality were determined to be less than significant. Therefore, the proposed quarry expansion will result in less than significant cumulative impacts related to conflict or obstruction of a water quality control plan or sustainable groundwater management plan.

Land Use

The geographic scope for cumulative impacts related to land use includes closely related past, present, and reasonably foreseeable future projects located in the surrounding area. The area influenced by cumulative land use effects related to adjacent parcels and the surrounding projects described above in Subsection 5.4.1, *Other Projects in the Area*. Related land use projects in the surrounding areas have been: 1) submitted for plan processing; 2) approved by Lassen County; and/or 3) engaged in active construction programs. This geographic extent is appropriate as land use impacts are generally localized and individual impacts of any future projects would be addressed on a project-by-project basis.

Conflict with Lassen County General Plan or Standish-Litchfield Area Plan?

The proposed Project will not result in changes within the current mining area of the Project site. The proposed expansion area is designated as "Extensive Agriculture" in the *Lassen County General Plan* and zoned U-P-A-C (Upland Conservation District/Agricultural Preserve Combining District). Mining activities and processing of natural mineral materials are allowable by use permit in this land use designation and zoning district. Project-level impacts related to land use goals and policies contained in the *Lassen County General Plan* or *Standish-Litchfield Area Plan* are less than significant.

The land use impacts of the Project are cumulatively considerable with other projects in the County that include development on land designated as "Extensive Agriculture." However, since the proposed quarry expansion is an allowable use with a Use Permit within the existing land use and zoning district of the Project site and the expansion area and current mining area will be reclaimed to open space and wildlife habitat following mining, the proposed Project will not contribute to significant cumulative impact related to conflict with *Lassen County General Plan* or *Standish-Litchfield Area Plan*.

Noise

The geographic context for cumulative noise impacts is limited to the areas near the Project site or projects that would use the local roadways also used by Project-related traffic (Ward Lake Road, Center Road (A27), Leavitt Lake Road). For another project to contribute to a cumulative noise impact, it would need to be operational at the same time as the proposed Project.

Result in substantial temporary or permanent increase in ambient noise levels in excess of standards established in the Lassen County General Plan?

As discussed in the Section 4.13, *Noise*, plant operation noise levels and activities within the expansion area will not exceed Lassen County noise standards at nearby receptors. Project-level impacts were determined to be less than significant. Noise generated at the Project site is cumulatively considerable in combination with all other noise sources in the area. Noise from the existing mining operation was included in the Project analysis. There are no known future projects proposed in the vicinity of the proposed Project that would generate additional noise and result in noise level increases at nearby receptors. Noise generated from operation of the proposed Project will result in a less than significant cumulative impact.

Noise levels up to 65 dB will occur along area roadways from the maximum traffic volumes generated by the Project during peak operations. Noise levels up to 65 dB Ldn are conditionally acceptable and allowed by Use Permit Amendment No. 2018-003. As discussed in the Noise section of the DSEIR, the Project will not result in a significant increase in existing traffic noise levels over baseline conditions. Project-level impacts related to traffic noise were determined to be less than significant with implementation of mitigation measures. Noise from material haul truck operations is cumulatively considerable in combination with any future traffic increases through the year 2050. Traffic from the proposed Project results in the highest noise levels on Ward Lake Road and Center Road West of Ward Lake Road. Noise levels along these roadways are 64.6 and 65.0 dB Ldn, respectively. There are no known projects in the County that will result in increased traffic and traffic related noise on these roadways. Noise from material haul truck operations is also cumulatively considerable in combination with projected traffic increases through the year 2050.

California Department of Finance predicts that the population for Lassen County will not increase or decrease significantly during the lifetime of the County's *Regional Transportation Plan* (RTP) (through 2037). The Lassen County population, excluding the institutional population is expected to decrease at a rate of -0.22 percent per year between 2017 and 2037 (Green Dot, 2018). Traffic noise from the proposed Project is not anticipated to combine with future projects or traffic from population growth in the county to result in a significant cumulative impact.

Result in the exposure or persons to or generation of excessive ground borne vibration or ground borne noise levels?

The proposed quarry expansion does not result in the addition of any new equipment or processes to the existing mining area that will increase vibration or ground borne noise levels. Blasting at the Project site currently occurs more than 2,500 feet from the closest residence and blasting within the proposed expansion area will occur greater than 4,500 feet from the closest residence. As described in Section 4.13, *Noise*, vibration levels attenuate with distance from the source and would not be perceptible at the nearest residence located 4,500 feet from the proposed expansion area. Mitigation Measure 4.13-2 provides that no grading, blasting, or excavating will be allowed between the hours of 6:00 p.m. and 7:00 a.m. year-round. With implementation of Mitigation Measure 4.13-2, impacts related to groundborne vibration and ground born noise levels will be less than significant.

Vibration and groundborne noise from the Project are cumulatively considerable in combination with other sources adjacent to the site. The mining operations on BLM land south of the Project site sometimes has processing equipment onsite that could generate vibration, however the

equipment is located over 4,600 feet from the proposed expansion area. Increases in vibration from truck traffic are cumulatively considerable in combination with projected traffic increases through the year 2050. Loaded truck pass-bys produce vibration levels below human annoyance thresholds and below levels that could result in damage to structures along area roadways. With implementation of Mitigation Measure 4.13-2 impacts related to vibrations would be cumulative less than significant.

Transportation

The cumulative setting for transportation consists of traffic generated by all existing and future (cumulative) development in the project area including buildout of the *Lassen County General Plan.* The geographic context for cumulative impacts for transportation and traffic impacts includes the roadway network utilized by the proposed Project. Project traffic will continue to utilize Ward Lake Road, and Center Road (A27) to access Highway 395.

Cumulative transportation and traffic impacts were analyzed in the 2019 EIR and were determined to be less than significant. Existing traffic volumes were determined to not substantially degrade the level of service on any of the Project roadways and no additional turn lanes were determined to be required for traffic generated by the Project. The proposed Project will not increase or change the distribution of current traffic generated by the existing operation. Additional traffic increases of 1 percent over the proposed additional 20 operational years is not anticipated to degrade roadway or intersection capacity in the Project area to result in a cumulative impact to service standards contained in local circulation policies.

Conflict or be inconsistent with CEQA Guidelines §15064.3, subdivision (b)?

Project-level impacts related to vehicle miles traveled (VMT) were determined to be less than significant. The VMT generated by the Project is cumulatively considerable in combination with all VMT along the area roadways as well as the projected increase in VMT in the County that will occur over the life of the Project. Based on demographic growth projections of 0.9 percent per year for population, housing, and employment, countywide the average annual increase in daily VMT in the county is 0.9 percent per capita (Green Dot, 2018).

Lassen County does not have a significance threshold for total, per capita or VMT per employee. According the OPR Guidance, a finding of a less than significant project-level impact would imply a less than significant cumulative impact, and vice versa. This is similar to the analysis typically conducted for greenhouse gas emissions, air quality impacts, and impacts that utilize plan compliance as a threshold of significance (OPR, 2018). Project-level impacts related to VMT were determined to be less than significant; therefore, the proposed quarry expansion will likewise result in a less than significant cumulative impact related to VMT.

Wildfire

The geographic scope for cumulative impacts to wildfire hazards includes all of Lassen County. This geographic extent is appropriate because much of the unincorporated areas of Lassen County are located in or near a state responsibility area or lands classified as very high fire hazards severity zones.

The Project Could Substantially Impair an Adopted Emergency Response Plan or Emergency Evacuation Plan?

The proposed Project is located at the end of a private access road, will not result in an increase in traffic, and will not interfere with the implementation of or physically interfere with an adopted emergency response or evacuation plan. This impact is less than significant and will not combine with other projects in the area to contribute to a cumulatively significant impact.

Due to Slope, Prevailing Winds, and Other Factors, the Project Could Exacerbate Wildfire Risks, and Thereby Expose Project Occupants to, Pollutant Concentrations from a Wildfire or the Uncontrolled Spread of Wildfire?

As discussed in Section 4.15, *Wildfire*, without controls, mining equipment and processes could increase the risk of fire if operated near vegetated areas during the dry season. Vegetation will be removed from mining areas prior to material extraction. The Mine Safety and Health Administration (MSHA) requires implementation of Fire Prevention and Control standards (30 CFR Part 36). These measures are implemented at the current operation and will be required in the expansion area as well. Project-level impacts related to the exposure of people to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire were determined to be less than significant. Other projects occurring in the County will be required to comply with applicable federal state, and local laws related to fire prevention, design features and operational measures. Impacts are addressed on a Project-specific basis and would not result in a significant cumulative impact.

Require the Installation or Maintenance of Associated Infrastructure (such as Roads, Fuel Breaks, Emergency Water Sources, Power Lines or Other Utilities) that may Exacerbate Fire Risk or that may Result in Temporary or Ongoing Impacts to the Environment?

Multiple projects in the County could require installation of infrastructure, including the proposed construction of a solar array and battery energy storage system that will require construction of transmission lines. The proposed Project does not include construction of any infrastructure that may exacerbate fire risk or result in temporary or ongoing impacts to the environment. Therefore, the Project will not combine with other projects to result in a significant cumulative impact.

Expose People or Structures to Significant Risks, Including Downslope or Downstream Flooding or Landslides, as a Result of Runoff, Post-Fire Slope Instability, or Drainage Changes?

There have been no fires in the vicinity of the Project site that would result in downstream flooding, landslides, runoff, post fire slope instability, or drainage changes affecting the Project site. Therefore, the proposed quarry expansion will not expose people or structures to significant risks. Project-level impacts were determined to be less than significant. Impacts of this nature are Project-site specific and not cumulatively considerable.

6.0 ALTERNATIVES

The California Environmental Quality Act (CEQA) requires that "an EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives" (CEQA Guidelines §15126.6). This chapter identifies potential alternatives to the proposed project and evaluates them, as required by CEQA. Key provisions of the CEQA Guidelines on alternatives (§15126.6(a) through (f)) are summarized below to explain the foundation and legal requirements for the alternatives analysis in the DSEIR.

- "The discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly" (§15126.6(b)).

- "The specific alternative of 'no project' shall also be evaluated along with its impact" (§15126.6(e)). "The no project analysis shall discuss the existing conditions at the time the Notice of Preparation is published, and at the time the environmental analysis is commenced, as well as what would reasonably be expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives" (§15126.6(e)(2)).

- "The range of alternatives required in an EIR is governed by a 'rule of reason' that require the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project" (§15126.6(f)).

- "Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent)" (§15126.6(f)(1)).

- For alternative locations, "only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR" (§15126.6(f)(2)(A)).

- "An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative" (§15126.6(f)(3)).

Per the CEQA Guidelines §15126.6(d), additional significant effects of the alternatives are discussed in less detail than the significant effects of the project as proposed.

The intent of this section is to evaluate alternatives capable of eliminating or substantially lessening significant impacts associated with the proposed Project. For this Project, two alternatives are evaluated:

- No Project Alternative (which consists of operations at the site remaining as currently permitted by Use Permit No. 96056 and Use Permit Amendment No. 2018-003).
- Reduced Expansion Alternative.

The discussions in this section identify only substantial changes in Project impacts anticipated with each alternative, as compared to the proposed Project. Resource areas not impacted by the proposed quarry expansion are not discussed in detail.

Descriptions of these alternatives are described below as well as a discussion of their impacts and how they would differ from the significant impacts of the proposed Project. In addition, a discussion of alternatives considered but rejected from further consideration and a discussion of the environmentally superior alternative are included below.

6.1 Factors in the Selection of Alternatives

Materials produced at the site include asphalt, concrete, various sizes of crushed rock and crushed base rock which are used as construction materials. The materials at the site have been evaluated both an independent testing laboratory and the California Department of Transportation (Caltrans) with test results indicating superior material not commonly found in the region. The quality of the resources and choice location to the existing and potential market aggregates and paving materials were the determining factors in choosing the site for the planned operations in 1981 (Miller's Custom Work, 1981).

CEQA Guidelines §15126.6 recommends that an EIR describe the rationale for selecting alternatives to be discussed. Alternatives were considered that would avoid or lessen any significant effects for the proposed Project and that could achieve most of the Project objectives. The alternative must also be feasible from an economic, environmental, legal, and technological standpoint.

6.2 Alternatives Considered but Rejected from Further Consideration

Section 15126.6(c) of the CEQA Guidelines permits the elimination of an alternative from detailed consideration due to:

- Failure to meet most of the basic project objectives;
- Infeasibility; and
- Inability to avoid significant environmental impacts.

Section 15126(f)(1) of the CEQA Guidelines states that "Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries…and whether the proponent can reasonably acquire control or otherwise have access to the alternative site. No one of these factors establishes a fixed limit on

the scope of reasonable alternatives." In addition, the California Supreme Court has stated that lead agencies, not project opponents, have the burden to formulate alternatives for inclusion in an EIR.

Two potential alternatives to the proposed Project that were initially considered but determined not to be viable and eliminated from further consideration are described below:

Alternative Project Location

CEQA Guidelines §15126.6(f)(2)(a) states that "only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR." An alternative location would require the identification and design of a quarry and aggregate processing facilities at another location within the Project region capable of producing up to 5 million tons of aggregate annually, or the identification of multiple quarry locations that could achieve that combined capacity. Successful development of a quarry and processing facilities at an alternative location would depend on a number of geologic, environmental, and economic factors. Site-specific studies would be required to evaluate a new site and its adequacy to support mining and processing operations. Issues to be addressed for a new site are dominated by availability and suitability. The site must be available for purchase or long-term lease with abundant aggregate resources to justify the investment necessary to permit and operate an alluvial rock quarry. Extensive overall feasibility studies would need to be prepared to evaluate the following environmental and logistical concerns:

- quality and quantity of aggregate resource and its suitability to meet construction specifications for concrete and asphalt;
- water supply availability;
- electricity service availability;
- distance to markets and potential increases in haul truck trip distances;
- available truck routes, road design, and existing and predicted future traffic volumes and levels of service;
- proximity to a state highway;
- existing and future surrounding land uses;
- effects of the mining and processing plants on these surrounding land uses, including aesthetics, air pollutants, light, and noise;
- potential impacts to groundwater and surface water quality and consumption;
- potential impacts to biological resources including special-status species and their habitat;
- potential presence of and impacts to significant cultural and paleontological resources; and
- options and costs for reclamation and use of site after mining.

No specific location with attributes necessary to accomplish the project objectives is known in enough detail to be identified as a specific alternative site. Because of the multiple and underdetermined site conditions that could exist at an alternative location, the County does not possess sufficient information to determine whether potential mining and processing sites at alternative locations are available to feasibly meet the project objectives.

Further, the proposed Project is located at an existing quarry and processing plant site. The Project's expansion provides for energy, cost, and other efficiencies achieved through expansion of the existing operation, and use of existing facilities. These efficiencies would not be achieved through development of one or more quarries at a new quarry location. For the reasons discussed above, the County has eliminated alternative locations from further consideration.

Alternative Expansion Area

An alternative expansion area was considered but rejected from further consideration. The area to the east of the existing operation was initially considered for the expansion. However, after initial exploration, it was determined the superior rock material was not present east of the current mining boundary. In addition, this alternative would not reduce or avoid the significant and unavoidable biological impacts of the proposed Project.

6.3 Project Objectives

The Project applicant has identified the following objectives for the proposed Project:

- Provide a local construction material supply to serve local and regional market demands.
- Provide a local source of materials for emergency jobs (during federal, State, or County declared emergencies) and other construction jobs requiring nighttime work.
- Extend the life of the quarry to extract additional superior materials from the site.
- Contribute to the improvement of the Lassen County economy by expanding an existing project that increases sales taxes.
- Expand an existing quarry operation without the need for either a County General Plan or Zone Amendment.

6.3 No Project Alternative

6.4.1 Description

The No Project Alternative includes the continuation of mining operations at the site as currently permitted under Use Permit No. 96056 and Use Permit Amendment No. 2018-003. Activities would continue to occur within the existing 138-acre mining boundary. Annual production would be limited to 100,000 tons except to supply emergency jobs. Mining activities would cease by the year 2030 and the mining area would be reclaimed.

6.4.2 Impacts

Under the No Project Alternative, environmental conditions at the site would remain as they currently exist. The No Project Alternative would eliminate the additional significant displacement impacts of the proposed Project to pronghorn and mule deer. The existing impacts to pronghorn and mule deer from the current operation would continue to occur until the mining area is reclaimed. The No Project Alternative would eliminate all other potential impacts of the proposed Project. Demand of local and regional construction projects in excess of 100,000 tons per year would be supplied by an alternate source. Depending on the location of the alternate source, the No Project Alternative could result in an increase in greenhouse gas emissions, vehicle miles

traveled, and air quality impacts if the source is located a greater distance from the construction projects than the Ward Lake Quarry.

6.4.3 Conclusion

The No Project Alternative would eliminate the additional significant impacts to pronghorn and mule deer of the proposed Project, but would not fully meet the Project objectives. The No Project Alternative may not achieve the first Project objective of meeting construction material demands of local and regional markets. The applicant has determined the current demand from their facility is up to 200,000 tons of construction material per year and the current operation is permitted for an annual production of 100,000 tons per year (except to provide materials to emergency projects). The No Project Alternative would meet the second Project objective until the end date of mining which is currently 2030. Beyond that date, material for emergency jobs would be provided by an alternate source. The No Project Alternative would fail to meet the third objective of extending the life of the quarry to extract additional superior materials from the site. Up to 5,000,000 tons of additional superior material would remain unused.

6.5 Reduced Expansion Alternative

6.5.1 Description

This alternative is similar to the proposed Project, but with a reduced expansion area and shorter mine life. As with the proposed Project, annual production would increase from 100,000 tons to 200,000 tons. The Reduced Expansion Alternative includes expansion of the mining area of the current operation to include an additional 26 acres. Due to the smaller expansion area, the life of the mine would be extended only 10 years. Mining would occur until 2040 and then the site would be reclaimed.

The location of the processing area of the operation would not change. Mining would occur as described for the proposed Project, but within the smaller expansion area. Mining activities in the expansion area would start immediately adjacent to the current mining area of the Project site and progress to the north. This alternative would require the same equipment operating at the same capacity as the proposed Project. The same average and maximum traffic volumes would be required to haul materials.

6.5.2 Impacts

Aesthetics and Visual Resources

The Reduced Expansion Alternative would increase the mining area of the current operation by 26 acres. This alternative would result in similar visual impacts compared to the proposed Project, but within a smaller area. The Reduced Expansion Alternative could also be visible from a smaller area surrounding the Project site and reclamation of the mine would occur 10 years earlier compared to the proposed Project. Similar to the proposed Project, the aesthetic and visual resource impacts of the Reduced Expansion Alternative would be less than significant.

Agriculture and Forestry

Similar to the proposed Project, the Reduced Expansion Alternative would have no impact related to conflict with an existing zoning for agricultural use or a Williamson Act contract and would have no impact to forestland or important farmland. The Reduced Expansion Alternative will result in the loss of 26 acres of low capability grazing land, but no important farmland. Similar to the proposed Project, the agricultural and forestry impacts of the Reduced Expansion Alternative would have no impact.

Air Quality

The Reduced Expansion Alternative would not change the daily or annual emissions compared to the proposed Project. The same equipment and traffic volumes would be required to achieve the maximum annual production volume of 200,000 tons per year. The Reduced Expansion Alternative would reduce the duration of time emissions from the operation would occur by 10 years compared to the proposed Project. Similar to the proposed Project, air quality impacts of the Reduced Expansion Alternative would be less than significant.

Biological Resources

Impacts to biological resources under the Reduced Expansion Alternative would be reduced when compared to the proposed Project. This alternative would decrease the duration of biological resource impacts by 10 years. This alternative includes a smaller expansion area than the proposed Project in which vegetation would be removed and ground disturbance would occur for material extraction. The reduced expansion area would reduce indirect impacts and direct habitat impacts to special status species, mule deer, and pronghorn antelope, however impacts would remain significant without mitigation. Displacement impacts to pronghorn and mule deer would remain significant and unavoidable.

Cultural and Tribal Cultural Resources

The Reduced Expansion Alternative mining area contains one isolated find and no known cultural resources. Impacts to currently undiscovered cultural resources, archaeological resources, tribal cultural resources, or human remains could occur during mining activities in the 26 acre expansion area. The reduced expansion area impacts to cultural and tribal cultural resources would require similar mitigation as proposed by the Project. Similar to the proposed Project, impacts would remain less than significant.

Energy

The Reduced Expansion Alternative would require the same annual energy requirements during operation as the proposed Project. However, the overall energy use of the Reduced Expansion Alternative would be less than the proposed Project since mining would end in 2040 instead of 2050. Similar to the proposed Project, energy impacts of Reduced Expansion Alternative would be less than significant.

Geology and Soils

The geology and soil impacts of the Reduced Expansion Alternative would be similar as those of the proposed Project, but would occur over a smaller area. Impacts related to geologic hazards and stability would be less than significant and no impacts related to expansive soils and wastewater disposal systems and septic tanks would occur. Impacts related to erosion of topsoil and paleontological resources and unique geologic features would be less than significant with the incorporation of mitigation similar to the proposed Project.

Greenhouse Gas Emissions

The Reduced Expansion Alternative would result in the same daily and annual greenhouse gas emissions as the proposed Project, however overall emissions from this alternative would be reduced since mining activities would cease in 2040. Similar to the proposed Project, the Reduced Expansion Alternative would result in less than significant greenhouse gas emission impacts.

Hazards and Hazardous Materials

The Reduced Expansion Alternative will have the same hazards and hazardous material impacts as the proposed Project. The Reduced Expansion Alternative will require the transport, use, storage, and disposal of the same hazardous materials used for the existing operation and proposed Project. Hazardous materials would be handled, stored, and transported in accordance with applicable laws and regulations. Fire prevention and control standards would ensue risks due to wildland fires are less than significant. Similar to the proposed Project, the Reduced Expansion Alternative would result in less than significant impacts related to hazards and hazardous materials.

Hydrology and Water Quality

The hydrology and water quality impacts of the Reduced Expansion Alternative would be the same as the impacts of the proposed Project. The 26 acre expansion area of the Reduced Expansion Alternative would include the southern half of the expansion area of the proposed Project. The expansion area would not be within a flood hazard area and would not expose people or structures to flooding or inundation by seiche, tsunami or mudflow. No surface waters would be impacted within the expansion area and all stormwater and wash water would be retained onsite. Groundwater use would not create a demand for water in excess of available supplies. Similar to the proposed Project, the Reduced Expansion Alternative would result in less than significant impacts to hydrology and water quality.

Land Use

The Reduced Expansion Alternative could potentially conflict with the same land use policies contained in the *Lassen County General Plan* and *Standish-Litchfield Area Plan* as the proposed Project. Land use impacts of the Reduced Expansion Alternative would be potentially significant without mitigation. Mitigation measures similar to those of the proposed Project for biological resources would be required for the Reduced Expansion Alternative. Similar to the proposed Project, land use impacts of the Reduced Expansion Alternative will be less than significant.

Noise

The Reduced Expansion Alternative would result in similar nose impacts as the proposed Project. The Reduced Expansion Alternative does not include changes to plant operational noise levels or traffic noise levels. Existing equipment used for material extraction at the current operation will be used in the expansion area. Equipment operated in the expansion area will be operated further from the residences than equipment operated within the current mining area and will result in lower levels of noise and vibration at the location of the nearest receptor. Similar to the proposed Project, noise impacts of the Reduced Expansion Alternative will be less than significant.

Transportation

The Reduced Expansion Alternative would generate the same average and maximum traffic and VMT as the proposed Project during operation. The expansion area would be accessed from the existing mining operation. The Reduced Expansion Alternative would not result in a conflict with local programs, plans, ordinance, or policies, will not increase traffic hazards, or result in inadequate emergency access. Similar to the proposed Project, traffic impacts of the Reduced Expansion Alternative would be less than significant.

Wildfire

As with the proposed Project, wildfire risks from the Reduced Expansion Alternative will be less than significant with prevention control standards currently practiced at the existing operation. The Reduced Expansion Alternative will not impair an emergency response plan or evacuation plan, or expose people or structures to significant risks. The Reduced Expansion Alternative would result in less than significant impacts related to wildfire.

6.6 Conclusion

The Reduced Expansion Alternative will result in similar impacts as the proposed Project, however impacts would occur for a shorter duration since under this alternative the life of the mine would be extended to 2040 instead of 2050. Direct impacts would occur within a smaller area. Overall pollutant and greenhouse gas emissions generated by the reduced expansion would be less than proposed Project due to the shorter duration of operations; however, the daily and annual emissions would remain the same during the operational period of the Reduced Expansion Alternative. The reduced expansion area does not include known cultural resources; therefore, mitigation measures to avoid impacts to a known cultural resource would not be required. However, mitigation measures for currently undiscovered cultural and tribal cultural resources as well as human remains would be required to reduce impacts to a less than significant level. As with the proposed Project, impacts related to air quality, biological resources, land use and geology will be potentially significant without mitigation. Impacts related to displacement of pronghorn and mule deer will remain significant and unavoidable.

The Reduced Expansion Alternative would meet the first two Project objectives of providing a local construction material supply to serve local and regional market demands and to provide a local source of materials for emergency jobs and other jobs requiring nighttime work during until the year 2040. Beyond the date of 2040, material for local and regional construction jobs, including emergency jobs would be provided by an alternate source, which may be located a greater distance

from local and regional construction sites. The Reduced Expansion Alternative would partially meet the objective of extending the life of the quarry to extract additional superior materials from the site since the life of mine would be extended 10 years from the current end date (to the year 2040). Up to 2,500,000 tons of additional material could be extracted from the 26-acre expansion area. This alternative would leave as much as 2,500,000 tons of superior material unavailable for use.

6.7 Environmentally Superior Alternative

CEQA Guidelines §15126.6 requires that the alternatives analysis must identify the "environmentally superior" alternative among the alternatives considered. The "no project" alternative would eliminate all of the impacts of the proposed Project at the Project site and would be the environmentally superior alternative. However, the "no project" alternative does not fully meet the Project objectives. In addition, CEQA Guidelines require that if the "no project" alternative is the environmentally superior alternative, the EIR must also identify the environmentally superior alternative among the other alternatives.

As discussed above, the Reduced Expansion Alternative would result in similar impacts as the proposed Project, but would reduce the area and time period over which impacts occur. The known cultural resource in the Project vicinity would be avoided in the smaller expansion area under the Reduced Expansion Alternative and no mitigation specific to the known cultural resource would be required. Impacts to aesthetics and visual resources, biological resources, and geology and soils would be slightly reduced due to the smaller expansion area, but the level of significance of these impacts would not change. The mitigation measures required under the proposed Project would still be necessary for cultural and tribal cultural resources, geology, land use and air quality to reduce impacts of the Reduced Expansion Alternative to be less than significant. The mitigation measures included for biological resources will also be required to reduce impacts to biological resources, however impacts related to displacement of mule deer and pronghorn will remain significant and unavoidable.

The overall and cumulative impacts of the Reduced Expansion Alternative would be reduced when compared to the proposed Project due to the smaller expansion area and shorter operational period. Therefore, in lieu of the "no project" alternative; the Reduced Expansion Alternative would be the environmentally superior alternative. However, it should be noted that the Reduced Expansion Alternative would only partially meet the Project objectives of the Project since it would result in less overall material being provided by the operation and materials would be supplied for a shorter duration of time. The Reduced Expansion Alternative would leave up to 2,500,000 tons of superior material unavailable for use for local and regional projects that could be efficiently extracted and processed using the existing equipment and infrastructure currently at the Project site.

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JUN 24 2021

LASSEN COUNTY DEPARTMENT OF PLANNING SERVICES

County of Lassen
Department of Planning and Building Services

• Planning • Building Permits • Code Enforcement • Surveyor • Surface Mining

Maurice L. Anderson, *Director*
707 Nevada Street, Suite 5
Susanville, CA 96130-3912
Phone: 530 251-8269
Fax: 530 251-8373
email: landuse@co.lassen.ca.us
website: www.co.lassen.ca.us

Zoning & Building
Inspection Requests
Phone: 530 257-5263

April 28, 2021

NOTICE OF PREPARATION OF A DRAFT SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

FILED
APR 28 2021
JULIE BUSTAMANTE
LASSEN COUNTY CLERK
By _____, Deputy

TO: Responsible and Trustee Agencies

FROM: Maurice Anderson, Director
Lassen County Department of Planning and Building Services
707 Nevada Street, Suite 5
Susanville, CA 96130

SUBJECT: EIR #2021-001, Ward Lake Pit Expansion

The County of Lassen will be the Lead Agency and will prepare a Draft Subsequent Environmental Impact Report (DSEIR) for the proposed Ward Lake Pit Expansion project. This Notice of Preparation (NOP) has been prepared to solicit comments from interested agencies as to the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the proposed project. When (and if) approved, your agency may need to use this SEIR when considering permits or other approvals for the project.

VESTA Resources, Inc. has prepared a Preliminary DSEIR, which includes a detailed project description, location map, and discussion of probable environmental impacts (attached). Additional documents, including the full Use Permit and Reclamation applications, are available upon request.

Due to the time limits mandated by State law, responses to this NOP must be sent at the earliest possible date, but no later than 30 days after receipt of this notice. Please send written responses to Cortney Flather, Natural Resources Technician, Lassen County Department of Planning and Building Services, at the above address or via email to cflather@co.lassen.ca.us. Please provide a contact person for your agency in the written response.

This Notice of Preparation, attachments, and the project file are available for review at the Lassen County Department of Planning and Building Services, located at 707 Nevada Street, Susanville, CA 96130. The department is open from 7 a.m. to 12 p.m. and 1 p.m. to 4 p.m., Monday through Friday, excepting holidays. These documents are also available on our website at www.lassencounty.org.

1.0 Project Location

The Ward Lake Quarry is located in Litchfield in Lassen County, California. The site lies on the southwest side of Shaffer Mountain. It is located approximately three miles east of Ward Lake and 13 miles east of Susanville, CA off of Ward Lake Road A.P.N.: 109-100-059-000 and 109-100-060-000. Access is by way of paved Ward Lake Road and paved Wells Drive, off Center Road (A-27).

2.0 PROJECT DESCRIPTION

The project is a proposal to expand mining operations at the Ward Lake Pit (CA mine ID #91-18-0008). If approved, the Use Permit would allow for an expansion of approximately 51 acres, an associated additional volume of 5,000,000 tons of material, an extension of the life of the mine from 2030 to 2050, and increase of maximum volume per year from 100,000 to 200,000 tons per year.

The Ward Lake Pit currently occupies 160 acres on a 442-acre parcel, owned by TLT Enterprises LLC. The surface mining operation is presently permitted for the mining of rock, crushing, screening, washing, material stockpiling, fuel storage; operation of a cement plant (12,000 cubic-yard annual limit) and asphalt plant; and the use of settling ponds, scales, an office, and a truck shop. The mine operates on a 24-hour schedule Monday through Saturday except from January 31 to March 31 every year (7:00 p.m. to 6:00 a.m.).

Grading, excavating, and blasting are prohibited onsite between January 1 and March 31 annually, except in a state of emergency, as declared by the local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville. Annual site production in excess of the permitted 100,000 tons is allowable during declared emergencies. The current life of the mine is until 2030.

The detonation of explosives is prohibited between the hours of 6:00 p.m. and 7:00 a.m. year-round. Current noise standards for the operation, as measured at the nearest affected residentially designated lands, require that daytime noise levels stay below 70 dBA and nighttime noise levels stay below 65 dBA (noise level standard varies with the cumulative number of minutes the noise lasts in any one-hour time period, see Lassen County Noise Element, Table III). The currently permitted activities and all associated conditions and restrictions serve as the baseline for review, as described in the Preliminary DSEIR. All existing ground disturbance associated with the mining operation was previously considered in an Environmental Document during the mines permitting process.

3.0 PROJECT SITE CHARACTERISTICS

The project area consists mainly of shrub communities, including sagebrush, bitterbrush, and rabbitbrush. Approximately 120 acres of the project site, out of 160 permitted acres, has been cleared of vegetation. The project area is considered important wintering range for mule deer (*Odocoileus hemionus*) and pronghorn (*Antilocapra americana*), and also serves resident chukar (*Alectoris chukar*). Special status wildlife species that are known to occur, or have the potential to occur, within the project area include the golden eagle (*Aquila chrysaetos*), northern harrier (*Circus cyaneus*), Swainson's hawk (*Buteo swainsoni*), greater sage-grouse (*Centrocercus urophasianus*), burrowing owl (*Athene cunicularia*), long-eared owl (*Asio otus*), short-eared owl (*Asio flammeus*), loggerhead shrike (*Lanius ludovicianus*), gray wolf (*Canis lupus*), American badger (*Taxidea taxus*), pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), pygmy rabbit (*Brachylagus idahoensis*), and white-tailed jackrabbit (*Lepus townsendii townsendii*). Special status plant species that are known to occur, or have the potential to occur, within the project area include ornate dalea (*Dalea ornata*), spiny milkwort (*Polygala subspinosa*), and Susanville beardtongue (*Penstemon sudans*).

There are no existing streams or bodies of water within the boundaries of the project site, and the site is not within the 100-year floodplain. Several permitted settling ponds are located at the north end of the project site, which drain into intermittent channels. The project site is located within the Honey Lake Valley Groundwater Basin, which has been identified as a "low priority basin" by the Department of Water Resources, signifying that it is not currently at risk for overdraft. The area surrounding the site is primarily used for agriculture and open space. The nearest residence is approximately 470 feet from the west property line of the existing quarry and is also the closest residence to the expansion area being 4,600 feet to the south.

4.0 Potential Environmental Impacts

VESTRA Resources, Inc. was hired by TLT Enterprises to oversee the Use Permit and CEQA process. VESTRA Inc. elected to forgo the Initial Study process, and instead prepared a Preliminary DSEIR, which was submitted with the Use Permit and Reclamation Plan Amendments. Pursuant to 15060 (d) of the CEQA Guidelines, Lassen County concurs that an EIR is clearly required for this project and will begin work directly on the EIR process. The Preliminary DSEIR prepared by VESTRA Resources Inc. identifies potentially significant impacts in the following categories:

- Air Quality
- Biological Resources
- Cultural and Tribal Cultural Resources
- Geology and Soils
- Land Use and Planning

Mitigation measures have been proposed that may reduce some impacts to a less than significant level. However, Biological Resources could have significant and unavoidable impacts that cannot be mitigated to a level of less than significant (see the attached Preliminary DSEIR for more information).

This project poses potentially significant environmental effects, primarily due to the size of the expansion. Mitigation measures that have been identified to reduce these effects include covering trucks, filtering and containment of dust, dust suppression, good housekeeping, setting land aside from future development, buffer zones for sensitive flora/fauna, habitat enhancement, avoidance of cultural and tribal resources, avoidance of paleontological resources, consulting with archeologists/paleontologists if there are any unanticipated discoveries, and all operating conditions of approval for Use Permit #2018-003. A review of the Preliminary DSEIR is necessary to determine if the proposed mitigations are sufficient to reduce any of the above-mentioned impacts to a less than significant level.

MLA:clf

Distribution: Supervisor Hammond (5); Perry Thompson (Applicant); VESTRA Resources (Consultant); Co. Assessor's Office; County Counsel; Co. Fire Warden/CAL FIRE; Co. Environmental Health Dept.; Co. Public Works/Road Div.; Lassen Co. Fish & Game Com.; CA Dept. of Fish & Wildlife (Redding/Wendel); Caltrans; Lahontan RWQCB (email); Department of Water Resources (DWR); Division of Mine Reclamation; Office of Historic Preservation; Department of Parks and Recreation; California Highway Patrol; Air Resources Board; Department of Toxic Substances Control; Native American Heritage Commission; State Lands Commission; Bureau of Land Management -Susanville; Pit River Tribe of California; Greenville Rancheria of Maidu Indians; Susanville Indian Rancheria; Honey Lake Maidu; Washoe Tribe of Nevada and California; Standish-Litchfield Fire Protection District; Co. Air Pollution Control Officer; Shaffer Elementary School

S:\PLA\Planning\2021\MP#2021-001, Perry Thompson\EIR#2021-001\NOP

Julie M Bustamante
COUNTY CLERK-RECORDER
REGISTRAR OF VOTERS
CLERK FOR THE BOARD OF
SUPERVISORS

220 S Lassen St Suite 5
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(530) 251-8217
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Website www.lassencounty.org

Office of the County Clerk-Recorder
Lassen County Courthouse
Susanville CA 96130

Lassen County Planning and Building
707 Nevada St Suite 5
Susanville, CA 96130

RE: Notice of Preparation of a Draft Subsequent Environmental Impact Report- Ward Lake Expansion

To Whom It May Concern:

I certify the attached notice was filed at Lassen County Historic Courthouse on 04/28/2021, located at 220 S Lassen Street, Suite #5, Susanville, CA 96130 and was posted for public inspection from the date of 04/28/2021 through 6/18/2021.

Best Regards,

Hollie Gilbert
Deputy Clerk

Enc.

RECEIVED

JUN 24 2021

LASSEN COUNTY DEPARTMENT OF
PLANNING AND BUILDING SERVICES

S:\CLK\Clerk Admin\Postings-Notice of return Letter

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Northern Region
601 Locust Street
Redding, CA 96001
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

RECEIVED
JUN 01 2021
LASSEN COUNTY DEPARTMENT OF
PLANNING AND BUILDING SERVICES

May 26, 2021

Cortney Flather
Natural Resources Technician
Lassen County Department of Planning and Building
707 Nevada Street
Susanville, CA 96130

SUBJECT: REVIEW OF NOTICE OF PREPARATION FOR WARD LAKE PIT EXPANSION ENVIRONMENTAL IMPACT REPORT #2021-001, STATE CLEARINGHOUSE NUMBER 2021040627, ASSESSOR PARCEL NUMBERS 109-100-059-000 AND 109-100-060-000, NEAR THE CITY OF SUSANVILLE, LASSEN COUNTY

Dear Cortney Flather:

The California Department of Fish and Wildlife (Department) has reviewed the Notice of Preparation (NOP) and a preliminary draft Subsequent Environmental Impact Report (DSEIR) dated February 2021, and prepared by VESTRA Resources, Inc. for the above-referenced project (Project). As a trustee for the State's fish and wildlife resources, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and their habitat. As a responsible agency, the Department administers the California Endangered Species Act and other provisions of the Fish and Game Code that conserve the State's fish and wildlife public trust resources. The Department offers the following comments and recommendations on this Project in our role as a trustee and responsible agency pursuant to the California Environmental Quality Act (CEQA), California Public Resources Code §21000 et seq.

Project Description

The Project "*includes modifications to existing permitted operations at the Ward Lake Quarry. The Project includes to following changes to existing operations:*

- *Expansion of approximately 51 acres, with an associated additional volume of 5,000,000 tons of material*
- *Extension of life of the mine from 2030 to 2050*
- *Increase of maximum volume per year from 100,000 tons to 200,000 tons per year*"

Comments and Recommendations

The Department has the following recommendations and comments as they pertain to biological resources:

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General Comments:

The Department recommends changing California Department of Fish and Game to California Department of Fish and Wildlife and to include updated scientific names with both genus and species.

Per CEQA Guidelines section 21082.2(a), "*the Lead Agency shall determine whether a project may have a significant effect on the environment based on substantial evidence in light of the whole record.*" The Department recommends the forthcoming DSEIR look at impacts to the entire project and not just special status species or habitats. Currently, the preliminary DSEIR focuses almost solely on special status species with no common species or habitats described. Reptiles, for instance, are not even discussed in the preliminary DSEIR.

California Natural Diversity Database (CNDDB)

The California Natural Diversity Database (CNDDB) is a positive sighting database. It does not predict where something may be found. The Department maps occurrences only where we have documentation that the species was found at the site. There are many areas of the state where no surveys have been conducted and therefore there is nothing on the map. That does not mean that there are no special status species present. The next step is to conduct surveys to document what is present and submit the information on special status species to the Department and CNDDB. All surveys should be conducted prior to approval of the Project and survey results should be sent to the Department at R1CEQARedding@wildlife.ca.gov.

Many of the wildlife and botanical descriptions repeatedly state that based on the CNDDB, there are no records and/or observations of a specific species. The Department recommends these descriptions be based on habitat present currently on site, current survey results, CNDDB, and other incidental information and not based solely on CNDDB records.

Habitats and Sensitive Natural Communities

The Department strongly recommends a thorough assessment of rare plants, and natural communities follow the Department's March 2018 "*Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities.*" The preliminary DSEIR described the habitat(s) using the Department's California Wildlife Habitat Relationships (CWHR). This document is useful for determining which wildlife species utilize what habitats, but it cannot be used for vegetation mapping. CWHR is not specific enough and can not determine sensitive natural communities. The Department recommends *A Manual of California Vegetation* (https://www.cnps.org/vegetation/manual-of-california-vegetation) along with the Department's March 2018 protocols be used to describe habitats present onsite.

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Golden Eagle (*Aquila chrysaetos*)

The preliminary DSEIR states, "*according to CNDDB, there are no known golden eagle occurrences within five miles of the proposed expansion area*." The Department's website has several references that could be of use to the consultant to determine impacts to this species. Threats to this species are varied but include loss of foraging areas, loss of nesting habitat, pesticide poisoning, lead poisoning, and collision with man-made structures such as wind turbines. Since this Project proposes the loss of 51 acres of foraging habitat, the Department strongly encourages the consultant contact the Department for further information and to conduct golden eagle surveys to ensure they are not utilizing the area.

Hydrology

Section 4.11.1 in the preliminary DSEIR states:

> *There are no existing streams or bodies of water within the boundaries of the proposed expansion area or current mining area. The Project is not located within a 100-year floodplain. The closest bodies of water to the Project site include an unnamed tributary to Secret Creek, Secret Creek, Willow Creek, Eagle Lake Ditch located 375 feet west of the Project site, and Ward Lake located 0.5 miles southwest of the Project site. Willow Creek is approximately 1 mile west of the site and the Susan River is approximately 2 miles south of the site. Hydrology is shown on Figure 3-5.*
>
> *The Project site contains several permitted settling basins near the north end of the existing mining area which drain into intermittent channels. The quarry site is made up of mostly fractured and weathered rock; therefore, the site is pervious and a majority of stormwater infiltrates. Concentrated flows are observed only during heavy rain events. The flows within the existing mine area are contained and slowed by berms and benches and ultimately directed into settling basins.*
>
> *The current mining operation on the Project site does not discharge stormwater. A Notice of Non-Applicability (NONA) for the* General Permit for Storm Water Discharges Associated with Industrial Activities *(NPDES No. CAS000001) was submitted for the current mining operation in 2015. Standard soil erosion control protocols are currently practiced throughout the site include the use of berms, water bars, or rolling dips, rock check dams on roadway ditches, diverting run-on away from stockpile areas, installing stabilizers as necessary (silt fence, wattles, etc.), and directing runoff within quarry to detention ponds.*

These paragraphs appear to conflict and should be clarified. There are settling basins, which are small bodies of water, located on the existing mine. These basins discharge into intermittent streams according to paragraph #2 above, but then paragraph #3 states there is no stormwater discharge. The Department recommends revising the hydrology section and include information on whether or not additional basins will be needed to offset the drainage from the expansion area.

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Mitigation

Impacting 51 acres of intact sagebrush scrub will have a significant impact on both common and special status species utilizing that area. The preliminary DSEIR states mammals or birds will go elsewhere once the area is impacted, however fails to acknowledge the permanent habitat loss and assumes that the remaining habitat has the carrying capacity to accept the displaced animals. The loss of foraging habitat is a potential significant impact and should be mitigated. Restoration of the area decades later should not be considered mitigation due to the temporal impact. The DSEIR states that the project applicant may choose to employ one of five proposed mitigation measures because the expansion will not have a significant adverse effect on special status wildlife or their habitat. The Department does not have enough information to concur with this conclusion and recommends the completion of additional field surveys to confirm this.

If the project applicant decides to acquire land for permanent protection, the parcel should be identified and evaluated. The Department requests a site visit to the proposed parcel and that they will have the ability to approve the use of the parcel for mitigation.

If you have any questions, please contact Amy Henderson, Senior Environmental Scientist, at (530) 225-2779, or by email at Amy.Henderson@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Donna L. Cobb
1AFB1E1AEF314DD...

Curt Babcock
Habitat Conservation Program Manager

ec: Cortney Flather, Natural Resources Technician
Lassen County Department of Planning and Building
cflather@co.lassen.ca.us

Adam McKannay, Amy Henderson
California Department of Fish and Wildlife
Adam.McKannay@wildlife.ca.gov, Amy.Henderson@wildlife.ca.gov

State Clearinghouse
State.clearinghouse@opr.ca.gov

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CEQACommentLetters@wildlife.ca.gov

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May 12, 2021

Cortney Flather
Lassen County
Planning and Building Services
707 Nevada Street, Suite 5
Susanville, CA 96130

Copy sent via email: CFlather@co.lassen.ca.us

SUBJECT: WARD LAKE PIT EXPANSION PROJECT; NOTICE OF PREPARATION; STATE CLEARING HOUSE NO. 2018022056

Dear Ms. Flather:

Thank you for including the Department of Conservation's Division of Mine Reclamation (Division) in the environmental review process for the Ward Lake Pit Expansion Project (Proposed Project) Notice of Preparation (NOP). The NOP indicates that Lassen County (County), as lead agency under the California Environmental Quality Act (CEQA), will prepare a Draft Subsequent Environmental Impact Report (SEIR) for the Proposed Project.

As described in the NOP, the Proposed Project will amend the existing use permit and reclamation plan amendment (RPA) for the Ward Lake Pit Mine (CA Mine ID# 91-18-0008) to allow for a mine boundary expansion of approximately 51 acres to a total of 160 disturbed acres, increase the maximum volume per year from 100,000 to 200,000, and extend the end date of mining to 2050.

The Division's primary focus is on active surface mining operations; however, the Division also addresses issues related to abandoned (pre-1976) legacy mines. Additionally, the Division has review responsibilities associated with lead agency implementation of SMARA. SMARA provides a comprehensive surface mining and reclamation policy to assure that:

- Adverse environmental effects of surface mining operations are prevented or minimized and mined lands are reclaimed to a usable condition which is readily adaptable for alternative land uses.
- Production and conservation of minerals are encouraged, while giving consideration to values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment.
- Residual hazards to the public health and safety are eliminated.

Division staff has reviewed the subject NOP pursuant to CEQA Statutes and Guidelines and offers the following comments at this time:

- Division staff will provide comments on the RPA for this proposed mining activity once the Division receives the complete RPA and any supporting documents,

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along with the statement from the County that certifies the submission as complete and in accordance with PRC Section 2772.1(a)(3)(A-C).

- Division staff will provide comments on the FACE for the Proposed Project in accordance with PRC Section 2773.4(a-d).

The Division requests to be included on the distribution list for this Proposed Project. Additionally, the Division requests that any subsequent project documents (e.g., the Draft SEIR, hearing notices for the Draft and Final SEIRs, and any supplemental environmental documents), as well as a copy of the certified Final SEIR, be sent to the Division at DMR-Submittals@conservation.ca.gov or the mailing address on the bottom of page 1 of this letter. If you have any questions, please contact me at (916) 323-9198.

Sincerely,

DocuSigned by:
Carol E. Atkins
73ECCB6738194DA...

Carol E. Atkins, Manager
Environmental Services Unit

ec: State Clearinghouse, state.clearinghouse@opr.ca.gov

Department of Conservation, Office of Legislative and Regulatory Affairs, OLRA@conservation.ca.gov

STATE OF CALIFORNIA Gavin Newsom, Governor

NATIVE AMERICAN HERITAGE COMMISSION

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PLANNING AND BUILDING SERVICES

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nahc@nahc.ca.gov
NAHC.ca.gov

April 28, 2021

Cortney Flather
Lassen County
707 Nevada Street, Suite 5
Susanville, CA 96130

Re: 2021040627, Ward Lake Pit Expansion Project, Lassen County

Dear Ms. Flather:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

a. A brief description of the project.

b. The lead agency contact information.

c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).

d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

a. Alternatives to the project.

b. Recommended mitigation measures.

c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

a. Type of environmental review necessary.

b. Significance of the tribal cultural resources.

c. Significance of the project's impacts on tribal cultural resources.

d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

a. Whether the proposed project has a significant impact on an identified tribal cultural resource.

b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
   a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
   b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Nancy.Gonzalez-Lopez@nahc.ca.gov.

Sincerely,

Nancy Gonzalez-Lopez
Cultural Resources Analyst

cc: State Clearinghouse

MINING AND RECLAMATION PLAN AMENDMENT
NOVEMBER 2020 - MINE BOUNDARY AMENDMENT

WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA



Prepared for

Hat Creek Construction and Materials, Inc.

RECEIVED

MAR 21 2022

LASSEN COUNTY DEPARTMENT OF
PLANNING AND BUILDING SERVICES

Prepared by

VESTRA Resources Inc.
5300 Aviation Drive
Redding, California 96002

FEBRUARY 2021
REVISED MARCH 2022

DMR Checklist

includes PRC Section 2772(c)(11) specifically referencing
Section 9.60.60(b) of the Lassen County Code

Reclamation Plan Content
Checklist

The Division of Mine Reclamation (DMR) reviews reclamation plans for compliance and completeness pursuant to Public Resources Code (PRC) Section 2772.1(b)(1). When submitting a reclamation plan to DMR, the lead agency must certify that the reclamation plan is a complete submission and is in compliance with SMARA and associated regulations and the lead agency's mining ordinance pursuant to PRC 2772.1(a)(3)(A-E). Additionally**,** pursuant to PRC 2772.1(a)(2), information prepared as part of a permit application or environmental document (pursuant to CEQA) shall be incorporated into the reclamation plan if it is used to satisfy the requirements of SMARA and associated regulations. These items shall be properly indexed in a Required Contents Chart and included in an appendix to the reclamation plan.

This checklist may assist operators and lead agencies when preparing and reviewing draft proposed reclamation plans and reclamation plan amendments in determining if they meet the minimum content requirements of the Surface Mining and Reclamation Act of 1975 (SMARA) and associated regulations (see box below for sections relevant to reclamation plans).

Surface Mining and Reclamation Act of 1975
Public Resources Code (PRC)
Division 2. Geology, Mines and Mining
Chapter 9. Surface Mining and Reclamation Act of 1975
Section 2710 et seq.

This portion includes requirements for reclamation plans.

Associated Regulations
California Code of Regulations (CCR)
Title 14. Natural Resources
Division 2. Department of Conservation
Chapter 8. Mining and Geology
Subchapter 1. State Mining and Geology Board

Article 1. Surface Mining and Reclamation Practice. Commencing with Section 3500

This portion includes minimum acceptable mining and reclamation practices for surface mining operations.

Article 9. Reclamation Standards. Commencing with Section 3700

This portion includes performance standards, which may apply to surface mining operations pursuant to CCR Section 3700.

The checklist is divided into seven topical areas: General Considerations, Geology and Geotechnical, Hydrology and Water Quality, Sensitive Species and Habitat, Topsoil, Revegetation, and Agriculture. To use the checklist, place a checkmark next to items that have been addressed by the reclamation plan or leave it blank if the reclamation plan is deficient. Alternatively, write N/A if the item is not applicable to the specific surface mining operation being reviewed.

Disclaimer: This checklist, prepared by DMR, paraphrases portions of SMARA and associated regulations that address the content of reclamation plans and plan amendments. DMR staff uses this checklist internally in performing our review of reclamation plans. However, use of this checklist is not required and it is provided only as a helpful tool. DMR always recommends consulting the full text of SMARA and associated regulations, available at the link below. Additionally, completion of this checklist does not guarantee completeness or compliance of the reclamation plan pursuant to PRC Section 2772.1(b)(1). Analysis of completeness and compliance requires thorough review of each specific project.

http://www.conservation.ca.gov/index/Pages/lawsregs.aspx

Mine Name: Ward Lake Quarry	Checklist Completed by: Vestra Resources
End Use: Open Space/ Ag Preserve	Date: November 10th, 2020

GENERAL CONSIDERATIONS

Authority	Requirements/Practices/Standards	✓ or N/A
PRC 2772(b)	Required contents chart: A chart identifying the location (e.g. page number, chapter, appendix, or other location in the reclamation plan) of content that meets the requirements of PRC Sections 2772, 2773, 2773.3 and CCR Articles 1 and 9 (as delineated in this checklist).	Sec 1
PRC 2772(c)(1)	Contact information: Name and address of the surface mining operator and any person designated by the operator as an agent for service of process (must reside in CA).	Sec 1
PRC 2772(c)(2)	Material quantity and type: The anticipated total quantity and type of minerals to be mined (see Annual Report Instructions, Exhibit B, for mineral types and units of measure).	Sec 1 & 3
PRC 2772(c)(3)	Dates: The initiation and termination dates of mining (be as specific as possible, e.g. December 31, 2030).	Sec 1 & 3
PRC 2772(c)(4)	Depth of mining: The maximum anticipated depth of the surface mining operation.	Fig 13
PRC 2772(c)(5) (A-F)	Reclamation plan maps shall include**:** Size and legal description of lands affected by surface mining operations;	Sec 4
	Names and addresses of owners of all surface interests and mineral interests;	Pg 3
	Property lines, setbacks, and the reclamation plan boundary;	Fig 1,9,12
	Existing and final topography with contour lines at appropriate intervals;	Fig 9 & 12
	Detailed geologic description of the area of the surface mining operation;	Fig 8
	Locations of railroads, utility features, and roads (access roads, temporary roads to be reclaimed, and any roads remaining for the end use).	Fig 1,9,12
	All maps, diagrams, or calculations that are required to be prepared by a California-licensed professional shall include the preparer's name, license number, signature & seal.	X
PRC 2772(c)(6)	Mining method and schedule: A description of the mining methods and a time schedule that provides for completion of mining on each segment so that reclamation can be concurrent or phased.	Sec 1, 3 & 4
PRC 2772(c)(7)	Subsequent use(s): A description of the proposed subsequent use(s) after reclamation	Sec 1 & 4
	Evidence that all landowners have been notified of the proposed use.	
PRC 2772(c)(9)	Impact on future mining: A statement regarding the impact of reclamation on future mining on the site.	Sec 4
PRC 2772(c)(10)	Signed statement: Statement signed by the operator accepting responsibility for reclamation of the mined lands per the reclamation plan.	N/A
PRC 2776(b-c)	Pre-SMARA areas: Reclamation plans shall apply to operations conducted after January 1, 1976 or to be conducted in the future. Mined lands disturbed prior to January 1, 1976 *and not disturbed after that date* may be excluded from the reclamation plan.	N/A
CCR 3502(b)(2)	Public health and safety: A description of how any potential public health and safety concerns that may arise due to exposure of the public to the site will be addressed.	Sec 2 & 3
CCR 3709(a)	Equipment storage and waste disposal: Designate areas for equipment storage and show on maps.	N/A
	All waste shall be disposed of in accordance with state and local health and safety ordinances.	Sec 3
CCR 3709(b)	Structures and equipment removed:	Pg 19

	Structures and equipment should be dismantled and removed at closure, except as demonstrated to be necessary for the proposed end use.	Pg 18,19
CCR 3713(a)	Well closures: Drill holes, water wells, monitoring wells will be completed or abandoned in accordance with laws, unless demonstrated necessary for the proposed end use.	N/A
CCR 3713(b)	Underground openings: Any portals, shafts, tunnels, or openings will be gated or protected from public entry, and to preserve access for wildlife (e.g. bats).	N/A

GEOLOGY AND GEOTECHNICAL

Authority	Requirements/Practices/Standards	✓ or N/A
PRC 2772(c)(5)	A description of the general geology of the area	Sec 2
	A detailed description of the geology of the mine site.	Sec 2
PRC 2773.3	If a metallic mine is located on, or within one mile of, any "Native American sacred site" and is located in an "area of special concern, " the reclamation plan shall require that all excavations and/or excess materials be backfilled and graded to achieve the approximate original contours of the mined lands prior to mining.	N/A
CCR 3502(b)(4)	The source and disposition of fill materials used for backfilling or grading shall be considered in the reclamation plan.	Sec 4
CCR 3502(b)(3)	The designed steepness and treatment of final slopes must consider the physical properties of slope materials, maximum water content, and landscaping.	Sec 4
	The reclamation plan shall specify slope angles flatter than the critical gradient for the type of slope materials.	Sec 4
	When final slopes approach the critical gradient, a Slope Stability Analysis will be required.	Sec 2
CCR 3704.1	Backfilling required for surface mining operations for metallic minerals.	N/A
CCR 3704(a)	For urban use, fill shall be compacted in accordance with Uniform Building Code, local grading ordinance, or other methods approved by the lead agency.	N/A
CCR 3704(b)	For resource conservation, compact to the standards required for that end use.	Sec 4
CCR 3704(d)	Final reclamation fill slopes shall not exceed 2:1 (H:V), except when allowed by site-specific engineering analysis, and the proposed final slope can be successfully revegetated. See also Section 3502(b)(3).	App C
CCR 3704(e)	At closure, all fill slopes shall conform with the surrounding topography or approved end use.	Sec 4
CCR 3704(f)	Final cut slopes must have a minimum slope stability factor of safety that is suitable for the end use and conforms with the surrounding topography or end use.	Sec 4

HYDROLOGY AND WATER QUALITY

Authority	Requirements/Practices/Standards	✓ or N/A
PRC 2770.5	For operations within the 100-year flood plain (defined by FEMA) and within one mile up- or downstream of a state highway bridge, Caltrans must be notified and provided a 45-day review period by the lead agency.	N/A
PRC 2772(c)(8)(A)	Description of the manner in which contaminants will be controlled and mine waste will be disposed.	Sec 3 & 4
PRC 2772(c)(8)(B)	The reclamation plan shall include a description of the manner in which stream banks/beds will be rehabilitated to minimize erosion and sedimentation.	N/A
PRC 2773(a)	The reclamation plan shall establish site-specific sediment and erosion control criteria for monitoring compliance with the reclamation plan.	Sec 4
CCR 3502(b)(6)	Temporary stream and watershed diversions shall be detailed in the reclamation plan.	N/A
CCR 3503(a)(2)	Stockpiles of overburden and minerals shall be managed to minimize water and wind erosion.	Sec 3

CCR 3503(b)(2)	Operations shall be conducted to substantially prevent siltation of groundwater recharge areas.	Sec 2, 3 & 4
CCR 3503(a)(3)	Erosion control facilities shall be constructed and maintained where necessary to control erosion.	Sec 2, 3 & 4
CCR 3503(b)(1)	Settling ponds shall be constructed where they will provide a significant benefit to water quality.	Sec 2, 3 & 4
CCR 3503(d)	Disposal of mine waste and overburden shall be stable and shall not restrict natural drainage without suitable provisions for diversion.	Sec 3
CCR 3503(e)	Grading and revegetation shall be designed to minimize erosion and convey surface runoff to natural drainage courses or interior basins.	Sec 2, 3 & 4
	Spillway protection shall be designed to prevent erosion.	N/A
CCR 3706(a)	Surface mining and reclamation activities shall be conducted to protect on-site and downstream beneficial uses of water.	Sec 2, 3 & 4
CCR 3706(b)	Water quality, recharge potential, and groundwater storage that is accessed by others shall not be diminished.	Sec 2, 3 & 4
CCR 3706(c)	Erosion and sedimentation shall be controlled during all phases of construction, operation, reclamation, and closure of surface mining operations to minimize siltation of lakes and water courses as per RWQCB/SWRCB.	Sec 2, 3 & 4
CCR 3706(d)	Surface runoff and drainage shall be controlled to protect surrounding land and water resources.	Sec 2, 3 & 4
	Erosion control methods shall be designed for not less than 20 year/1 hour intensity storm event.	
CCR 3706(e)	Impacted drainages shall not cause increased erosion or sedimentation. Mitigation alternatives shall be proposed in the reclamation plan.	N/A
CCR 3706(f)(1)	Stream diversions shall be constructed in accordance with the Lake and Streambed Alteration Agreement (LSAA) between the operator and the Department of Fish and Wildlife.	N/A
CCR 3706(f)(2)	Stream diversions shall also be constructed in accordance with Federal Clean Water Act and the Rivers and Harbors Act of 1899.	N/A
CCR 3706(g)	All temporary stream diversions shall eventually be removed and the affected land reclaimed.	N/A
CCR 3710(a)	Surface and groundwater shall be protected from siltation and pollutants in accordance with the Porter-Cologne Act, the Federal Clean Water Act, and RWQCB/SWRCB requirements.	Sec 2, 3 & 4
CCR 3710(b)	In-stream mining shall be conducted in accordance with Section 1600 et seq. of the California Fish and Game Code, Section 404 of the Clean Water Act, and Section 10 of the Rivers and Harbors Act of 1899.	N/A
CCR 3710(c)	In-stream mining shall be regulated to prevent impacts to structures, habitats, riparian vegetation, groundwater levels, and banks.	N/A
	In-stream channel elevations and bank erosion shall be evaluated annually using extraction quantities, cross-sections, and aerial photos.	N/A
CCR 3712	Mine waste and tailings and mine waste disposal units are governed by SWRCB waste disposal regulations and shall be reclaimed in accordance with this article: CCR Article 1. Surface Mining and Reclamation Practice. Section 3500 et seq.	Sec 3

SENSITIVE SPECIES AND HABITAT

Authority	Requirements/Practices/Standards	✓ or N/A
CCR 3502(b)(1)	A description of the environmental setting (identify sensitive species, wildlife habitat, sensitive natural communities, e.g. wetlands).	Sec 2
	Impacts of reclamation on surrounding land uses.	Pg 10,19
CCR 3503(c)	Fish and wildlife habitat shall be protected by all reasonable measures.	Pg 10
CCR 3703(a)	Sensitive species shall be conserved or mitigated as prescribed by the federal and California Endangered Species Acts.	Pg 10
CCR 3703(b)	Wildlife habitat shall be established on disturbed land at least as good as pre-project, unless end use precludes its use as wildlife habitat.	Sec 4
CCR 3703(c)	Wetlands shall be avoided or mitigated at 1:1 minimum for both acreage and habitat value.	N/A
CCR 3704(g)	Piles or dumps shall not be placed in wetlands without mitigation.	N/A
CCR 3710(d)	In-stream mining shall not cause fish to be trapped in pools or off-channel pits, or restrict migratory or spawning activities.	N/A

TOPSOIL

Authority	Requirements/Practices/Standards	✓ or N/A
CCR 3503(a)(1)	Removal of vegetation and overburden preceding mining shall be kept to a minimum.	Sec 3
CCR 3503(f)	When the reclamation plan calls for resoiling, mine waste shall be leveled and covered with a layer of finer material. A soil layer shall then be placed on this prepared surface.	Sec 4
	The use of soil conditioners, mulches, or imported topsoil shall be considered where such measures appear necessary.	Sec 4
CCR 3704(c)	Mine waste shall be stockpiled to facilitate phased reclamation and kept separate from topsoil or other growth media.	Sec 4
CCR 3705(e)	If soil is altered or other than native topsoil, soil analysis is required. Add fertilizers or soil amendments if necessary.	Sec 4
CCR 3711(a)	All salvageable topsoil shall be removed as a separate layer.	Sec 3
	Topsoil and vegetation removal should not precede mining by more than one year.	
CCR 3711(b)	Topsoil resources shall be mapped prior to stripping and location of topsoil stockpiles shown on map included in the reclamation plan.	Fig 1
	Topsoil and other growth media shall be maintained in separate stockpiles.	Sec 3
	Test plots may be required to determine the suitability of growth media for revegetation purposes.	Sec 4
CCR 3711(c)	Soil salvage operations and phases of reclamation shall be set forth in the reclamation plan to minimize the area disturbed and to achieve maximum revegetation success.	Sec 3 & 4
CCR 3711(d)	Topsoil and growth media shall be used to phase reclamation as soon as can be accommodated following the mining of an area.	Sec 1, 3 & 4
	Topsoil stockpiles shall not be disturbed until needed for reclamation.	Sec 3
	Topsoil stockpiles shall be clearly identified.	Sec 3
	Topsoil shall be planted with vegetation or otherwise protected to prevent erosion and discourage weeds.	Sec 3
CCR 3711(e)	Topsoil shall be redistributed in a manner resulting in a stable, uniform thickness consistent with the end use.	Sec 3 & 4

REVEGETATION

Authority	Requirements/Practices/Standards	✓ or N/A
PRC 2773(a)	The reclamation plan shall be specific to the property and shall establish site-specific criteria for evaluating compliance with the reclamation plan with respect to revegetation.	Sec 4
CCR 3503(g)	Available research regarding revegetation methods and selection of species given the topography, resoiling characteristics, and climate of the mined areas shall be used.	Sec 2 & 4
CCR 3705(a)	Baseline studies shall be conducted prior to mining activities to document vegetative cover, density, and species richness.	Sec 4
	Vegetative cover shall be similar to surrounding habitats and self-sustaining.	Sec 4
CCR 3705(b)	Test plots shall be conducted simultaneously with mining to ensure successful implementation of the proposed revegetation plan.	Sec 4
CCR 3705(c)	Decompaction methods, such as ripping and disking, shall be used in areas to be revegetated to establish a suitable root zone for planting.	Sec 4
CCR 3705(d)	Roads shall be stripped of roadbase materials, resoiled, and revegetated, unless exempted.	Pg 19
CCR 3705(f)	Temporary access shall not disrupt the soil surface on arid lands except where necessary for safe access. Barriers shall be installed to keep unauthorized vehicles out.	Pg 19
CCR 3705(g)	Use local native plant species (unless non-native species meet the end use).	Sec 4
	Areas to be developed for industrial, commercial, or residential shall be revegetated for the interim period to control erosion.	N/A
CCR 3705(h)	Planting shall be conducted during the most favorable period of the year for plant establishment.	Sec 4
CCR 3705(i)	Use soil stabilizing practices and irrigation when necessary to establish vegetation.	Sec 4

CCR 3705(j)	If irrigation is used, demonstrate that revegetation has been self-sustaining without irrigation for two years prior to the release of financial assurance.	N/A
CCR 3705(k)	Noxious weeds shall be monitored and managed.	Sec 4
CCR 3705(l)	Plant protection measures such as fencing and caging shall be used where needed for revegetation success. Protection measures shall be maintained until revegetation efforts are successfully completed and the lead agency authorizes removal.	Sec 4
CCR3705(m)	Quantitative success standards for vegetative cover, density, and species richness shall be included in the reclamation plan.	Sec 4
	Monitoring to occur until success standards have been achieved.	Sec 4
	Sampling techniques for measuring success shall be specified. Sample size must be sufficient to provide at least an 80 percent statistical confidence level.	Sec 4

AGRICULTURE

Authority	Requirements/Practices/Standards	✓ or N/A
CCR 3707(a)	Where the end use will be agriculture, prime agricultural land shall be returned to a fertility level specified in the reclamation plan.	N/A
CCR 3707(b)	Segregate and replace topsoil in proper sequence by horizon in prime agricultural soils.	N/A
CCR 3707(c)	Post reclamation productivity rates for prime agricultural land must be equal to pre-project condition or to a similar site for two consecutive years.	N/A
	Productivity rates shall be specified in the reclamation plan.	Sec 4
CCR 3707(d)	If fertilizers and amendments are applied, they shall not cause contamination of surface or groundwater.	N/A
CCR 3708	For sites where the end use is to be agricultural, non-prime agricultural land must be reclaimed to be capable of sustaining economically viable crops common to the area.	N/A

LASSEN COUNTY CODE

Chapter 9.60 Surface Mining and Reclamation Plan Regulations

9.60.010 Purpose and intent. ✓

9.60.020 Definitions. ✓

9.60.030 Incorporation of SMARA and state regulations. ✓

9.60.040 Applicability.

(a) Requirements for Use Permit. Use Permit application included

(b) Minor Amendment to Use Permit or Reclamation Plan. Rec Plan application included

(c) Requirements for Reclamation Plans. ✓

(d) Exemptions. ✓

9.60.050 Contents of applications for use permits for surface mining operations and reclamation plans.

(a) ...all applications for use permits for surface mining operations shall contain the surface mining application supplement required by the planning department. Included

(b) As many copies of reclamation plan application as may be required shall be submitted in conjunction with all applications for use permits for surface mining operations. Included

(c) Applications shall include the necessary environmental review forms and information prescribed by the planning department. Included

(d) The planning department will review the application package for completeness. ✓

9.60.060 Processing. ✓

9.60.070 Performance standards for reclamation plans.

(a) All new or revised reclamation plans shall conform to minimum statewide performance standards required pursuant to SMARA Section 2773(b), as adopted by the state mining and geology board, including but not limited to wildlife habitat, backfilling, revegetation, drainage, agricultural land reclamation, equipment removal, stream protection, topsoil salvage, and waste management. ✓

(b) The county may impose additional performance standards developed either in review of individual projects, as warranted, or through the formulation and adoption of county-wide performance standards (Ord 509,§2, 1992). Included (see County form)

9.60.080 Phasing of reclamation. ✓

9.60.090 Findings for approval. ✓

9.60.100 Financial assurances for reclamation plans. 2021 FACE submitted July 2021

(a) ...the County shall require as a condition of approval one or more forms of security which will be released upon satisfactory performance of reclamation. FAM: Bond/Rider

(b) Financial assurances will be required to ensure compliance with elements of the reclamation plan including revegetation and landscaping requirements; restoration of aquatic or wildlife habitat; protection of archaeological sites; restoration of water bodies and water quality; slope stability and erosion and drainage control; disposal of hazardous materials; and other mitigation measures. ✓

(c) The amount of the financial assurances shall be based upon the estimated costs of reclamation for each year or phase stipulated in the reclamation plan. ✓

(d) In projecting the costs of financial assurances, it shall be assumed... that the operation could be abandoned by an operator and, consequently, the county or state may need to contract for mobilization and reclamation of the site. ✓

(e) Where reclamation is accomplished in annual increments, the amount of financial assurances required for any one year shall be adjusted annually and shall be adequate to cover the full estimated costs for reclamation of any land projected to be in a disturbed condition from mining operations by the end of the following year. ✓

(f) Financial assurances for reclamation that is accomplished in multiple-year phases shall be handled in the same manner as described for annual reclamation. ✓

9.60.110 Inspections. ✓

9.60.120 Interim management plans. ✓

9.60.130 Time limit for commencement of use permits for surface mining operations. ✓

9.60.140 Violations and penalties. ✓

9.60.150 Fees. ✓

9.60.160 Conflicting regulations. ✓

MINING AND RECLAMATION PLAN AMENDMENT
NOVEMBER 2020 – MINE BOUNDARY AMENDMENT

WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

Prepared for

Hat Creek Construction and Materials, Inc.

This report was prepared under the direction of a Professional Civil Engineer & a Professional Geologist

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C Geotechnical Report
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1.0 PROJECT SUMMARY

1.1 Mine History

The Ward Lake Quarry has been operated since 1980, initially under a use permit issued to Caltrans. Caltrans had an agreement dated November 1979 with Miller's Custom Work to use materials from the site.

In 1981, Miller's Custom Work applied for and was granted an expansion of the operation to include excavation and removal of rock over an 80-acre area and installation of a hot plant for asphaltic concrete processing. The road connecting Ward Lake Road to the site was also approved at this time. An Environmental Impact Report (EIR) was prepared for that project in May 1981.

In 1994, Miller's Custom Work applied for an expansion of the 1981 permitted operation. An Initial Environmental Study/Mitigated Negative Declaration was prepared by Lassen County, the project was approved, and expanded operations began; however, a lawsuit was brought against the applicants and the County maintaining, among other items, that the Initial Environmental Study/Mitigated Negative Declaration were inadequate under CEQA and the concrete plant was not a permitted use in an area zoned U-C or Upland Conservation. The Lassen County Superior Court agreed, in part. Related to the inadequacy of the environmental review, the Initial Environmental Study/Mitigated Negative Declaration were found to be deficient in two areas – impacts to the deer and antelope herds and visual impacts. These two issues were the focus of an EIR which was prepared in June 1997.

Amendments to the Use Permit covered in the 1997 EIR included:

1. The rezoning of the parcel from "U-C" (Upland Conservation) to "U-C-2" (Upland Conservation/Resource Management District) to allow operation of a ready-mix concrete plant (already onsite and operating within limits imposed by the Superior Court).
2. Onsite production of ready-mix concrete added to the use permit as an allowed use.
3. Increase in the height of the exposed rock quarry face from the existing +/- 84 feet to a maximum of 150 feet with associated increase in harvest volume from 500,000 cubic yards (CY) to 1,700,000 CY.
4. Expansion of the season of operation from seven months (April through October) to year-round as weather permits.

The Reclamation Plan was already approved for the mining operation, which included regrading of slopes to no greater than 2H:1V, benching of the quarry face, and revegetation with native plants. During the 1997 amendment process, the quarry operator reduced the operating hours from 24 hours a day to between the hours of 6:00 a.m. and 7:00 p.m. The quarry previously operated as needed, 24 hours a day, seven days a week.

TLT Enterprises LLC acquired ownership of the quarry in 2011. The quarry was leased to Hat Creek Construction and Materials, Inc., which has operated it since that time.

Hat Creek Construction continued operating the Ward Lake Quarry under the original conditions outlined in Use Permit 96056 and previous Reclamation Plan No. 94032.

In 2017, Hat Creek Construction filed an amendment to Use Permit 96065 to address changes to the operating conditions at the site. The proposed Use Permit Amendment included:

- Modifying the operating hours to again allow for periods of 24-hour operations. This change was requested to respond to changes in State of California contracting practice requiring nighttime operation on Caltrans project to minimize daytime traffic impacts;
- Extending the life of the quarry from 2020 to 2030; and
- Increasing the annual volume to be mined per year to over 100,000 tons if responding to emergency situations.

A Subsequent Environmental Impact Report was completed at the request of Lassen County. Use Permit Amendment No. 2018-003 was approved on May 14, 2019. Although the Reclamation Plan for the site was not a primary issue and no reclamation plan amendment was submitted, the operating conditions at the site were incorporated by reference by the County into approval of Reclamation Plan Amendment 2018-001. No other portion of the Reclamation Plan was amended at that time.

This Reclamation Plan Amendment addresses the proposed expansion of the quarry by approximately 78.6 acres to the north of the existing quarry. The current Use Permit and Reclamation Plan are included as Appendix A.

1.2 Proposed Amendment

This proposed Reclamation Plan Amendment requests an expansion of the quarry area, extension of the life of the mine, and increase in annual volume removed. The proposed changes to the current Use Permit and Reclamation Plan include:

- Expansion of approximately 78.6 acres, with an associated additional volume of 5,000,000 tons of material
- Extension of life of the mine from 2030 to 2050
- Increase of maximum volume per year from 100,000 tons to 200,000 tons per year

See Site Plan (Figure 1).

1.3 Project Name

Ward Lake Quarry

1.4 California Mine Identification Number

91-18-0008

1.5 Mine Operator

Hat Creek Construction and Materials, Inc.
24339 Highway 89 North
Burney, California 96013
(530)335-5501

1.6 Property Owner

TLT Enterprises LLC.
24339 Highway 89 North
Burney, California 96013
(530)335-5501

1.7 Owner of Mineral Rights

Bureau of Land Management
2950 Riverside Drive
Susanville, California 96130
(530) 257-0456

1.8 Designated Agent

Perry Thompson
Hat Creek Construction and Materials, Inc.
24339 Highways 89 North
Burney, California 96013
(530)335-5501

1.9 Location

The Ward Lake Quarry is located in Litchfield in Lassen County, California. The site lies on the southwest side of Shaffer Mountain. It is located approximately three miles east of Ward Lake, off of Ward Lake Road, in Lassen County. The general site location is shown on Figure 2.

1.9.1 Section, Township, and Range

The current mining area and proposed expansion area are located in Sections 28, 32, and 33, Township 30 North, Range 14 East, MDB&M.

1.9.2 Latitude and Longitude

The latitude and longitude at the center of the project are N 40° 24' 52.12" and W -120° 25' 2.07", respectively.

1.9.3 Directions to Site

From Susanville, head east on Johnsonville Road, continue on Center Road, left on Ward Lake Road, turn right onto Wells Drive, proceed to site entrance.

1.10 Legal Description/Total Parcel Size

This Reclamation Plan Amendment addresses mining and reclamation activities within portions of APN 109-100-59 (historically, APN 109-100-40) and APN 109-100-60 (historically, APN 109-100-42). TNT Enterprises also owns APN 109-100-29, but nothing will take place on that parcel.

The total parcel size of APN 109-100-59 is 442 acres and the total parcel size of APN 109-100-60 is 240 acres, for a total mine area of 682 acres. Parcel boundaries are shown on Figure 3.

1.11 Total Area to be Mined

The currently disturbed area under Use Permit 96056 is approximately 138 acres. This Reclamation Plan Amendment adds an expansion of approximately 78.6 acres. The new total area of the mine is approximately 216.6 acres.

1.12 Total Area to be Reclaimed

The total area to be reclaimed as of 2020 is 138 acres. Total acres to be disturbed and reclaimed are 216.6 acres.

1.13 Quantity and Type of Materials to be Mined

Ward Lake Quarry will continue to mine and process construction aggregates, gravel, and sand for use on construction and road projects. The current material output is 100,000 tons/year. This project proposes to increase that to 200,000 tons/year. The total quarry volume of expansion is 5,000,000 tons.

1.14 Proposed Startup and Termination Dates

This mine is in current operation and is scheduled to end in 2030. This Reclamation Plan Amendment proposes to increase the life of the mine to 2050. The beginning of disturbance in the proposed expansion area will begin upon approval of this Reclamation Plan Amendment.

1.15 Proposed Land Use Following Reclamation

The ultimate end use of the currently permitted site is open space and wildlife habitat. The end use will be the same for the proposed expansion area.

2.0 SITE CONDITIONS

2.1 General Site Characteristics

The Ward Lake Quarry is located in Litchfield in Lassen County, California. The site lies on the southwest side of Shaffer Mountain at an elevation of approximately 4500 feet above mean sea level (MSL). Topography of the proposed expansion area generally slopes from east to west with gentle to moderate slopes.

No drainages exist within the boundary of the proposed expansion area. Secret Creek, an intermittent drainage, is located approximately 450 feet outside of the north boundary of the proposed expansion area within the parcels owned by TNT Enterprises LLC. No operations will take place within the stream area.

The proposed expansion area is situated directly north of the current operations. The undeveloped portions of the property support a sagebrush vegetative community.

2.1.1 General Plan and Zoning Information

The two parcels (APN 109-100-59 and APN 109-100-60) are designated as "Extensive Agriculture" by the Lassen County General Plan. APN 109-100-59 is zoned "U-C-2/Upland Conservation Resource Management District" and APN 109-100-60 is zoned "U-C-A-P/ Upland Conservation/Agricultural Preserve Combining District." Current zoning and General Plan land use are shown on Figures 4 and 5, respectively.

2.1.2 Surrounding Land Use

Land use adjacent to the current operation boundaries are defined by the Lassen County General Plan Land Use as "Agricultural Residential" to the west, "Extensive Agriculture" to the north, and "Open Space" to the south and the east. Zoning adjacent to the current operations is "Open Space District" to the south and east, "Upland Conservation /Agricultural Preserve Combining District" to the north, and "Upland Conservation/Agricultural Residential/Building Site Combining/Agricultural District" to the west. See Figures 4 and 5.

The General Plan land use designations for properties adjacent to the proposed expansion area are "Extensive Agricultural" to the west, "Open Space" to the north and east, and "Mountain Resort/Belfast Initiative Area" to the north and west. The zoning designations for the adjacent parcels are "Upland Conservation District" to the west and "Open Space" to the south, east, and north.

There are twelve residences located within one mile of the quarry. The nearest residence occurs approximately 470 feet from the west property line of the existing quarry and was constructed in approximately 2007. The nearest residence to the proposed expansion area (the same home) is approximately 4,600 feet to the south. Nearby residences are shown on Figure 6 and adjacent property ownership is shown on Figure 7.

The site is located four miles east of the California State Correctional Center. The community of Litchfield is located three miles to the southeast and is generally shielded from the site by topography. The city of Susanville is located approximately 14 miles to the west.

2.1.3 Transportation

Materials are transported from the project site by a private road entering Ward Lake Road and hence to County Road 27/Conservation Center Road. Truck traffic was addressed in the 2019 permit review. There is currently a maximum daily trip generation of 716 material-hauling trucks per day. The proposed increase in annual volume is not expected to increase the number of maximum daily truck trips.

2.1.4 Utilities and Services

The agencies in the following list provide public or private services or utilities to the project site:

Fire Protection:	Standish/Litchfield Fire Protection District
Law Enforcement:	Susanville Police Department
Electricity:	Lassen Municipal Utility District
Natural Gas:	None
Water:	Well on property
Sewage:	None (portable toilets)
Solid Waste:	Lassen County Landfill
Telephone:	Frontier Telephone

2.1.5 Aesthetics

The mine is located approximately one mile north of Highway 395 in Litchfield, California. A low ridge currently separates the mine area from surrounding lands, which has eliminated a direct view of operations from surrounding properties to the west and south. Disturbance of an additional 78.6 acres will increase the footprint of disturbed land to the north and alter topography at the Ward Lake Quarry site. The ridge separating the mine from the surrounding lands will still act as a visual barrier for the proposed expansion area to the south and east. The new area will be visible from the west, as is the current site area. Visual impacts are not anticipated to change. Visual Analysis is included in Appendix B.

2.2 Geologic Description

The project site is located on the margin of the Cascade Range and the Basin and Range geologic/geomorphic provinces of California. The Cascade Range province extends from the northern end of the Sierra Nevada north to the Canadian border. In the project vicinity, the Cascade Range province is bounded to the west by the Klamath Mountain province, to the east by the Basin and Range province, to the south by the Sierra Nevada province, and to the north by the Cascade Range extending through Oregon and Washington.

The Cascade Range province consists of a north-northwest-trending, relatively linear belt of active and dormant strata and shield volcanoes. The regional geologic conditions are dominated by

andesitic, rhyolitic and andesitic volcanic rocks mantled with surficial deposits consisting of pyroclastic rocks, lahar deposits, alluvium, and local lacustrine sediments (Hinds 1952).

The Basin and Range province is characterized by interior drainage with lakes and playas, and the typical horst and graben structure (subparallel, fault-bounded ranges separated by down-dropped basins). In these basins, moderate to extensive thicknesses of lacustrine (lake) and alluvial deposits are present.

The site is underlain by Quaternary-age terrace deposits and Pleistocene-age volcanic rocks (Grose et al. 2013; Lydon et al. 1960). The terrace deposits are near-shore emergent lacustrine deposits associated with the ancestral Lake Lahontan, which covered most of the project region (Grose, et al. 2013). The volcanic rocks consist of interlayered basalt, andesite, and rhyolite tuff and flows labeled the Andesite Flows and Pyroclastics of Litchfield (Grose et al. 2013). A more detailed geologic descriptions is included in the Geotechnical Report prepared by BAJADA Geosciences, Inc., included as Appendix C. Surface geology is shown on Figure 8.

2.2.1 Seismic Considerations

The Holocene-active Honey Lake and Warm Springs Valley faults have been mapped in the project region, with the project site being north of the mapped trend of the Warm Springs Valley fault. Both the Honey Lake and Warm Springs faults exhibit right-lateral displacement and are significant faults within the Walker Lane fault zone (Wills, 1990). The Honey Lake fault is about 35 miles long and capable of generating a MW 7.0 earthquake (USGS, 2020b). The Warm Springs Valley fault is about 24 miles long and capable of generating a MW 6.8 earthquake (USGS, 2020b).

The Honey Lake fault is located about 7 miles southwest of the project site. The Warm Springs Valley fault is mapped about 13 miles south of the site. The State's fault location maps do not show the Warm Springs Valley fault projecting north of Honey Lake; however, lineations mapped from aerial photographs of the region and observed faulting within the existing quarry area project north through the quarry area and region with a trend that is coincident with the Warm Springs fault.

The quarry site is not within a special studies zone associated with the Alquist-Priolo Earthquake Fault Zoning Act (AP). Thermal wells and springs exist in the Wendel and Susanville areas; however, there are no known thermal wells or springs on the project site or adjacent lands.

2.2.2 Slope Stability

BAJADA Geosciences, Inc., performed a number of slope stability evaluations to estimate the maximum safe slope inclination at the site. The geologic conditions at the site consist of a layered rock and soil model. This model has competent, hard, fractured basalt flows sandwiched between weak rock and soil that contains cobble- and boulder-size clasts of harder andesite and rhyolite. Thus, the stability of the slope will not be governed by orientations and proliferations of discontinuity orientations of rock within the slope but more so by the stability of the soil interbeds.

Using this model, gross stability evaluations of slopes with varying inclinations and heights were performed. Slopes ranging in height from 150 to 350 feet were evaluated to estimate the maximum slope inclination that would provide a minimum Factor of Safety (FOS) value for static and pseudostatic conditions of 1.25 and 1.0, respectively, for those heights. Table 1 summarizes the results of stability where the minimum FOS is achieved for each slope height.

Table 1
RESULTS OF STABILITY ANALYSES

Slope Height (feet)	Slope Inclination (degrees)	Loading Condition	FOS	Acceptable FOS?
150	45	Static	1.55	Yes
		Pseudostatic	NP	NA
	50	Static	1.39	Yes
		Pseudostatic	NP	NA
	55	Static	1.26	Yes
		Pseudostatic	1.02	Yes
200	45	Static	1.47	Yes
		Pseudostatic	NP	NA
	50	Static	1.31	Yes
		Pseudostatic	1.05	Yes
250	45	Static	1.40	Yes
		Pseudostatic	NP	NA
	50	Static	1.25	Yes
		Pseudostatic	1.00	Yes
300	45	Static	1.36	Yes
		Pseudostatic	1.07	Yes
350	45	Static	1.31	Yes
		Pseudostatic	1.03	Yes

NP= Not performed; NA=Not applicable

2.3 Topography

Topography in the vicinity of the expansion area slopes from east to west with gentle to moderate slopes. Elevations within the proposed quarry expansion area range from about 4200 feet above msl to 4540 feet above msl. Prior to mining activities, the currently operating site was characterized by a small knob rising approximately 200 feet from the current base of operations. The pit floor in the currently operating mine site is now flat with a less than 4 percent slope and is used for crusher, asphalt concrete, office, shop, and stockpile areas. All other areas are utilized for material excavation. Current topography is shown on Figure 9.

2.4 Hydrology

There are no existing streams or bodies of water within the boundaries of the proposed expansion area. Drainage in the proposed expansion area occurs as sheet flow to the west and hence to an intermittent unnamed tributary to Secret Creek. Secret Creek is an intermittent stream located north of the proposed expansion area which eventually discharges into Willow Creek. Hydrology is shown on Figure 10.

The quarry site is composed up of mostly fractured and weather rock; therefore, the site is pervious and a majority of stormwater infiltrates. Concentrated flows are observed only during heavy rain events. These flows are contained and slowed by berms and benches and ultimately directed into settling basins.

The predominant source of groundwater recharge of the mine area is percolation through the soil and weathered bedrock into the subsurface. Present mining operations have not encountered groundwater. The proposed additional mining area is currently higher in elevation than the current mining operation. The quarry floor as proposed will remain at a higher elevation than the current quarry. The project site does not exist within a 100-year floodplain.

The site does not discharge stormwater and received a Notice of Non-Applicability (NONA) under *Order 2014-0057-DWQ General Permit for Stormwater Discharge Associated with Industrial Activities* in 2015.

2.5 Soils

According to the Natural Resource Conservation Services (NRCS) Web Soil Survey, soils at the project site are comprised of Devada-Rock outcrop association (2 to 50 percent slopes; nonirrigated land capability class 7e; no specified irrigated land capability classification), Orhood very stony sandy loam (5 to 15 percent slopes; non-irrigated land capability class 7s; no specified irrigated land capability classification), McConnel-Mottsville complex (2 to 9 percent slopes; non-irrigated land capability class 6e; irrigated land capability class 3e), and Fivesprings-Longcreek association (9 to 30 percent slopes; non-irrigated land capability class 7s; no specified land capability classification). These soils are listed by the NRCS as well drained to excessively drained with no flooding or ponding concerns. Soils report is included in Appendix D.

2.6 Natural Resources

2.6.1 Terrestrial Biological Resources

A Biological Assessment was completed for the proposed expansion area. A reconnaissance-level survey of the site was conducted to define site-specific vegetation types within the project area and to detect any potential habitat for special-status flora or fauna. The Biological Assessment report is included as Appendix E.

The proposed expansion area consists mainly of shrub communities including sagebrush, bitterbrush, and rabbitbrush that are used as forage for several bird species including sage grouse, chukar, Swainson's hawk, golden eagle, and a variety of other nongame birds and mammals. The area is also located within mule deer and winter range of the Horse Lake deer herd as well as resident and wintering pronghorn antelope herds.

The dominant habitat type identified through the California Wildlife Habitat Relationships (CWHR) classification is sagebrush (Mayer and Laudenslayer 1988). Sagebrush habitat is usually large, open, and often discontinuous and stands are usually dominated by big sagebrush (*Artemisia tridentata*). This habitat occurs over a range of middle and high elevations. Sagebrush is often mixed with other similar shrub species, such as rabbitbrush (*Chrysothamnus* spp.), horsebrush (*Tetradymia* spp.), and bitterbrush (*Purshia* spp.). In some places, stands may have an understory of

perennial grasses and forbs. The expansion will remove an additional 78.6 acres of this habitat type. This site will be reclaimed to open space and wildlife habitat.

2.6.2 Special-Status Plants and Wildlife

Special-status species identified by California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS), and CWHR database searches and literature review were evaluated for their potential to occur within the project area. CNDDB occurrences within five miles of the site are shown on Figure 11. No special-status plant or wildlife species were identified within the proposed expansion area during field surveys. Additional pre-ground-disturbance surveys will be conducted.

Potential for occurrence was based on habitat requirements and proximity to known recorded occurrences of a species. Table 2 shows project impact determinations for potentially occurring special-status species. In the case that any sensitive species were encountered, CDFW would be contacted and a plan would be enacted to conserve or mitigate the species.

The potentially occurring species that were generated through desktop review were assessed based on the actual observed habitat types onsite. The assessment found that the following species have the potential to occur and require further discussion. For additional detail, please refer to Appendix D.

- Golden eagle (*Aquila chrysaetos*)
- Northern harrier (*Circus cyaneus*)
- Swainson's hawk (*Buteo swainsoni*)
- Greater sage-grouse (*Centrocercus urophasianus*)
- Burrowing owl (*Athene cunicularia*)
- Long-eared owl (*Asio otus*)
- Short-eared owl (*Asio flammeus*)
- Loggerhead shrike (*Lanius ludovicianus*)
- Gray wolf (*Canis lupus*)
- American badger (*Taxidea taxus*)
- Pallid bat *(Antrozous pallidus)*
- Townsend's big-eared bat *(Corynorhinus townsendii)*
- Pygmy rabbit (*Brachylagus idahoensis*)
- White-tailed jackrabbit (*Lepus townsendii townsendii*
- Ornate dalea (*Dalea ornata*)
- Spiny milkwort (*Polygala subspinosa*)
- Susanville beardtongue (*Penstemon sudans*)

Table 2 POTENTIALLY OCCURRING SPECIAL-STATUS SPECIES			
Common and Scientific Names	**Status Fed/State or CRPR**	**Preferred Habitat**	**Known and Potential Occurrence in Project Area**
Invertebrates			
Carson wandering skipper *(Pseudocopaeodes eunus)*	FT/--	Alkaline desert seeps dominated by saltgrass	No potential for occurrence due to lack of suitable habitat
Amphibians			
Foothill yellow-legged frog *Rana boylii*	--/CSC	Slow-moving, gravelly streams and rivers with sunny banks in forests and chaparral	No potential for occurrence due to lack of gravelly streams or water bodies
Birds			
Tricolored blackbird *Agelaius tricolor*	--/CE	Nest near fresh water in adjacent vegetation, especially near marshes. Forage in grasslands and croplands	No potential for occurrence due to lack of suitable habitat
Golden eagle *Aquila chrysaetos*	--/CFP	Needs open terrain for hunting – grassland, desert, savannah, shrub. Nests on cliffs and in large trees	Potential for occurrence due to suitable foraging habitat
Northern harrier *Circus cyaneus*	--/CSC	Grasslands, fields, and marshes	Potential for occurrence due to suitable foraging habitat
Swainson's hawk *Buteo swainsoni*	--/CT	Large, open grasslands in riparian systems	Potential for occurrence due to some suitable foraging habitat
Greater sandhill crane *Grus canadensis tabida*	--/CT	Shortgrass plains, grain fields and open wetlands for foraging. Nests in wetlands	No potential for occurrence due to lack of suitable habitat
Greater sage-grouse *Centrocercus urophasianus*	--/CSC	Open, continuous sagebrush communities	Potential for occurrence due to suitable habitat
Burrowing owl *Athene cunicularia*	--/CSC	Open, dry grassland, desert, and shrub	Potential for occurrence due to suitable habitat
Long-eared owl *Asio otus*	--/CSC	Roost in dense vegetation and forage in open grasslands or shrublands	Potential for occurrence due to suitable foraging habitat
Short-eared owl *Asio flammeus*	--/CSC	Large, open areas with low vegetation including prairie, grassland, shrubsteppe, agricultural areas	Potential for occurrence due to suitable habitat
Loggerhead shrike *Lanius ludovicianus*	--/CSC	Open areas with short vegetation and well-spaced shrubs or low trees	Potential for occurrence due to suitable habitat
Mammals			
Pallid bat *Antrozous pallidus*	--/CSC	Forages over many habitats; roosts in buildings, trees, rocky outcrops and crevices in mines and caves; also in oak and pine forested areas, usually near a source of water	Potential for occurrence due to suitable habitat
Townsend's big-eared bat *Corynorhinus townsendii*	--/CSC	Found in all but subalpine and alpine habitats. Requires mines, caves, rock piles, and lava tubes for roosting	Potential for occurrence due to suitable habitat
Gray wolf *Canis lupus*	FE/CE	Highly variable	No records in project vicinity in 93 years; has been located recently in other areas of Lassen County

Table 2 POTENTIALLY OCCURRING SPECIAL-STATUS SPECIES			
Common and Scientific Names	**Status Fed/State or CRPR**	**Preferred Habitat**	**Known and Potential Occurrence in Project Area**
North American wolverine *Gulo gulo luscus*	PFT/CT	Arctic, boreal, and alpine habitats. South of the Canadian border, restricted to high mountain environments near the treeline	No potential for occurrence due to lack of suitable habitat
American badger *Taxidea taxus*	--/CSC	Dry, open stages of shrub and forest with friable soils	Potential for occurrence due to suitable habitat
Pygmy rabbit *Brachylagus idahoensis*	--/CSC	Sagebrush, bitterbrush, and pinyon-juniper	Potential for occurrence due to suitable habitat
White-tailed jackrabbit *Lepus townsendii townsendii*	--/CSC	Sagebrush, subalpine conifer, juniper, alpine dwarf-shrub, and perennial grassland	Potential for occurrence due to suitable habitat
Plants			
Winged dock (*Rumex venosus*)	2B.3	Great Basin scrub (sandy); 1200-1800 m	Not observed onsite
Western seablite (*Suaeda occidentalis)*	2B.3	Great Basin scrub (alkaline, mesic); usually in wetlands; 1200-1500 m	Not observed onsite
Ornate dalea (*Dalea ornata*)	2B.1	Pinion-Juniper woodland; 1365-1700 m	Not observed onsite
Playa phacelia (*Phacelia inundata*)	1B.3	Great Basin scrub, lower montane coniferous forest, playas; 1350-2000 m	Not observed onsite
Spiny milkwort (*Polygala subspinosa*)	2B.2	Sagebrush scrub, Pinion-Juniper woodland, gravelly, rocky; 1330-1705 m	Occurs in vicinity, not observed but may be found onsite
Susanville beardtongue (*Penstemon sudans*)	4.3	Great Basin scrub, lower montane coniferous forest (openings), Pinyon-Juniper woodland; volcanic, rocky, sometimes roadsides; 1200-2425 m	Occurs in vicinity, not observed but may be found onsite

Key (Wildlife): Federally Endangered (FE), Proposed Federally Endangered (PFE); Federally Threatended (PFT); California Endangered (CE); California Threatened (CT); California Fully Protected (CFP); California Species of Special Concern by DFG (CSC).

Key (Plants): 1B.2: "moderately" rare, threatened, or endangered in California and elsewhere; **1B.3**: "not very" rare, threatened, or endangered in California and elsewhere; **2B.1**: "seriously" rare, threatened, or endangered in California but more common elsewhere; **2B.2**: "moderately" rare, threatened, or endangered in California but more common elsewhere; **2B.3**: "not very" rare, threatened, or endangered in California but more common elsewhere.

2.7 Climate

Maximum temperatures approach 90 degrees during the summer months of July and August. Minimum temperatures are often below freezing from late fall through early spring (Susanville Municipal Airport ID 048702; years of record 1893-2016).

Average monthly precipitation is low, staying below 3 inches, and falls primarily as snow during winter months. Monthly precipitation is shown in Table 3. No data are available for the average monthly pan evaporation for this area. The 25-year, 24-hour storm event amount is 4.03 inches.

Table 3 PRECIPITATION SUMMARY SUSANVILLE MUNICIPAL AP ID048702 (1893-2015) (inches per month)		
Month	**Precipitation**	**Snow**
Jan	2.96	11.6
Feb	2.12	7.3
Mar	1.73	5.2
Apr	0.79	1.2
May	0.77	0.3
Jun	0.55	0
Jul	0.23	0
Aug	0.17	0
Sep	0.46	0
Oct	1.05	0.5
Nov	1.61	1.8
Dec	2.6	7.6
Average	**15.04**	**35.6**

2.8 Archaeological and Historical Resources

An archaeological inventory survey was conducted on November 16, 2020, by a qualified professional archaeologist, to identify and document any archaeological, historical, or cultural resources located within the proposed expansion area. The archeological field survey identified one prehistoric cultural resource within the project area, just outside of the mine footprint. The cultural resource identified within the expansion area is a prehistoric resource consisting of sparse scatter of lithics including flake and tool fragment artifacts. The site will be protected from disturbance until additional evaluation has been completed per County mitigation measures.

2.9 Air Resources

The Ward Lake Quarry operates under PTO-19-140 issued by the Lassen County Air Pollution Control District. No new permits will be required for the proposed expansion.

3.0 EXCAVATION AND MINING PLAN

The following description of mining will supersede the existing reclamation plan where discrepancies occur.

3.1 Project Activities and Timeline

Mining activities are permitted under the current Use Permit 96056 and Reclamation Plan 94032. Current operations involve excavation and processing of rock, sand, and gravel. The mine operates Monday through Saturday, between the hours of 6:00 a.m. and 7:00 p.m., with 24-hour operations carried out on an as-needed basis. All materials are processed onsite. Materials may be imported to the site as needed for processing. The life of the Ward Lake Quarry is currently permitted to 2030. The life of the mine is proposed to be extended until 2050.

Processing of mined materials takes place onsite. This includes sorting, crushing, and washing of aggregate. The materials are used for the manufacture of asphalt concrete, aggregate base, ready-mix concrete, and road construction and repair materials. There is potential need to import materials from other locations to blend with aggregates to meet certain specifications. These materials will be stockpiled at the crusher site.

Mining of the proposed expansion area will commence upon approval of this Reclamation Plan Amendment. The expansion will follow the same operating procedures already approved for the current operations. Activities at the processing location will not change. The current mine face will be reclaimed as the expansion area is mined.

The proposed expansion is approximately 78.6 acres to the north of the existing quarry. This expansion has an estimated volume of 5,000,000 tons of material. The overall maximum volume of material moved per year is proposed to increase from 100,000 tons to 200,000 tons. In an effort to reduce the movement of material from the expansion area, a portable crusher may be moved into the flat area on the western side of the proposed expansion area.

Open pit methods are used for the mining of materials. Mine operations currently include extraction excavation from a basalt rock quarry.

3.2 Equipment Use

Equipment and vehicles onsite during mining activities include:

- Fuel tank
- Fuel hauler
- Loader
- Generator (s)
- Storage container
- Concrete batch plant
- Concrete truck
- Service truck

- Man lift
- Belly dump
- Articulated dump truck
- Crusher
- Asphalt batch plant
- Scale

Structures onsite during mining activities include:

- 2,400-square-foot shop building
- 1,375-square-foot office
- 144-square-foot well house
- 3,600-square-foot asphalt plant (footprint)
- 600-square-foot asphalt plant operations office
- 2,100-square-foot concrete plant (footprint)
- 600-square-foot concrete plant office
- 480-square-foot scale house
- 1,080-square-foot fuel containment
- 2,500-square-foot fuel containment

3.3 Hours of Operation

The mine hours of operation are from 6:00 a.m. to 7:00 p.m., six days per week. Operations occur between the hours of 7:00 p.m. and 6:00 a.m. on an as-needed basis.

3.4 Material Removal

The expansion will be operated in the same way as the current mine area. It is an open pit mine for basalt rock and sand and gravel deposits. Rock is crushed and the rock and sand are sorted and stockpiled. The materials are either transported for use offsite or used onsite for the production of asphalt concrete or ready-mix concrete.

As permitted, there is an occasional need to import supplemental aggregates for the concrete production. These are the same procedures as permitted for the current operation. A portable crusher may be moved closer to the active quarry face in the expansion areas as the mine face moves farther north. This is to make the process more efficient overall.

The processing plant will remain where it is located and perform as previously permitted. Rock will be removed beginning at the south near the current operation and moving to the north. As with the current operation, limited blasting will occur.

Final topography is included on Figure 12 and cross-sections are shown on Figure 13.

3.5 Erosion Control

Stormwater runoff is contained onsite and does not discharge offsite. A Notice of Non-Applicability (NONA) was filed in 2015 for the current operations. Surface water will continue to be directed onsite toward the settling ponds and will not be discharged offsite. Stormwater that does not infiltrate will be diverted via a series of ditches and berms

Standard soil erosion control protocols are currently practiced throughout the site and will continue during operations in the expansion area. These include:

- Use of berms, water bars, or rolling dips
- Diverting run-on from stockpile areas
- Planting vegetation/installing stabilizers as necessary
- Retention of all stormwater runoff within quarry to settling ponds

3.6 Topsoil

Topsoil is shallow onsite, as rock is located near the surface. The little topsoil available will be removed using a loader or similar equipment. Topsoil salvaged in the expansion area will be stockpiled separately from other mined materials. The topsoil (and/or other growth media) stockpiles will be clearly signed in the field to prevent inadvertent use. In addition, the location of the soil stockpile in areas not used for other materials will prevent inadvertent use. The topsoil (and/or other growth media) stockpiles are protected from wind and water erosion by planting with an erosion-control mix, as well as keeping the stockpiles in a low profile with moderate slopes. Topsoil stockpiles are located on Figure 1.

When available, topsoil may be imported to the site to assist in the future restoration and reclamation activities (such as from construction project spoils or landslide.)

3.7 Vegetation Removal

Vegetation removal in the expansion area will be completed using an excavator, loader, and dozer. Due to the predominant low sage and sagebrush vegetation type, there is little vegetation to be removed.

3.8 Disposal of Mine Waste

The proposed project does not anticipate producing mine waste. The quarry currently processes and markets all materials removed from the site.

3.9 Water Use

The expansion will not use water other than for dust abatement. Water is used in the processing of materials at the currently permitted location. Water discharged from the gravel/aggregate washing operations is retained in settling ponds. Additional water is provided by the wells near the mine site as needed. No new wells are proposed in the expansion area.

3.10 Water Diversions

There are no streams or bodies of water located within the 78.6-acre proposed expansion area. No waterways will be diverted.

3.11 Pollution Prevention

The only potential sources of pollution in the project area are possible spills of fuels and oils used in equipment onsite and particulate matter in the form of dust produced from material removal and crushing of material. BMPs are in place for current mine activities and will be implemented for the proposed expansion area as well. BMPs maintaining control of dust include:

- Keep stockpile and work surfaces moist
- Provide earthen wind breaks
- Place fine aggregate stockpiles between coarse aggregate piles to screen from winds
- Equipment layout should take advantage of natural or existing wind breaks
- Maintain proper operating procedures of asphalt and concrete ready-mix plants allowing for covering of conveyors if needed
- Fuel and fluids used for equipment stored in double-walled containment systems
- All maintenance conducted in the onsite shop

3.12 Noise Control

Noise considerations for the Ward Lake Pit were extensively studied in the Subsequent Environmental Impact Report in 2019. No changes to operating procedures will take place in the current production area. In the area of the expansion, noise-producing activities will be limited to excavation and hauling of materials.

3.13 Public Safety

There will be no change to public safety protocols. The site is gated and has 24 hour surveillance.

4.0 RECLAMATION PLAN

Site reclamation activities for the existing site were approved in previous reclamation plans. Previous reclamation plans will apply to areas other than the proposed expansion area. The overall goal of reclamation is to return the site to a condition similar to pre-mining condition.

The end use of the currently operating mine as well as the expansion area is to be open space and wildlife habitat.

The proposed expansion will be used solely as a quarry. No new equipment or processing plants will be used with the exception of a possible portable crusher. The existing equipment at the currently operating site will be used to process materials extracted from the expansion. The addition of 78.6 acres and the final slope and benching configuration for expansion are included in this Reclamation Plan Amendment. The revegetation seed mix and the timing of reclamation have been modified and are described herein this Reclamation Plan Amendment.

4.1 Currently Permitted Area – Reclamation Plans 94032 and 2018-001

As permitted, revegetation of the current mine area will include the following:

- Slopes prepared
- Broadcast seeding to spread seed mixes
- The processing area will be seeded with a mix of sagebrush (*Artemisia tridentate*) at two pounds of pure live seed (PLS) per acre, rabbitbrush (*Ericameria nauseosa*) at four pounds of PLS per acre, bitterbrush (*Purshia tridentate*) pure seed at one pound per acre, bluebunch wheatgrass (*Elymus spicatus*)at three pounds of PLS per acre.
- The existing quarry area will be seeded with a mix of sagebrush (*Artemisia tridentate*) at one and a half pounds of PLS per acre, rabbitbrush (*Ericameria nauseosa*) at three pounds of PLS per acre, bluebunch wheatgrass (*Elymus spicatus*) at three pounds of PLS per acre, bottlebrush squirreltail (*Elymus elymoides*) at three pounds of PLS per acre, green ephedra (*Ephedra viridis*) at one pound of PLS per acre, and bitterbrush (*Purshia tridentate*) plugs at twenty-six plugs per acre.

4.2 Schedule

Reclamation is to be completed concurrently with mining operations. Reclamation will occur such that ten acres will be disturbed at a given time for mining and reclamation activities. Once five acres are mined, mining excavation would occur on an additional five acres while concurrently reclaiming the depleted five-acre disturbance. It is anticipated that the resource will be depleted by 2050.

4.3 Engineering Data

4.3.1 Final Slope of Project Area

The final slope of the proposed expansion area will be 1:1 (H:V) per the Geotechnical Report included in Appendix C. Mine faces will be shaped to have a 50-foot highwall and 12-foot benches at a 1:1(H:V) slope. The quarry wall will be composed of hard rock and will not require stabilization. The area is composed of hard rock and, as recommended in the Geotechnical Report, highwalls will be graded at an inclination as to meet the minimum factor of safety (FOS). Benches will be constructed to drain to the margins of the highwall and/or to centralized collection areas that capture and convey drainage to the bottom of the cut slope. Cross-sections are shown on Figure 13.

There are existing gravel roads into the expansion area. Gravel roads will be left in place for monitoring of the reclaimed area, as not to disturb vegetation growth. Signs will be posted to keep vehicles off revegetated areas.

4.3.2 Reclaimed Land Use

Reclamation will return the area to open space/wildlife habitat.

4.3.3 Erosion and Drainage Control

Erosion and sedimentation will be controlled during and after reclamation activities. Surface runoff will be controlled using appropriate grading along with the implementation of BMPs including the use of:

- Mulches
- Vegetative cover
- Straw wattles
- Water bars/rolling dips
- Rock-lined ditches

4.3.4 Topsoil Replacement

The topsoil will be transferred from the stockpile and into the reclamation area using the same techniques as specified in the current mining and reclamation plan. When the excavation operations and the construction of embankment slopes have ceased, the topsoil will be spread to a uniform depth. The topsoil will be compacted to stabilize the material; however, compaction will not occur to a point where the topsoil is not an effective growing medium. The compaction will be completed with track equipment.

Topsoil will not be placed on the rock faces, only on the excavation floor and benches.

4.4 Streambed Restoration

No waterways will be diverted. Streambed restoration is not required.

4.5 Groundwater Quality Protection

No impacts to groundwater due to mining are anticipated.

4.6 Building and Equipment Removal

No structures are planned to be constructed in the quarry expansion area. No new equipment or processing plants will be used in the expansion area with the exception of a possible portable crusher. If a portable crusher is brought into the area, it will be removed prior to reclamation commencement.

4.7 Revegetation Plan Design

4.7.1 Baseline Studies

Baseline studies in the expansion area for vegetation cover, density, and species richness were conducted following *Rehabilitation of Disturbed Lands in California: A Manual for Decision Making* (Newton 2003). Surveys were completed within the low sagebrush habitat which dominates the expansion area. Methods were repeated via systematic sampling in order to achieve greater than eighty percent confidence in results. Data was collected using a $1m^2$ quadrat. The initial plot location was determined by random point projection using a GPS device and subsequent plots were systematically placed 1 meter apart. Methods were sufficiently repeated via systematic sampling in order to achieve adequate confidence in results (greater than eighty percent). Results are included in Table 4.

Table 4
WARD LAKE QUARRY BASELINE PLOT SUMMARY

Plot	% Cover (Veg)	% BG (Rock)	% Cover Perennial	% Cover Annual	Species Richness
1	55	45	50	25	5
2	10	90	0	50	2
3	10	90	20	25	5
4	30	70	10	35	4
5	60	40	30	90	3
6	50	50	30	80	4
7	65	35	10	70	4
8	75	25	65	25	6
9	50	50	85	20	4
10	30	70	45	20	4
11	50	50	35	60	4
12	85	15	80	20	3
13	75	25	60	50	5
14	10	90	0	50	4
AVERAGES	**46.79**	**53.21**	**37.14**	**44.29**	**4.07**

Percent cover was quantified for the entire plant community (mean=86.42 percent) and for each growth type (shrub [mean=7.73 percent], forb [mean=4 percent], annual grass [mean=24.64 percent], and perennial grass [mean=6.19 percent]). The percent cover of the entire vegetative community is greater than the total percent cover due to overlap in canopy layers.

Annual grasses were removed from the percent cover calculation as they annuals consist of cheat grass and medusahead which are invasive and will be controlled. Percent cover of shrubs (mean=7.73 percent), of perennial grass (mean=6.19 percent) and of forbs (mean=4 percent) equals approximately 18 percent cover.

Species richness was quantified within each plot to achieve an average number of species across the landscape (mean=4 species).

A species inventory was generated for the baseline botanical surveys. Eleven plant species were identified within the study area:

- Antelope bitterbrush (*Purshia tridentata*)
- Rubber rabbitbrush (*Ericameria nauseosa*)
- Big sage brush (*Artemisia tridentata* spp.)
- Mormon tea (*Ephedra viridi*s)
- Hooker's balsamroot (*Balsamorhiza hookeri*)
- Bristly fiddleneck (*Amsinckia tesselata*)
- Redstem stork's bill (*Erodium cicutarium*)
- Cheatgrass (*Bromus tectorum*)
- Medusahead (*Elymus caputa medusa*)
- Bluebunch wheatgrass (*Pseudoreogneria spicata*)
- Common wooly sunflower (*Eriophyllum lanatum*)

4.7.2 Proposed Plant Pallet

The quarry floor and benches in the 78.6-acre expansion area will be seeded with a mix of sagebrush (*Artemisia tridentate*) at two pounds of PLS per acre, rabbitbrush (*Ericameria nauseosa*) at four pounds of PLS per acre, bitterbrush (*Purshia tridentate*) one pound of pure seed per acre, and blue bunch wheat grass (*Elymus spicatus*) at three pounds per acre.

4.7.3 Seed and Plant Sources

Seed will be ordered from a reputable supplier that collected or grew out seed from a source as close to the project site as possible. Seed will be properly labeled as genus, species, subspecies, variety, and source and will be handled and packed in a manner that ensures the purity and viability of the materials. Weed seed will not exceed 0.5 percent of the PLS and inert material. Seeding rates will be given in pounds of PLS per acre. The seed mix will be measured and packaged by the seed supplier.

4.7.4 Plant Placement

Seeds will be broadcast using a tractor-mounted seeder and then tracked in with machinery. Plugs will be hand planted. Seeding will take place in the fall prior to the first rain. Hand planting will be conducted in the spring as the soil temperatures warm.

4.7.5 Irrigation

No irrigation is planned.

4.7.6 Test Plots

Test plots will be implemented per SMARA regulations and Division of Mine Reclamation guidelines. The purpose of the test plots is to determine on a small scale the effectiveness of planting and survival of native grass and shrub seeds and the cultivated plugs of target tree species. Test plot design will follow recommendations in the "*Rehabilitation of Disturbed Lands in California A manual for decision-making"* published by the California Department of Conservation.

Test plots will be installed once an area sufficient for the plot area has been mined and depleted. Each plot will consist of approximately 50-foot by 50-foot fenced area separated by sufficient distance, and a physical barrier, such as hay bales, in between plots to achieve isolation between plots. Factors that will be assessed by test plots includes the germination success of seed and establishment success of plugs, as well as benefits of soil amendments or treatment such as inoculation of planting with mycorrhizae from nearby (undisturbed) shrubs. Deer-friendly fencing will be placed around each plot. Plots will be monitored, and results will be compared to the performance standards described in Section 4.9. If simple regeneration efforts are unsuccessful, additional treatments, such as the use of mulches and ripping, will be tested. Additional treatments will be determined as test plots progress. Treatments may include:

- Chip mulch
- Commercially available mulches
- Ripping
- Fertilizers
- Weed matts/fabrics
- Plant solar protection (cartons)
- Plant deer protection (Vexar tubes)

4.8 Monitoring and Maintenance

4.8.1 Vegetation Monitoring

Vegetation surveys will be conducted once annually following reclaiming when dominant vegetation has matured and both early- and late-season species can be correctly identified. Surveys will be conducted by a professional experienced in undertaking field surveys and knowledgeable of plant taxonomy and ecology. The results of vegetation surveys will be used to compare site conditions over the maintenance and monitoring period.

4.8.2 Invasive Plant Control

Some invasion by noxious weeds, primarily medusahead and cheatgrass, is anticipated as a number of invasive species are ubiquitous in the region. It is unlikely the operator will be able to completely eliminate these species due to the large sources of seed on the site. Most mechanical, cultural, and chemical treatments are ineffective in situations where overseeding with other grasses is desired.

Milestone® (aminopyralid), applied at a rate of 14 ounces/acre as a fall pre-emergent, can provide some success. Milestone is broadleaf-selective herbicide that is safe for use on most grasses. A supplemental label (2ee) has been issued for medusahead control in Arizona, California, Colorado, Idaho, Oregon, Washington, Wyoming, and Utah. In the northern Central Valley, research shows that 14 ounces/acre can provide control. The treatment must be applied as a pre-emergent in the fall of year 2.

In this specific application, seeding for revegetation will also be conducted in the fall so the applications of herbicide will need to be conducted in the year following establishment.

Please note the herbicide application will remove all broadleaf native and nonnative plants. The effect on native grasses (bunchgrass) is unknown, and the application will also inhibit the sprouting of other annual species. For this reason, the herbicide application will be conducted only if determined to be necessary.

Brush species seeded for reclamation will be protected by covers or other means.

4.8.3 Monitoring Report

By December 1 of each monitoring year, a report will be prepared containing the results of the monitoring and an assessment of the data. Included will be a summary of those performance criteria attained and those for which corrective measures were undertaken to achieve compliance. Photographic and other evidence (i.e., maps, laboratory reports, etc.) will be used to support the final assessment. Raw data and maintenance log sheets will also be included as appendices.

4.9 Performance Criteria

Performance criteria have been developed for plant types planted during reclamation of the proposed expansion area. Should the evaluation of performance criteria reveal that revegetated areas are significantly behind in their target percentages, the reasons for insufficient plant germination and/or growth will be determined and appropriate remedial actions will be undertaken to meet the established criteria.

Remedial actions could include planting additional material of the species or substitutions of other species better suited to the sites failing to attain desired performance criteria. Remedial actions will be applied to all areas requiring them, not merely to the monitored plots.

Revegetation of these areas will meet the following success standards:

- Shrub and grass species will achieve 5 percent cover in year 1, 10 percent by year 2, and 18 percent in years 3 to 5. If survival drops below these numbers, plants will be replaced the following fall;
- Establish a minimum species richness of at least two native perennial shrub species and one perennial grass species in three years over the reclaimed expansion area;
- Average basal density of 3 perennial plants within three years as quantified within 1-meter plots; and
- Invasive exotic species will not compose greater than 10 percent of the cover in any year.

Maintenance of the reclaimed areas during the early stages of plant establishment is essential to the attainment of reclamation objectives and performance criteria. The revegetation areas will be maintained in good condition through regular monitoring to detect problems before they affect the attainment of performance criteria.

Monitoring by a qualified biologist or forester will be conducted following completion of reclamation until performance criteria have been met for two consecutive years with no human intervention. Corrective or remedial actions will be undertaken if success criteria are not attained in a given monitoring year.

4.10 Natural Regeneration

Some natural regeneration will occur within portions of the project area. Seeds will be dispersed onto the reclamation area by natural sources (wind, gravity, animals, etc.) and may be transported from relatively long distances. Natural regeneration will produce volunteers of a variety of indigenous species.

The natural revegetation of native species will be encouraged and allowed to occur. If undesirable species not native to the area begin to invade such that they become a threat to the establishment of desirable native species, these species will be eradicated by hand, mechanical means, controlled burning, use of herbicides, or a combination of these methods.

4.11 Impact on Future Mining

This Reclamation Plan Amendment precludes future mining on the site after reclamation.

5.0 ADMINISTRATIVE REQUIREMENTS

5.1 Financial Assurance

Hat Creek Construction previously accepted responsibility for reclamation per Use Permit 96056 and Reclamation Plan 94032, accepts responsibility for this Reclamation Plan Amendment, and has provided financial assurance for completion of site reclamation in compliance with SMARA. The most recent Financial Assurance Cost Estimate was submitted in 2021.

5.2 Annual Inspections

Hat Creek Construction will allow access to Lead Agency officials for the purpose of annual inspections of the mining project. The required annual report will be prepared in conclusion to the annual inspection and provided to the State Mining and Geology Board by July 1 of each year.

5.3 Reclamation Plan Amendments

An amended reclamation plan will be submitted to the Lead Agency prior to any substantial deviations from approved plans.

6.0 REFERENCES

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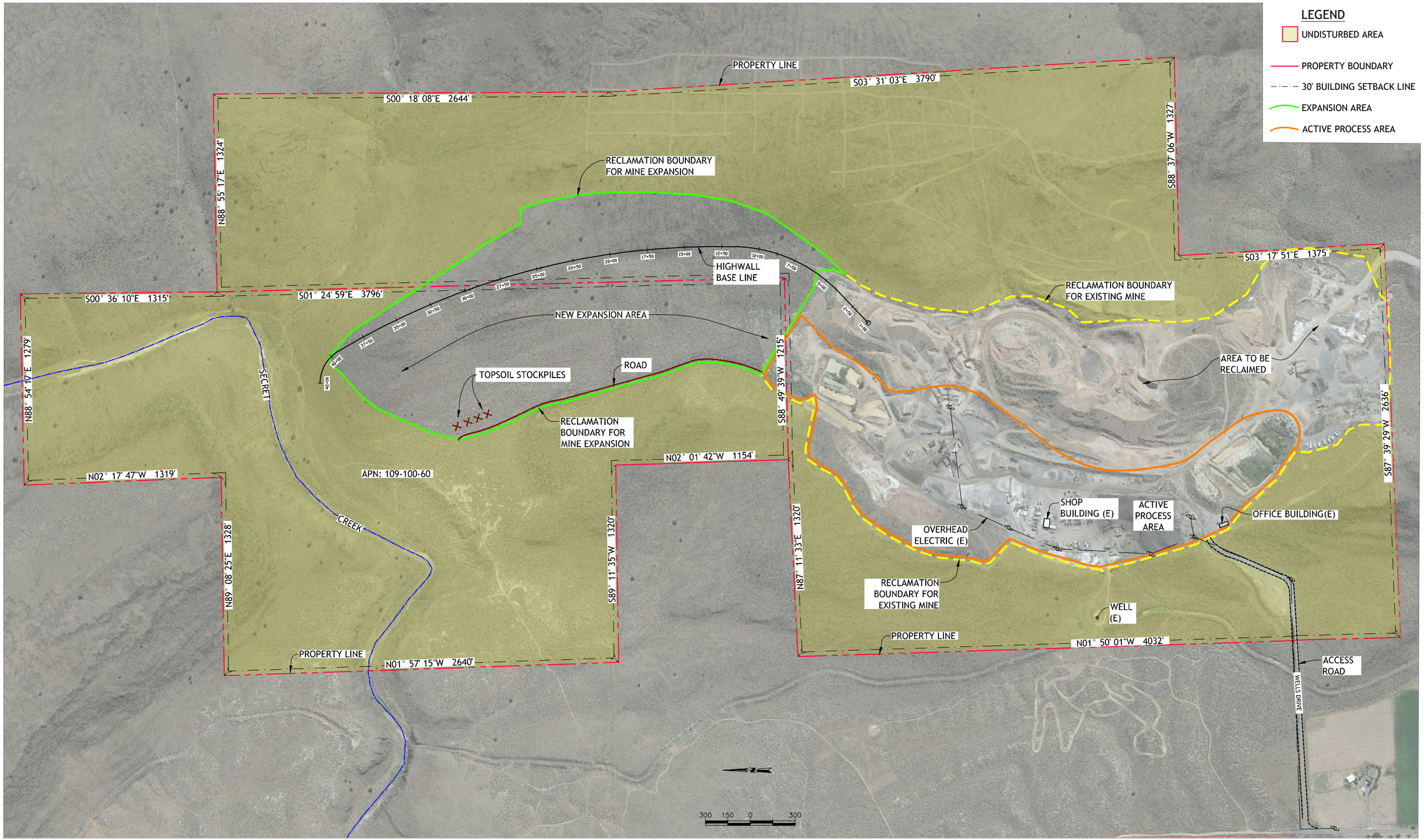
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Figures



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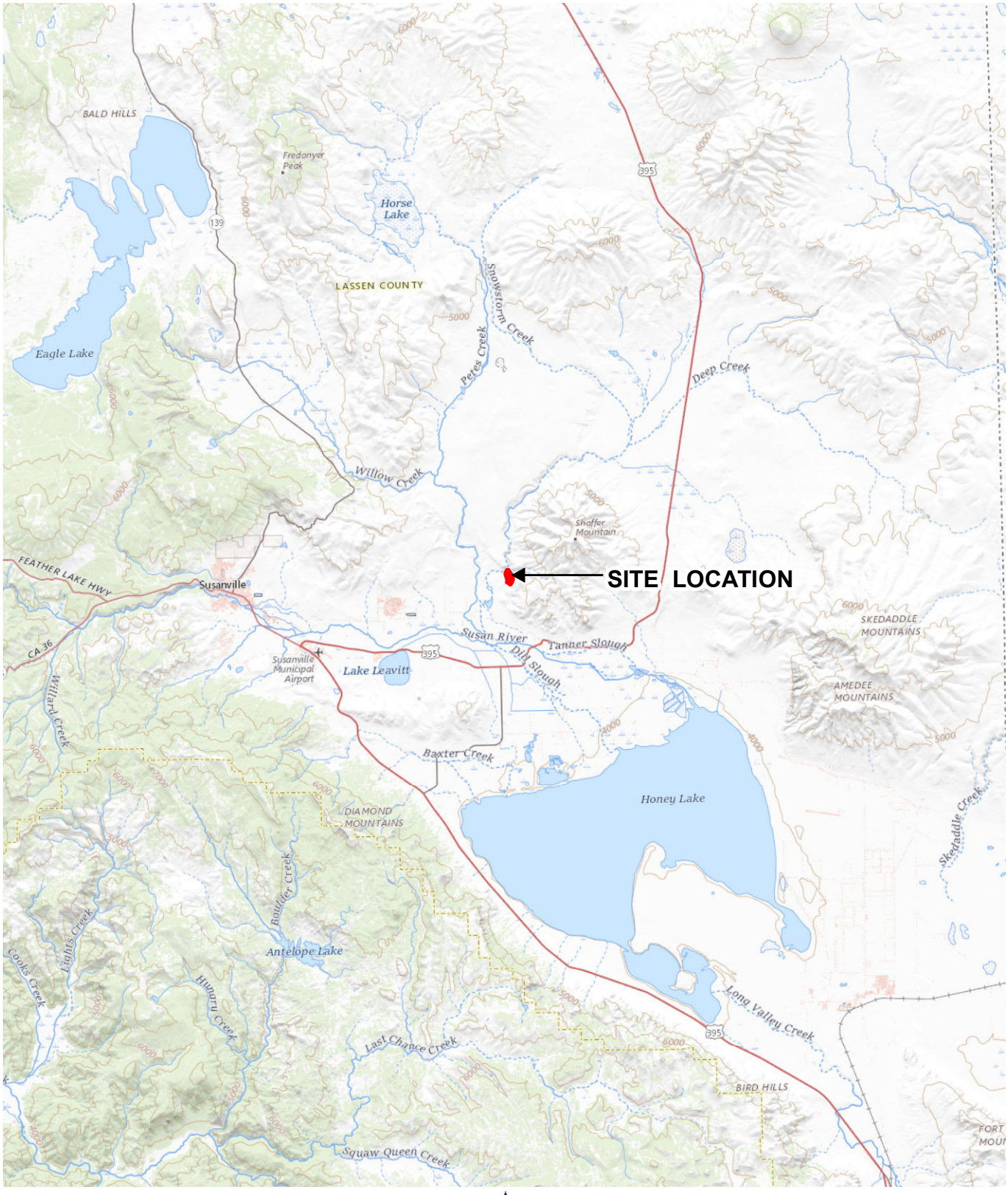
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CHK: SG
APVD: SG

FIGURE 1
SITE PLAN
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
SUSAN DIANE GOODWIN
Exp. 6/30/21
No. 61857
CIVIL
STATE OF CALIFORNIA

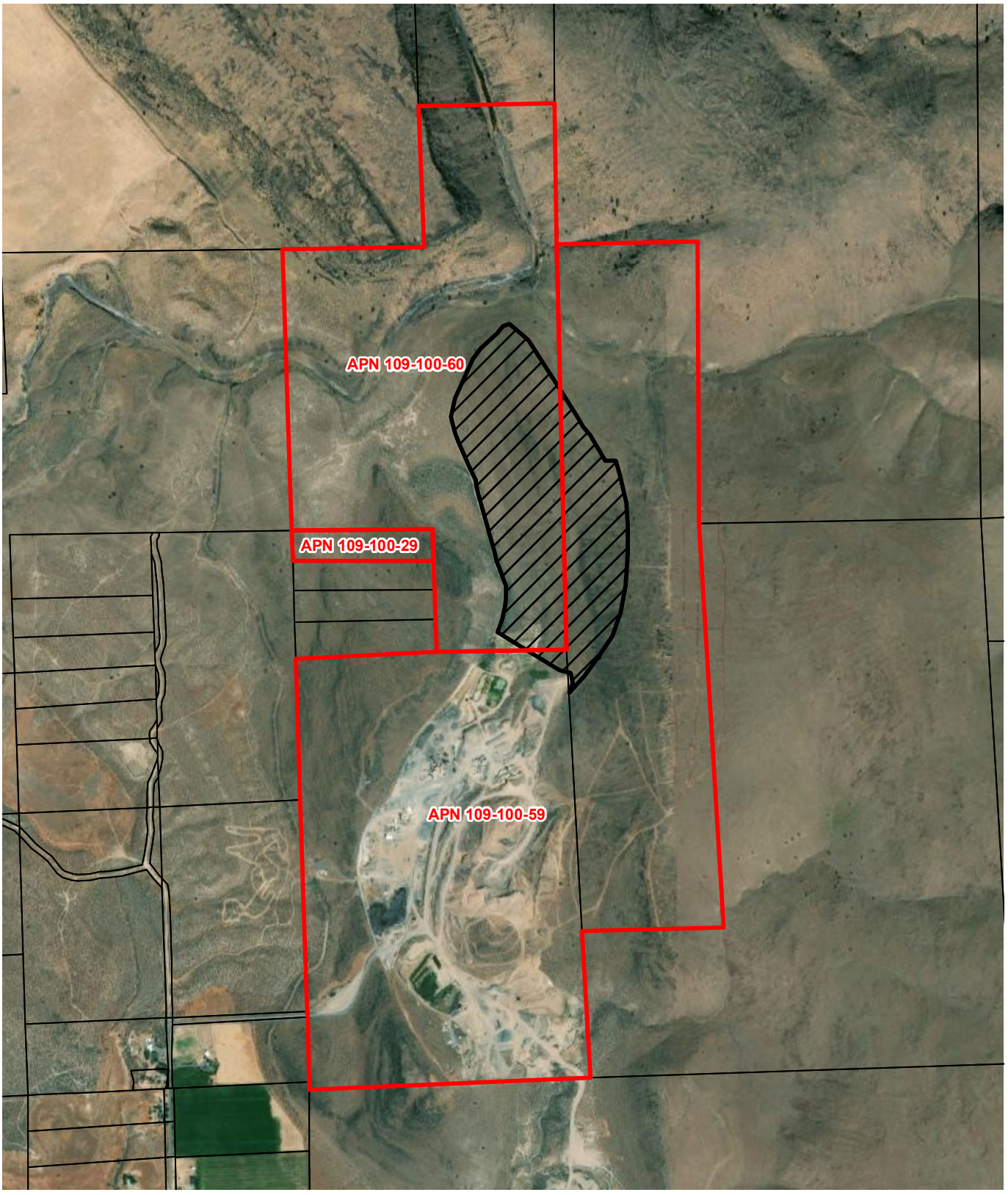
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FIGURE 2
GENERAL SITE LOCATION
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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Approximate Parcel Boundary

Proposed Expansion Area

N

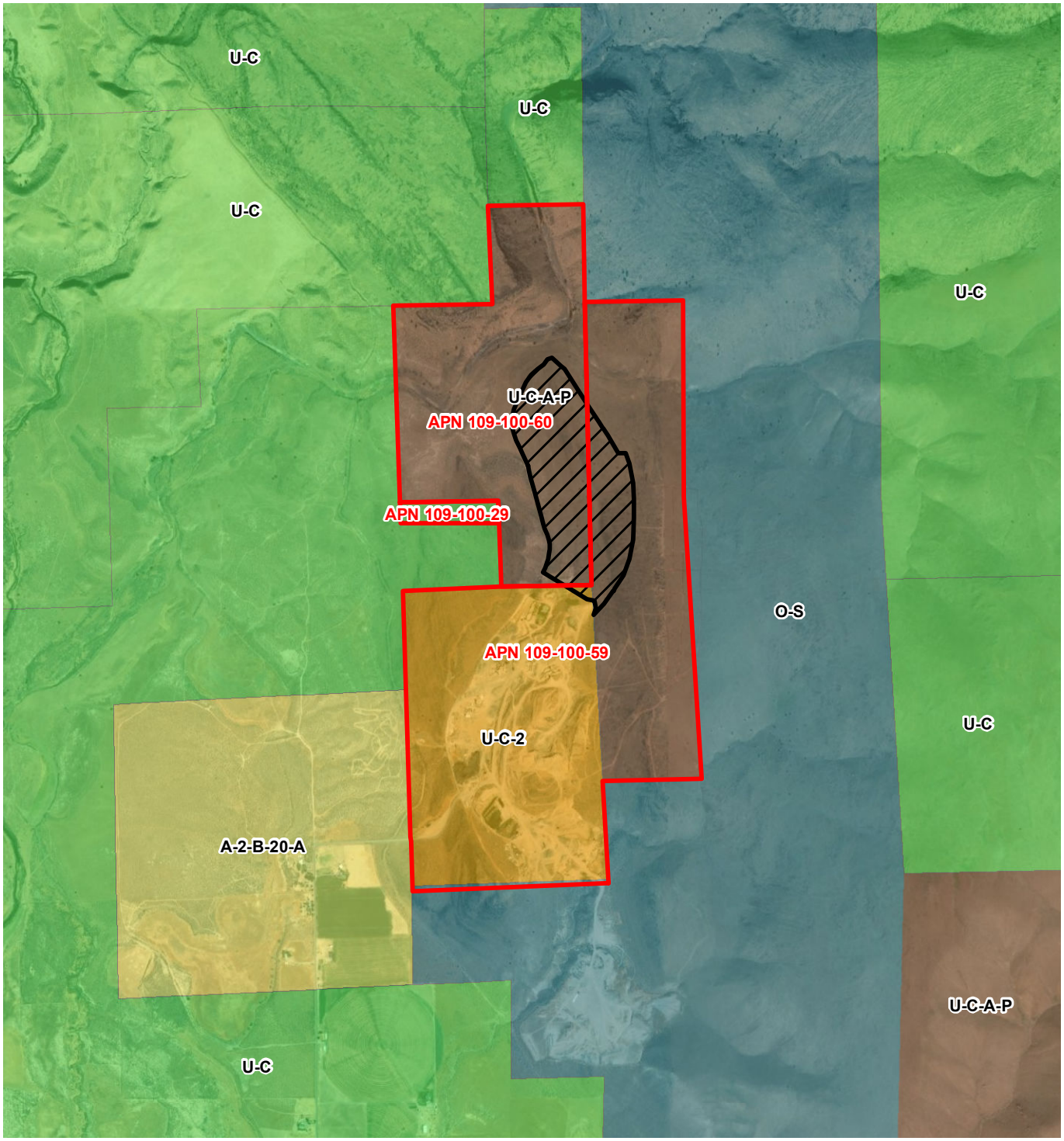
0 0.125 0.25 0.5 Miles

VESTRA

SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH

FIGURE 3
PARCEL BOUNDARIES
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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Approximate Parcel Boundary

Proposed Expansion Area

A-2-B-20-A (Agricultural Residential District/Building Site Combining District/Agricultural Combining Districts)

O-S (Open Space District)

U-C (Upland Conservation District)

U-C-2 (Upland Conservation/Resource Management District)

U-C-A-P (Upland Conservation District/Agricultural Preserve Combining District)

N

VESTRA

0 1,000 2,000 4,000 Feet

SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH; LASSEN COUNTY 2018

FIGURE 4
ZONING
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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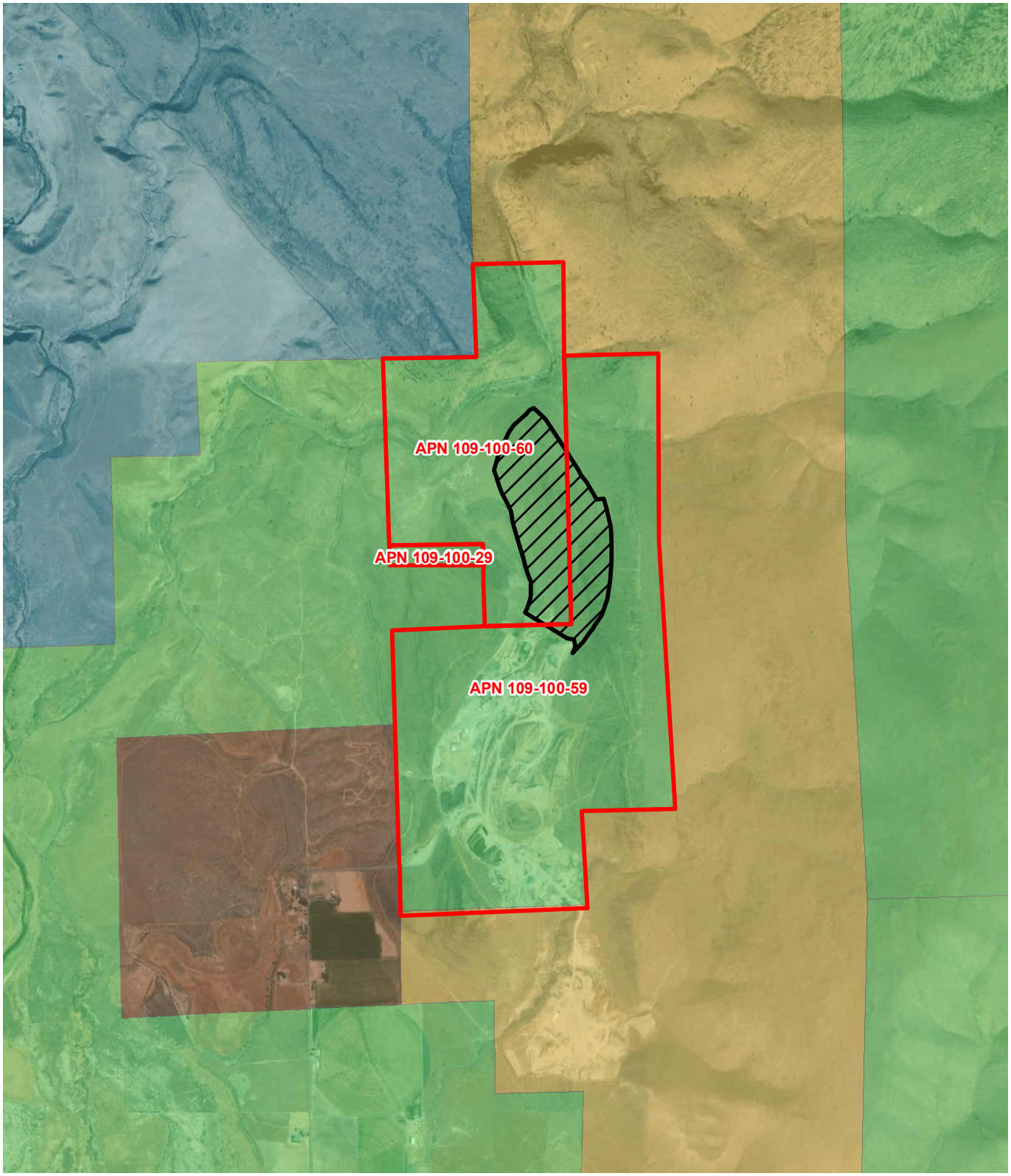
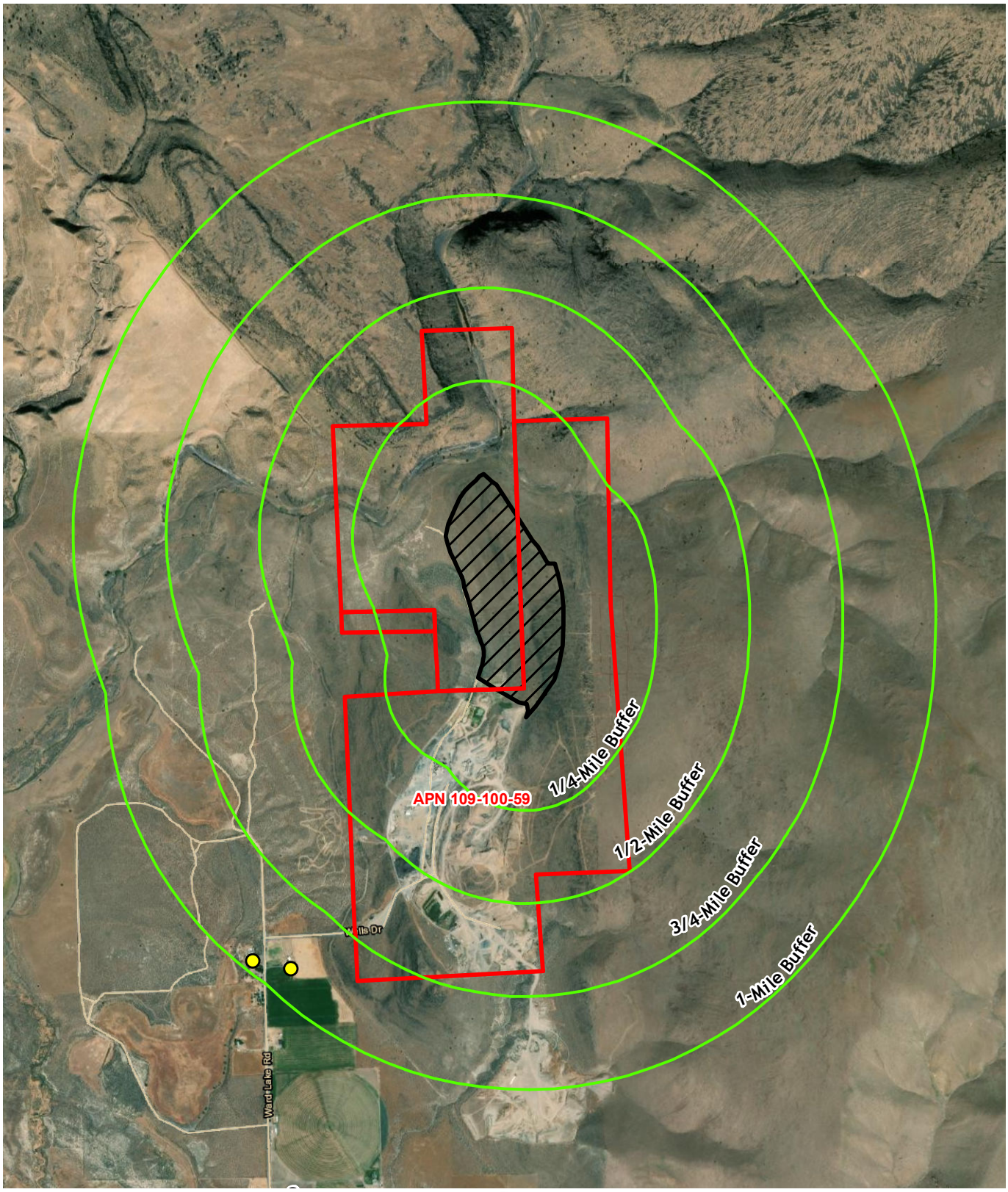


FIGURE 5
GENERAL PLAN LAND USE
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH; LASSEN COUNTY 2014

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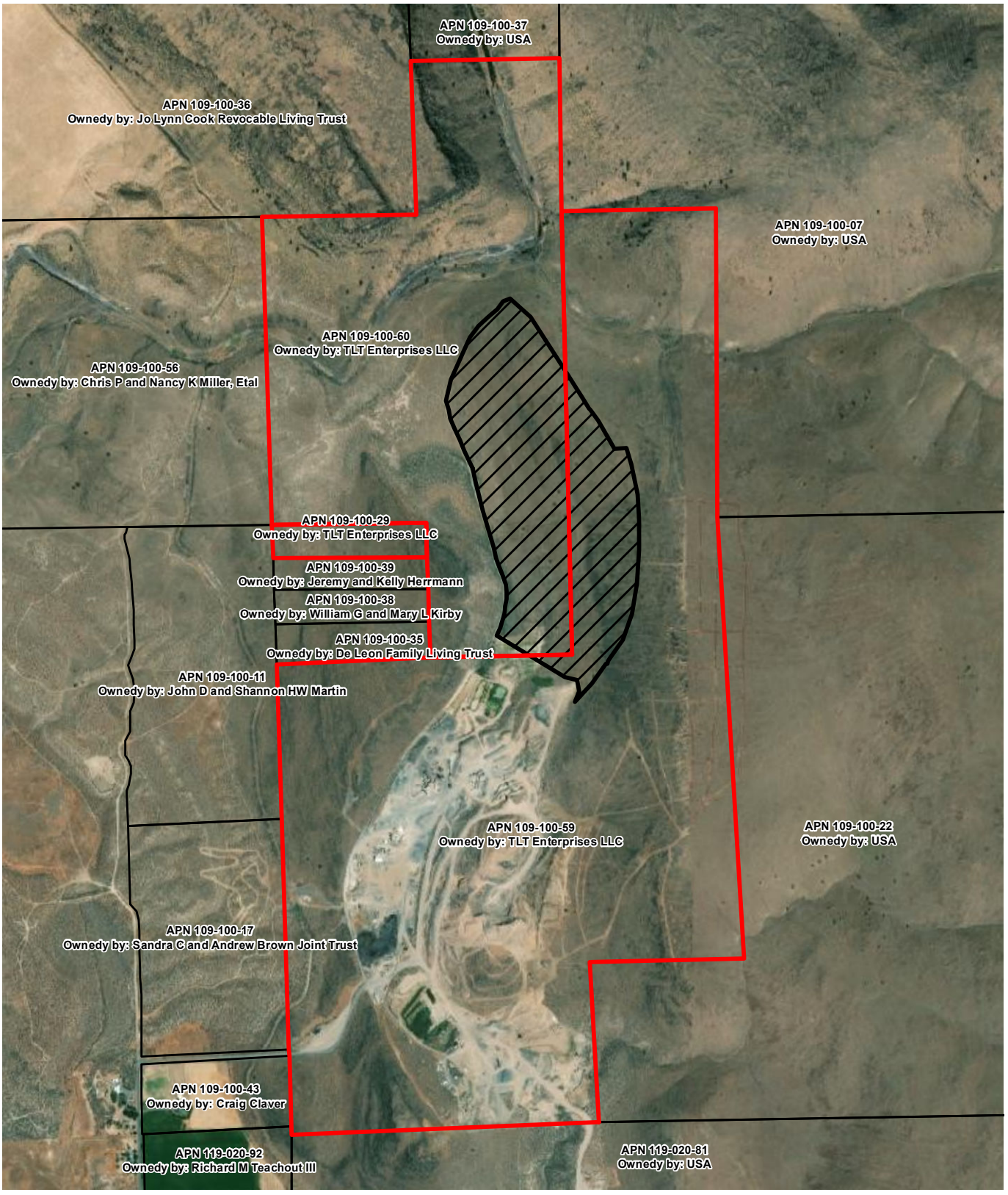


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SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH

FIGURE 6
NEARBY RESIDENCES
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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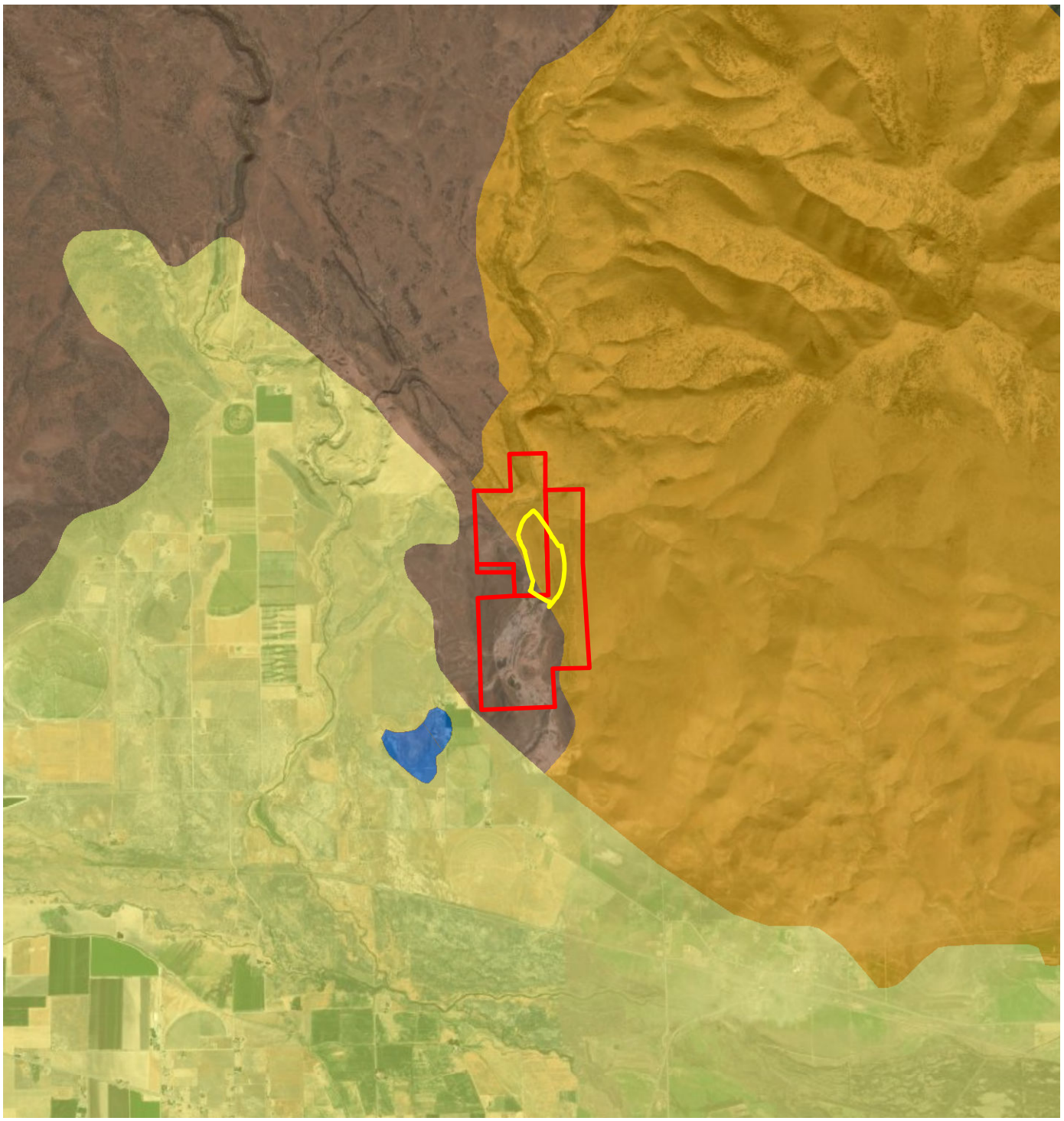


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SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH; CNDDB AUGUST 2020

FIGURE 7
ADJACENT LAND OWNERS
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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Proposed Expansion Boundary

Approximate Parcel Boundary

Q: Quaternary alluvium and marine deposits (Pliocene to Holocene)

Qv: Quaternary volcanic flow rocks, unit 1 (Cascade volcanic field) (Quaternary)

Tv: Tertiary volcanic flow rocks, unit 17 (Cascade Range)

Water

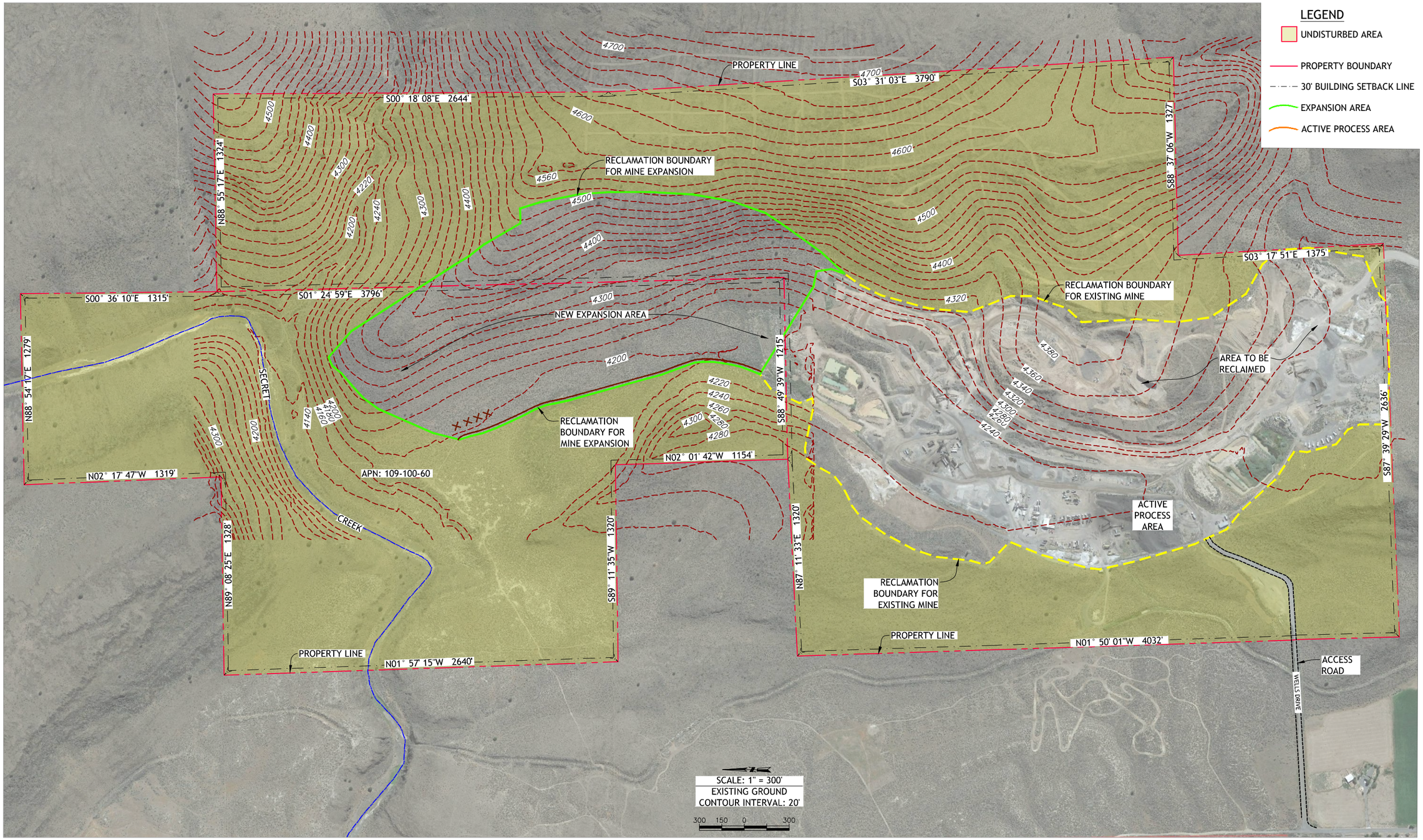
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0 0.5 1 2 Miles

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH; USGS 2014

FIGURE 8
GEOLOGY
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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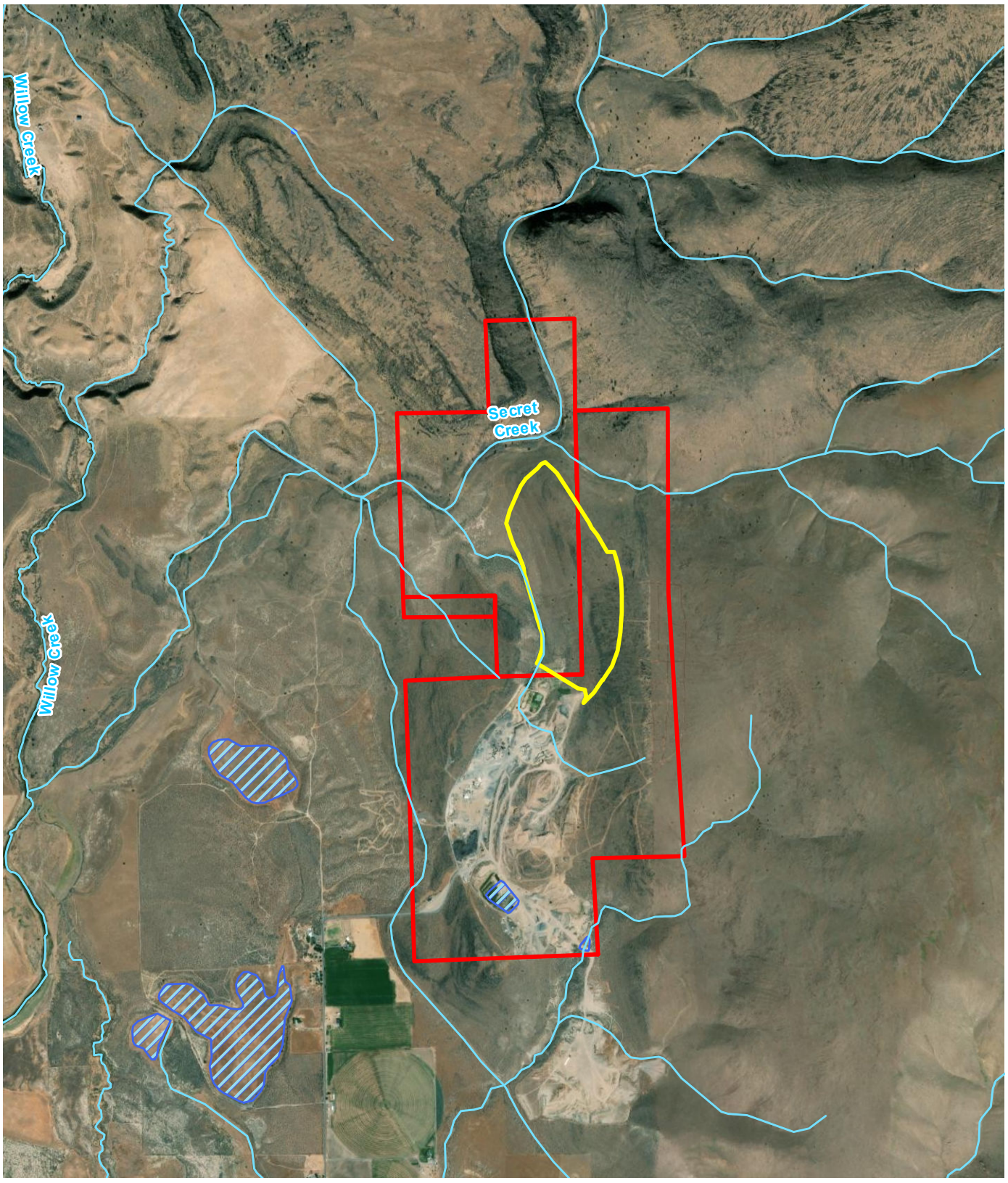
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APVD: SG

FIGURE 9
CURRENT TOPOGRAPHY
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
SUSAN DIANE GOODRICH
No. 61687
CIVIL
STATE OF CALIFORNIA
10/5/20

SHEET OF
DATE 10/05/20
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Watercourse
Waterbody
Proposed Expansion Boundary
Approximate Parcel Boundary

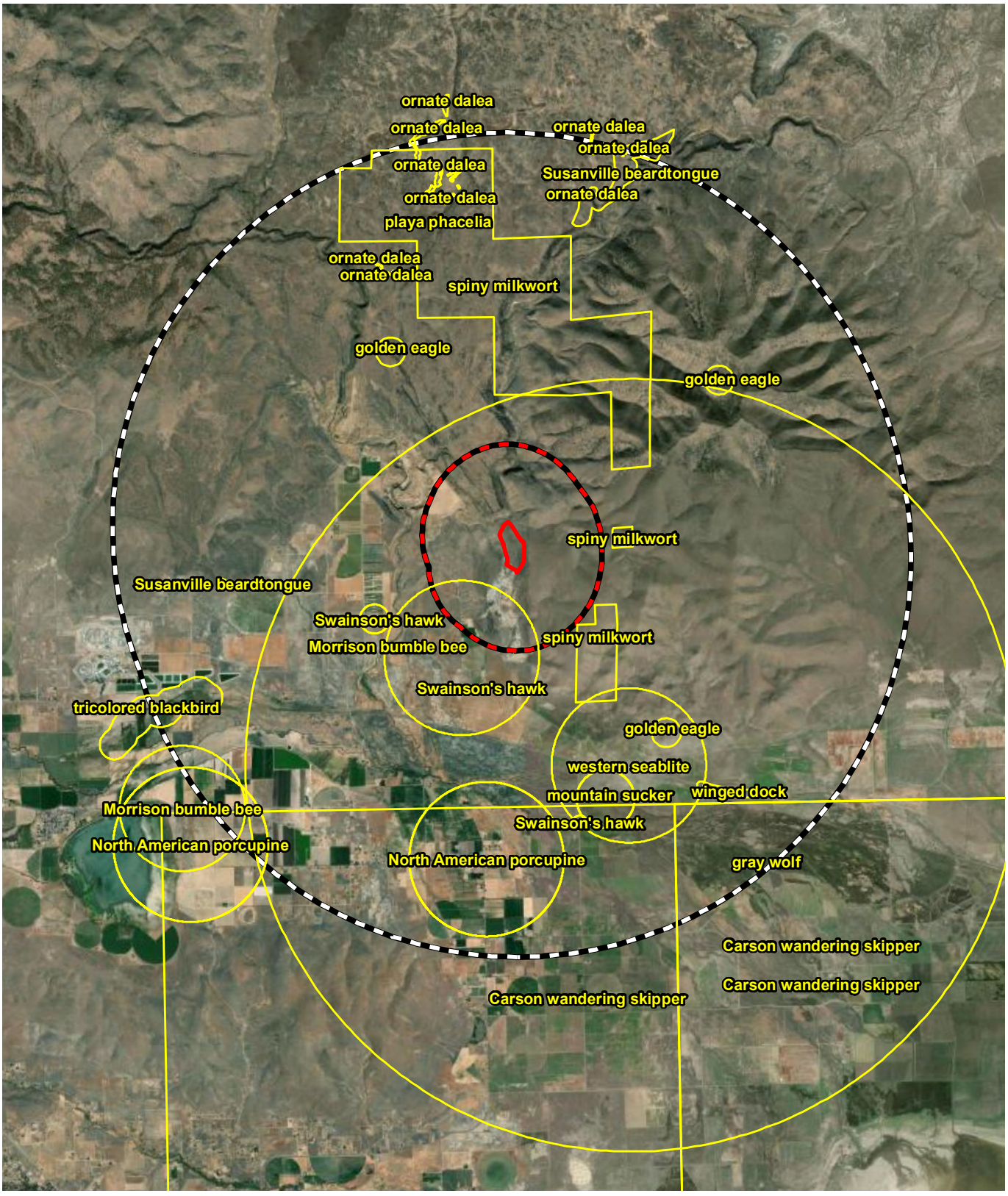
0 1,000 2,000 4,000 Feet

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SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH; USGS 2014

FIGURE 10
HYDROLOGY
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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CNDDB Occurrence

Proposed Expansion Area

1-Mile Buffer Around Proposed Expansion Area

5-Mile Buffer Around Proposed Expansion Area

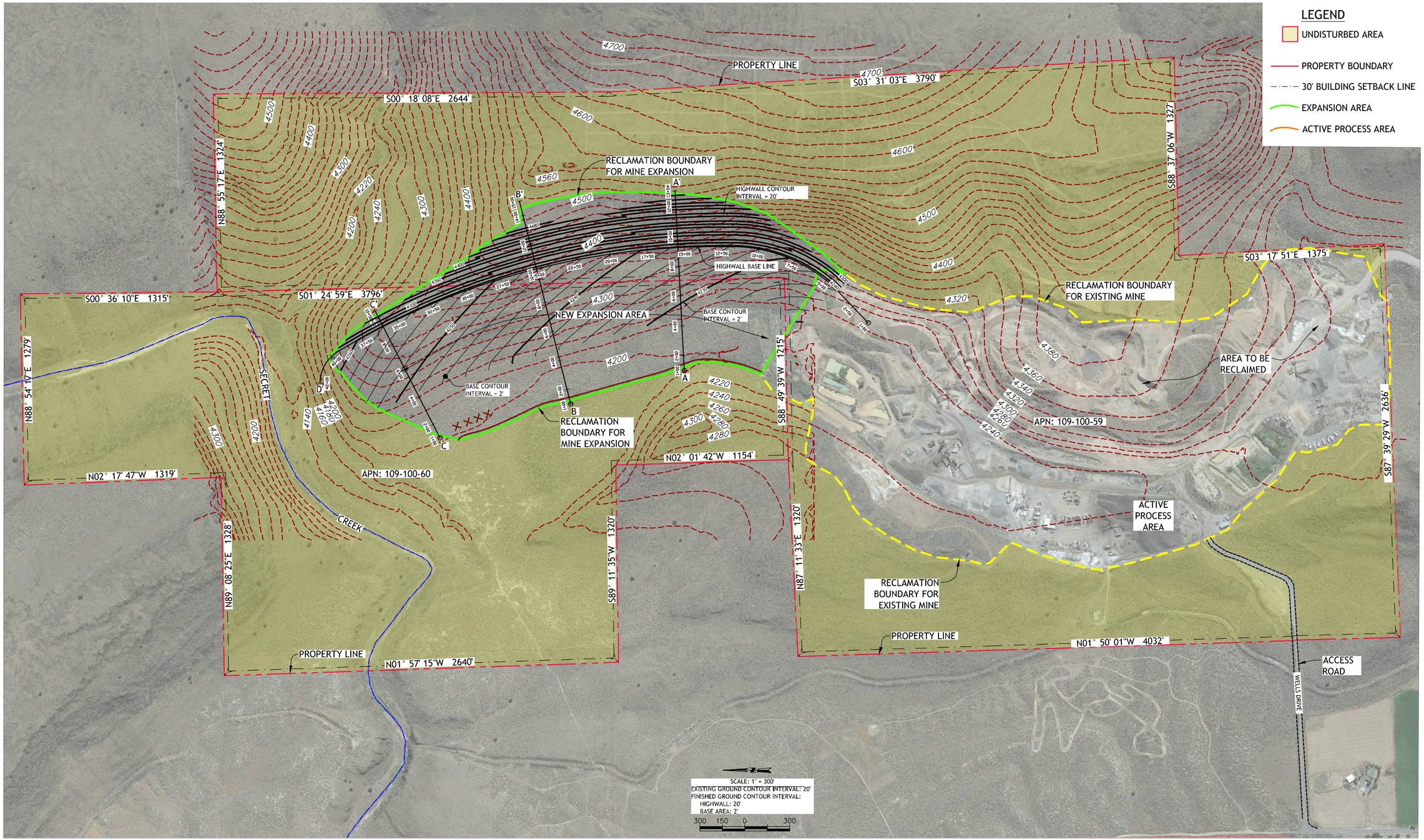
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0 0.75 1.5 3 Miles

SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH; CNDDB AUGUST 2020

FIGURE 11
CNDDB OCCURRENCES
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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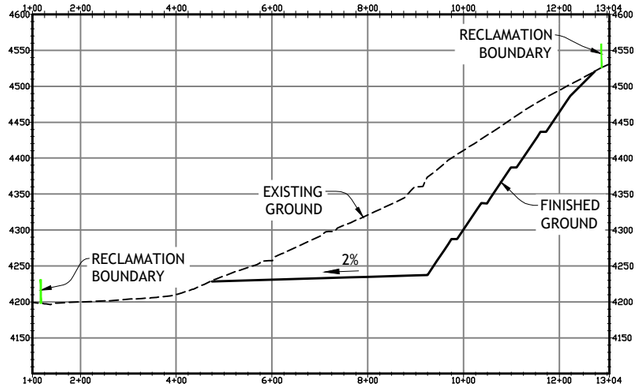
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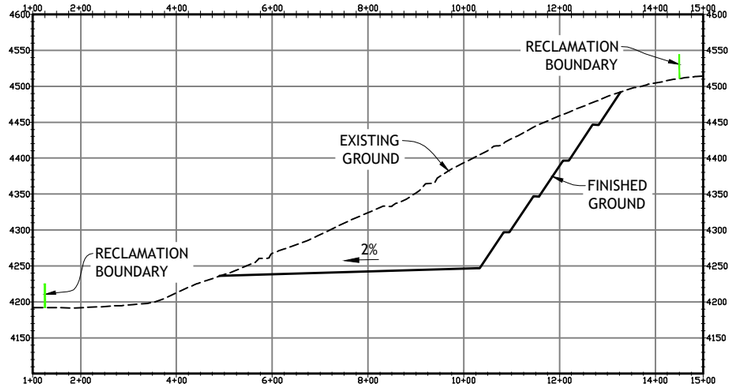
FIGURE 12
FINAL TOPOGRAPHY
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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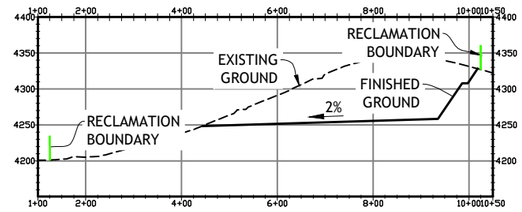
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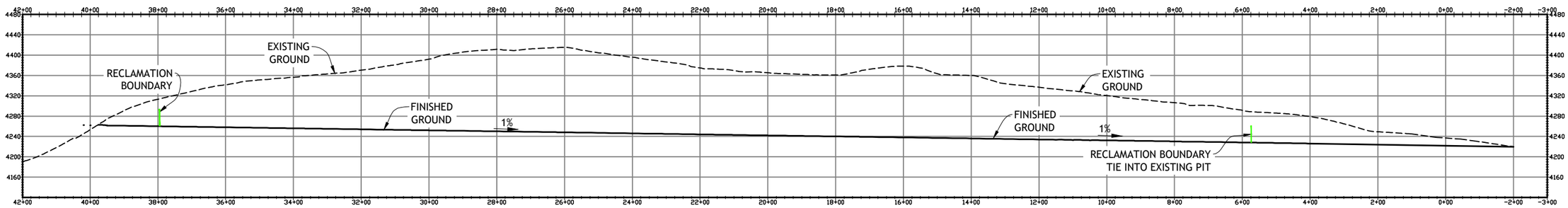
PROFILE A-A'
HORIZONTAL SCALE: 1" = 300'
VERTICAL SCALE: 1" = 100'



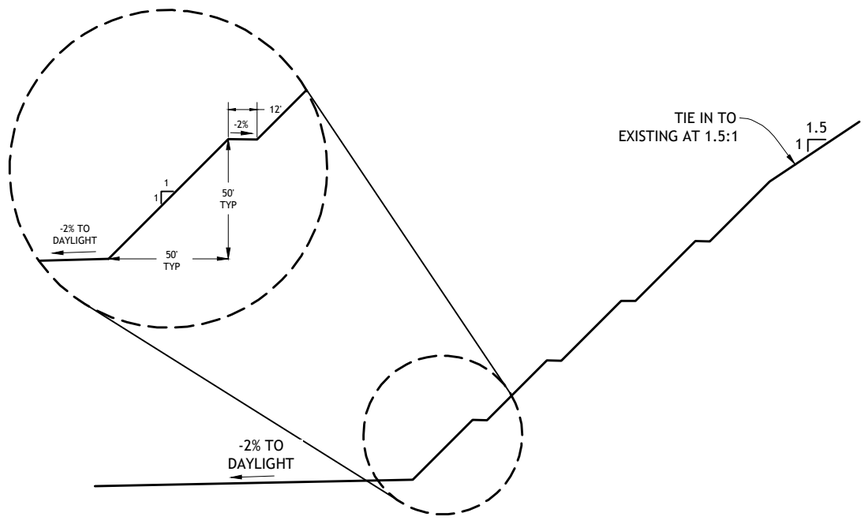
PROFILE B-B'
HORIZONTAL SCALE: 1" = 300'
VERTICAL SCALE: 1" = 100'



PROFILE C-C'
HORIZONTAL SCALE: 1" = 300'
VERTICAL SCALE: 1" = 100'



PROFILE HIGHWALL BASE
HORIZONTAL SCALE: 1" = 300'
VERTICAL SCALE: 1" = 100'



HIGHWALL - TYPICAL SECTION
NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
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FIGURE 13
CROSS SECTIONS
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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OF
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JOB NO. 71305

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Appendix A

Current Use Permit/Reclamation Plan

FILE NO. 96056

LASSEN COUNTY

USE PERMIT

APPLICATION

The following application form shall be used to apply for a Use Permit as per Chapter 18.112 of the Lassen County Code.

1. Proposed Use See attached Project Description and Explanatory Supplement

2. Name of Applicant MILLER'S CUSTOM WORK, INC.

   Mailing Address P.O. Box 1300, Susanville, CA 96130

   Phone No. 257-4207 Date April 12, 1996

   Day Phone same

3. If applicant is not the Property Owner of Record of the project site, please complete the following:

   Name of Property Owner DARREL E. MILLER, Successor Trustee of the Miller Family Trust UTA dated 6/21/79 as to an undivided 2/3 interest and DARREL E. MILLER as to an undivided 1/3 interest.

   Mailing Address P.O. Box 1300, Susanville, CA, 96130

   Phone No. 257-4207

   I hereby give the above applicant(s) permission to apply for and conduct upon my property the use applied for in this application.

   April 12, 1996
   Date

   X Darrel E. Miller
   Signature of Property Owner

4. Assessor's Parcel No. 109-100-40

5. Present Zoning U-C

6. Complete the use permit application supplement sheet and attach.

7. Attach a plot plan of the proposed project with a landscaping plan (if applicable).

8. Feel free to attach any photographs or attachments in relation to this application.

   I hereby understand that the use permit applied for is the same as described in this application and/or as modified in my revisions approved by the Planning Department prior to approval.

   April 12, 1996
   Date

   James C. Miller
   Signature of Applicant
   JAMES C. MILLER, President

(7/86)

E PERMIT APPLICATION SUPPLEMENT

File # 98-CU

Complete the following application supplement. Answer all questions that relate to the proposed use. A thorough description of the proposed use will aid in the timely processing of the application.

PROPOSED USE See attached Project Description and Explanatory Supplement

SITE LOCATION Western slope of Shaffer Mountain, East of Ward Lake (APN 109-100-40)

TIME FRAMES

Proposed timeframe for the project and each major phase (i.e. when structures and improvements will be completed): The project already substantially exists; project life per reclamation plan extends to 2020.

PROJECT SITE

Existing use of property: See attached project description

Uses of surrounding properties to the: north open range south surface mining east open range west farming

PROJECT INFORMATION (See Supplemental Project Description attached for further info)

Product or service to be provided: Asphalt and Redimix Concrete; Crushed Aggregates; sand

Hours of operation: 6:00a. m. to 6:00 p. m. Days of operation 5to6

Number of shifts: (currently) 1 Employees at largest shift: 10

Number of shifts: (proposed) 1 Employees at largest shift: 10

Number of deliveries or pick-ups: ~~per day xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx~~

and Number of visitors/customers anticipated: per day appx 10 per week appx 55

Will the project result in a change in the ambient noise levels for adjacent properties? yes ____ no X If yes, please specify ____

Noise level in ~~Dbl.~~ Dba at: 50 feet ____, 100 feet ____, property line - dba = 50

~~"Measurements are currently being taken and will be provided"~~ Attached

BUILDING INFORMATION

Existing Building and Improvements

Describe existing structures and improvements to be used in conjunction with this application: Access roads, utilities, batch plants, crushers, scales, etc., and related portable and removable equipment, fuel tanks, containment basins around hazardous fluids, per SPCC Plan (copy attached), operations trailer.

Floor Area: existing structures (sq. ft.) N/A

Seating capacity: (if applicable) N/A

Existing structures or improvements to be removed: N/A

Max. Height (ft.): Existing structures N/A

Proposed New Construction

Desribe proposed structures and improvements (e.g. parking, roads, water and sewer systems, etc.) None

Floor Area : new structures (sq. ft.) N/A

Seating capacity: (if applicable) N/A

(revised 1/87) (over)

Max. Height (ft.): proposed structures N/A

Description of exterior night lighting: N/A

Will grading or filling be required? ____ yes ____ cubic yards, X no

LANDSCAPING AND PARKING

Site Coverage: Total area to be covered by driveways, structures, etc. (%) N/A

Landscaping plan submitted: yes _____ no X N/A

Parking spaces: Existing spaces ____ employee ____ customer ____
Proposed spaces ____ employee ____ customer ____ N/A

Proposed parking plan submitted: yes _____ no X N/A

Describe proposed surface of parking area: N/A

SERVICES AVAILABLE

Indicate how the following services will be provided for your project and availability of service.

a. Electricity: Existing onsite by LMUD

b. Natural Gas: None

c. Water Supply: Existing wells

d. Sewage Disposal: Portable toilets

e. Solid Waste Disposal: Minimal - to Landfill as needed

If an extension of service lines is necessary, indicate which service(s) and the distance of the extension(s) N/A

SERVICE DISTRICTS

Please name if applicable

High School District: Lassen

Elementary School District: Shaffer

Fire Protection District: Standish/Litchfield

Water District: None

Community Services District: None known

Sanitation District: None

Other: None known

LICENSES OR APPROVALS REQUIRED

District: LCAPCD (ATO attached) Regional: LRWQCD

State: None known Federal: None known

Office Use Only *

Planning Area: _____ Fees: Application _____
Zoning District: _____ Environmental _____
Combining District: _____
Date Accepted: _____
Deed Reference: Book____ Page_____
Planning Area Standards: _____ Page: _____

Notes:

(revised 1/87)

PROJECT DESCRIPTION

The Re-permiting of existing surface mining operation to reflect current and future operations. The project includes quarrying of rock, excavation of sand and gravel, crushing, screening, washing, and stockpiling; transportation of a portion of the foregoing mineral materials offsite for commercial purposes. Utilization of a portion of the foregoing mineral materials for the onsite production of asphalt concrete and ready mix concrete; the occasional import of supplemental aggregates and materials for such concrete production; rezoning of project from U-C to U-C-2; implementation of existing reclamation plan (#94032) during the life of project, and at project life end which is currently projected to be in year 2020.

/klb/1324

SUPPLEMENT TO PROJECT DESCRIPTION

(THREE PAGES ARE AFFIXED HERETO)

The project is presently in existence at the project site substantially as proposed in the Project Description pursuant to an existing use permit, and other entitlements or authorizations. The project's restated permit sought hereby is subject to an existing and approved reclaimation plan which itself is subject to minor amendment for project mitigation purposes, if any are necessary.

This application, and its related applications, are submitted to bring the project under one use permit. The highlights of the changes sought via these applications vis-a-vis existing uses and/or authorizations, include but are not limited to, the following:

(a) increase height of exposed rock face from the existing 84 feet to 150 feet (See attached calculations and maps);

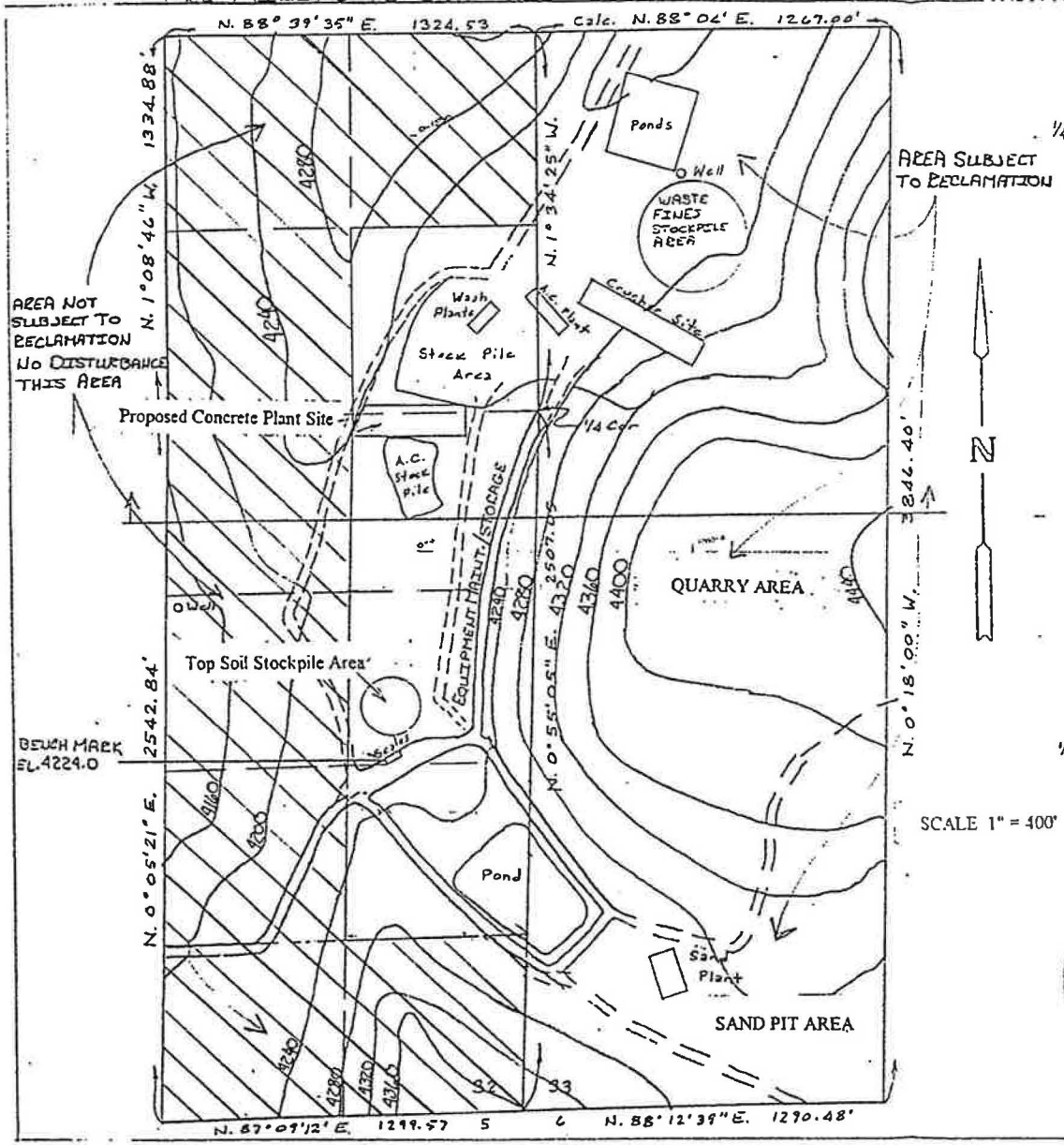
(b) onsite production of the ready mix concrete in addition to the existing approved production of asphalt concrete;

(c) recognition of year-round use of project site;

(d) recognition of 160 acre project site. All mining will be contained within the original authorized 80 acres of which presently approximately 27 acres has been utilized. The balance will be used for topsoil, overburden or equipment storage (See attached maps).

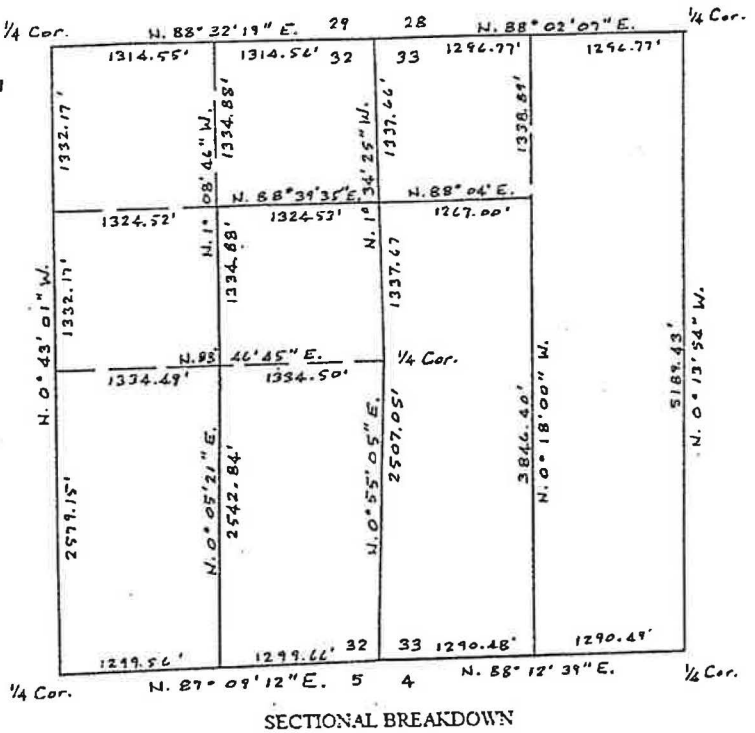
/klb/1324

PRE MINING TOPOGRAPHIC CONDITION



AREA SUBJECT TO RECLAMATION

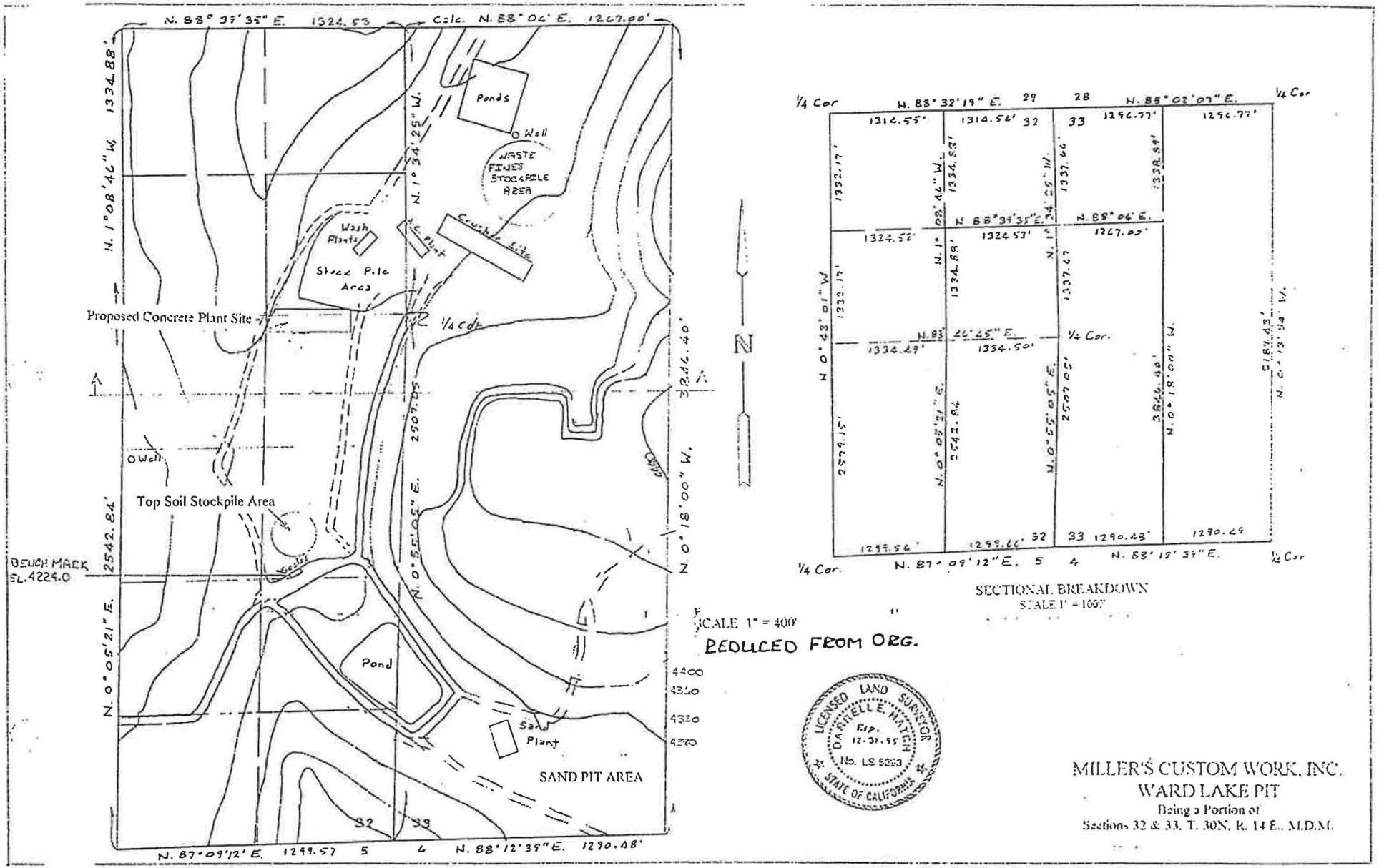
SCALE 1" = 400'



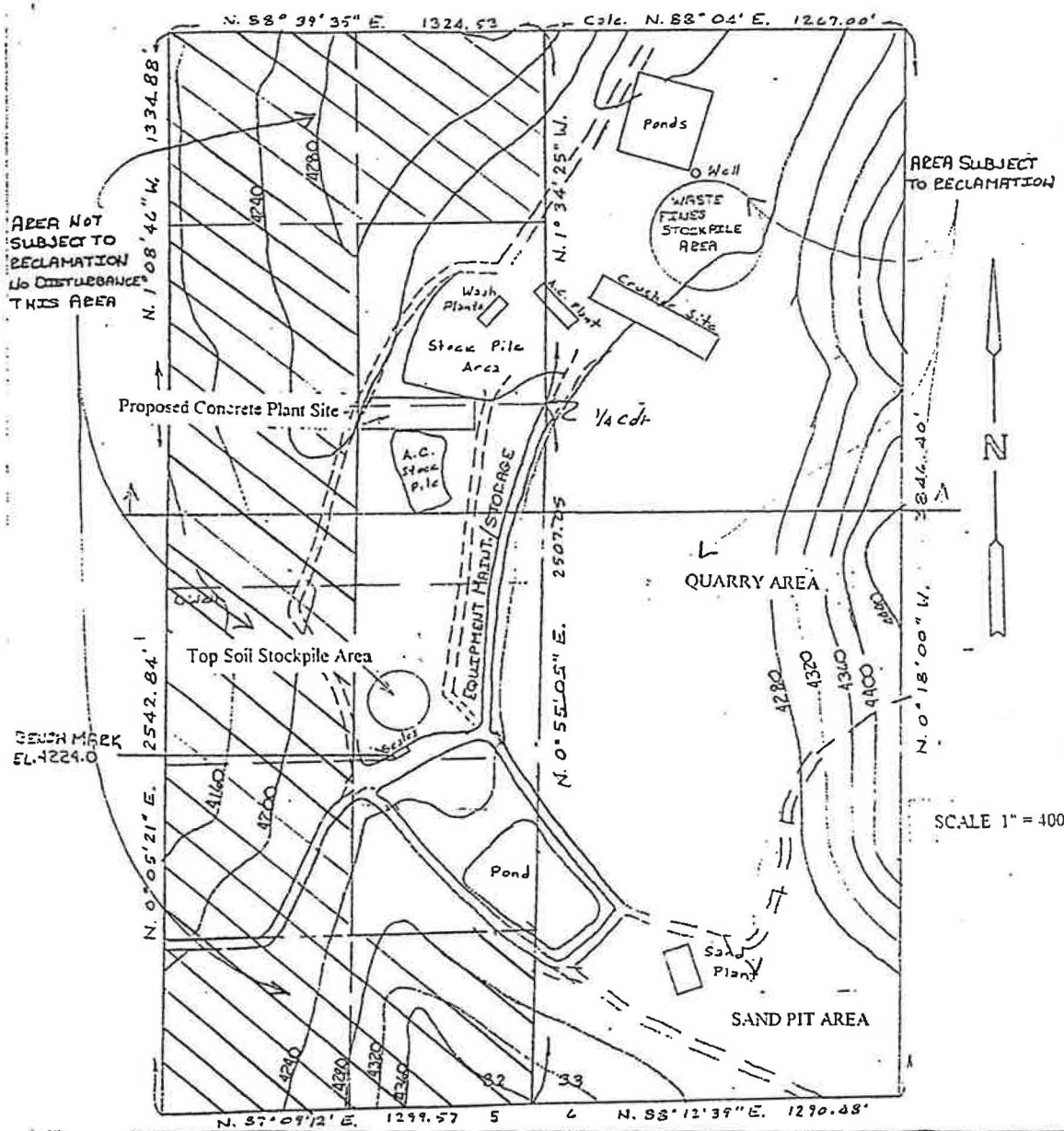
SECTIONAL BREAKDOWN
SCALE 1" = 1000'

LICENSED LAND SURVEYOR
DARRELL E. HATCH
Exp. 12-31-95
No. LS 5293
STATE OF CALIFORNIA

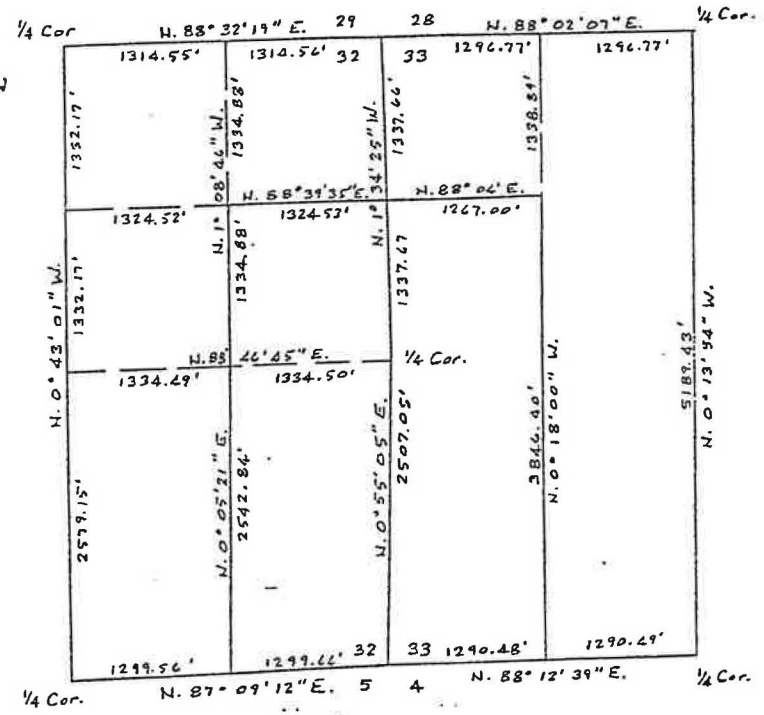
MILLER'S CUSTOM WORK, INC.
WARD LAKE PIT
Being a Portion of
Sections 32 & 33, T. 30N, R. 14 E., M.D.M.



TOPO CONDITIONS AS PRESENTLY EXIST (5/96)



POST MINING TOPOGRAPHIC CONDITION



SECTIONAL BREAKDOWN
SCALE 1" = 1000'

LICENSED LAND SURVEYOR
DARRELL E. HATCH
Exp. 12-31-95
No. LS 5253
STATE OF CALIFORNIA

MILLER'S CUSTOM WORK, INC.
WARD LAKE PIT
Being a Portion of
Sections 32 & 33, T. 30N. R. 14 E., M.D.M.

File copy
Supplemental info

CAL. LIC. #428856 NEV. LIC. #9144

MILLER'S CUSTOM WORK INC.

P.O. BOX 1300, 471-825 DIANE DR. SUSANVILLE, CA 96130
(916) 257-4207 VOICE (916) 257-7160 FAX

September 9, 1994

RECEIVED
SEP 12 1994
Lassen County
Department of Community Development

Mr. Richard Simon
Lassen County Dept. of Community Development
707 Nevada Street
Susanville, Ca. 96130

RE: Amendments to the reclamation plan and site maps

Dear Rick,

In response to your letter dated August 19, 1994 I have incorporated the following changes to the site plans and reclamation plan.

Item 16 a. The site plan includes pre mine and post mine contours;
Item 16 b. top soil stockpiles have been identified on the site plan;
Item 16 c. top soil stockpiles will be identified on the site and shall not be removed;
Item 16 d. areas targeted for reclamation and areas not to be disturbed have been identified on the site plans;
Item 16 e. cross sections of the excavation area have been drawn to reflect pre and post mine elevations.
Item 16 f. A bench mark has been set in the west wing wall of the scale foundation. The elevation is 4224.0. It has been set where it can't be disturbed by the activities.
Item 17. Section 20 of the reclamation addresses the disposition of the water wells on the site.
Item 18. Section 21 j. addresses crimping seeds into the resoiled areas of reclamation.
Item 19. We will coordinate with the Bureau of Land Management for recontouring and reclaiming the area in the southern part of the sand pit area.
Item 20. Section 20 of the reclamation plan addresses the end use of the site as open space and wildlife habitat.
If I have missed anything please contact me as time is of the essence.

Sincerely,

James C. Miller

James C. Miller
President

AGC CALIFORNIA
The VOICE of the Construction Industry

MEMBER
NAPA
NATIONAL ASPHALT
PAVEMENT ASSOCIATION

File copy
Subsequent App - Replaces original

RECEIVED
JUL 15 1994
Lassen County
Department of Community Development

LASSEN COUNTY

USE PERMIT

COPY MADE

APPLICATION

not in Packet 8-3-94

The following application form shall be used to apply for a use permit as per Chapter 18.112 of the Lassen County Code.

1. Proposed Use Mining, Sand & Gravel, Asphalt, Concrete Etc.

2. Name of Applicant Miller's Custom Work Inc.

   Mailing Address P.O. Box 1300, Susanville Ca. 96130

   Phone No. 916-257-4207 Date _____

   Day Phone 916-257-4207

3. If applicant is not the Property Owner of Record of the project site, please complete the following:

   Name of Property Owner _____

   Mailing Address _____

   Phone No. _____

   I hereby give the above applicant(s) permission to apply for and conduct upon my property the use applied for in this application.

   _____ James C. Miller
   Date Signature of Property Owner

4. Assessor's Parcel No. 109-100-40

5. Present Zoning A-1

6. Complete the use permit application supplement sheet and attach.

7. Attach a plot plan of the proposed project with a landscaping plan (if applicable).

8. Feel free to attach any photographs or attachments in relation to this application.

   I hereby understand that the use permit applied for is the same as described in this application and/or as modified in my revisions approved by the Planning Department prior to approval.

   7/15/94 James C. Miller
   Date Signature of Applicant

(7/86)

L A S S E N C O U N T Y

APPLICATION SUPPLEMENT
FOR
SURFACE MINING USE PERMIT AND RECLAMATION PLAN

1. APPLICANT: Name Miller's Custom Work Inc.

Address P.O. Box 1300, Susanville Ca. 96130

Telephone 916-257-4207

PROPERTY OWNER: Name Miller's Custom Work Inc.

Address P.O. Box 1300, Susanville Ca. 96130

Telephone 916-257-4207

OWNER OF MINERAL RIGHTS: Name U.S. Department of the Interior, BLM

Address 705 Hall Street

Susanville Ca. 96130

Telephone 916-257-5381

MINE OPERATOR: Name Miller's Custom Work Inc.

Address P.O. Box 1300

Susanville Ca. 96130

Telephone 916-257-4207

2. ASSESSORS PARCEL NUMBER(S) 109-100-40

3. LEGAL DESCRIPTION OF PROPERTY: Sec.32: SE1/4 of the NE1/4; The East 1/2 of the SE1/4; Sec.33: The SW1/4 of the NW1/4; the West 1/2 of the SW1/4; Township 30 North, Range 14 East MDBM.

4. PRESENT USE OF THE SITE: Mining operation including Quarrying, Crushing, screening, washing and stockpiling rock, sand and gravel and asphalt concrete hot plant operation.

5. PRESENT LAND USES IN THE VICINITY OF THE SITE: Mining, agricultural use to the South and West of the site.

MINING OPERATION INFORMATION

6. PROPOSED STARTING DATE (OR DATE OPERATION BEGAN): 1981

PROPOSED TERMINATION DATE: 2020

7. DESCRIBE THE MINERAL COMMODITY(IES) TO BE MINED: Basalt rock formations, sand and gravel depostis.

8. APPROXIMATE QUANTITY OF MINERAL COMMODITY TO BE MINED:

Annually 100,000 cu.yds. / (tons) (circle one)

Project Total 2,600,000 cu.yds. / (tons) (circle one)

9. APPROXIMATE QUANTITY OF OVERBURDEN TO BE MINED:

Annually 1000 (cu.yds.) / tons

Project Total 26000 (cu.yds.) / tons

10. EXPLAIN THE MINING METHODS PROPOSED (open pit, dredge, etc.):

Open pit methods have been used and will continue to be used.

11. DESCRIBE ALL PROCESSING TO BE DONE ON-SITE (Include equipment used):

A: Rock from the quarry is fed to a primary jaw crusher by front end loader, from the primary crusher the rock is conveyed to secondary cone and impact crushers where the rock if further crushed to smaller particle sizes. The aggregate is then screened to size and conveyed to piles where the loaders pick it up and haul to stockpiles. Continued on a seperate sheet of paper.

12. DESCRIBE PROPOSED USE OF MINED MATERIAL(S): The materials are used for the manufacture of asphalt concrete, aggregate base, ready mix concrete leach field rock, chips for seal coating highways, gravel for driveways etc.

13. WILL OPERATIONS BE:

continuous _____

intermittent _____ (explain) _____

seasonal ___x___ (explain) As weather permits

14. AMOUNT OF SURFACE AREA TO BE DISTURBED BY MINING OPERATIONS INCLUDING EXTRACTION, PROCESSING, STOCKPILES, ACCESS/HAUL ROADS, OFFICES, ETC.:

Annually _____ acres

Each Phase _____ acres

Total 160 acres

15. MAXIMUM ANTICIPATED DEPTH OF MINING ACTIVITY (Measured from pre-mined surface):

Approxamently 150 feet.

11. Processing Description Continued

B: Sand from the sand pit is loaded into a hopper by front end loaders. The sand is then conveyed to a screening plant and sized and separated into size classifications. The Pea Gravel is conveyed to a stockpile and the Concrete Sand is run through a sand screw to remove any clay particles. The Concrete Sand is then taken to the stockpile area by front end loaders.

C: Aggregates sized for use in the Asphalt Concrete processing are loaded into the proper bin according to their respective gradation. The aggregates are then fed proportionantly to the drier drum where the material is dried and mixed with the liquid asphalt. The mixture is then dumped onto a drag slat conveyor and conveyed to the storage and loadout silo where the mixture is loaded into the haul trucks and shipped to various jobsites.

D: Some of the aggregates and sand will be used in the Ready Mix Concrete portion of the processing operation.Concrete Rock and Concrete Sand is fed to the bins and weighed proportionantly according to the mix design. After the materials are weighed they are conveyed to the mixer truck where the rock, sand, cement and water are mixed together and shipped to the various customers.

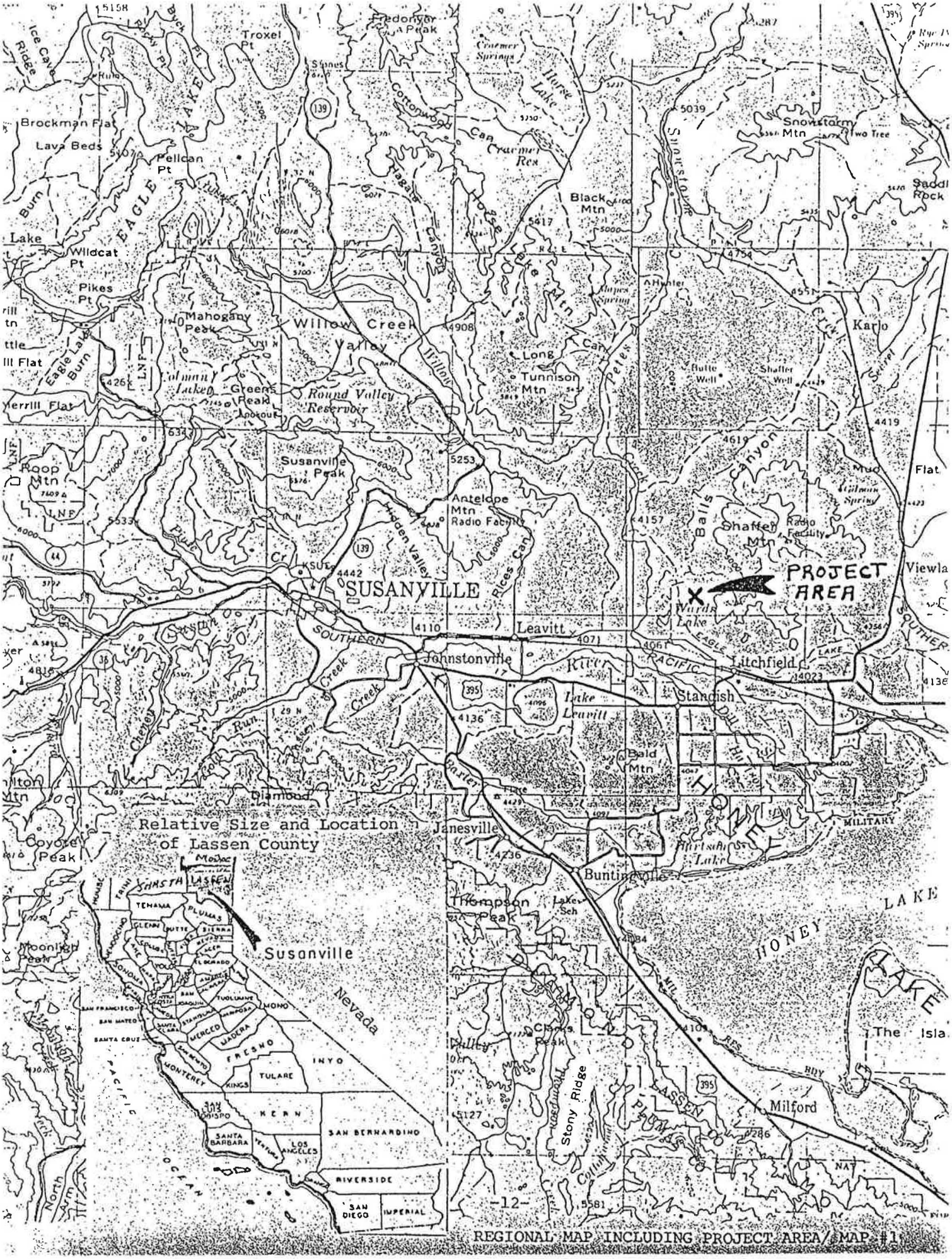
E. There will possibly be a need to import materials from other locations to blend with aggregates to meet certain specifications. These materials will be stockpiled at the crusher sites.

ENVIRONMENTAL SETTING

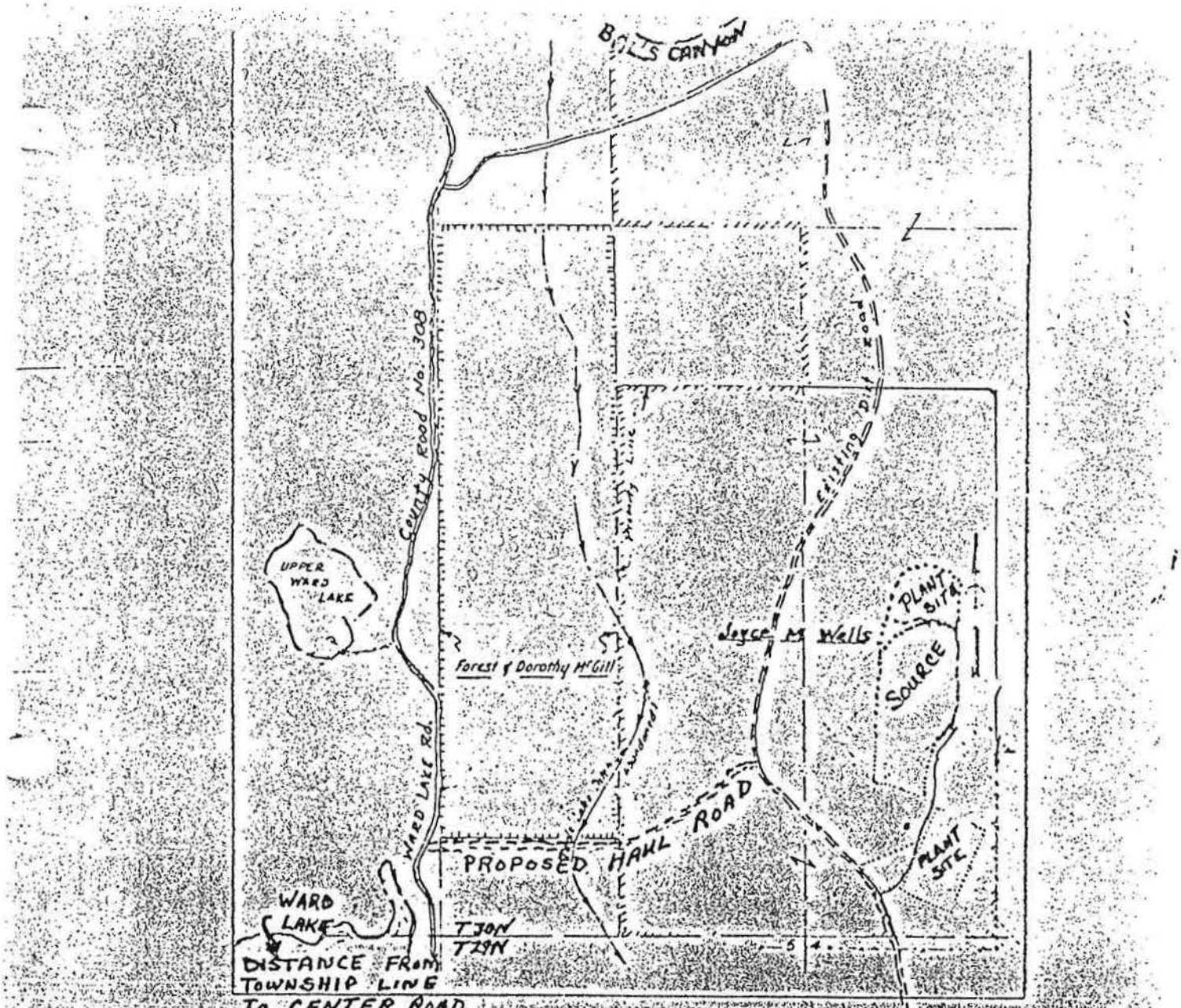
Within the project area and surrounding property, rocky and gravely soils combined with a lack of water source have limited the amount of natural plant life. It's an area of marginal grazing land with a cover of annual native grasses, Rabbit brush, Sage brush and bitter brush. Areas surveyed show Sage brush quantities within the site to be about 1254 plants per acre, Bitter brush to be about 13 plants per acre and rabbit brush to be about 52 plants per acre. Total plants per acre seem to be about 1319 plants per acre on the average and the area of plant coverage could be about 70 percent. At the time of the original use permit application process Bureau of Land Management Botanist and California Dept. of Fish and Game Wildlife Biologist surveyed the area and found no known endangered or rare plants per their listing included at the proposed project site. On June 21st, 1994 B.L.M. botanist Gary Schoolcraft completed another site investigation for Threatened, Endangered, Rare, or Sensitive Plants, especially looking for **Dalea Ornata** and it's habitat within the project site. No T/E, rare or sensitive plants were found or are suspected on the property. Immediate surrounding properties are similar in nature and considered marginal grazing land. Pronghorn Antelope, Mule Deer, Quail, Chukkar, Doves, and Cottontail rabbits are the game animals generally found within the project type habitat. The Great Basin Life Zone also supports numerous non-game mammals, birds and reptiles.

Assessor's parcel number 109-100-40 includes 240 acres within Sections 32 and 33 in Township 30 North, Range 14 East. The project site is on the Western slope of Shaffer Mountain. The topography of the site is flat to moderately steep sloping upward from the base of Shaffer Mountain.

Adjacent properties are privately owned parcels to the west and north, and east, and federally managed lands to the south managed by the B.L.M. The immediate surrounding properties are without current development. Lower areas to the west and south have been utilized for ranching and farming operations. A low ridge separates the actual plant sites from surrounding lands eliminating a direct view of planned operations form surrounding properties to the west and south. The nearest residence is aproxamently 1/4 mile west of the western property boundary. There are no cultural resources within the project boundaries.



REGIONAL MAP INCLUDING PROJECT AREA/ MAP #1





SECTION B-B'



SECTION A-A'

Note: It will not be necessary to remove material to the lower limit, but excavated areas must have smooth slopes and must be graded to drain.

TYPICAL CROSS SECTIONS OF EXCAVATION

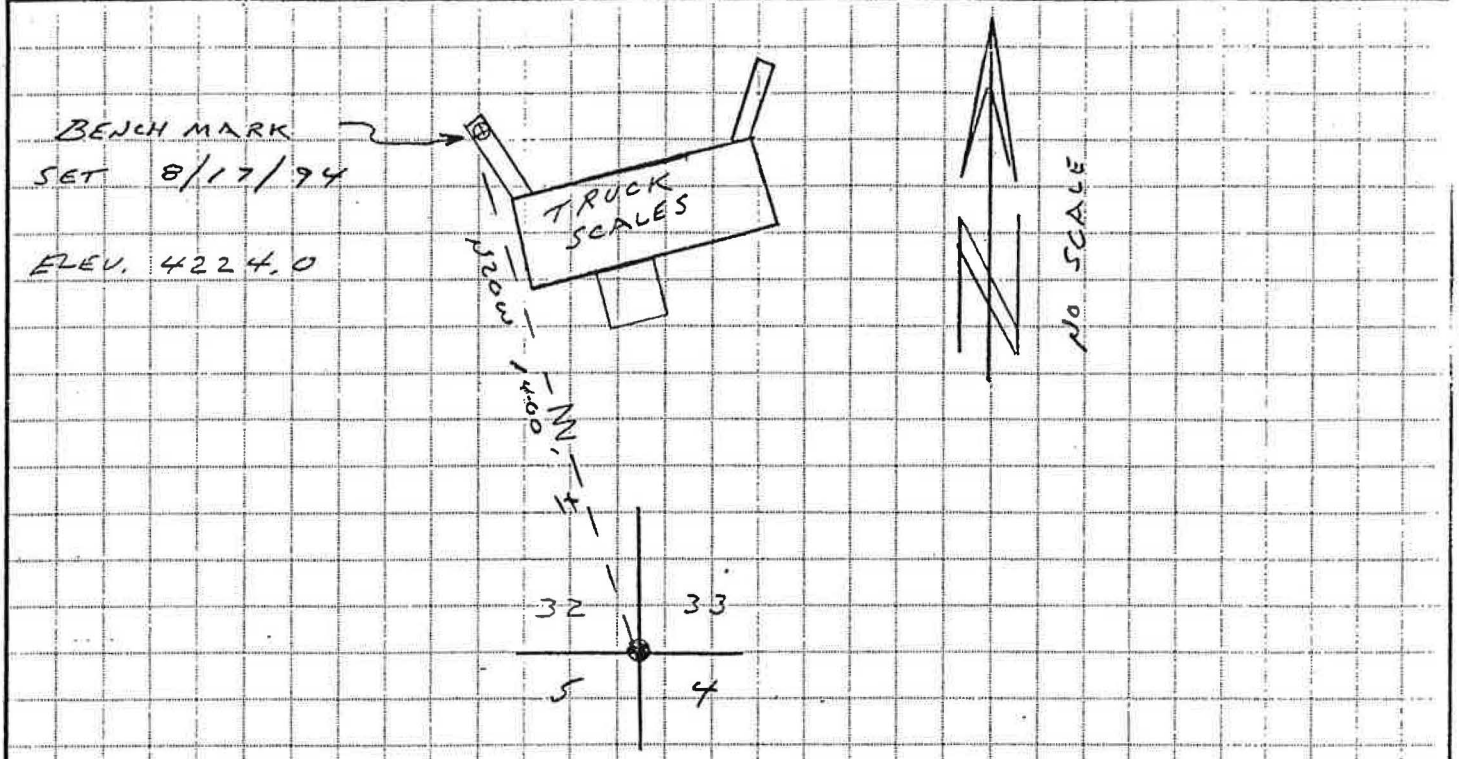
Scale in Feet

MILLER'S CUSTOM WORK
35 GRAND AVENUE
SUSANVILLE, CALIF. 96130

PROJECT AREA MAP #1-C

NST ENGINEERI. , INC.
Engineering - Planning - Surveying
1495 Riverside Drive
SUSANVILLE, CA 96130
(916) 257-5173

JOB MILLERS CUSTOM WORK
SHEET NO. WA. LAKE PIT OF
CALCULATED BY DATE 8/18/94
CHECKED BY DATE
SCALE



BENCH MARK - USGS DATUM - WARD LAKE PIT - LASSEN COUNTY

SET PK NAIL AND SHINER IN THE CENTER OF THE N. END OF A 9" WIDE x 6' LONG x 4' DEEP CONCRETE WING WALL, AT THE N.WLY. CORNER OF THE TRUCK SCALES FOR THE WARD LAKE PIT.

SAID BENCH MARK BEARS APPROXIMATLEY N20°E 1400' FT. FROM THE S.E. CORNER OF SECTION 32, T. 30 N., R. 14 E., M.D.M.

SURVEYED BY. Stephen H. Schmidt
STEPHEN H. SCHMIDT

LICENSED LAND SURVEYOR
STEPHEN H. SCHMIDT
EXP 9/30/94
No. 4643
STATE OF CALIFORNIA

94-04-18

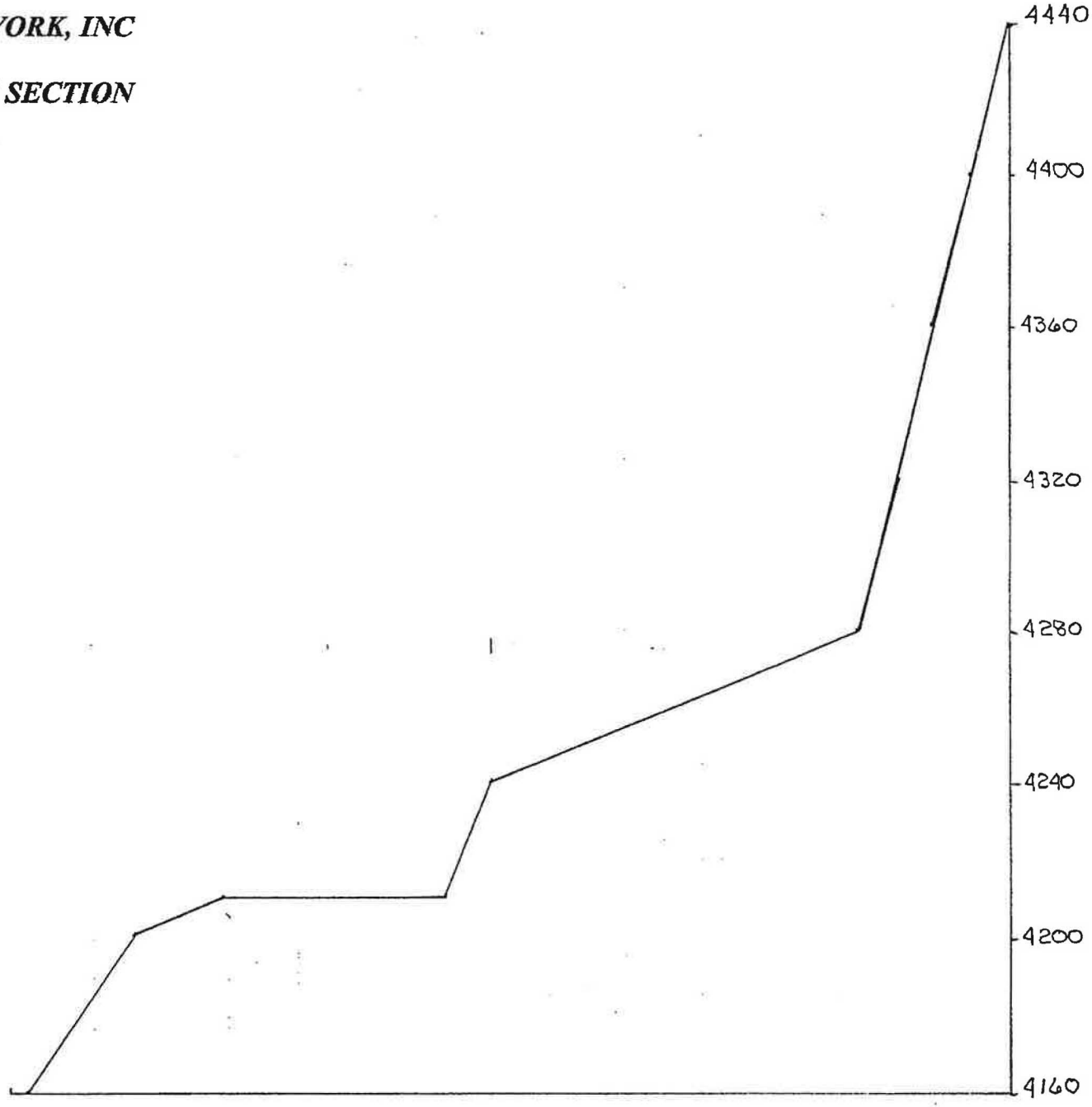
PRODUCT 204-1 (Single Sheets) 205-1 (Padded) NEBS Inc., Groton, Mass. 01471. To Order PHONE TOLL FREE 1-800-225-5380

MILLER'S CUSTOM WORK, INC
WARD LAKE PIT
POST MINING CROSS SECTION

SCALE

H--1"=400'

V--1"=40'

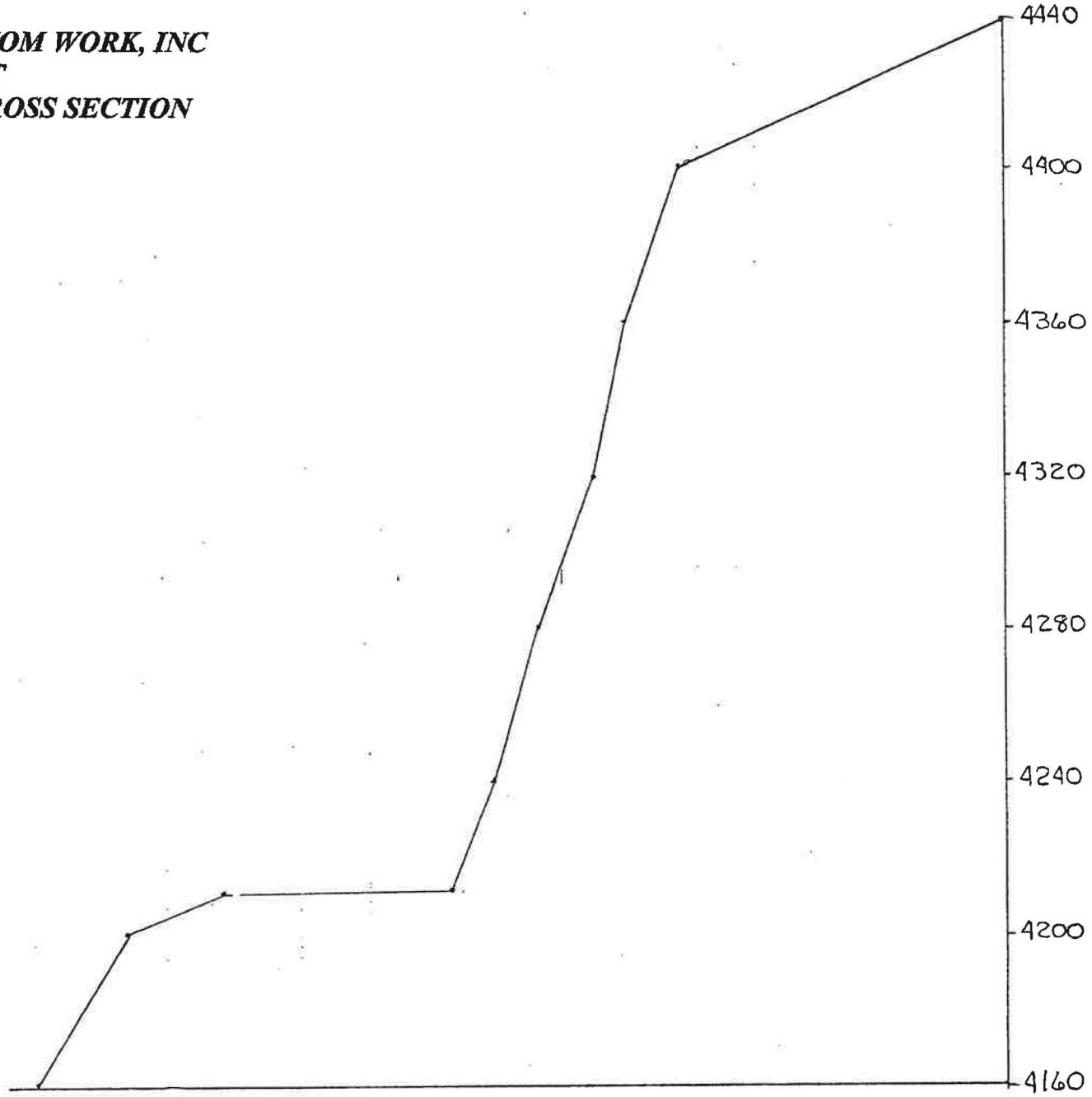


MILLER'S CUSTOM WORK, INC
WARD LAKE PIT
PRE MINING CROSS SECTION

SCALE

H--1"=400'

V--1"=40'



17. GEOLOGICAL DESCRIPTION

The project site is located where the Modoc Plateau meets the Great basin. This is an area of Cenozoic volcanic rock, the lower levels of which have been converted to gravel by shoreline action of ancient Lake Lahontin. The Deposits to be mined are located just above the high water line of Lake Lahontin in large deposits of Pleistocene volcanic basalt, sand and gravel. Some of the deposits appears as ledge rock, the exposed edges of a volcanic flow, and sand and gravel deposits from the shore line of the lake.

18. BIOPHYSICAL CHARACTERISTICS

Within the project area and surrounding property, rocky and gravely soils combined with a lack of water source have limited the amount of natural plant life. It's an area of marginal grazing land with a short sparse cover of annual native grasses, Rabbit brush, Sage brush and bitterbrush. Areas surveyed show Sage brush quantities within the site to be about 1254 plants per acre, Bitter brush to be about 13 plants per acre and rabbit brush to be about 52 plants per acre. Total plants per acre seem to be about 1319 plants per acre on the average and the area of plant coverage could be about 70 percent. At the time of the original use permit application process Bureau of Land Management Botanist and California Dept. of Fish and Game Wildlife Biologist surveyed the area and found no known endangered or rare plants per their listing included at the proposed project site. On June 21st, 1994 B.L.M. botanist Gary Schoolcraft completed a site investigation for Threatened, Endangered, Rare, or Sensitive Plants, especially looking for **Dalea Ornata** and it's habitat within the project site. No T/E, rare or sensitive plants were found or are suspected on the property. Immediate surrounding properties are similar in nature and considered marginal grazing land. Pronghorn Antelope, Mule Deer, Quail, Chukkar, Doves, and Cottontail rabbits are the game animals generally found within the project type habitat. The Great Basin Life Zone also supports numerous non-game mammals, birds and reptiles.

19. TIME SCHEDULE

We anticipate the operation of the quarry and sand and gravel plants at this location to operate to the year 2020. Based on the estimated reserves within the property at the current production, the pit should be depleted within the next 26 years.

20. PROPOSED END USE

When the rescources are depleted and reclamation has been acomplished the land will be designated for open space and wildlife habitat. The existing water wells on the site will be preserved in working order to supply water for and reclamation. When reclamation is complete the wells will be capped and left in place.

21. RECLAMATION PLAN

a. Reclamation of disturbed areas will consist of spreading top soil from the site and mineral wastes form the mining process over the disturbed areas and reseeded with native vegetation, ie, sage brush, rabbitt brush and bitter brush. The final slope will be track walked with a track type tractor to facilitate water infiltration and provide sites where seeds can collect.

b. As material is wasted from the processing operation, it will be placed in stockpiles or used for building pads for the crushing equipment and used later for the reclamation.

c. When the equipment is eventually removed from the site, the waste materials will be spread over the disturbed areas affected by the mining operation.

d. There is a need to store fuel and oils for the heavy machinery at the project site. We also have storage facilities for liquid asphalt used in the production of asphalt concrete. These materials are stored in large tanks on the site. The fuel tanks will be enclosed within berms. Any fuel can be contained within the bermed area should a spill occur.

e. We have constructed a series of retention ponds on the site to catch storm water runoff. The topography of the site is a gentle to moderately sloped area. The rainfall in the area is minimal and erosion within the site is minimal.

f. Mining wastes generated through washing operations are contained in settling ponds on the site. The water in the ponds is recirculated and used repeatedly.

g. Runoff from the site is contained within the site and does not reach any surface waterways. The NPDES permit application is in the process at this time.

h. There are no streambeds, banks, channels or drainages within the project site that have been impacted by the mining operation.

i. When the pit is depleted the ground will be recontoured to a gentile rolling slopes. The slopes within the quarry area will be of hard rock therefore will not require any slope stabilization. The angle of repose will be a minimum ratio of 2 feet horizontal to 1 foot verticle. The slopes within the sand pit will shaped to 2:1 ratio also. The slopes within the sand pit are not as stable as the quarry, therefore will require seeding for stabilization. There are no waste dumps within the site. The crusher tailings will be used in the reclamation of the site. The road system within the property has very minimal cuts and the roads can be used after the resources are depleted and the property is used for other purposes.

j. Disturbed lands and the actual pit areas will be reseeded with species native to the surrounding and undisturbed areas. After topsoil has been applied and seeds have been planted, a track type tractor will be used to track walk and crimp the seeds into the resoiled areas.

k. Hazardous conditions that will exist at the site will be the final angle of repose of the quarry walls at the eastern side of the quarry. A barbed wire fence will be constructed along this eastern side to protect the public and wildlife from accidentally entering any hazardous areas.

l. Reclamation will be accomplished when segments of the site resources are depleted, i e when the sand pit area or the quarry areas are depleted.

m. As certain phases of the operation are completed the equipment will be removed from the property and taken to other sites or disposed of.

n. The area south of the sand pit that has been excavated will be reclaimed as follows. Sufficient materials exist adjacent to the excavation to restore the slope to 2:1. Top soil

removed from the area will be spread over the area and the slope will be track walked with a tractor to roughen the slope.

22. RECLAMATION AND FUTURE MINING

The proposed reclamation of the site should not impede future development of mine sites within the area. The BLM has a site to the south of our property and surrounding properties could be utilized for mining purposes.

23. PERFORMANCE STANDARDS FOR RECLAMATION

Every effort will be made to reclaim vegetation at the site as it was prior to disturbance. Performance standards can be set to guide the revegetation effort and to set goals at specific time periods for plant establishment and quantity of cover.

5 YEARS

At the end of five years there should be about 15 percent coverage of new growth of sage brush, bitter brush and rabbit brush.

10 YEARS

Between the 5 year and 10 year period more seeds will be planted to try and obtain about 50 percent coverage.

15 YEARS

At the end of 15 years I would expect 70 percent plant coverage, the same as existing undisturbed areas.

The performance standards will be monitored continuously to ensure the goals for full revegetation can be achieved within the time frame set fourth.

MAPS / DIAGRAMS REQUIRED

(submit maps at appropriate scale, but at least one set of all maps should be submitted on paper no larger than 11" by 17" to facilitate reproduction)

16. SUBMIT MAPS DRAWN TO SCALE SHOWING:

    a. Boundaries of the affected lands;
    b. Vicinity map showing general location of the site;
    c. Topography of the area and the site with detail of mined lands;
    d. Location of existing land features including streams, drainages, ponds/lakes, wet areas, roads, railroads, utilities buildings and existing significant ground disturbance, on and immediately adjacent to the site;
    e. Location of new access/haul roads to be constructed;
    f. Delineation of areas within the site proposed for:

        1. excavation/pit;
        2. waste dumps;
        3. materials stockpiles (including stockpiled top soil or other growth media intended to be used in reclamation);
        4. materials processing;
        5. siltation ponds (if proposed), and other sediment control facilities;
        6. equipment maintenance/storage;
        7. structures
        8. utilities
        9. wells

    g. Map(s) and cross-section(s) of mining site including contours (a) before mining and (b) after reclamation. Indicate existing and proposed maximum slope ratios after reclamation.
    h. Copy of Assessors map(s) showing the entire site.

17. Attach a description of the geology of the area generally surrounding the mine site, and a detailed description of the geology of the mine site itself.

18. Describe in detail the pre-mine biophysical characteristics of the project site and explain how these characteristics relate to surrounding lands. Emphasis should be on vegetation, wildlife, known rare, endangered and threatened species of plants and animals occurring on the site or in the vicinity, wet areas, surface drainage system(s). Refer to and include copies of any reports, surveys, and other documentation used in your description. If mining or other ground disturbing activities have already taken place, the characteristics of similar lands adjacent to the mining site may be used.

19. Provide a time schedule of proposed mining activities on each segment of mined lands or each phase of the operation.

20. Provide a detailed description of the proposed use or uses of the mined lands after mining activities have ended and reclamation is complete. Refer to the Reclamation Standards For Surface Mine Operations Within Lassen County, available from the County Planning Department, and attach any supporting documentation applicable to the proposed end use.

21. Describe how reclamation of mined lands will be accomplished. This section should address at least the following:

    a. reclamation techniques that will be used to accomplish the proposed end use;
    b. storage and protection of top soil or other growth media;
    c. resoiling or other techniques to provide viable growth media on disturbed lands;
    d. control of contaminants, if any;
    e. erosion control during and after mining activities;
    f. disposition of mining wastes;
    g. protective measures against contamination of surface and ground water. Include Regional Water Quality Control Waste Discharge and/or NPDES permit number(s);
    h. rehabilitation of any affected streambeds, banks, channels, drainages;
    i. reshaping/contouring disturbed lands -- stabilization of mined slopes, waste dumps, tailings, road cuts, etc.;
    j. revegetation of disturbed lands with species appropriate for the site and the proposed end use;
    k. protective measures for long term mitigation of hazardous conditions (highwall stability, cut/fill slopes, etc.);
    l. reclamation time schedule (related to each segment of mined lands or phase of operations);
    m. disposition of equipment used in all phases of operation.

22. Provide a statement describing how reclamation of this site in the manner proposed will affect future mining in the area.

FINANCIAL ASSURANCES

23. Upon approval of the surface mining permit and reclamation plan, and prior to issuance of an "Authorization To Operate," financial assurance(s) ensuring that reclamation is performed in accordance with the approved reclamation plan must be submitted to and approved by Lassen County. Assurances may take the form of surety bonds, irrevocable letters of credit, trust funds, certificates of deposit, or other forms of financial assurance acceptable to the State Board and Lassen County.
The financial assurance shall remain in effect for the duration of the surface mining operation and any additional period, to be determined by the lead agency, until reclamation is determined to

be complete. The amount of the financial assurance shall be sufficient for the lead agency to hire an independent contractor to perform reclamation according to the approved plan in the event that the mine operator/permittee defaults on reclamation. It is the responsibility of the mine operator/permittee to provide estimates of the cost of carrying out reclamation according to the approved reclamation plan to Lassen County in order to determine the amount of the reclamation bond. Estimates must be prepared by a qualified third party not otherwise employed by the mine operator. Such person may be a registered engineer, registered geologist, or other person with similar qualifications who is familiar with reclamation techniques and associated costs.

Financial assurances shall be made payable to Lassen County and the State Geologist. Financial assurances, along with copies of the third party estimate of costs must be submitted to Lassen County for review and approval prior to issuance of the "Authorization To Operate." Reclamation assurances may be subject to annual review and adjustment in consideration of operation compliance, inflation, reclamation already performed, etc.

STATEMENT OF RESPONSIBILITY

24. I, James C. Miller, do hereby accept full responsibility for reclaiming the lands herein described in accordance with the approved reclamation plan for this operation, and the conditions imposed by Lassen County as lead agency.

James C. Miller (Signature) 7/15/94 (Date)

(Position/Relationship to Operation) Corporation President

(revised 5-92)

820.03/application

FILE NO. 79-80-44 (11-02-85)

USE PERMIT

A Use Permit is hereby granted to the applicant identified below for an amendment to the applicant's original Use Permit #79-80-44, which allows the excavation, etc. of rock for asphalt concrete and aggregate materials and the operation of an asphalt concrete batch plant, 2 miles northwest of Litchfield, CA, in accordance with Lassen County Code Chapter 18.112 and subject to the conditions of approval specified below.

Applicant: Miller's Custom Works, Inc.

Mailing Address: 35 Grand Ave., Susanville, CA 96130

This Use Permit shall apply only to the project described in the Use Permit Supplement sheet and related graphics for the proposed project attached hereto. Modification of the use hereby permitted shall be made by amendment to this Use Permit or by application for an issuance of a new Use Permit.

This Use Permit shall be subject to the following conditions of approval (refer to attachment if necessary):

That Condition No. 5, as recorded, be deleted and replaced with the following condition:

> That County Road 308 (Ward Lake Road) be surfaced with asphaltic surfacing to the approval of the County Road Department. Said surfacing may be co-ordinated with the Road Department. All work will be accomplished by November 1, 1986. The operator of the project shall be responsible for adequate dust control on the haul road for 500 feet east of Ward Lake Road and on Ward Lake Road until the paving is completed.

cc: Lassen County Road Department

Note: In any case where a use allowed by this use permit does not comply with the conditions of the permit the Planning Commission shall take action to revoke the permit and terminate the use as per Lassen County Code Section 18.112.060.

The proposed use addressed herein has been reviewed by the Lassen County Planning Commission and has been approved for a use permit as per Lassen County Code Chapter 18.112, subject to the conditions of approval specified above.

Date Approved: January 8, 1986 Date: January 22, 1986

Approved By: Planning Commission

Signature of Planning Director

CONDITIONS FOR USE PERMIT #79-80-44
MILLER'S CUSTOM WORK

Omit 1. That this use permit is non-transferrable without the prior consent of the Lassen County Planning Commission;

✓2. That the applicant comply with the requirements of Lassen County Ordinance No. 440 and apply for, receive and accept a Surface Mining Permit and Reclamation Plan before this Use Permit becomes valid;

✓3. That the applicant meet all the requirements of the Lassen County Air Pollution Control Officer;

✓4. That the applicant meet all requirements of the Lahontan Regional Water Quality Control Board and the Lassen County Sanitarian;

✓5. That County Road 308 (Ward Lake Road) and the haul road for 500 feet east of County Road 308 be surfaced with a minimum of .17 asphaltic concrete to a width of 24 feet by the applicant to a traffic index of 6.5. Said surfacing to be completed within one year of the issuance of this permit;

✓6. That dust and fumes around the plant site and along the roads to and from the site be controlled to the satisfaction of the Lassen County Board of Supervisors;

✓7. That the noise level will not exceed 65 db at the property line between the hours of 10:00 P.M. and 7:00 A.M.;

✓8. That no explosives shall be detonated between the hours of 6:00 P.M. and 7:00 A.M.;

✓9. That the proposed haul road depicted in Project Area Map #1-C in the E.I.R. be the only road used in conjunction with the project;

✓10. That excavation, crushing, stockpiling and AC manufacturing be limited to an area described as follows:

T.30N., R.14E., M.D.B.&M.
Section 33: The SW¼ of the NW¼;
The NW¼ of the SW¼;
The N½ of the SW¼ of the SW¼;
The N½ of the S½ of the SW¼ of the SW¼.

feet. [illegible] will be from 5 to 20

5) Post mining [illegible]

August 19, 1994

Jim Miller
Miller's Custom Work, Inc.
P.O. Box 1300
Susanville, CA 96130

RE: Use Permit #94032, Miller's Custom Work, Inc., to amend current permits at Ward Lake Pit operation.

Dear Jim:

At the August 3, 1994 meeting of the Lassen County Planning Commission, the above referenced application was approved subject to the following conditions. This letter is to advise you of these conditions and procedure for appeal.

1. This use permit is granted for the use as approved by the Planning Commission on August 3, 1994. Substantial revisions and/or expansions of the project will require amendment of the permit or a new use permit subject to the approval of the Planning Commission.

2. (Original Cond. #1) This use permit is non transferrable without the prior consent of the Lassen County Planning Commission.

3. (Original Cond. #3, amended) The operator shall secure all necessary permits/approval from the Lassen County Air Pollution Control District. Evidence of approval shall be submitted to the Community Development Department.

4. (Original Cond. #4, amended) The operator shall secure all necessary permits/approval from the Lahontan Regional Water Quality Control Board and the State Water Resources Control Board. Evidence of approval(s) shall be submitted to the Community Development Department.

5. (Original Cond. #6, amended) Dust from all aspects of the operation shall be controlled by the operator at all times.

6. (Original Cond. #8) No explosives shall be detonated between the hours of 6:00 p.m. and 7:00 a.m.

7. (Original Cond. #9, amended) The existing paved haul road shall be the only road used for access to the site in conjunction with the project.

8. (Original Cond. #10, amended) All mining activities shall take place within the area described in the application as follows:

T. 30 N., R. 14 E., M.D.B. & M.

Section 32: The SE 1/4 of the SE 1/4 of the NE 1/4;

The E 1/2 of the NE 1/4 of the SE 1/4;

The NE 1/4 of the SE 1/4 of the SE 1/4.

Section 33: The SW 1/4 of the NW 1/4;

The W 1/2 of the SW 1/4.

9. The operator shall identify the boundaries of the approved mine activity area and flag the corners so that the boundaries are readily visible to County and State officials authorized to inspect the site.

10. The operator shall construct containment basins around permanent on site fuel storage tanks per County Ordinance 485; and other fluids tanks as may be required by County and State agencies.

11. A valid financial assurance shall be maintained for the operation at all times while the operation is subject to the state SMARA regulations, and until the site is determined to be reclaimed to the satisfaction of Lassen County.

12. (Original Cond. #1 of Rec. Plan, amended) The locations of both the Asphalt Hot Plant and the (future) Concrete Plant shall be shown on the detailed site plan to be submitted to the Community Development Department and included in the Reclamation Plan.

13. (Original Cond. #2 of Rec. Plan) Topographical changes within the excavation area shall be reshaped to a maximum slope of 2H:1V.

14. (Original Cond. #3 of Rec. Plan, amended) All top soil shall be stockpiled and protected from erosion, and shall be returned to the excavation areas (except the quarry face) at the time of reclamation. The location of the top soil stockpile shall be shown on the detail site plan and incorporated into the reclamation plan.

15. (Original Cond. #4 of Rec. Plan, amended) Disturbed areas, including but not limited to stockpile sites, equipment storage and maintenance areas, processing sites, and excavation sites (except quarry face), shall be revegetated with appropriate species as approved by the Community Development Department. Criteria by which the success of revegetation shall be determined, including percent of cover and density, shall be incorporated into the reclamation plan.

16. The maps associated with the reclamation plan shall be amended as follows:

The site plan shall include topographic contours;
Top soil stockpiles shall be identified on the site plan;
Top soil stockpiles shall be identified on the ground to ensure it is not removed;
Areas targeted for reclamation and areas not intended to be disturbed shall be identified on the site plan;
Cross section maps of the excavation areas, as well as bench marks by which to measure excavation depth, shall be submitted;
Bench marks shall be identified and preserved on the ground.

17. The reclamation plan shall be amended to address the disposition of the existing wells on site.

18. The reclamation plan shall be amended to include provisions for applying mulch (rice straw, gravel, native plant materials removed during site clearing, or other acceptable material) which shall be crimped into the resoiled areas of the site upon reclamation.

19. The operator shall coordinate with the Bureau of Land Management regarding recontouring the cut slope (located in the southwest portion of the site) to the required 2H:1V maximum slope.

20. The reclamation plan shall be amended to identify the proposed end use of the site as "open space and habitat."

21. The operating season shall be limited to March 1 through December 31 each year, or such other season as agreed to by the operator and the Department of Fish and Game. The site shall be secured for closure before January 1 each year, including temporary erosion controls and appropriate slope stabilization.

If any interested party is dissatisfied with this determination, a letter of appeal must be submitted to the Board of Supervisors within ten (10) days from the date of this letter. Any such appeal should be submitted to the County Clerk, together with the filing fee of $159.00.

Sincerely,

Robert K. Sorvaag,
Director

RKS:rws

cc: Department of Fish and Game
Lassen County APCD
Lahontan RWQCB

up/94032/tentapv

RESOLUTION NO. 97-067

RESOLUTION OF THE LASSEN COUNTY BOARD OF SUPERVISORS ESTABLISHING FINDINGS RELATED TO CEQA AND APPROVAL OF USE PERMIT (#96056), AND REZONE (#96056), CERTIFYING THE FINAL ENVIRONMENTAL IMPACT REPORT (#96056) AND APPROVING USE PERMIT (#96056) AND REZONE (#96056), MILLER'S CUSTOM WORK, INC. WARD LAKE PIT PROJECT

WHEREAS, Lassen County has received and accepted the conditional use permit and rezone applications submitted by Miller's Custom Work, Inc. for the expansion of the Ward Lake Aggregate Pit Operation; and

WHEREAS, pursuant to Chapter 18.112, Section 18.112.035(a) of the Lassen County Code, when an application for a use permit is accompanied by an application to rezone the project site, the Planning Commission's review of and recommendations regarding the use permit and the project as a whole shall be advisory to the Board of Supervisors; and

WHEREAS, the Planning Commission, after due notice, has considered, in an advisory capacity to the Board of Supervisors, the Final EIR #96056 prepared and submitted by Planning Concepts, an independent contractor, Use Permit #96056, and Rezone #96056, submitted by Miller's Custom Work, Inc., to expand the Ward Lake Aggregate Pit and rezone the project site from U-C Upland Conservation to U-C-2 Upland Conservation / Resource Management, and has submitted its findings and recommendation to this Board by Resolution #9-01-97; and

WHEREAS, the Environmental Review Officer of Lassen County has prepared an Initial Environmental Study and an Environmental Impact Report (EIR) concerning the above project in accordance with the California Environmental Quality Act (CEQA); and

WHEREAS, Lassen County has caused notice to be given, in accordance with the law, of public hearing before the Planning Commission and the Board of Supervisors in these matters, which Planning Commission hearing was opened on August 6, 1997, and concluded on September 3, 1997, and which Board of Supervisors hearing was held on September 23, 1997; and

WHEREAS, the Community Development Director has furnished to the Board of Supervisors, and the Board has incorporated into the record of this matter, the EIR, and the documents discussing the significant environmental effects identified in the EIR, proposed findings concerning mitigation, project alternatives, and project benefits including a statement of overriding consideration, as well as including evidence in support of the proposed findings; and

WHEREAS, the Board of Supervisors has duly considered the EIR as required by CEQA, and reviewed the above project and actions in light of that EIR; and

WHEREAS, before consideration of the proposed project, this Board called for comments on the proposal and all persons so desiring to comment were duly heard; and

WHEREAS, the Board has considered all of the testimony presented during the public comment period and the public hearing, as well as the findings and recommendation of the Planning Commission.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF SUPERVISORS AS FOLLOWS:

1. The foregoing recitals are true and correct, and the Board of Supervisors has jurisdiction to consider and act upon the subject matters of this resolution; and

2. The Lassen County Board of Supervisors certifies that it has reviewed and considered the information contained in the Final Environmental Impact Report (FEIR) dated July 31, 1997, for the Miller's Custom Work, Inc. Ward Lake project, and the findings and recommendations of the Planning Commission as contained in Commission Resolution #9-01-97; and

3. The Board hereby adopts as its findings the CEQA findings of fact and statements of overriding consideration concerning the Miller's Custom Work, Inc. project, consisting of the use permit and rezone, which detailed findings are attached hereto as EXHIBIT ONE, and incorporated herein; and

4. The Board hereby adopts as its findings the findings for approval of the conditional use permit and rezone for the Miller's Custom Work, Inc. project, which detailed findings are attached hereto as EXHIBIT TWO, and incorporated herein; and

5. The Board, after careful consideration of the facts, evidence, comments and recommendations contained in the FEIR, and as submitted during the public review of the EIR and as presented orally and in writing at the public hearings, and as presented in Commission Resolution #9-01-97, hereby:

a. Adopts the findings and statements of overriding consideration as set forth in exhibits ONE and TWO attached hereto.

b. Certifies that it has reviewed and considered the information contained in the FEIR for the Miller's Custom Work, Inc. project, dated July 31, 1997, and further certifies that the FEIR has been completed in compliance with CEQA.

c. Finds that the project is consistent with the Lassen County General plan and the Standish-Litchfield Area Plan, as such Area Plan was amended August 19, 1997.

d. Approves the conditional use permit #96056 and rezone #96056, subject to the conditions of approval attached hereto as EXHIBIT THREE.

e. Adopts the Mitigation Monitoring Program set forth in the FEIR.

f. Finds that the project, together with the conditions of approval, will not, under the circumstances of this case, be substantially detrimental to the health, safety, peace, morals, comfort and general welfare of persons residing or working in the neighborhood of such use, nor be substantially detrimental or injurious to people, property or improvements in the neighborhood.

PASSED AND ADOPTED at a regular meeting of the Board of Supervisors of the County of Lassen, State of California, on the Twenty-third day of September, 1997, by the following vote:

AYES: Supervisors Chapman, Neely, Loubet, Dahle

NOES: None

ABSTAIN: None

ABSENT: Supervisor Lough

APPROVED: Jim Chapman
Acting Chairman
Lassen County Board of Supervisors

ATTEST:
Theresa Nagel
Theresa Nagel, County Clerk,
Lassen County

In accordance with Section 25103 of the Government Code of the State of California a copy of this document has been delivered to the Chairman of the Board of Supervisors, County of Lassen on 9-23-97
By Theresa Nagel
Clerk /Deputy Clerk of the Board of Supervisors

I, THERESA NAGEL, County Clerk of the County of Lassen, State of California, and ex-officio Clerk of the Board of Supervisors thereof, do hereby certify that the foregoing resolution was duly adopted by said Board of Supervisors at a regular meeting held on the 23 day of Sept, 1997.

Theresa Nagel
County Clerk and ex-officio Clerk of the
Board of Supervisors

up/rezone/96056/BrdRes

EXHIBIT THREE

CONDITIONS OF APPROVAL
USE PERMIT #96056

1. This use permit is granted for the use as reviewed by the Planning Commission on September 3, 1997, and as approved by the Board of Supervisors on _____, subject to the terms and conditions set forth herein. Substantial revisions and/or expansion of the project will require a new use permit subject to the approval of the Planning Commission.

2. In case of conflict between the conditions specified herein and those attached to use permits #79-80-44 and #11-02-85, issued to Miller's Custom Work, Inc. pertaining to the Ward Lake Pit, the conditions herein shall control.

PRIOR TO ISSUANCE OF THE AUTHORIZATION TO OPERATE UNDER THIS USE PERMIT

3. The operator shall secure all necessary permits from the Lassen County Air pollution Control District. Evidence of approval shall be submitted to the Community Development Department.

4. The operator shall secure all necessary permits from the Lahontan RWQCB and/or the State Water Resources Board. Evidence of approval(s) or a copy of the letter certifying that no off site discharge will occur, exempting the operation, shall be submitted to the Community Development Department.

5. The applicant shall prepare and implement a Spill Prevention and Countermeasure Plan to the satisfaction of the Regional WQCB.

6. The operator shall secure any necessary encroachment permits from the County Road Department.

7. A valid financial assurance, in an amount adequate to cover the costs of complete site reclamation, shall be in place, payable to "Lassen County or the Department of Conservation," prior to issuance of the Authorization to Operate and at all times that the project is subject to SMARA. The financial assurance instrument shall be reviewed periodically for adequacy and shall be amended by the operator as required by the lead agency.

8. Inasmuch as the conditions of approval of this use permit (#96056) shall cause the need to revise the existing approved reclamation plan for the operation, the applicant shall apply to so amend the reclamation plan.

9. The operator shall submit a New Mine Report to the State, with a copy to the Community Development Department, within 30 days of approval by the County, and shall submit annual reports to the State and County every year thereafter, as long as the project is subject to SMARA.

10. The applicant shall enter into a fair share agreement with the County Road Department to chip seal Ward Lake Road from the project access road to the intersection of Conservation Center Road. The agreement shall address the timeframe within which the chip seal is to take place. Unless otherwise specified and agreed to by both parties, the applicant shall be responsible to provide aggregate materials and oil, and the County shall provide the necessary labor to complete the work. Unless authorized by the County Engineer in writing, all work shall be complete within two years from the date of use permit approval.

11. The applicant shall remove all debris from the culvert at the north end of Ward Lake Road immediately upon approval of the project, and shall be responsible to prevent additional debris, originating from the mine site, from blocking the culvert for the duration of the mine operation.

OPERATIONAL CONDITIONS

12. Prior to installation or operation of the ready mix concrete batch plant the applicant shall either:

    a) Redesign project to omit the concrete batch plant; or

    b) The applicant shall secure the rezoning of the site to a district that allows for concrete batch plants.

13. The following reclamation shall be required and, where different from or in addition to the provisions of the approved reclamation plan, said reclamation plan shall be amended by application:

    Reclamation of graded areas. The intent of the Reclamation Plan shall be to recreate to the extent possible a viable, self-sustaining plant community similar to that which existed prior to mining as follows:

    Sand and Gravel Excavation Areas: These areas shall be regraded to maximum slopes of 2H:1V, shall be resoiled with adequate growth medium to support vegetation including fines from the crusher and stockpiled topsoil and shall be revegetated with native species including sage, bitterbrush, and rabbit brush. The success of revegetation in these areas shall be monitored by qualified personnel with reports submitted to the County Community Development Department at least once per year for five years. The final approved species list and planting

density must be approved by the County in consultation with the Department of Fish and Game.

Rock Quarry Area: This area shall be re-graded to a maximum overall slope of 2H:1V and shall be benched with minimum 10 foot wide benches at vertical intervals appropriate for the type of material, but not greater than 15 feet. The benches shall be sloped to drain toward the hillside, shall be resoiled with adequate growth medium to support vegetation including fines from the crusher and stockpiled topsoil and revegetated using native range grasses, shrubs, and trees if they can be supported.

The operator shall institute a test plot program on the first available rock face bench to determine the best species mix and planting scheme for subsequent benches. The test plots shall be set up and monitored by qualified personnel with reports submitted to the County Community Development Department at least once per year for five years. The final approved species list and planting density must be approved by the County in consultation with the Department of Fish and Game.

Timing/ Phasing of Reclamation: Reclamation of sub-areas shall take place in a phased manner where possible as excavation is completed.

Protection of Replanted Areas: Replanted areas shall be protected by fencing or other approved method intended to exclude livestock and deer until vegetation is established. Perimeter livestock fencing shall be provided and shall be four wires maximum, bottom wire smooth and no closer than 18 inches to the ground with total fence height not to exceed 42 inches. More site specific deer proof fencing shall also be provided directly around replanting areas.

14. The approved reclamation plan for the project, and any future amendments thereto, is hereby incorporated into this use permit. Adherence to the provisions of the approved reclamation plan, and any County-approved amendments thereto, is hereby made a condition of approval.

15. Top soil (the top surface layer supporting vegetation) shall be scraped and salvaged concurrent with mining, stockpiled and protected from erosion, and shall be re-applied to disrupted surfaces, to promote revegetation and slope stability upon reclamation.

16. At a minimum, wet suppression shall be used to control dust at all times from excavation, processing activities and on haul roads.

17. The disturbed portion of the site, including quarry highwall benches, shall be revegetated with native and/or compatible species per the approved reclamation plan.

18. On site fuel tanks shall be placed and kept in impermeable containment structures capable of holding at least 110% of the tank capacity pursuant to the County's above ground fuel storage standards.

19. The operator will participate in the County's mine permit administration and monitoring program by submitting annual fees pursuant to County Code Section 9.60.110.

20. If any historic or pre-historic artifacts are discovered, work in the immediate vicinity shall stop, the lead agency shall be notified and a qualified archaeologist brought in at the operators expense to assess the resource(s) and recommend mitigation.

21. Except in a state of emergency, as declared by the local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville, no grading, excavating, or blasting on the site shall be allowed between January 1 and March 31 annually.

22. Hours of operation, including truck traffic to and from the site on Ward Lake Road shall be limited to 6:00 a.m. to 7:00 p.m. Monday through Saturday.

23. In the event that the ready mix concrete plant is allowed and installed on site, the applicant shall paint that portion of the concrete plant visible from Ward Lake Road and Conservation Center Road as determined by the County, to blend with surrounding natural background colors.

24. Ready mix concrete production shall be limited to 12,000 cubic yards per year

25. The operator shall contract with a California Air Resources Board certified private contractor for an annual compliance test at the Ward Lake operation to determine compliance with APCD permit. The test shall be conducted during facility operations before January 1 every year and the results submitted to the APCD for review.

26. Explosives shall be handled by a licensed operator, and shall be stored in an ATF inspected and approved magazine.

27. No explosives shall be detonated between the hours of 6:00 p.m. and 7:00 a.m.

28. The operation shall not exceed the noise standards for industrial activities as described in the Lassen County Noise Element as follows:

> Noise produced by industrial uses shall not exceed 70 dB Ldn/CNEL at the nearest property line. (1989 Noise Element, page 21, #9)

The standards of Table III (1989 Noise Element page 19) are also applicable.

29. The operator shall, at the lead agency's request, measure the noise levels in the vicinity of operating equipment, at the nearest property line and at the nearest residential property

line, and submit the result to the lead agency for review. Measurements shall be taken by a qualified acoustical analyst.

30. The paved access to the site from Ward Lake Road shall serve as the only truck access to and from the site.

31. The operation (except the access road) shall be conducted within the following described area:

Township 30N., Range 14E., MDB & M:

Section 32: SE ¼ of the SE ¼ of the NE ¼;
E ½ of the NE ¼ of the SE ¼
NE ¼ of the SE ¼ of the SE ¼

Section 33: SW ¼ of the NW ¼:
W ½ of the SW ¼

32. The location of equipment, quarry, sand and gravel pits, maintenance areas, etc. shall be as shown in the site maps incorporated into the approved reclamation plan as such plan may be amended from time to time with County approval.

33. The operator shall identify the boundaries of the approved mine activity area and flag the corners so that the boundaries are readily visible to County and State officials authorized to inspect the site.

34. The applicant shall provide the necessary funding to the County Road Department to install speed limit signs on Ward Lake Road, upon determination by the County Engineer, applying accepted traffic safety considerations, that speed limit signs would be beneficial in reducing truck speeds and increasing safety on Ward Lake Road. The applicant shall further provide the County funding to install a stop sign at the intersection of the project access road and Ward Lake Road upon similar determination by the County Engineer that such a sign would be beneficial. The applicant's obligations herein shall be valid for a period not to exceed two years from the date of project approval.

35. In the event that the approval of this Use Permit is legally challenged on grounds including, but not limited to, CEQA compliance and/or general plan consistency or adequacy, the County will promptly notify the applicant of any claim, action, or proceeding, and the County will cooperate fully in the defense of the matter. Once notified that a claim, action or proceeding has been filed to attack, set aside, void or annul an approval by the Planning Commission or the Board of Supervisors concerning this Use Permit, the applicant agrees to defend, indemnify and hold harmless the County and its agents, officers and employees.

RESOLUTION NO. 19-024

RESOLUTION OF THE LASSEN COUNTY BOARD OF SUPERVISORS MAKING FINDINGS RELATED TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT AND APPROVAL OF USE PERMIT AMENDMENT #2018-003 AND RECLAMATION PLAN AMENDMENT #2018-001, CERTIFYING THE FINAL ENVIRONMENTAL IMPACT REPORT #2018-001, AND APPROVING USE PERMIT AMENDMENT #2018-003 AND RECLAMATION PLAN AMENDMENT #2018-001 (AMENDING USE PERMIT AND RECLAMATION PLAN #96056), FOR WARD LAKE PIT (MINE ID #91-18-0008), TLT ENTERPRISES LLC (Perry Thompson)

WHEREAS, Lassen County has received and accepted use permit and reclamation plan amendment applications submitted by TLT Enterprises LLC (Perry Thompson) for Ward Lake Pit surface mining operation, to allow for 24-hour mining operations (Monday through Saturday), extend the life of the mine from 2020 to 2030, and allow annual site production in excess of the permitted 100,000 tons during declared emergencies; and

WHEREAS, the Lassen County Environmental Review Guidelines (Board of Supervisors Resolution No. 01-043), and Lassen County Code Section 18.112, establish the procedures for project review consistent with both the California Environmental Quality Act (CEQA), and County use permit policy; and

WHEREAS, the Environmental Review Officer of Lassen County, following preliminary project review, prepared an Initial Study (IS#2018-001) to determine if the proposed project could result in significant environment effects; and

WHEREAS, the Lassen County Planning Commission reviewed the Initial Study, and determined that there is substantial evidence in the record that, if approved, the project will result in significant environmental impacts, and that a Subsequent Environmental Impact Report should be prepared and certified prior to project approval; and

WHEREAS, a Draft Subsequent Environmental Impact Report (DSEIR) was prepared by Lassen County in accordance with the California Environmental Quality Act (CEQA), to disclose environmental impacts, and evidence presented within said DSEIR indicates that, after mitigation, the project will result in significant and unavoidable environmental impacts; and

WHEREAS, the DSEIR was circulated for public review, in accordance with Sections 15087 and 15105 of the CEQA Guidelines, and all comments received, pertaining to the DSEIR, were responded to by Lassen County and incorporated into the FSEIR; and

WHEREAS, the Planning Commission as an advisory body was tasked with reviewing the DSEIR, and proposed Use Permit and Reclamation Plan Amendments, and making recommendations to the Board of Supervisors; and

WHEREAS, the Planning Commission, after due notice, considered, in an advisory capacity to the Board of Supervisors, Use Permit Amendment #2018-003 and Reclamation Plan Amendment #2018-001, submitted by TLT Enterprises LLC (Perry Thompson) for Ward Lake Pit surface mining operation; and

WHEREAS, the Planning Commission adopted Resolution No. 4-01-19, making findings and recommending that the Board of Supervisors consider Use Permit Amendment (#2018-003) and Reclamation Plan Amendment (#2018-001) for Ward Lake Pit (mine ID #91-18-0008), TLT Enterprises LLC (Perry Thompson), and that the Board consider certification of the Final Subsequent Environmental Impact Report (FSEIR); and

WHEREAS, pursuant to the Lassen County Environmental Review Guidelines (Board of Supervisors Resolution No. 01-043) section 1(b) and section 15025 of the CEQA Guidelines, the Board of Supervisors is required to prepare a Statement of Overriding Considerations in order to approve a project for which significant and unavoidable environmental impacts have been disclosed; and

WHEREAS, the Board of Supervisors, after due notice, has considered the Final Subsequent Environmental Impact Report #2018-001, prepared by Lassen County, and Use Permit Amendment #2018-003 and Reclamation Plan Amendment #2018-001, submitted by TLT Enterprises LLC (Perry Thompson) for Ward Lake Pit surface mining operation, to allow for 24-hour mining operations (Monday through Saturday), extend the life of the mine from 2020 to 2030, and allow annual site production in excess of the permitted 100,000 tons during declared emergencies; and

WHEREAS, Lassen County has caused notice to be given, in accordance with the law, of a public hearing before the Board of Supervisors on these matters, for which a hearing was opened on April 23, 2019, and concluded on May 14, 2019; and

WHEREAS, the Director of Planning and Planning and Building Services has provided to the Board of Supervisors, and the Board has incorporated into the record of this matter, the FSEIR, and supporting documents discussing the environmental effects of the proposed project, proposed findings concerning mitigation, project alternatives, and evidence of project benefits to support preparation of a Statement of Overriding Consideration including substantial evidence in support of the required findings; and

WHEREAS, the Board of Supervisors has duly considered the FSEIR as required by CEQA, and reviewed the above project and actions in light of the FSEIR; and

WHEREAS, before consideration of the proposed project, this Board called for comments on the proposal and all persons so desiring to comment were duly heard; and

WHEREAS, the Board of Supervisors has considered all of the testimony presented during the public comment period and the public hearing.

NOW, THEREFORE, BE IT RESOLVED, that the Lassen County Board of Supervisors has jurisdiction to consider the subject matters of this resolution; and

BE IT FURTHER RESOLVED, that the Board of Supervisors, as the decision making body of the lead agency,

(1) Certifies that the FSEIR has been completed in compliance with CEQA,
(2) Certifies that it has reviewed and considered the information contained in the FSEIR dated April 2019, prior to approval of the TLT Enterprises LLC, Ward Lake Pit amendment project, and further
(3) Certifies that the FSEIR reflects the lead agency's independent judgement and analysis; and

BE IT FURTHER RESOLVED, that the Board of Supervisors finds

(1) That changes or alterations have been required in, or incorporated into, the project, which avoid or substantially lessen the significant environmental effects, as identified in the FSEIR and explained further in the CEQA findings of fact, attached hereto as EXHIBIT ONE, and
(2) That specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives, identified in the FSEIR, that would reduce impacts to aesthetics, biological resources, and noise to a less-than-significant level; and

BE IT FURTHER RESOLVED, that the Board of Supervisors hereby adopts as its findings the CEQA findings of fact and evidence submitted in support of a Statement of Overriding Considerations, attached hereto as EXHIBIT TWO, concerning the TLT Enterprises LLC, Ward Lake Pit project, consisting of a use permit amendment and reclamation plan amendment, for which detailed findings are attached (EXHIBIT ONE), and incorporated herein; and

BE IT FURTHER RESOLVED, that the Board of Supervisors adopts a Statement of Overriding Consideration, finding that specific economic, social, or other benefits, including region-wide or statewide environmental benefits, of the proposal project outweigh the unavoidable adverse environmental effects, therefore considering the adverse environmental effects to be "acceptable." This Statement of Overriding Consideration is supported by substantial evidence (EXHIBIT TWO); and

BE IT FURTHER RESOLVED, that the Board of Supervisors hereby adopts as its findings the findings for approval of the use permit amendment and reclamation plan amendment for the TLT Enterprises LLC, Ward Lake Pit amendment project, which detailed findings are attached hereto as EXHIBIT THREE, and incorporated herein; and

BE IT FURTHER RESOLVED, that the Board of Supervisors finds

(1) That the project will not, under the circumstances of the particular case, be detrimental to the health, safety, peace, morals, comfort and general welfare of persons residing or working in the neighborhood of such use, nor be detrimental or injurious to property and improvements in the neighborhood or to the general welfare, and
(2) That the project is consistent with the *Lassen County General Plan, 2000*, and the *Standish-Litchfield Area Plan* 1982; and

BE IT FURTHER RESOLVED, that the Board of Supervisors approves Use Permit Amendment #2018-003 and Reclamation Plan Amendment #2018-001, subject to the conditions of approval attached hereto as EXHIBIT FOUR; and

BE IT FURTHER RESOLVED, that the Board of Supervisors adopts the Mitigation Monitoring Program attached hereto as EXHIBIT FIVE, as established in conditions of approval (EXHIBIT FOUR).

PASSED AND ADOPTED at a regular meeting of the Board of Supervisors of the County of Lassen, State of California, on the 14th day of May, 2019, by the following vote:

AYES: Supervisors Hemphill, Gallagher, Teeter and Albaugh.

NOES: None.

ABSTAIN: None.

ABSENT: Supervisor Hammond.

Chairman of the Board of Supervisors
County of Lassen, State of California

Attest:
JULIE BUSTAMANTE
Clerk of the Board

By: _____
MICHELE YDERRAGA, Deputy Clerk of the Board

I, MICHELE YDERRAGA, Deputy Clerk of the Board of the Board of Supervisors, County of Lassen, do hereby certify that the foregoing resolution was adopted by the said Board of Supervisors at a regular meeting thereof held on the 14th day of May, 2019.

_____
Deputy Clerk of the County of Lassen Board of Supervisors

EXHIBIT ONE

CEQA FINDINGS

FINDINGS OF FACT REGARDING ENVIRONMENTAL IMPACTS,
MITIGATION MEASURES, PROJECT ALTERNATIVES,
PROJECT BENEFITS AND STATEMENT OF
OVERRIDING CONSIDERATION

DRAFT SUBSEQUENT ENVIRONMENTAL IMPACT REPORT
TLT ENTERPRISES LLC, WARD LAKE PIT AMENDMENT PROJECT
LASSEN COUNTY, CALIFORNIA

The Lassen County Planning Commission hereby adopts the following findings relating to the TLT Enterprises LLC, Ward Lake Pit amendment project in an advisory capacity to the Board of Supervisors, including a recommendation that the Board adopt these same findings and certify the Final Subsequent Environmental Impact Report (FSEIR).

The California Environmental Quality Act (CEQA) findings for the proposed action follow. To the extent that these findings are adopted by the Board of Supervisors, said findings shall apply to the certification that the FSEIR has been prepared in compliance with CEQA.

CEQA FINDINGS:

I. THE ENVIRONMENTAL IMPACT REPORT

A. TLT Enterprises LLC (the applicant) submitted applications for a use permit amendment and reclamation plan amendment, which applications were accepted by the County as complete on March 9, 2018.

B. An initial study dated June 1, 2018, was conducted by Lassen County. Based on the initial study, it was determined by the Planning Commission that a Subsequent Environmental Impact Report was necessary to evaluate the potential significant effects of the project on the environment, with a focus on potential impacts to aesthetics, traffic, biological resources, and noise, as these impacts were identified as potentially significant in the Initial Study.

C. A Notice of Preparation dated June 19, 2018, was prepared and distributed to interested individuals, agencies and property owners in the vicinity.

D. An Administrative Draft Subsequent Environmental Impact Report was prepared for County staff review before preparation of the Draft Subsequent Environmental Impact Report (DSEIR). Subsequently, the DEIR was prepared to identify, describe, and analyze the environmental effects of the proposed project and alternatives.

E. Lassen County sent the Notice of Completion of the DSEIR to the State Clearinghouse on March 1, 2019. State Review began on March 4, 2019. Notices of

The DSEIR was published on the Lassen County Planning and Building Services webpage and a Notice of Completion, with notice of availability of the DSEIR, was sent to interested parties, agencies and property owners within 1 mile of the project site on March 5, 2018.

F. The DSEIR was released to the public and agencies for a 45-day review and comment period, beginning on March 5, 2019 and ending on April 18, 2019. The Planning Commission held a public hearing during the 45-day DSEIR review period to provide the public, agencies and the Planning Commission an opportunity to comment on the DSEIR. The hearing was opened at the March 20, 2019, Planning Commission meeting and was continued to the April 2, 2019, meeting. Notice of the public hearing was published in the newspaper and distributed to agencies and property owners within 1 mile of the project site on March 5, 2019, with a corrected notice published on March 12, 2019.

G. A Final Subsequent Environmental Impact Report (FSEIR) will be prepared, and will incorporate the responses to comments received as a result of the public review of the DSEIR. The FSEIR is expected to be substantially the same as the DEIR except that it will include copies of the comments on the DSEIR, responses to those comments, as well as changes in or additions to the text of the DSEIR in response to comments for clarification or additional information. The FSEIR will give direct responses to each comment letter received.

H. the DSEIR analyzes the impacts of the TLT Enterprises LLC, Ward Lake Pit amendment project.

II. FINDINGS REGARDING NO IMPACTS

The DSEIR identifies those aspects of the project that pose no environmental impacts. No mitigation measures are necessary for these aspects of the project.

A. Impacts to Traffic

1. Impacts:
    a) Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections).
    b) Need for additional turn lanes.

2. Findings:
    a) Impacts to traffic are discussed in Section 4.11 of the DSEIR
    b) No increase in total truck trips will occur as part of the project. There will be no change in existing traffic load and capacity. For the duration of 2 to 4 nighttime-required highway projects per year, the traffic volume will be redistributed to nighttime hours (7:00 p.m. to 6:00 a.m.). This redistribution will result in less daytime traffic loading. No impact to traffic load and capacity of the street system is anticipated.
    c) The need for an exclusive eastbound left turn lane on Center Road (A27) at the Ward Lake Road intersection and the need for an exclusive westbound right turn lane on Center Road (A27) at the Ward Lake Road intersection were reviewed based on guidelines presented in the AASHTO publication A Policy on Geometric Design of Highways and

Streets. Analyses of these intersections found that there is a need to construct turning lanes due to increased traffic from project operations.
d) The Planning Commission finds the traffic sections above to have no impact.

III. FINDINGS REGARDING LESS-THAN-SIGNIFICANT IMPACTS

The DSEIR identifies those environmental impacts that are less than significant. No mitigation measures are necessary for less-than-significant impacts.

A. Impacts to Air Quality

1. Impacts:
a) Exposure of sensitive receptors to substantial concentrations of toxic air contaminants

2. Findings:
a) Impacts to air quality are discussed in Section 4.3 of the DSEIR
b) The Health Risk Assessment prepared for the Project assessed the health impacts to nearby sensitive receptors from diesel particulate matter generated by additional truck trips, and operation of generators onsite. Cancer risks and non-cancer health hazards were calculated to be below thresholds for significant health impacts.
c) The only known current or future project within the vicinity of the proposed Project that could combine with the Project-related diesel particulate matter emissions to result in a cumulatively significant impact is a smaller aggregate mine located adjacent to and south of the site on Bureau of Land Management (BLM) administered land. As discussed in the Health Risk Assessment prepared for the Project, the majority of any health impacts from mine operations are due to the operation of generators as haul truck emissions occur over the length of a haul route and are not near receptors for much duration. The adjacent mine does not have any concrete or asphalt plants or associated generators that would generate diesel particulate matter. The adjacent mine does not have any generators, therefore cumulative impacts related to toxic air contaminants are anticipated to be less than significant.
d) The Planning Commission finds impacts to air quality to be less than significant.
e) The Planning Commission finds cumulative impacts to air quality to be less than significant.

B. Impacts to Biological Resources

1. Impacts:
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by DFG or U.S. Fish and Wildlife Service (USFWS).

2. Findings:
a) Impacts to biological resources are discussed in Section 4.4 of the DSEIR
b) Fifteen special-status species are known or have the potential to occur within the project area. Impacts were assessed based on habitat availability and documented occurrences of the species. Nocturnally foraging animals are likely to avoid the project

area and utilize alternate habitat in the adjacent public land and privately-owned agricultural fields. Diurnal animals will not be impacted by nighttime activities.
c) As discussed in Section 4.4 of the DSEIR, the Project-level impacts of onsite nighttime operations and traffic from the project were determined to have a less-than-significant impact on any special-status species in the project area. Impacts of the project to special status species are not cumulatively considerable. There are no current or future known projects requiring nighttime operations in the County that would combine with the project to result in cumulatively significant impacts to special status species.
d) The Planning Commission finds the above impacts to biological resources to be less than significant.
e) The Planning Commission finds the above cumulative impacts to biological resources to be less than significant.

C. Impacts to Greenhouse Gas Emissions

1. Impacts:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

2. Findings:

a) Impacts to greenhouse gas emissions are discussed in Section 4.5 of the DSEIR
b) The County determined in the Initial Study that the Project may have a less-than-significant impact to GHG emissions, directly or indirectly, that may significantly impact the environment. No changes are being proposed to the permitted production of the asphalt or concrete plants, and therefore the total amount of GHG produced by the plant remains unchanged. An analysis of potential truck emissions completed by Lassen County using thresholds from the Bay Area GHG Management District resulted in values below the CEQA thresholds of significance for GHG (see initial study). The additional analysis including the calculated emissions from the asphalt plant and concrete plant, support the assessment and conclusion that the Project will have a less-than-significant impact to GHG emissions, directly or indirectly, on the environment.
c) No specific area plans or numerical threshold of significance for GHG emissions have been established by Lassen County. Therefore, the focus is whether the Project is consistent with applicable federal and state regulations and programs adopted to achieve state and regional reductions in GHG emissions. The Project is not in violation of any State or Federal standard.
d) The Project does not violate any state or federal plans or standards. In addition, the operation of the facility is a benefit to Lassen County in that the maintenance of roads and other infrastructure requiring the generation of asphalt pavement and concrete are necessary for support of a safe public transportation system within Lassen County. The generation of pavement material and concrete are required whether located at this facility or other facilities further away. The transportation of materials from facilities further away would result in higher emissions per ton of material produced due to the increased emission from miles traveled by truck. For these reasons, this impact is considered less than significant and no mitigation is required. The Project will not result in a cumulative

impact that would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.
e) The Planning Commission finds impacts to greenhouse gas emissions to be less than significant.
f) The Planning Commission finds cumulative impacts to greenhouse gas emissions to be less than significant.

D. Impacts to Hazards and Hazardous Materials

1. Impacts:
a) Create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
b) Expose people or structures to a significant risk of loss, injury or death involving wildland fires.

2. Findings:
a) Impacts to hazards and hazardous materials are discussed in Section 4.6 of the DSEIR
b) The Project does not include changes to mineral or asphalt production. The existing permitted mineral and asphalt production amount were analyzed under a previous environmental document and the impact was concluded to be less than significant. Additionally, the operation is required to have the necessary permits from Lassen County Environmental Health for storing hazardous materials. Operations will continue to follow the applicable laws and regulations regarding hazardous material transport, as defined in Section 353 of the California Vehicle Code.
c) The Project includes nighttime operations that may add to the risk of fire starting on site at night. However, wildfire spreading is reduced at night, due to increased relative humidity and decreased temperature and wind. The potential of fire to spread to the few residences in the area is low, due to roads and agricultural use. Additionally, it is expected that operation will move from day to night (project specific), without additional shifts. Because the volume of mining is not increasing, but rather undergoing a change in its timing, the cumulative risk for wildfire will not increase.
d) Project-level impacts related to the transport, use or disposal of hazardous materials will be less than significant and will not be cumulatively considerable. There are no projects in the county that will combine with the project to result in a cumulative impact related to hazardous materials.
e) The Project will result in no hazards and hazardous material impacts with exception of a possible change in the risk of fire starting onsite at night during 24-hour operations. The Project will not introduce new activities at the site or increase the likelihood of fires onsite. Project impacts related to wildland fires will not be cumulatively considerable, and will not contribute to cumulative impacts.
f) The Planning Commission finds impacts to hazards and hazardous materials to be less than significant.
g) The Planning Commission finds cumulative impacts to hazards and hazardous materials to be less than significant.

E. Impacts to Hydrology and Water Quality

1. Impacts:

a) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. The Project will not change groundwater use at the Project site. The project is not expected to create a demand for water in excess of available supplies.

2. Findings:

a) Impacts to hydrology and water quality are discussed in Section 4.7 of the DSEIR
b) The Project will not change groundwater use at the Project site. The project is not expected to create a demand for water in excess of available supplies.
c) Hydrology and Water Quality impacts are cumulatively considerable when considered with all current and future projects within the same groundwater basin that may utilize groundwater. There is currently no trend or pattern indicating overdraft in the basin. The Project is not expected to create a demand for water in excess of available supplies. No additional projects that would use a substantial amount of groundwater have been identified in the County.
d) The Planning Commission finds impacts to hydrology and water quality to be less than significant.
e) The Planning Commission finds cumulative impacts to hydrology and water quality to be less than significant.

F. Impacts to Noise

1. Impacts:

a) Result in the exposure or persons to or generation of excessive ground borne vibration or ground borne noise levels.

2. Findings:

a) Impacts to noise are discussed in Section 4.9 of the DSEIR
b) The project will not introduce any new equipment or processes to the project site that will increase the levels of vibration or ground born noise levels generated by current onsite operations. The project would result in an increase in truck traffic on roadways during nighttime hours, however loaded trucks produce vibration levels less than the threshold at which vibration becomes annoying or levels that could cause damage to any buildings along the material haul route.
c) The Project does not result in the addition of any new equipment or processes to the project site that will increase vibration or ground borne noise levels, and there are no projects within the area that will include stationary sources of vibration or ground borne noise levels. Increases in vibration from truck traffic are cumulatively considerable in combination with projected traffic increases through the year 2030. However, even when increased traffic volumes are considered, loaded truck pass-bys produce vibration levels below human annoyance thresholds and below levels that could result in damage to structures along area roadways.
d) The Planning Commission finds the above impacts to noise to be less than significant.

e) The Planning Commission finds the above cumulative impacts to noise to be less than significant.

G. Impacts to Public Services

1. Impacts:

a) Result in the Need for New or Physically Altered Facilities related to Fire Protection.

2. Findings:

a) Impacts to public services are discussed in Section 4.1 of the DSEIR

b) The addition of nighttime operations could increase the risk of onsite fires, but this is not anticipated to affect service ratios, response times or other performance objectives for fire protection services.

c) Impacts from the Project are cumulatively considerable in combination with all other current and future projects that would result in an increased demand for fire protection services. The County has not identified any cumulative projects within Lassen County. The Project will change the timing of fires onsite due to 24-hour operations but will not result in an overall increase in fire risks at the site.

d) The Planning Commission finds impacts to public services to be less than significant.

e) The Planning Commission finds cumulative impacts to public services to be less than significant.

H. Impacts to Traffic

1. Impacts:

a) Exceed, either individually or cumulatively, a level of service standard established by the County congestion management agency for designated roads or highway.

b) Conflict with local circulation policies.

c) Cause a cumulative increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).

d) Cause a cumulative need for additional turn lanes.

2. Findings:

a) Impacts to traffic are discussed in Section 4.11 of the DSEIR.

b) Analysis of intersection traffic capacity at Center Road (A27)/Ward Lake Road and Center Road (A27)/Cutoff Road focused on the impacts to the Level of Service defined for each roadway. No degradation to Level of Service is anticipated.

c) The Lassen County General Plan Circulation Element and the Standish-Litchfield Area Plan Circulation Element contain goals, policies, and implementation measures related to circulation in the project area. The Project will have a minimal impact on the Level of Service at the Center Road (A27)/Ward Lake Road and Center Road (A27)/Cutoff Road intersections. Level of Service at these intersections will remain at LOS A under existing, plus Project, traffic conditions.

d) Lassen County requires that no public highway or roadway should be allowed to fall to or exist for a substantial amount of time at or below a Level of Service rating of "E" (i.e., road at or near capacity; reduced speed; extremely difficult to maneuver; some

stoppages).The Project combined with a 1 percent traffic increase each year is not anticipated to degrade roadway capacity below a Level of Service of "E".
e) The Project combined with a 1 percent traffic increase each year is not anticipated to degrade roadway or intersection capacity or result in the need for additional turn lanes.in the Project area.
f) Combined with regional growth of 1 percent each year, the Project traffic is not expected to result in a significant cumulative impact to the load and capacity of the street system.
g) The Planning Commission finds the above impacts to traffic to be less than significant.
h) The Planning Commission finds the above cumulative impacts to traffic to be less than significant.

I. Impacts to Utilities and Service Systems

1. Impacts:
a) Require New or Expanded Water Supply Entitlements.

2. Findings:
a) Impacts to utilities and service systems are discussed in Section 4.12 of the DSEIR
b) Well water is used by the current operation for wet suppression of onsite dust. While the amount of groundwater used by the surface mining operation may be impacted by the proposed Project amendment, the Project is not expected to create a demand for water in excess of available supplies.
c) The geographic context for cumulative impacts related to water at the site is the Honey Lake Valley Groundwater Basin. The Project water use will not have significant impact to groundwater supplies and no new or expanded water quality entitlements will be required.
d) The Planning Commission finds impacts to utilities and service systems to be less than significant.
e) The Planning Commission finds cumulative impacts to utilities and service systems to be less than significant.

J. Impacts to Energy Consumption

1. Impacts:
a) The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials may be discussed.
b) The effects of the project on local and regional energy supplies and on requirements for additional capacity.
c) The effects of the project on peak and base period demands for electricity and other forms of energy.
d) The degree to which the project complies with existing energy demands.
e) The effects of the project on energy resources.
f) The projects projected transportation energy use requirements and its overall use of efficient transportation alternatives.

2. Findings:

a) Impacts to energy consumption are discussed in Section 4.13 of the DSEIR

b) Because project work during operations will be transferred from daytime to nighttime use, there will be only a slight increase in generator fuel consumption. The increase in generator use for lighting represents a small draw on generator power and will be for limited duration, two to four times per year. The project would not result in any unusual characteristics that would result in excessive long-term operational fuel consumption. Fuel consumption associated with vehicle trips generated by the project would not be considered inefficient, wasteful, or unnecessary; in fact, the local nature of the facility results in fewer vehicle trips for local construction projects. The extension of the project for a 10-year period will continue the use of diesel fuel for generators and heavy-duty trucks. All new trucks must meet new emission control guidelines. The Hat Creek Construction fleet is in change-out period for trucks. In addition, Hat Creek Construction will be making improvements to the mixes of asphalt to be more energy and resource efficient, such as using RAP in mixes.

c) The project will not have a negative impact on local and regional energy supplies. The use of locally produced asphalt and aggregate will reduce overall energy demand due to decrease in miles from the location of final use.

d) There are no project impacts on peak and base period demand for electricity and other forms of energy.

e) The project is in compliance with existing energy standards.

f) The project uses diesel for onsite fuel. No other alternatives are available.

g) No transportation alternatives are available for product delivery at this time. Energy use is not anticipated to increase over time.

h) The Project will not combine with other projects to create a significant impact on local and regional energy supplies resulting in a need of additional capacity. The Project will not combine with other projects to result in an increase on peak and base period demand for electricity and other forms of energy, or result in a significant impact on energy resources.

i) The Planning Commission finds impacts to energy consumption to be less than significant.

j) The Planning Commission finds cumulative impacts to energy consumption to be less than significant.

IV. FINDINGS REGARDING IMPACTS MITIGATED TO A LESS-THAN-SIGNIFICANT LEVEL

The DSEIR identifies those environmental impacts that are mitigable. Conditions of Approval for the project will be imposed that will mitigate or avoid these mitigable impacts.

A. Impacts to Biological Resources

1. Impacts:

a) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; specifically nighttime operations to Pronghorn antelope, mule deer and nocturnal foragers.

i) Additional Noise and Light Levels.

ii) Increased Traffic Impacts to Wildlife.

2. Mitigation Measures:

a) Operator shall continue limits on operations from January to March 31. Impacts can be lessened through continuing seasonal operating restrictions included in the Condition of Approval for Use Permit No. 96056: *Except in a state of emergency, as declared by the local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville, no grading, excavating, or blasting on the site shall be allowed between January 1 and March 31 annually.*

b) Operator shall conduct no nighttime operations (7:00 p.m. to 6:00 a.m.) during the period of January 1 to March 31. Applying the existing operational restriction to the proposed nighttime operations would eliminate additional disturbance/displacement of pronghorn antelope and mule deer utilizing the winter habitat during the winter months.

c) Year-round nighttime operation restrictions. No grading, blasting, or excavating shall be allowed onsite between the hours of 6:00 p.m. and 7:00 a.m.

d) Lighting fixture design. To minimize the effects of lighting of artificial light on wildlife, lighting fixtures associated with nighttime project work shall be downward facing and fully shielded. Lighting equipment should be designed and installed to minimize light pollution.

e) Noise reduction barriers. Adverse effects from noise may be reduced through installation of noise berms constructed around the project area where heavy machinery is in use. Barriers can eliminate or minimize the impacts of vibrations that may result from nighttime operations.

f) No "jake brake" usage. This option can significantly reduce the noise impacts from the increased traffic volume. "No use of jake brake" signs shall be posted on the access road and at the Center Road (A27) and Ward Lake Road intersection.

g) Wildlife crossing signage on roadways. This option would educate drivers about the potential for wildlife encounters on roads during nighttime hours. Signage will be permanent. This measure can prevent direct mortalities to nocturnal wildlife. Signs will be added along Center Road and Ward Lake Road with County approval.

h) Reduce traffic speed on roadways. This mitigation would reduce the speed limit in order to minimize traffic impacts to wildlife. "Reduce speed to 25 MPH" signs would reduce the speed limit on Ward Lake Road during nighttime hours, granting a longer reaction time should any wildlife be encountered on a roadway.

i) Driver education. Hat Creek Construction will conduct education events to increase driver awareness to avoid wildlife vehicle impacts.

3. Findings:

a) Impacts to biological resources are discussed in Section 4.4 of the DSEIR.

b) The addition of periods of 24-hour operations would result in additional disturbance to pronghorn antelope and mule deer by extending onsite operational noise to nighttime hours and introducing nighttime lighting. 24-hour operations could have a significant impact if these operations were to occur in the period from December to March. However, nighttime operations are prohibited for this period. Nighttime operations are prohibited from January 1 to March 31.

c) Nighttime operations between April 1 and December 31 could result in potential encounters on roadways with pronghorn antelope and mule deer during dawn and dusk.

d) The Planning Commission finds impacts to the above biological resources, after implementation of the above mitigation measures, to be less than significant.
e) The Planning Commission finds cumulative impacts to the above biological resources, after implementation of the above mitigation measures, to be less than significant.

B. Impacts to Land Use

1. Impacts:
a) Conflict with Lassen County General Plan or Standish-Litchfield Area Plan.

2. Mitigation Measures:
a) Operator shall continue limits on operations from January to March 31.
Impacts can be lessened through continuing seasonal operating restrictions included in the Condition of Approval for Use Permit No. 96056: *Except in a state of emergency, as declared by the local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville, no grading, excavating, or blasting on the site shall be allowed between January 1 and March 31 annually.*
b) Operator shall conduct no nighttime operations (7:00 p.m. to 6:00 a.m.) during the period of January 1 to March 31. Applying the existing operational restriction to the proposed nighttime operations would eliminate additional disturbance/displacement of pronghorn antelope and mule deer utilizing the winter habitat during the winter months.
c) Year-round nighttime operation restrictions. No grading, blasting, or excavating shall be allowed onsite between the hours of 6:00 p.m. and 7:00 a.m.
d) Lighting fixture design. To minimize the effects of lighting of artificial light on wildlife, lighting fixtures associated with nighttime project work shall be downward facing and fully shielded. Lighting equipment should be designed and installed to minimize light pollution.
e) Noise reduction barriers. Adverse effects from noise may be reduced through installation of noise berms constructed around the project area where heavy machinery is in use. Barriers can eliminate or minimize the impacts of vibrations that may result from nighttime operations.
f) No "jake brake" usage. This option can significantly reduce the noise impacts from the increased traffic volume. "No use of jake brake" signs shall be posted on the access road and at the Center Road (A27) and Ward Lake Road intersection.
g) Wildlife crossing signage on roadways. This option would educate drivers about the potential for wildlife encounters on roads during nighttime hours. Signage will be permanent. This measure can prevent direct mortalities to nocturnal wildlife. Signs will be added along Center Road and Ward Lake Road with County approval.
h) Reduce traffic speed on roadways. This mitigation would reduce the speed limit in order to minimize traffic impacts to wildlife. "Reduce speed to 25 MPH" signs would reduce the speed limit on Ward Lake Road during nighttime hours, granting a longer reaction time should any wildlife be encountered on a roadway.
i) Driver education. Hat Creek Construction will conduct education events to increase driver awareness to avoid wildlife vehicle impacts.

3. Findings:
a) Impacts to land use are discussed in Section 4.8 of the DSEIR

b) Goal L-22 contained in the Lassen County General Plan Land Use Element is "Protection and enhancement of important wildlife habitats to support healthy, abundant and diverse wildlife populations."
c) Goal L-22 does not contain mention of a specific species or criteria for consistency; however, the Project site does contain critical winter range for pronghorn and mule deer. The impacts of nighttime operations to pronghorn and mule deer and special-status species are discussed in the Biological Resources section of the DSEIR. With implementation of the Biological Resource Mitigation Measures, the Project will not conflict with Goal L-22 of the Lassen County General Plan Land Use Element.
d) The Planning Commission finds impacts to land use, after implementation of the above mitigation measures, to be less than significant.
e) The Planning Commission finds cumulative impacts to land use, after implementation of the above mitigation measures, to be less than significant.

C. Impacts to Noise

1. Impacts:
a) Result in exposure of persons to or generation of noise levels in excess of standards established in the Lassen County General Plan.
i) Materials Facility Extended Hours of Operations.
ii) Materials Haul Truck Operations.

2. Mitigation Measures:
a) The operator shall restrict the start-up of onsite generators to between the hours of 7:00 a.m. to 10:00 p.m.
b) Shield the asphalt plant generator noise levels by placing the generator behind either a berm or barrier, and orienting the generator opening to the north. The berm or barrier shall extend to a height even with the top of the generator enclosure.
c) No use of "jake" brakes leaving the Project site.
d) "Reduce speed" signs will be posted by the operator for tucks on the access road and Ward Lake Road and "no use of jake brake" signs will be posted by the operator on the access road and at the Center Road (A27) and Ward Lake Road intersection.
e) Maintain traffic noise below 65 dB Ldn by reducing truck traffic during 24-hour operations to 550 one-way truck trips (275 arriving and 275 departing).

3. Findings:
a) Impacts to land use are discussed in Section 4.8 of the DSEIR
b) Based upon the measured noise levels, it is expected that the on-site activities, which include the batch plants and crushing operations, will result in hourly noise levels equal to, or less than, 45 dBA L50. The primary increase in L50 values occurred between 6:00 a.m. and 8:00 a.m. during the generator start-up operations. Once operations occur, they are generally in the mid 30 dBA L50 range. Based upon the Noise analysis, the nighttime noise levels could exceed the Lassen County nighttime noise level criteria of 40 dBA L50, if generator start-up operations occur during the nighttime hours of 10:00 p.m. to 7:00 a.m.
c) Figure 4 of the Lassen County Noise Element identifies a conditionally acceptable range of 60-70 dBA Ldn for transient noise sources.

d) The Project will continue to exceed the 60 dBA Ldn noise level standard along Ward Lake Road, and a portion of Center Road (A27), west of Ward Lake Road under worst-case operating conditions. Mitigation Measure e) (above) will lessen the current impact to 65 dBA Ldn, a conditionally acceptable level, assuming a distribution of 377 one-way truck trips between 7:00 a.m. and 10:00 p.m. and 173 one-way truck trips during nighttime hours.
e) The Planning Commission finds the above impacts to noise, after implementation of the above mitigation measures, to be less than significant.
f) The Planning Commission finds the above cumulative impacts to noise, after implementation of the above mitigation measures, to be less than significant.

V. FINDINGS REGARDING SIGNIFICANT AND UNAVOIDABLE IMPACTS

The DSEIR identifies those environmental impacts that are significant and unavoidable. Although these impacts cannot be avoided, Conditions of Approval for the project will be imposed that will mitigate these impacts.

A. Impacts to Aesthetic and Visual Resources

1. Impacts:
a) Substantially degrade the existing visual character or quality of the site and its surroundings through project lighting and nighttime views.
b) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area (headlight impacts).

2. Mitigation Measures:
a) Direct lighting internally into the site and berm site areas to minimize impact when possible.
b) Install fully shielded (pointing downward) lighting fixtures.
c) Use only low beams on trucks in residential areas during nighttime operations.

3. Findings:
a) Impacts to aesthetics and visual resources are discussed in Section 4.2 of the DSEIR
b) The Project will alter the visual character of the site through the use of nighttime lighting during 24-hour operations. Lighting fixtures are currently used onsite during the morning and evening hours. The Project will extend the use of the lighting to include the hours between 7:00 p.m. and 6:00 a.m. during periods of 24-hour operation.
c) The Project will allow 24-hour operations resulting in an increase in nighttime truck traffic on Project area roads. The Project will result in increased nighttime traffic headlight use on roadways in the Project area. Local roadways used by Project traffic will include Ward Lake Road and Center Road (A27). Homes along Ward Lake Road are as close as 60 feet from the roadway. Headlight use will not impact large-scale nighttime views, but does have the potential to significantly degrade the existing visual quality of areas close to the roadways at night.
e) The Planning Commission finds impacts to aesthetics and visual resources, after implementation of the above mitigation measures, to be significant and unavoidable to residences along Ward Lake Road.

f) The Planning Commission finds cumulative impacts to aesthetics and visual resources, after implementation of the above mitigation measures, to be significant and unavoidable.

B. Impacts to Biological Resources

1. Impacts:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by DFG or U.S. Fish and Wildlife Service (USFWS).

i) Extending Site Life.

2. Mitigation Measures:

No mitigation measures are available.

3. Findings:

a) Impacts to biological resources are discussed in Section 4.4 of the DSEIR

b) The Project would extend the life of the mine an additional 10 years, from 2020 to 2030. Extension of the life of the mine for 10 years would extend the significant impact of the existing operation to pronghorn and mule deer. The project would not result in any additional impacts to pronghorn or mule deer; however, it would extend impacts that have been determined to be significant and unavoidable. Extending the life of the mine would also prolong the amount of time before the site can be reclaimed back to habitat for these species.

c) The Planning Commission finds the above impacts to biological resources to be significant and unavoidable.

d) The Planning Commission finds the above cumulative impacts to biological resources to be significant and unavoidable.

C. Impacts to Noise

1. Impacts:

a) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

b) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

2. Mitigation Measures:

a) The operator shall restrict the start-up of onsite generators to between the hours of 7:00 a.m. to 10:00 p.m.

b) Shield the asphalt plant generator noise levels by placing the generator behind either a berm or barrier, and orienting the generator opening to the north. The berm or barrier shall extend to a height even with the top of the generator enclosure.

c) No use of "jake" brakes leaving the Project site.

d) "Reduce speed" signs will be posted by the operator for tucks on the access road and Ward Lake Road and "no use of jake brake" signs will be posted by the operator on the access road and at the Center Road (A27) and Ward Lake Road intersection.

e) Maintain traffic noise below 65 dB Ldn by reducing truck traffic during 24-hour operations to 550 one-way truck trips (275 arriving and 275 departing).

3. Findings:

a) Impacts to noise are discussed in Section 4.9 of the DSEIR
b) The Project will result in traffic noise increases along the Material Haul Routes Increases in traffic noise levels would result in a significant increase in noise levels in the in the project vicinity above those existing without the project.
c) The Planning Commission finds the above impacts to noise, after implementation of the above mitigation measures, to be significant and unavoidable.
d) The Planning Commission finds the above cumulative impacts to noise, after implementation of the above mitigation measures, to be significant and unavoidable.

VI. FINDINGS REGARDING PROJECT ALTERNATIVES

Section 15126(c) of the California Environmental Quality Act Guidelines calls for exploration of all available mitigation measures and an explanation of the reason for selecting the recommended measures. Other mitigation options that are available are listed below, as well as the reason they were not recommended in the DSEIR. However, the Planning Commission and Board of Supervisors may choose to consider any of these measures in their deliberations.

A. Alternative 1 – No Project Alternative.

1. The "no project" alternative would include the continuation of mining operations at the site as currently permitted under Use Permit 96056. Hours of mining operations would remain 6:00 a.m. to 7:00 p.m., Monday through Saturday; mining would continue until the year 2020; site production would be limited to the permitted 100,000 tons per year.

Under the "no project" alternative, materials for projects requiring nighttime hauling and delivery of material would be supplied by another source. In addition, the operation would only be able to supply materials to fewer/smaller projects.

2. Impacts:

a) Under the "no project" alternative, environmental conditions at the site would remain as they currently exist. The "no project" alternative would eliminate any impacts of the proposed Project related to aesthetics, air quality, biological resources, land use, noise, and traffic and transportation in the Project area.
b) Under the "no project" alternative, materials for large local projects or local projects requiring 24-hour material hauling would be provided by a different source. Depending on the location of the alternate source, the "no project" alternative could result in an increase in greenhouse gas emissions or air quality impacts since construction materials for local projects may need to be provided by sources located a greater distance from construction projects.

3. Findings:

a) The "no project" alternative would eliminate the significant impacts of the proposed Project at the project site, but would not meet any of the Project objectives.

b) The "no project" alternative could result in an increase in greenhouse gas emissions and air quality impacts if sources out of the area are used for local construction projects requiring 24-hour material hauling.

B. Alternative 2 – Reduced Truck Trip Alternative – 550 Total Trucks, Daytime Only.

1. This alternative is similar to the proposed Project, but with a reduction in the number of total truck trips as well as no trucking or onsite operations between the hours of 10:00 p.m. to 7:00 a.m. This reduced truck trip alternative includes hauling, Monday through Saturday; extension of the life of the mine from 2020 to 2030; and annual site production in excess of the permitted 100,000 tons per year if required during Federal-, State-, or County- declared emergencies.

The reduced truck trip alternative would limit maximum daily truck trips to 550 one-way truck trips (275 in and 275 out) instead of 700 (350 in and 350 out). Trucking would occur only from the hours of 7:00 a.m. to 10:00 p.m. This volume of trucks was identified by j.c. brennan & associates, Inc., as the number of trucks that would reduce traffic noise levels to 60 dB Ldn along roadways utilized by the Project.

Under the reduced truck trip alternative, the applicant could only provide materials for jobs requiring 275 or less truckloads of materials each day during daytime hours. This alternative would limit the number and size of construction jobs the project could serve. Larger construction projects or those requiring nighttime hauling of materials would obtain materials from other sources that could provide the required volume of materials or would need to obtain materials from more than one source.

2. Impacts:

a) Aesthetics and Visual Resources:

i) The reduced truck trip alternative would reduce the amount of truck traffic in the Project area compared to the proposed Project during nighttime hours. The reduced truck trip alternative would still result in truck traffic and headlight use between the hours of 7:00 a.m. to 10:00 p.m.

ii) The visual impacts of stationary nighttime lighting at the materials processing facility would be reduced under this alternative since the reduced truck trip alternative would not involve 24-hour operations at the site requiring lighting. However, onsite lighting would still be required at the tail end of operations between 7:00 a.m. and 10:00 p.m.

b) Air Quality

i) The reduced trucking alternative would result in a reduction of emissions related to truck hauling trips. The reduced truck trip alternative would reduce project emissions to be about 80 percent of those generated by the proposed Project during peak operating periods.

c) Biological Resources

i) Impacts to biological resources under the reduced truck trip alternative would be reduced when compared with the proposed Project. The reduced truck trip alternative would reduce the risk of wildlife mortalities on roadways since fewer truck trips would occur during nighttime hours.

Trucking would still occur between 7:00 a.m. and 10:00 p.m. and mortalities may still occur at rates over those of the currently permitted operation.

d) Land Use

i) The reduced truck trip alternative could potentially conflict with the same land use policies contained in the *Lassen County General Plan* and *Standish-Litchfield Area Plan* as the proposed Project.

e) Noise

i) The number of truck trips under this alternative is the number of trips determined by the noise consultant that would lessen the noise impact to 60 dB Ldn along area roadways in the Project area.

ii) Under this alternative, noise from the materials facility extended hours of operation would be less than that of the proposed Project since the materials facility would not operate between the hours of 10:00 p.m and 7:00 a.m.

f) Traffic

i) The reduced truck trip alternative would generate less truck traffic than the proposed project. This alternative would limit the maximum daily trucks to 550 (275 in and 275 out each day).

3. Findings:

a) Under the reduced truck trip alternative, truck traffic and headlight use would still result in a significant and unavoidable impact.

b) Under the reduced truck trip alternative, impacts of the lighting from the materials processing facility would be significant and unavoidable to residences along Ward Lake Road.

c) Although the reduced truck trip alternative would reduce air quality emissions from trucking, the air quality impacts of the proposed Project were considered less than significant. Under the reduced truck trip alternative, the emissions generated by onsite equipment would be the same as those generated by the proposed Project.

d) Under the reduced truck trip alternative, biological impacts would be the same as those of the proposed Project: potentially significant without mitigation. The reduced truck trip alternative would still require mitigation measures to reduce trucking impacts to biological resources. This alternative will not reduce the significant and unavoidable impacts to antelope and mule deer from extending the life of the mine an additional 10 years.

e) Land use impacts of the reduced truck trip alternative would be potentially significant without mitigation. Mitigation measures similar to those of the proposed Project for biological resources and pavement degradation would be required for the reduced truck trip alternative.

f) The reduced truck trip alternative would comply with Lassen County traffic noise standards and would result in a less-than-significant increase in traffic noise levels when compared to existing peak baseline operating conditions. The reduced truck trip alternative would result in less-than-significant impacts related to truck traffic noise.

g) Under the reduced truck trip alternative, the noise impacts from the facility would be less than significant.

h) Similar to the proposed project, the reduced truck trip alternative would result in a less-than-significant impact to intersection level of service and the need for additional turn lanes on the local roadway network. Traffic impacts would be less than significant.
i) The reduced truck trip alternative would meet the Project objective of extending the life of the quarry to extract additional superior materials from the site.
ii) The reduced truck trip alternative would meet the objective of providing materials for construction projects, however would eliminate those requiring nighttime work. The reduced truck trip alternative would reduce the number of construction jobs the facility could serve at one time and would allow only the acceptance of jobs that do not require nighttime work. This alternative may partially meet the first two Project objectives depending on local and regional market demand; however, it would greatly limit the construction jobs served. The reduced truck trip alternative will hinder meeting the first two Project objectives.

C. Alternatives Considered but Rejected from Further Consideration

1) Alternative Project Location
i) An alternative project location was considered but further rejected because the materials at the site are considered superior material not commonly found in the region.
ii) The Project includes specific modifications to an existing operation that may not be feasible at an alternate existing mining site.
iii) For these reasons, an alternative Project location was rejected from further analysis.

2) Sixty-two Truck Trip Alternative
i) An alternative to the proposed project was considered, in which the maximum daily truck trips would be limited to a total of 62 (31 arriving and 31 departing), during 24-hour operations.
ii) This number of truck trips was determined by the noise consultant to reduce ambient truck traffic noise levels to a less-than-significant increase.
iii) This alternative was rejected because it was determined infeasible for regular operations. Although this alternative would not directly interfere with the Project objective of extending the life of the quarry to extract additional superior materials from the site, it would not allow the number of truck trips required to meet the first two Project objectives in full. In many cases, a 62 total truck trip daily maximum would not allow the operation to serve local and regional demands, emergency jobs, or other construction jobs requiring nighttime work sufficiently.

VII. FINDINGS REGARDING PROJECT BENEFITS

A. CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposal project

outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered "acceptable."

B. The Board of Supervisors must make findings related to said benefits, supported by substantial evidence, to make a Statement of Overriding Considerations.

C. The Applicant provided a summary of project benefits on March 26, 2019, for consideration by the Planning Commission and the Board of Supervisors.

VIII. STATEMENT OF OVERRIDING CONSIDERATIONS

A. When the lead agency approves a project which will result in the occurrence of significant effects, which are identified in the final EIR but are not avoided or substantially lessened, the agency shall state in writing the specific reasons to support its action based on the final EIR and/or other information in the record. The statement of overriding considerations shall be supported by substantial evidence in the record.

B. If an agency makes a statement of overriding considerations, the statement should be included in the record of the project approval and should be mentioned in the notice of determination. This statement does not substitute for, and shall be in addition to, findings required pursuant to Section 15091.

C. The Board of Supervisors must make findings related to said Statement of Overriding Considerations, in order to approve a project resulting in the occurrence of significant and unavoidable impacts.

D. The Planning Commission recommends that the Board of Supervisors review any substantial evidence of project benefits outweighing the unavoidable adverse environmental effects, as provided by the applicant, and consider making a statement of overriding considerations.

EXHIBIT TWO
SUBSTANTIAL EVIDENCE FOR STATEMENT OF OVERRIDING CONSIDERATION

RECEIVED

Hat Creek Construction & Materials, Inc. (HCCMI)
Ward Lake Facility Expansion

CEQA requires the decision-making agency to balance the benefits of a project against its significant unavoidable impacts when determining whether to approve a project. If the benefits of the project outweigh its unavoidable adverse environmental effects, those effects may be considered acceptable.[1] CEQA requires the agency to state in writing the specific reasons for considering a project acceptable when significant impacts are not avoided or substantially lessened. Those reasons must be based on substantial evidence in the Final EIR or elsewhere in the administrative record.[2]

The proposed project would result in significant unavoidable impacts related to noise impact to neighboring properties, even after incorporation of all feasible mitigation measures. These significant unavoidable impacts are identified and discussed in the Subsequent Environmental Impact Report and the Revised Environmental Noise Analysis that have been provided to Lassen County by HCCMI. It is proposed by HCCMI that these significant unavoidable impacts are outweighed by the benefits of approving the Ward Lake Facility Expansion, each of which, independently of the others, constitutes overriding consideration warranting approval of the proposed project. Those benefits are as follows:

- The expanded operations of the Ward Lake Facility are imperative to the continued operation of the facility. The continuing operations of the facility are in the best interest of HCCMI and Lassen County for additional reasons as noted below.
- Recently, more and more construction projects are being contractually required to be completed at night. Something the original EIR's on the property could not evaluate, as it is new trend in the local area. The requirement to perform work at night on various construction projects has been established to reduce the overall impact to the substantial majority of the general public. It has been shown that the inconvenience to the public is greatly reduced by performing many construction projects during the nighttime hours. The benefits extend not only to the decreased inconvenience to the traveling public, but it also significantly reduces the financial impact to all of the other businesses that are near the construction project.
- HCCMI, through the use of the Ward Lake Facility, is a significant contributor to the Lassen County economy. The contribution to Lassen County is not only by direct payments (such as property taxes and other taxes), but also by hiring and paying millions of dollars per year to employees that reside, pay taxes, and spend money in Lassen County. HCCMI also spends considerable amounts each year with local businesses that further enhances the local economy.
- The Ward Lake Facility provides critical services to Lassen County. The Ward Lake Facility is a unique operation in Lassen County since it is the only business that

provides aggregates, concrete, and asphalt mix to the local community from one location. In fact, it possesses the only asphalt mix plant in Lassen County. Without this facility, the State, County, Federal Agencies, and the public would be forced to haul asphalt mix from outside Lassen County to perform work inside Lassen County. Without the facilities at Ward Lake, the costs to construct in Lassen County would increase and the revenues from projects would be removed and spent in other areas.

- Without the Ward Lake Facility, the overall environmental impacts would increase. As noted above, the facility possesses the only asphalt mix plant in Lassen County. If the Ward Lake asphalt plant no longer existed in Lassen County and all asphalt mixes were imported to Lassen County, then the additional transportation would result in a net negative impact to the environment. The additional transportation would require the consumption of more fuel, more hours of vehicle emissions, more tires worn out, more roadways damaged, and therefore ultimately a higher carbon footprint than currently exists.

Hat Creek Construction believes that these specific considerations associated with the project serve to override and outweigh the project's significant unavoidable effects. Therefore, pursuant to CEQA Guidelines Section 15093(b), these adverse effects should be considered acceptable.

Should you have any questions, or need any additional information, please feel free to contact me.

Sincerely,

Hat Creek Construction & Materials, Inc.

Perry Thompson
President

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[2] CEQA Guidelines, 2012. Section 15093(a)

[3] CEQA Guidelines, 2012. Section 15093(b)

Nancy McAllister

From:	Christiana Darlington <christiana@clereinc.net>
Sent:	Thursday, March 28, 2019 2:19 PM
To:	Nancy McAllister
Cc:	perry@hatcreekconstruction.com; Gaylon Norwood; Matthew May; wjolinston@vestra.com; Bon Criss; Maurice Anderson
Subject:	Re: Ward Lake - Statement of Overriding Considerations
Attachments:	Construction Impacts on Businesses.pdf
Follow Up Flag:	Follow up
Flag Status:	Flagged

Hello Nancy,

Hat Creek is providing the County with the following information to be considered when drafting statements of overriding consideration regarding its permit modification:

It is arguable that the mitigation measures found in the document will lessen impacts to a less than a significant level, but to be cautious and ensure maximum clarity of the impacts to the public, the County can make findings to support overriding considerations under CEQA, based on the benefits of the project, beyond the implementation of the mitigation based on the following information:

- number of people employed as a result of the proposed project.
  - There are approximately 75 people directly and indirectly employed in connection to the Ward Lake facility. Some employees are full time employees at the facility, other employees are hauling materials in and out of the facility, and others are employed on the construction projects that we are supplying from the Ward Lake Facility.
- amount of money paid to said employees that reside and spend money in Lassen County.
  - Hat Creek Construction contributed approximately $3.5 million in wages in 2018 to the Lassen County area.
- estimated amount of money kept in Lassen County by projects using locally sourced materials.
  - Yearly gross sales (construction and materials) from the Ward Lake facility has averaged around $15,000,000. Although it is not possible to determine the exact amount that would no longer be kept in Lassen County without our facility, we would estimate that 70% or $10,500,000 would be removed from Lassen County annually.
- estimated monetary losses to local businesses that would be otherwise affected by road construction, which would be prevented by nighttime work.
  - Although this value is significant, it is nearly impossible to determine. We have attached a copy of a study that was performed in Houston, TX that shows that 77% of businesses suffered a loss of sales connected to a road construction project near their businesses (Table 4, page 141). Although not all

Impacts can be eliminated, the performance of night work greatly decreases the hours per day that the business operations overlap with road construction and is a very effective mitigation.

Beyond economic benefits it is important to recognize the societal benefits of having locally owned businesses based in California handling large contracts for California public works. If Hat Creek did not win this work, it could be handled by non-local competitors. This increases the confidence of other local businesses and increases the likelihood of business retention and retaining local youth after they earn their educations out of the area.

Also, if out of the area businesses were needed to complete these road improvement projects there would likely be a more significant impact on roadways and air quality as trucks from outside the area, with longer haul routes, would be handling the work.

Please note that without the contracts that require nighttime work, Hat Creek Construction would most certainly see their Ward Lake pit relevancy diminish substantially, and would like close a significant portion of their business, effecting job retention and economics for the broader Northeastern California economy

As to the noise impacts specifically, note that the General Plan allows for noise impacts beyond those requested - and that the request to 65 dbh is well below the maximum of 70dbh. Industrial projects are expected to create noise within the spectrum of 60- 70 dbh.

Please let me know if you need an help with references to guidelines or relevant PRC codes, but I assume you have access to that information.

Please contact me with questions

Meanwhile, Hat Creek is looking for confirmation of the anticipated BOS hearing date. If April 23, 30 or May 7 is possible we strongly hope we can get to the BOS before May 10, 2019

Thank you,

Christiana

EXHIBIT THREE

FINDINGS FOR APPROVAL OF USE PERMIT AMENDMENT #2018-003 AND RECLAMATION PLAN AMENDMENT #2018-001

The Planning Commission hereby makes the following findings in support of the approval of Use Permit Amendment #2018-003 and Reclamation Plan Amendment #2018-001 for the TLT Enterprises LLC, Ward Lake Pit Amendment Project:

1. The Lassen County Planning Commission approved Use Permit #79-80-44 on May 6, 1981, allowing a surface mine operation and asphalt batch plant.

2. The Lassen County Planning Commission approved Use Permit #11-02-85 on January 8, 1986, amending Condition #5 of original Use Permit #79-80-44, related to the asphaltic surfacing of Ward Lake Road.

3. The Lassen County Planning Commission approved Use Permit and Reclamation Plan #94032 on August 3, 1994, adding a concrete batch plant and expanding mine boundaries.

4. The Lassen County Board of Supervisors approved Use Permit and Reclamation Plan #96056 on September 23, 1997, expanding mine boundaries and allowing year-round operations with limited winter activity. The Board also approved an associated rezone at this time, to allow for the previously approved concrete operations.

5. The applicant is proposing an amendment to allow 24-hour mining operations, Monday through Saturday. The applicant is also proposing an extension of the life of the mine from 2020 to 2030 and annual site production in excess of the permitted 100,000 tons during declared emergencies. All other requirements of approved Use Permit and Reclamation Plan #96056 not addressed by the proposed amendment or approving resolution, with conditions, will be maintained.

6. Current hours of operation of the Ward Lake Pit surface mine are 6:00 a.m. to 7:00 p.m., Monday through Saturday.

7. The California Department of Transportation (Caltrans) has expressed intentions of requiring increased nighttime roadwork on future projects, in order to minimize the impact on traffic and on the traveling public.

8. The subject parcel is a 442-acre parcel that is located in portions of Sections 28, 32, and 33 in Township 30 North, Range 14 East, Mount Diablo Base and Meridian and is represented by Assessor's Parcel Number 109-100-59. This property is owned by TLT Enterprises LLC, a California Limited Liability Company, as shown at a Grant Deed recorded on February 6, 2012 as Document Number 2012-00605, and at a Grant Deed recorded on March 23, 2017 as Document Number 2017-01109, both of the Official Records of Lassen County.

9. The parcel described in the finding above was created by Lot Line Adjustment Number 2015-009 which was approved by the Lassen County Technical Advisory Committee on May 13, 2015. The Certificate of Lot Line Adjustment was recorded on March 23, 2017 as Document Number 2017-01107 of the Official Records of Lassen County. Therefore, the subject parcel is found to have been created in compliance with the California Subdivision Map Act and local ordinances.

10. The portion of assessor's parcel number 109-100-59 that is zoned U-C-A-P (formerly APN 109-100-42) was previously under Williamson Act Contract Number AA-62, but was released from said contract upon cancelation by the Lassen County Board of Supervisors on September 22, 2015.

11. Mining or processing of natural mineral materials is a use allowed by use permit in the U-C and U-C-2 zoning districts under Lassen County Code § 18.68.040 and § 18.69.040, respectively.

12. The project site is not within the 100-year flood plain according to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM).

13. A noise study was conducted to analyze impacts resulting from noise levels of onsite operations and associated traffic. Impacts of noise from onsite operations were determined to be less than significant after mitigation, while impacts of traffic on permanent and periodic ambient noise increases above levels existing without the project were determined to be significant and unavoidable in the Draft Subsequent Environmental Impact Report.

14. Installation of noise berms was proposed as a mitigation measure; however, to be used as a mitigation and use permit condition, design and location specifics must be clarified.

15. A biological resource evaluation and nighttime wildlife survey conducted at the project site showed no special-status wildlife species to be present onsite or in the immediate surrounding area. Impacts to special-status wildlife species with potential to occur in the project area were analyzed and determined to be less than significant in the Draft Subsequent Environmental Impact Report.

16. Impacts of nighttime operations on pronghorn, mule deer, and nocturnal foragers were found to be less than significant after mitigation; however, impacts to pronghorn and mule deer that have previously been determined to be significant and unavoidable would be prolonged by the extension of the site life from 2020 to 2030.

17. Impacts related to the substantial degradation of existing visual character or quality of the site and its surroundings through project lighting and nighttime views, as well as impacts related to the creation of a new source of substantial light or glare which would adversely affect day or nighttime views in the area (headlight impacts), were determined to be significant and unavoidable to residences along Ward Lake Road in the Draft Subsequent Environmental Impact Report.

18. Access to the Pit is from Ward Lake Road, County Road 308, a portion of which is in the County Maintained Road System, which has access off Center Road, County Road 215, which is in the County Maintained Road System.

19. Existing and proposed truck traffic from the Ward Lake Pit operation has and will continue to degrade the quality of the Lassen County maintained portion of Ward Lake Road.

20. To make the mandatory findings required by Lassen County Code Section 18.112.100, it is the opinion of the Lassen County Department of Public works that an eastbound left-hand turn lane be required on Center Road at the intersection with Ward Lake Road, as the existing and proposed project traffic has potential to impair the health, safety, peace, morals, comfort and general welfare of persons residing or working in the project area.

21. Eight residences are located along Ward Lake Road; an estimated 24 residences are located along Center Road (A-27) and Highway 395, east of Ward Lake Road through the community of Litchfield; and approximately six additional residences are located along Center Road (A-27), west of Ward Lake Road toward the California Correctional Center and High Desert State Prison.

22. The Lassen County Director of Planning and Building Services has determined that this project is not a minor amendment pursuant to Lassen County Code, Section 9.60.040(b) and is subject to the California Environmental Quality Act (CEQA).

23. The Lassen County Environmental Review Officer, through Initial Study #2018-001, determined that preparation of a Subsequent Environmental Impact Report is required for Use Permit Amendment #2018-003 and Reclamation Plan Amendment #2018-001. The findings of Initial Study #2018-001 and determination of the Environmental Review Officer were certified by the Lassen County Planning Commission on June 6, 2018, with the adoption of Resolution #6-05-18. A Subsequent Environmental Impact Report is currently being processed for this project.

24. The California Department of Conservation, Division of Mine Reclamation (DMR), was sent notice on February 22, 2018, May 25, 2018, and June 19, 2018, of the Use Permit and Reclamation Plan Amendment being processed by Lassen County, acting as lead agency.

25. Lassen County Code, Chapter 18.112.020 establishes the process for the approval of amendments to existing Use Permits and Reclamation Plans.

26. The Department of Planning and Building Services reviewed the proposed amendment and has found that it meets all provisions of the Surface Mining and Reclamation Act (SMARA) and Lassen County Code, Chapter 9.60.

27. The County's Technical Advisory Committee (TAC) is charged with the review of Use Permits and Reclamation Plans pursuant to Lassen County Code Chapter 9.60.060(c).

28. The Planning Commission is the primary decision making body for Use Permits, Reclamation Plans and amendments thereto; however, because certification of the EIR requires Board of Supervisors approval, the Planning Commission will make a recommendation as to whether or not this project is consistent with the *Lassen County General Plan, 2000*; the *Lassen County Land Use Element*, *Lassen County Natural Resource Element*; and any other pertinent policies. See Attachment A for relevant plan goals and policies, as identified by Planning and Building Department staff.

29. Lassen County Code, Section 18.112.100 requires that the decision making body make the following findings for the approval or denial of a Use Permit application:

    i. That the project will or will not, under the circumstances of the particular case, be detrimental to the health, safety, peace, morals, comfort and general welfare of persons residing or working in the neighborhood of such use, nor be detrimental or injurious to property and improvements in the neighborhood or to the general welfare.

    ii. That the project is or is not consistent with the Lassen County general plan, or any applicable area plan or resource plan adopted as part of the general plan.

EXHIBIT FOUR
CONDITIONS OF APPROVAL
USE PERMIT AMENDMENT #2018-003

1. All requirements and conditions of the previously approved Use Permit and Reclamation Plan #96056 remain applicable, excepting the changes addressed in Use Permit Amendment #2018-003 and Reclamation Plan Amendment #2018-001.

2. No nighttime operations (7:00 p.m. to 6:00 a.m.) shall be conducted during the period of January 31 through March 31 of each year.

3. No grading, blasting, or excavating shall be allowed onsite between the hours of 6 p.m. and 7:00 a.m., year-round.

4. Start-up of onsite generators shall be restricted to between the hours of 7 a.m. and 10:00 p.m.

5. Within 60 days of issuance of authorization to operate, all lighting on site shall be downward facing and fully shielded. All lighting shall be directed internally into the site and berm site areas to minimize impact.

6. Haul trucks shall only use low beams when passing along Ward Lake Road during nighttime operations.

7. Haul trucks associated with the mining operation shall not use Center Road (A-27) east of Ward Lake Road between the hours of 10:00 p.m. and 7 a.m.; during these hours all trucks must turn west onto Center Road from Ward Lake Road to avoid the community of Litchfield.

8. Haul trucks (loaded or empty) associated with the mining operation shall not exceed a daily average of 26 round trips (26 arriving and 26 departing) throughout the calendar year and shall not exceed a daily maximum of 275 round trips (275 arriving and 275 departing), with a maximum of 173 total trips occurring between the hours of 10:00 p.m. and 7:00 a.m., excluding personal employee vehicles and light-duty trucks assigned to employees.

9. Scale log data for Ward Lake Pit (CA Mine ID #91-18-0008) shall be provided to Lassen County by the mine operator by July 1, annually.

10. Use of "Jake brake" (engine brake) shall be prohibited along the mine access road and Ward Lake Road; Within 60 days of issuance of authorization to operate, the mine operator shall post "No Use of Jake Brake" signs on the access road and at the Center Road and Ward Lake Road intersection, in coordination with the Lassen County Department of Public Works.

11. Within 60 days of issuance of authorization to operate, the mine operator shall post advisory "Reduced Speed to 25 MPH" signs on the access road and Ward Lake Road (one northbound and one southbound, at minimum), in coordination with the Lassen County Department of Public Works.

12. Within 60 days of issuance of authorization to operate, the mine operator shall post "Wildlife Crossing" signs along Ward Lake Road and Center Road, in coordination with the Lassen County Department of Public Works.

13. The mine operator (TLT Enterprises/Hat Creek Construction) shall conduct driver education events, annually at minimum, to increase driver awareness to reduce impacts to wildlife and local residents, and shall give notice the Planning and Building Services Department prior to the date of each event.

14. The mine operator shall give written notice to the Lassen County Department of Planning and Building Services and all residents of Ward Lake Road at least 72 hours prior to commencing a non-emergency project, requiring nighttime operations, that will last 5 or more days and/or was awarded by way of formal bid process.

15. The operator shall assist Lassen County Road Department with the installation of an eastbound left-hand turn lane on Center Road onto Ward Lake Road, within 30 months of project approval (timeline as established by the Director of Public Works), by providing the necessary asphalt materials.

16. The operator shall assist the Lassen County Road Department with the repair of and/or asphalt concrete overlay of the Lassen County maintained portion of Ward Lake Road, within 30 months of project approval (timeline as established by the Director of Public Works), by providing the necessary asphalt materials.

17. Within 60 days of project approval, the operator shall submit a $200,000.00 surety bond, payable to Lassen County, as financial assurance for the completion of the above road maintenance assistance. Upon completion of all required assistance, the surety bond shall be released back to the operator. If the above road maintenance is to be completed in phases, the Director of Public Works may authorize incremental release of said bond, as phased work is completed.

18. Prior to issuance of an authorization to operate by Lassen County, the operator shall install a berm or barrier to shield residences in the project vicinity from noise produced by the asphalt plant generator. The berm or barrier shall extend to a height even with the generator enclosure. The opening of the generator enclosure shall be oriented to the north.

EXHIBIT FIVE
MITIGATION MONITORING PROGRAM

MITIGATION AND MONITORING PROGRAM CONTENTS

This section contains the Mitigation Monitoring Program (MMP) for the Ward Lake Pit Amendment Project (EIR2018-001, UP2018-003, RP2018-001). The MMP includes a brief discussion of the legal basis for and the purpose of the program, discussion, and direction regarding complaints about noncompliance, a key to understanding the monitoring matrix, and the monitoring matrix itself.

LEGAL BASIS OF AND PURPOSE FOR THE MITIGATION MONITORING PROGRAM

California Public Resources Code §21081.6 requires public agencies to adopt mitigation monitoring or reporting programs whenever certifying an Environmental Impact Report (EIR) or a Mitigated Negative Declaration. This requirement facilitates implementation of all mitigation measures adopted through the California Environmental Quality Act (CEQA) process.

The MMP contained herein is intended to satisfy the requirements of CEQA as they relate to the FSEIR prepared for the proposed project. It is intended to be used by County staff, participating agencies, project applicant, project contractors, and mitigation monitoring personnel during implementation of the proposed project. Mitigation is defined by State *CEQA Guidelines* §15370 as a measure that does any of the following:

- *Avoids impacts altogether by not taking a certain action or parts of an action.*
- *Minimizes impacts by limiting the degree or magnitude of the action and its implementation.*
- *Rectifies impacts by repairing, rehabilitating, or restoring the impacted environment.*
- *Reduces or eliminates impacts over time by preservation and maintenance operations during the life of the project.*
- *Compensates for impacts by replacing or providing substitute resources or environments.*

MITIGATION MONITORING TABLE

The attached table, WARD LAKE PIT AMENDMENT MITIGATION MONITORING PROGRAM, identifies the mitigation measures for the project as noted throughout the FSEIR. The table has the following columns:

Mitigation Measure: Lists the mitigation measures identified within the FSEIR for a specific impact, along with the number for each impact/measure enumerated in the FSEIR.

Implementation Phase: Identifies at what point in time, review process, or phase the mitigation measures will be completed.

Monitoring Phase: Identifies at what point in time, review process, or phase the mitigation measures will be monitored.

Enforcing Agency: References the County department responsible for enforcement of the mitigation, as well as the County department or any other public agency with which coordination is required to satisfy the identified mitigation measure.

Verification: Spaces to be initialed and dated by the individual designated to verify adherence to a specific mitigation measure.

NONCOMPLIANCE COMPLAINTS

Any person or agency may file a complaint asserting noncompliance with the mitigation measures associated with the proposed project. The complaint shall be directed to the County in written form, providing specific information on the asserted violation. The County shall conduct an investigation and determine the validity of the complaint. If noncompliance with a mitigation measure has occurred, the County shall take appropriate action to remedy any violation. The complainant shall receive written confirmation indicating the results of the investigation or the final action corresponding to the particular noncompliance issue.

WARD LAKE PIT AMENDMENT MITIGATION MONITORING PROGRAM

Mitigation Measure	Implementation Phase	Monitoring Phase	Enforcing Agency	Verification of Compliance		
				Initials	Date	Remarks
MM 4.2.5.1(1) Direct lighting internally into the site and berm site areas to minimize impact when possible	Ongoing	Ongoing	Lassen County Planning and Building			
MM 4.2.5.1(2) Install fully shielded (pointing downward) lighting fixtures	Within 60 days of issuance of authorization to operate	60 days after issuance of authorization to operate	Lassen County Planning and Building			
MM 4.2.5.2(1) Use only low beams on trucks in residential areas during nighttime operations	Ongoing	Ongoing	Lassen County Planning and Building			
MM 4.4.5.2(a)(1) Operator shall continue limits on operations from January to March 31. Impacts can be lessened through continuing seasonal operating restrictions included in the Condition of Approval for Use Permit No. 96056: *Except in a state of emergency, as declared by the local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville, no grading, excavating, or blasting on the site shall be allowed between January 1 and March 31 annually.*	Ongoing	Ongoing	Lassen County Planning and Building			

MM 4.4.5.2(a)(2) Operator shall conduct no nighttime operations (7:00 p.m. to 6:00 a.m.) during the period of January 1 to March 31. Applying the existing operational restriction to the proposed nighttime operations would eliminate additional disturbance/ displacement of pronghorn antelope and mule deer utilizing the winter habitat during the winter months.	Ongoing	Ongoing	Lassen County Planning and Building			
MM 4.4.5.2(a)(3) Year-round nighttime operation restrictions. No grading, blasting, or excavating shall be allowed onsite between the hours of 6:00 p.m. and 7:00 a.m.	Ongoing	Ongoing	Lassen County Planning and Building			
MM 4.4.5.2(a)(4) Lighting fixture design. To minimize the effects of lighting of artificial light on wildlife, lighting fixtures associated with nighttime project work shall be downward facing and fully-shielded. Lighting equipment should be designed and installed to minimize light pollution.	Within 60 days of issuance of authorization to operate	60 days after issuance of authorization to operate	Lassen County Planning and Building			
MM 4.4.5.2(a)(5) Noise reduction barriers. Adverse effects from noise may be reduced through installation of noise berms constructed around the project area where heavy machinery is in use. Barriers can eliminate or minimize the impacts of vibrations that may result from nighttime operations.	Prior to issuance of an authorization to operate	Prior to issuance of an authorization to operate	Lassen County Planning and Building			
MM 4.4.5.2(a)(6) No "jake brake" usage. This option can significantly reduce the noise impacts from the increased traffic volume. "No use of jake brake" signs shall be posted on the access road and at the Center Road (A27) and Ward Lake Road intersection.	Within 60 days of issuance of authorization to operate	60 days after issuance of authorization to operate	Lassen County Planning and Building, in coordination with Lassen County Public Works			
MM 4.4.5.2(c)(1) Wildlife crossing signage on roadways. This option would educate drivers about the potential for wildlife encounters on roads during nighttime hours. Signage will be permanent. This measure can prevent direct mortalities to nocturnal	Within 60 days of issuance of authorization to operate	60 days after issuance of authorization to operate	Lassen County Planning and Building, in coordination with Lassen County Public Works			

wildlife. Signs will be added along Center Road and Ward Lake Road with County approval.						
MM 4.4.5.2(c)(2) Reduce traffic speed on roadways. This mitigation would reduce the speed limit in order to minimize traffic impacts to wildlife. "Reduce speed to 25 MPH" signs would reduce the speed limit on Ward Lake Road during nighttime hours, granting a longer reaction time should any wildlife be encountered on a roadway.	Within 60 days of issuance of authorization to operate	60 days after issuance of authorization to operate	Lassen County Planning and Building, in coordination with Lassen County Public Works			
MM 4.4.5.2(c)(3) Driver education. Hat Creek Construction will conduct education events to increase driver awareness to avoid wildlife vehicle impacts.	Ongoing	Ongoing	Lassen County Planning and Building			
MM 4.8.5.1 [*see MM 4.4.5.2(a)(1-6) and MM 4.4.5.2(c)(1-3)*]						
MM 4.9.5.1(a)(1) The operator shall restrict the start-up of onsite generators operations to between the hours of 7:00 a.m. to 10:00 p.m.	Ongoing	Ongoing	Lassen County Planning and Building			
MM 4.9.5.1(a)(2) Shield the asphalt plant generator noise levels by either placing the generator behind a berm or barrier, and orient the generator opening to the north. The berm or barrier shall extend to a height even with the top of the generator enclosure.	Prior to issuance of an authorization to operate	Prior to issuance of an authorization to operate	Lassen County Planning and Building			
MM 4.9.5.1(b)(1) No use of "jake" brakes leaving the Project site	Ongoing	Ongoing	Lassen County Planning and Building			
MM 4.9.5.1(b)(2) "Reduce speed" signs will be posted by the operator for tucks on the access road and Ward Lake Road and "no use of jake brake" signs will be posted by the operator on the access road and at the Center Road (A27) and Ward Lake Road intersection	Within 60 days of issuance of authorization to operate	60 days after issuance of authorization to operate	Lassen County Planning and Building, in coordination with Lassen County Public Works			
MM 4.9.5.1(b)(3) Maintain traffic noise below 65 dB Ldn by reducing truck traffic during 24-hour operations to 550 one-way truck trips (275 arriving and 275 departing) *The Lassen County General Plan requires discretionary*	Ongoing	Ongoing	Lassen County Planning and Building			

approval to allow for noise levels between 60 dB Ldn and 70 dB Ldn. A condition of approval to allow for noise up to 65 dB Ldn should be added.						
MM 4.9.5.3 [*see MM 4.9.5.1(a)(1-2) and MM 4.9.5.1(b)(1-3)*]						
MM 4.9.5.4 [*see MM 4.9.5.1(a)(1-2) and MM 4.9.5.1(b)(1-3)*]						

VIEWSHED TECHNICAL SUMMARY

WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA



Prepared for

Hat Creek Construction

Prepared by

VESTRA Resources Inc.
5300 Aviation Drive
Redding, California 96002

NOVEMBER 2020

VIEWSHED TECHNICAL SUMMARY

WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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71305

NOVEMBER 2020

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1.0 INTRODUCTION

1.1 Background

The project site is located approximately 11.5 miles east of the city of Susanville and is situated approximately 3 miles north of Highway 395. The general site location is shown on Figure 1. The existing visual character of the site vicinity is that of high desert shrubland. Topography in project area is sloped toward the Susan River to the south.

This visual analysis is provided for CEQA review of the proposed mining operations and was conducted to present the change in visual quality associated with the project.

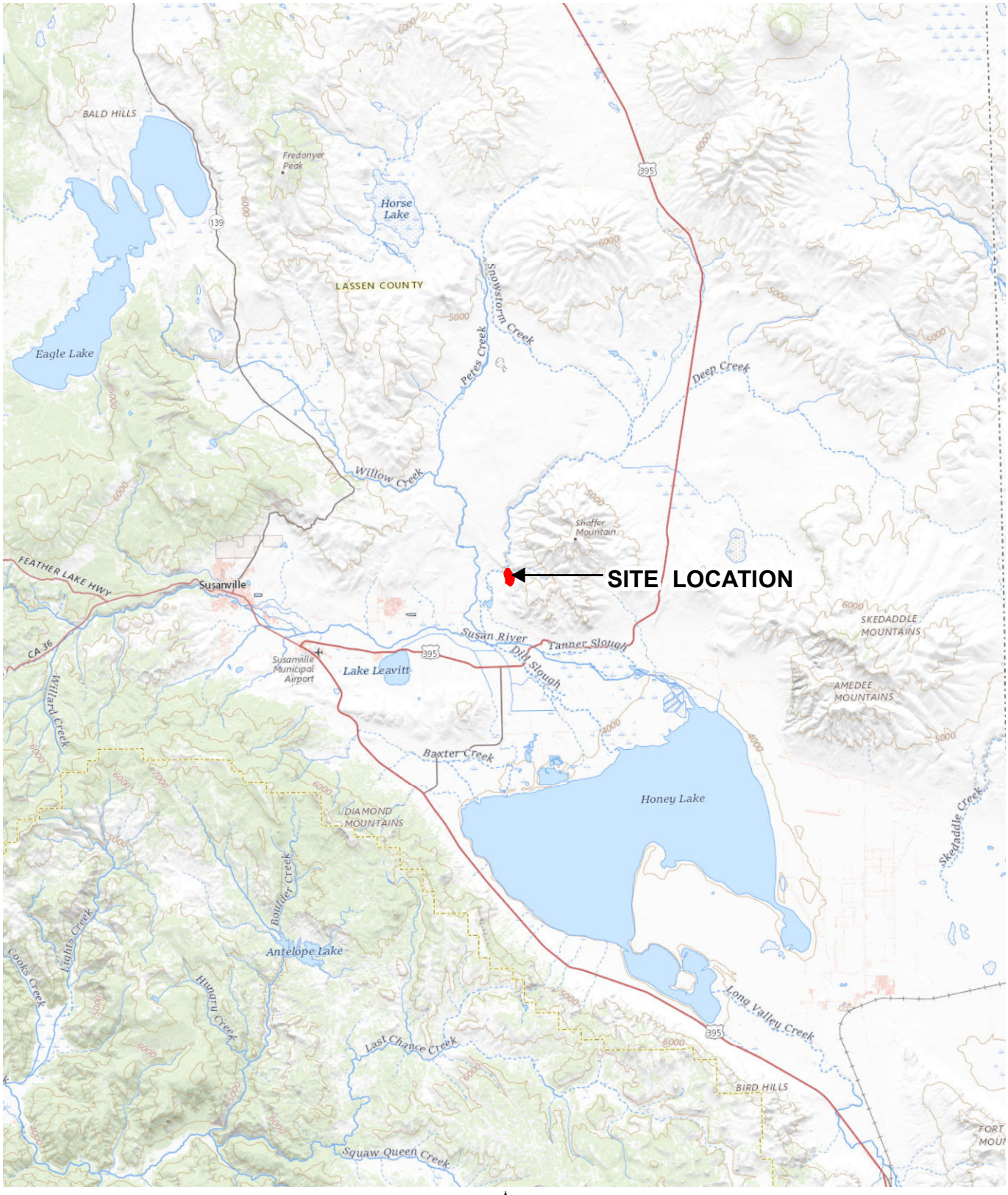
1.2 Project Area

The current Ward Lake mine area is approximately 160 acres, 100 acres of which are used for quarry operations. The facility includes the mining of rock, crushing, scales, office, truck shop, cement plant, asphalt plant, settling ponds, fuel storage, and material stockpiles. The project also includes various sediment control structures. The area surrounding the site is used for agriculture, mineral extraction, and open space.

The proposed expansion of Ward Lake Quarry includes the addition of approximately 51 acres to the mine boundary, a portion of which would be used for quarry operations. Access roads currently exist within the remaining area. The proposed expansion area is shown on Figure 2.

1.3 Current Condition

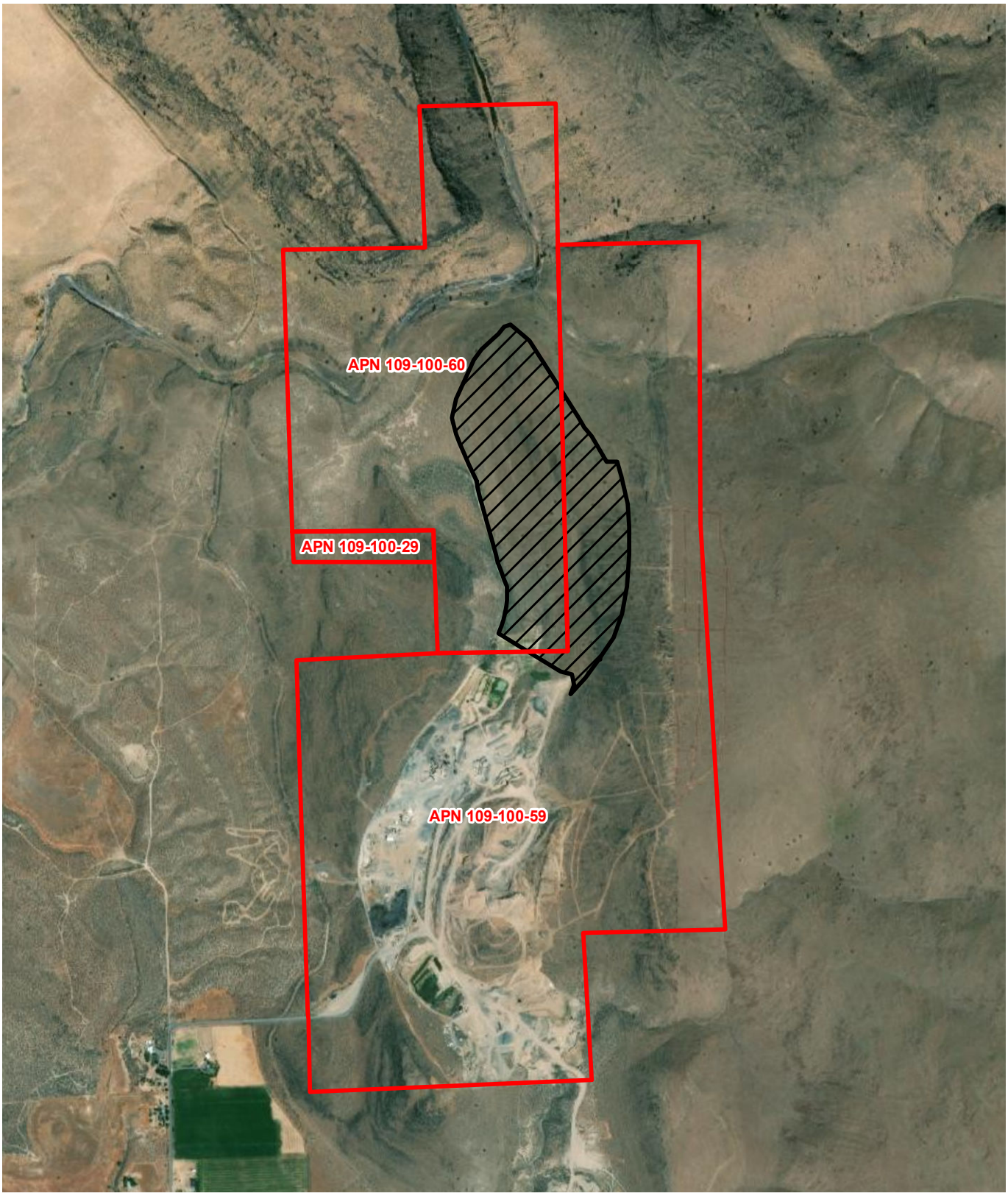
The current visual condition of the site is undeveloped open space. Vegetation is sparse due to the nature of the geology and soils in the area as well as agricultural practices including grazing. This lack of vegetation is part of the current view.



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FIGURE 1
GENERAL SITE LOCATION
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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Approximate Parcel Boundary

Proposed Expansion Area

N

0 0.125 0.25 0.5 Miles

VESTRA

SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH

FIGURE 2
GENERAL SITE LAYOUT
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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2.0 VISUAL SIMULATION ANALYSIS

2.1 Process

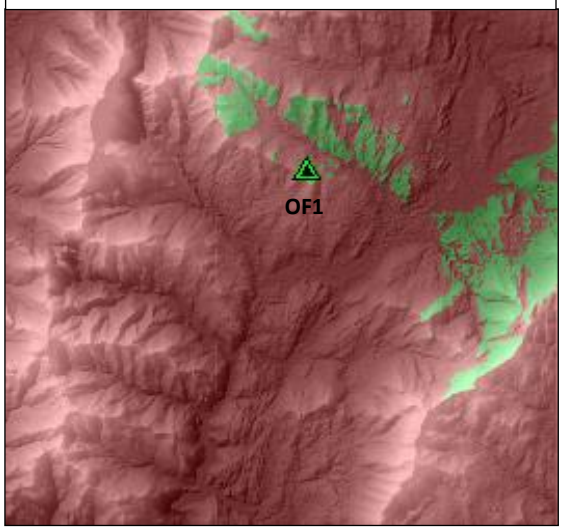
The shape of a terrain surface affects which portions of the surface area can be seen from any given point. To assess the visual components of this project, Geographic Information Systems (GIS) was used to evaluate visibility across the project area from various locations. GIS is a collection of computer hardware, software, and geographic data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. ArcGIS is a Geographic Information System package developed by Environmental Systems Research Institute (ESRI).

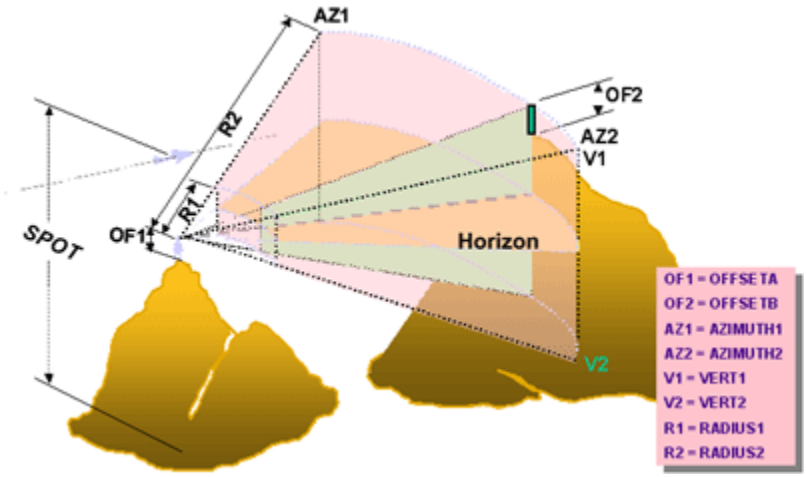
A viewshed identifies the locations in a given area that can be seen from one or more observation points. The elevation data used to perform viewshed analyses are raster-based data. Raster data is data in which a surface is divided into a grid and each cell in the grid contains an elevation value. The resolution of raster data is the distance, in surface units, of the sides of each cell in the grid. An example of this is the elevation data provided by the U.S. Geological Survey (USGS) for use in GIS. These data sets are commonly provided at either a 10-meter or 30-meter resolution. Viewshed analysis provides a value that indicates how many observer points can be seen from each location. If you have only one observer point, each cell from which the observer point can be seen is given a value of one. All cells from which the observer point cannot be seen are given a value of zero. Observer points can be points or linear features.

A viewshed is useful when you want to know how visible objects might be. Not only can you determine which cells can be seen from the observation point, if you have several observation points, you can also determine which observers can see each observed location. Knowing which observer can see which locations can affect decision making.

The image below graphically depicts how a viewshed analysis is performed. The observation point is on the mountaintop to the left (at OF1 in the image). The direction of the viewshed is within the cone looking to the right. You can control how much to offset the observation point from the surface (for example, the height of the tower), and the direction(s) to look in both the horizontal and vertical dimensions.

Displaying a hillshade underneath the elevation and the output from a Viewshed Analysis is a useful technique for visualizing the relationship between visibility and terrain.



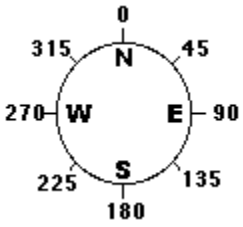


Nine characteristics of the viewshed are controlled as follow:

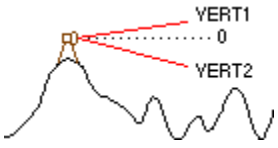
1. The surface elevations for the observation points (Spot)
2. The vertical distance in surface units to be added to the z-value of the observation points (OffsetA)
3. The vertical distance in surface units to add to the z-value of each cell as it is considered for visibility (OffsetB)



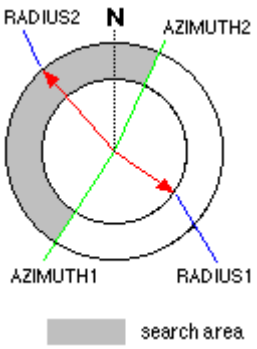
4. The start of the horizontal angle to limit the scan (Azimuth1)
5. The end of the horizontal angle to limit the scan (Azimuth2)



6. The top of the vertical angle to limit the scan (Vert1)
7. The bottom of the vertical angle to limit the scan (Vert2)



8. The inner radius that limits the search distance when identifying areas visible from each observation point (Radius1)
9. The outer radius that limits the search distance when identifying areas visible from each observation point (Radius2)



In order to perform a viewshed analysis, the elevation data should be as detailed as possible. For the Skyline project, the elevation data was derived from the USGS 10-meter digital elevation model (DEM) that is interpolated into a grid format.

Interpolation is a method of creating raster data specifically designed for the creation of hydrologically correct DEMs. It is based on the ANUDEM program developed by Michael Hutchinson (1988, 1989). See Hutchinson and Dowling (1991) for an example of a substantial application of ANUDEM and for additional associated references. A brief summary of ANUDEM and some applications are given in Hutchinson (1993). The version of ANUDEM used is 4.6.3.

The interpolation procedure has been designed to take advantage of the types of input data commonly available and the known characteristics of elevation surfaces. This method uses an iterative finite difference interpolation technique. It is optimized to have the computational efficiency of local interpolation methods, such as inverse distance weighted (IDW) interpolation, without losing the surface continuity of global interpolation methods, such as Kriging and Spline. It is essentially a discretized thin plate spline technique (Wahba, 1990), for which the roughness penalty has been modified to allow the fitted DEM to follow abrupt changes in terrain, such as streams and ridges. It is also the only ArcGIS interpolator specifically designed to work intelligently with contour inputs.

Contours are the most common method for storage and presentation of elevation information. Unfortunately, this method is also the most difficult to properly utilize with general interpolation techniques. The disadvantage lies in the undersampling of information between contours, especially in areas of low relief.

At the beginning of the interpolation process, ArcGIS uses information inherent to the contours to build a generalized drainage model. By identifying areas of local maximum curvature in each contour, the areas of steepest slope are identified and a network of streams and ridges is created (Hutchinson, 1988). This information is used to ensure proper hydrogeomorphic properties of the output DEM and can also be used to verify accuracy of the output DEM.

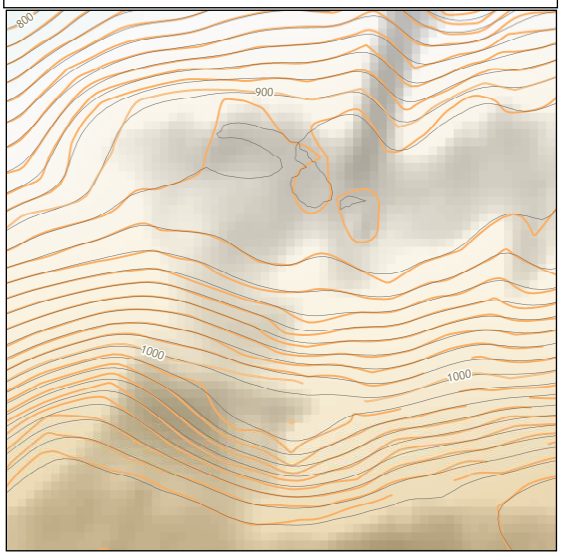
After the general morphology of the surface has been determined, contour data is also used in the interpolation of elevation values at each cell. When the contour data is used to interpolate elevation information, all contour data is read and generalized. A maximum of 50 data points are read from these contours within each cell. At the final resolution, only one critical point is used for each cell. For this reason, having a contour density with several contours crossing output cells is redundant.

Before using in a viewshed analysis, created surfaces should be evaluated to ensure that the data and parameters supplied to the program result in a realistic representation of the surface. There are many ways to evaluate the quality of an output surface, depending on the type of input available to create the surface.

The most common evaluation is to create contours from the new surface and compare them to the input contour data. It is best to create these new contours at one-half the original contour interval to examine the results between contours. Drawing the original contours and the newly created contours on top of one another can help identify interpolation errors.

In the example shown below, the contours created from the new surface are shown with the original 10-foot interval contour data for comparison (1:1,000 scale).

Original 10-foot interval contours compared to contours created from the new surface.



The comparison shows that the contours do differ in some areas, but the difference in this case is acceptable as the distance between the two sets of contour lines rarely exceeds 5 feet in length.

The product of the interpolation of the field survey contour data was the creation of 10-foot-resolution, hydrologically correct digital elevation model (DEM). It has been shown that there is a minor bias in the interpolation algorithm that causes the raster dataset to have slight variations from the input contours. This variation can result in a slight variation in the results when calculating the profile curvature of the output surface but is otherwise not noticeable, and does not affect the overall intended use in a viewshed analysis.

2.2 Observer Locations

The observer location points used in the viewshed analysis were determined using two observer points located at high and low site elevations. Using the viewshed analysis, the proposed mining operation was determined to be intermittently visible from areas along Highway 395. These segment locations and proposed mining area are shown on Figure 3.

2.3 General Map Reference Data

A number of GIS data layers were obtained as reference data for the maps and figures created as a result of the viewshed analysis. Most of vector (linear) data layers are existing data sets from VESTRA's in-house GIS data catalog, which is a compilation of data from various federal, state, county, and municipal sources.

The primary display data layer of aerial imagery utilizes National Agriculture Imagery Program (NAIP) data. The NAIP acquires imagery during the agricultural growing seasons in the continental U.S. The 2018 NAIP imagery for Lassen County has a 50-centimeter ground sample distance (GSD) with a horizontal accuracy that matches within five meters of a reference ortho image.



Highway Segment Potentially Visible from Ward Lake Quarry

Highway

Project Area

0 0.75 1.5 3 Miles

N

VESTRA

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH

FIGURE 3
HIGHWAY SEGMENTS AND PROPOSED PROJECT AREA
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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3.0 VIEWSHED ANALYSIS RESULTS

The product of the viewshed analyses of was the creation of 10-meter-resolution raster data layers showing visibility from two locations in the proposed mining area. This is from the proposed mining area outward (rather than from the outside looking inward toward the proposed mining area). The resulting projected data is shown on Figures 4 and 5. Table 1 shows the total linear feet from the viewshed analysis where the proposed mining area is visible from Highway 395 within five miles of the proposed project area.

Table 1
VIEWSHED STATISTICS

Observation Location	Linear Feet of Highway 395 within Five Miles of Project Area
North Observation Point	10,702
South Observation Point	5,974

In summary, the proposed mining area will be visible from portions of Highway 395. This area is not subject to changes in vegetation as the vegetation at the proposed mining area is sparse. No scenic highways or rivers are located in the project vicinity.

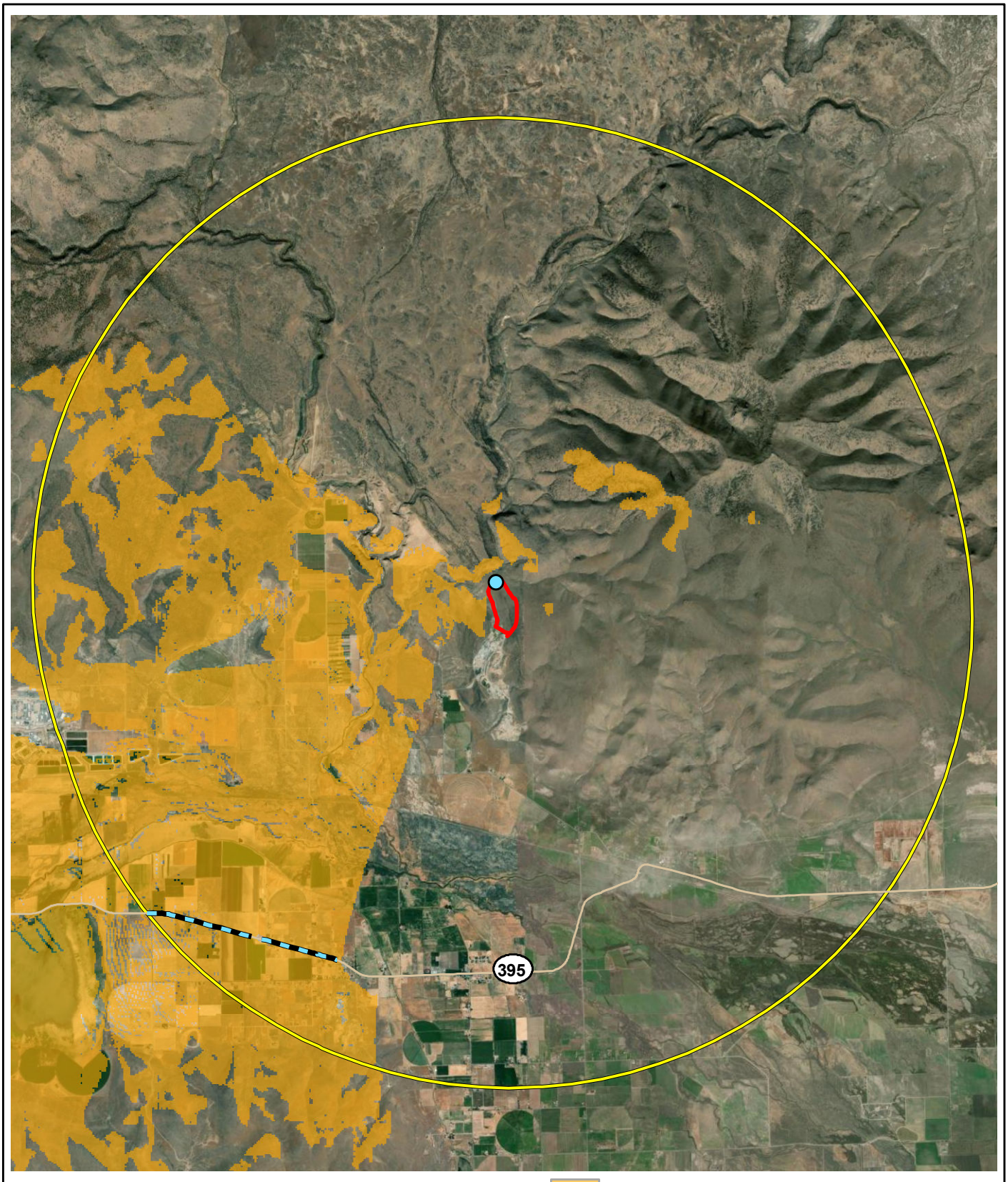
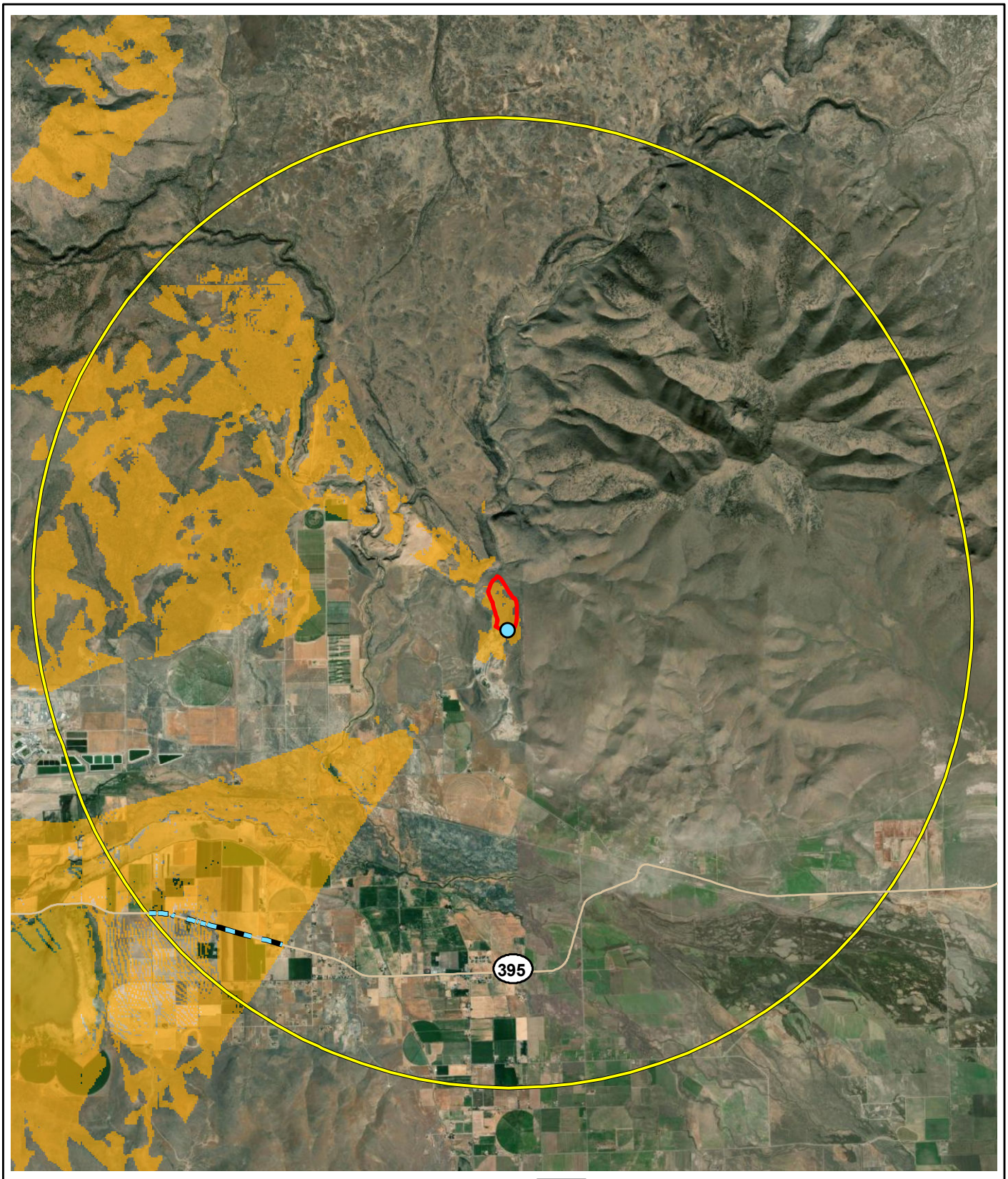


FIGURE 4
VIEWSHED ANALYSIS WITHIN FIVE MILES OF NORTH OBSERVATION LOCATION
WARD LAKE QUARRY
SUSANVILLE, CALIFORNIA

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH

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South Observation Location

Highway

Segment of Highway Visible from South Observation Location

Viewshed Area Visible from South Observation Location

5-Mile Buffer Around Project Area

Project Area

VESTRA

0 0.75 1.5 3 Miles

N

FIGURE 5
VIEWSHED ANALYSIS WITHIN FIVE MILES OF SOUTH OBSERVATION LOCATION
WARD LAKE QUARRY
SUSANVILLE, CALIFORNIA

SOURCE: DIGITALGLOBE 2018 AERIAL PHOTOGRAPH

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Hutchinson, M.F. 1988. *Calculation of hydrologically sound digital elevation models*. Paper presented at Third International Symposium on Spatial Data Handling at Sydney, Australia.

-----. 1989. A new procedure for gridding elevation and stream line data with automatic removal of spurious pits. *Journal of Hydrology* 106: 211-232.

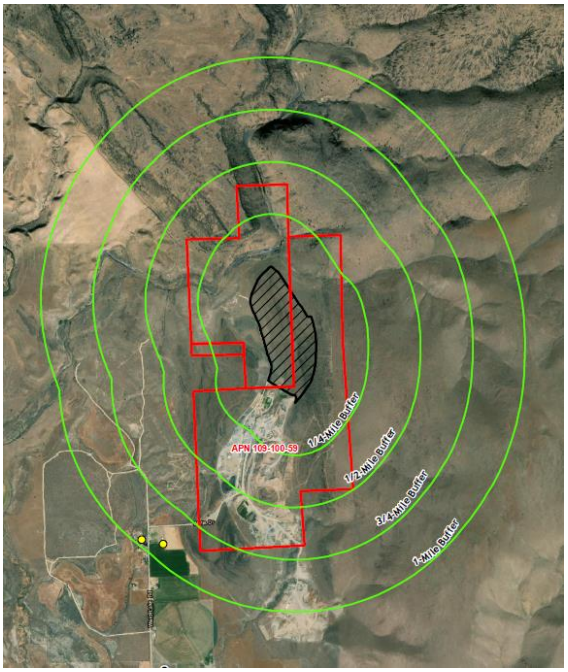
-----. 1993. Development of a continent-wide DEM with applications to terrain and climate analysis. In *Environmental Modeling with GIS*, ed. M. F. Goodchild et al., 392–399. New York: Oxford University Press.

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Wahba, G. 1990. *Spline models for Observational data*. Paper presented at CBMS-NSF Regional Conference Series in Applied Mathematics. Philadelphia: Soc. Ind. Appl. Maths.

Ward Lake Pit Expansion
Air Quality and Health Risk Assessment Technical Report



Prepared for:

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Prepared by:

RCH GROUP
planning & environmental consulting

September 9, 2021

1.0 INTRODUCTION

This document presents results of an air quality analysis and health risk assessment (HRA) associated with the proposed Ward Lake Pit Expansion near Susanville, California in Lassen County. This document provides an overview of the existing air quality conditions at the project site, an analysis of potential air quality impacts that would result from implementation of the proposed project, and identification of applicable regulatory requirements. Issues related to climate change and greenhouse gas (GHG) emissions are also addressed.

The HRA focuses on health impacts on existing residences and schools from diesel generators and offroad equipment associated with the aggregate extraction and resultant diesel particulate matter (DPM) emissions from the proposed project. The HRA was prepared based on the California Office of Environmental Health Hazard Assessment (OEHHA)'s *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments.*[1] The HRA was conducted to determine the health impacts, in terms of excess cancer risk and non-cancer hazards, using the significance levels identified within the State CEQA Guidelines, Appendix G.

The supporting information, methodology, assumptions, and results used in the air quality analysis are provided in **Attachment A: Air Quality Calculations**. The supporting methodology, assumptions, and results used in the HRA are provided in **Attachment B: Health Risk Assessment Methodology, Assumptions, and Results**. For existing residents and schools, the HRA indicates less-than-significant health impacts from proposed project activities associated with diesel generators and offroad equipment.

The air quality analysis includes a review of criteria pollutant[2] emissions such as carbon monoxide (CO)[3], nitrogen oxides (NO_x)[4], sulfur dioxide (SO_2)[5], volatile organic compounds

[1] Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, February 2015, Accessed January 26, 2021, http://oehha.ca.gov/air/hot_spots/hotspots2015.html

[2] Criteria air pollutants refer to those air pollutants for which the USEPA and CARB has established National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) under the Federal Clean Air Act (CAA).

[3] CO is a non–reactive pollutant that is a product of incomplete combustion of organic material, and is mostly associated with motor vehicle traffic, and in wintertime, with wood–burning stoves and fireplaces.

[4] When combustion temperatures are extremely high, as in aircraft, truck and automobile engines, atmospheric nitrogen combines with oxygen to form various oxides of nitrogen (NO_x). Nitric oxide (NO) and NO_2 are the most significant air pollutants generally referred to as NO_x. Nitric oxide is a colorless and odorless gas that is relatively harmless to humans, quickly converts to NO_2 and can be measured. Nitrogen dioxide has been found to be a lung irritant capable of producing pulmonary edema.

[5] SO_2 is a combustion product of sulfur or sulfur–containing fuels such as coal and diesel. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

(VOC) as reactive organic gases (ROG)[6], particulate matter less than 10 micrometers (coarse or PM_{10}), particulate matter less than 2.5 micrometers (fine or $PM_{2.5}$).[7]

2.0 PROJECT OVERVIEW

The existing surface mining operation (100,000 tons per year annual limit) is presently permitted for the mining of rock, crushing, screening, washing, material stockpiling, fuel storage; operation of a cement plant (12,000 cubic-yard annual limit) and asphalt plant (400,000 tons per year); and the use of settling ponds, scales, an office and a truck shop. Grading, excavating, and blasting are prohibited onsite between January 1 and March 31 annually, except in a state of emergency. Currently permitted operations at the project site allow the applicant to provide materials for emergency projects and construction projects that require continuous 24-hour operations. In order to respond to emergency projects, the annual removal volume of the mine presently could exceed 100,000 tons. The majority of operations occur from April through October. In addition, the current operation includes mining from 2020 through 2030 to allow increased extraction of materials from the site.

The Lassen County Air Pollution Control District (APCD) is the local air district governing Lassen County which is part of the Northeast Plateau Air Basin. The Lassen County APCD requires permits for proposed construction, alteration or replacement of equipment or facilities which may cause the issuance of air contaminants. The Ward Lake Pit maintains a permit to operate (PTO-19-140: expiration date March 31, 2024) for existing onsite equipment such as a hot mix asphalt plant, a lime slurry mix plant, a concrete plant, a crushing plant, a sand wash plant, and several diesel generators. As of the permit issuance, the facility had five diesel generators with the following upgrades or replacements planned:

- One 750 horsepower (hp) diesel generator associated with the asphalt plant, which has been switched to line power.
- One 750 hp diesel generator associated with the aggregate plant, which will be switched to line power by January of 2022.
- One 755 hp diesel generator associated with the aggregate plant, which will be updated with Air District approved Tier 4 engine[8] or switched to line power by January of 2023.

[6] VOC means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions and thus, a precursor of ozone formation. ROG are any reactive compounds of carbon, excluding methane, CO, CO_2 carbonic acid, metallic carbides or carbonates, ammonium carbonate, and other exempt compounds. The terms VOC and ROG are often used interchangeably.

[7] PM_{10} and $PM_{2.5}$ consists of airborne particles that measure 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs, causing adverse health effects.

- One 475 hp diesel generator associated with the lime plant, which will be updated with Air District approved Tier 4 engine or switched to line power by January of 2024.
- One 470 hp diesel generator associated with the wash plant, which will be updated with Air District approved Tier 4 engine or switched to line power by January of 2025.

The facility also has a daily and annual limit on the number of haul truck trips.

The proposed project includes increasing the crushing operations (from 100,000 to 200,000 tons per year) and expansion of the mine to include an additional 78.6 acres of mining area. The typical and maximum daily operations are not expected to change as a result of the proposed project. However, the annual number of crushing operation hours may be greater as a result of the proposed project in order to process the greater annual; amount of aggregate. This change in hours of operation may also include the 755 hp diesel generator associated with the aggregate plant (which by January of 2023 will be an Air District approved Tier 4 engine or switched to line power).[9] Therefore, the air quality analysis (to be conservative) included greater hours of operation for the diesel generator associated with the aggregate plant and assumed the diesel generator would not be replaced by line power.

The end date of mining would be extended to 2050; an additional 20 years. The equipment supporting for material processing (i.e., loaders, excavators) would also increase in annual operations to match the increase in crushing operations. The proposed project would not change the hot mix asphalt plant, the lime slurry mix plant, the concrete plant, portable plant, and diesel generator operations associated with hot mix asphalt plant and portable plant nor would the proposed project change the daily or annual haul truck trip limit.[10] Therefore, the air quality analysis and HRA focuses on pollutant emissions associated with the aggregate processing operations and supporting activities (i.e., blasting operations and diesel generators associated with crushing and offroad equipment such as loaders, excavators, and dozers).

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[8] USEPA has implemented regulations and a tiering system to reduce emissions from off-road equipment with increasing combustion efficiency (i.e., decreasing emissions) where Tier 1 is the least efficient (greatest emissions) and Tier 4 is the most efficient (least emissions). The regulations have been implemented over time such that Tier 1 was phased out in the 1990's and Tier 2 was required, followed by implementation of Tier 3 and Tier 4 by 2015 with a phase out of Tier 2.

[9] Per applicant, the diesel generator associated with the aggregate plant is assumed to increase in operations by 33 percent on an annual basis to sufficiently adjust to the increase in aggregate production.

[10] Haul truck volumes would not change as a result of the proposed project and is currently limited by the following condition of approval: haul trucks (loaded or empty) associated with the mining operation shall not exceed a daily average of 26 round trips (26 arriving and 26 departing) throughout the calendar year and shall not exceed a daily maximum of 275 round trips (275 arriving and 275 departing), with a maximum of 173 total trips occurring between the hours of 10:00 p.m. and 7:00 a.m., excluding personal employee vehicles and light-duty trucks assigned to employees. The maximum number of annual truck trips would continue to be 8,112.

Equipment onsite includes loaders, generators, a concrete batch plant, concrete trucks, service truck, man lift, belly dump, articulated dump truck, crusher and asphalt batch plant. Wet suppression is used when necessary to control dust caused by excavation, processing activities, and materials transport.

3.0 EXISTING CONDITIONS

The project site is located in the Northeast Plateau Air Basin (Air Basin), which comprises Siskiyou, Modoc and Lassen counties. The Air Basin has a climate regime that is distinct from the rest of California. The Air Basin has sharply defined seasons that follow a continental, rather than marine, pattern. Winters are cold and snowy; summers are warm and dry. The Air Basin includes part of the Klamath Mountains to the west and the Cascade Range and Modoc Plateau, plus a slice of the Great Basin along its eastern edge. Mount Shasta rises 14,162 feet, dominating the view from much of the basin. Another volcanic peak, Mount Lassen, stands 10,457 feet high. Extensive forestland runs across saddles between the region's peaks. The volcanic Modoc Plateau extends across the northeastern expanse, with an elevation mostly above 4,500 feet.

The region receives little to no transported air pollution from major urban areas. As in many rural areas in California, particulates from dust and wood smoke are sometimes a problem. Only the city of Yreka experiences occasional ozone concentrations that approach "near exceedances".

Land uses such as residences, schools, children's daycare centers, hospitals, and convalescent homes are considered to be more sensitive than the general public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. California Air Resources Board (CARB) has identified the following people as most likely to be affected by air pollution: children less than 14 years of age, the elderly over 65 years of age, athletes, and those with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive population groups.

Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas, because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational uses are also considered sensitive, due to the greater exposure to ambient air quality conditions and because the presence of pollution detracts from the recreational experience.

The project site is surrounded by open grazing lands. Immediately adjacent to and south of the site, a smaller aggregate mine is located on Bureau of Land Management (BLM)-administered land. Other BLM land is located to the east and south and the Wells Ranch is located directly to the north. Six homes are located on parcels from 10 to 80 acres in size to the west and south along Ward Lake Road.

The nearest residence is approximately 875 feet from the western property line of the project site. Shaffer Elementary School is located 2.4 miles to the southeast of the project site.

Federal Clean Air Act

The federal Clean Air Act (CAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The federal CAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: National Ambient Air Quality Standards (NAAQS) for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor control measures, stratospheric ozone protection, and enforcement provisions. The USEPA is responsible for administering the federal CAA. The federal CAA requires the USEPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

California Clean Air Act

The California CAA was first signed into law in 1988. The California CAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state's air quality goals, planning and regulatory strategies, and performance. CARB is the agency responsible for administering the California CAA. CARB established California Ambient Air Quality Standards (CAAQS) pursuant to the California Health and Safety Code (CH&SC) [§39606(b)], which are similar to the federal standards.

Ambient Air Quality Standards

Regulation of air pollutants is achieved through both NAAQS and CAAQS and emissions limits for individual sources. Regulations implementing the federal CAA and its subsequent amendments established NAAQS (national standards) for the six criteria pollutants. California has adopted more stringent CAAQS (state standards) for most of the criteria air pollutants. In addition, California has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Because of the meteorological conditions in the state, there is considerable difference between state and federal standards in California.

The ambient air quality standards are intended to protect the public health and welfare, and they incorporate an adequate margin of safety. They are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, including asthmatics, the very young, elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels somewhat above the ambient air quality standards before adverse health effects are observed.

Under amendments to the federal CAA, USEPA has classified air basins or portions thereof, as either "attainment" or "non-attainment" for each criteria air pollutant, based on whether or not the national standards have been achieved. The California CAA, which is patterned after the federal CAA, also requires areas to be designated as "attainment" or "non-attainment" for the state standards. Thus, areas in California have two sets of attainment/nonattainment designations: one set with respect to the federal standards and one set with respect to the state standards.

Table 1 shows the federal and state ambient air quality standards for different criteria pollutants and also summarizes the related health effects and principal sources for each pollutant.

Table 1: Ambient Air Quality Standards and Major Pollutant Sources

Pollutant	Averaging Time	State Standard	Federal Standard	Major Pollutant Sources
Ozone	8 hour	0.070 ppm	0.070 ppm	Formed when ROG and NOx react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/ industrial mobile equipment.
	1 hour	0.09 ppm	---	
Carbon Monoxide	8 hour	9.0 ppm	9 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles
	1 Hour	20 ppm	35 ppm	
Nitrogen Dioxide	Annual Average	0.030 ppm	0.053 ppm	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads
	1 Hour	0.18 ppm	0.100 ppm	
Sulfur Dioxide	Annual Average	---	0.030 ppm	Fuel combustion, chemical plants, sulfur recovery plants and metal processing
	24 Hour	0.04 ppm	0.14 ppm	
	1 Hour	0.25 ppm	0.075 ppm	
Particulate Matter (PM10)	Annual Arithmetic Mean	20 µg/m³	---	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays)
	24 hour	50 µg/m³	150 µg/m³	
Particulate Matter (PM2.5)	Annual Arithmetic Mean	12 µg/m³	12 µg/m³	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.
	24 hour	---	35 µg/m³	
Lead	Calendar Quarter	---	1.5 µg/m³	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	30 Day Average	1.5 µg/m³	---	

NOTE: ppm = parts per million; and µg/m³ = micrograms per cubic meter
SOURCE: California Air Resources Board, *Air Quality Standards*, Accessed January 26, 2021, https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards.

Local Air Quality

There are no ambient air quality monitoring stations or other facilities conducting ambient air quality monitoring of toxic contaminants in Lassen County; therefore, local ambient concentrations are not available. The only ambient air quality monitoring station located in the Northeast Plateau Air Basin is the Yreka-Foothill Drive Monitoring Station, located approximately 170 miles northwest in Yreka within Siskiyou County. Consideration of data from "regional sites" impacted by similar natural and man-made sources is an accepted practice by the USEPA; therefore, a summary of ambient air quality monitoring data collected by the Yreka-Foothill Drive Monitoring Station for ozone and $PM_{2.5}$ (PM_{10} monitoring was discontinued in 2016) is provided in **Table 2**. Although the region experiences elevated concentrations, Lassen County is in attainment/unclassified for federal and state PM_{10} and $PM_{2.5}$ standards as well as ozone.[11]

Table 2: Air Quality Data Summary (2017 - 2019)

	Standard[a]	2017	2018	2019
Ozone				
Highest 1 Hour Average (ppm)[b]	0.090	0.053	0.089	0.069
Days over State Standard		0	0	0
Highest 8 Hour Average (ppm)[b]	0.070	0.049	**0.075**	0.059
Days over National Standard		0	**4**	0
Highest 8 Hour Average (ppm)[b]	0.070	0.049	0.075	0.059
Days over State Standard		0	4	0
Particulate Matter ($PM_{2.5}$)				
Highest 24 Hour Average ($\mu g/m^3$)[b]	35	**79**	**143**	**74**
Days over National Standard		**26**	**57**	**4**
State Annual Average ($\mu g/m^3$)[b]	12	11.1	**14.4**	5.9

NOTES: Values in **bold** are in excess of at least one applicable standard.

a. Generally, state standards and national standards are not to be exceeded more than once per year.
b. ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.
c. PM_{10} is not measured every day of the year. Number of estimated days over the standard is based on 365 days per year.

Source: California Air Resources Board, *Air Quality Trend Summaries*, https://www.arb.ca.gov/adam/trends/trends1.php

According to the Lassen County APCD, the Air Quality Index in Lassen County is classified as "GOOD" for the majority of the year, although events such as wildfires and inversion layers in winter months can periodically degrade air quality

[11] Maps of State and Federal Area Designations, https://ww2.arb.ca.gov/resources/documents/maps-state-and-federal-area-designations

According to the Lassen County 2012 Regional Transportation Plan, elevated PM_{10} concentrations can be caused by sources including fugitive dust, combustion from automobiles and heating, road salt, and conifers, among others. Constituents that comprise suspended particulates include organic, sulfate, and nitrate aerosols that are formed in the air from emitted hydrocarbons, chloride, sulfur oxides, and oxides of nitrogen. Particulates reduce visibility and pose a health hazard by causing respiratory and related problems CARB further identifies motor vehicles, wood-burning stoves and fireplaces, dust from construction, landfills, and agriculture, wildfires and brush/waste burning, industrial sources, and windblown dust from open lands as major sources of PM_{10}.

Toxic Air Contaminants

Toxic Air Contaminants (TAC) are pollutants that may be expected to result in an increase in mortality or serious illness or that may pose a present or potential hazard to human health. Health effects include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. Although ambient air quality standards exist for criteria pollutants, no such standards exist for TAC. Many pollutants are identified as TAC because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TAC that are known or suspected carcinogens, the CARB has consistently found that there are no levels or thresholds below which exposure is free of risk. Individual TAC vary greatly in the risk they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. For certain TAC, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health risks, a similar factor called a Hazard Index is used to evaluate risk. In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Toxic Air Contaminant Identification and Control Act (Assembly Bill [AB] 1807) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) supplements the AB 1807 program by requiring a statewide air toxics inventory and notification of people exposed to a significant health risk and sensitive receptors.

Lassen County General Plan

The Natural Resources Element of the Lassen County General Plan includes the following applicable goal, policies, and implementation measures related to air quality:[12]

> Goal N-22: Air quality of high standards to safeguard public health, visual quality, and the reputation of Lassen County as an area of exceptional air quality.

[12] Lassen County General Plan, *Natural Resources Element*, September 1999.

Policy NR-74: The Board of Supervisors will continue to consider, adopt and enforce feasible air quality standards which protect the quality of the County's air resources.

NR-Q: The County will continue to regulate the emission of pollutants within its jurisdiction through the regulations and procedures adopted for the Lassen County APCD.

NR-R: In review of proposed projects pursuant to the CEQA, the County shall consider potential air quality impacts and shall, through the APCD, support appropriate measures for mitigation of significant environmental impacts upon air quality.

Policy NR-75: The County shall consider the appropriateness and feasibility of air pollution control requirements for individual projects and may grant variances to specific requirements pursuant to established procedural guidelines.

Lassen County APCD Rule 4:18 (Fugitive Dust Emissions)

Compliance with regulatory requirements related to fugitive dust are applicable to reduce impacts to less than significant. Based on Lassen County APCD Rule 4:18 (Fugitive Dust Emissions), reasonable precautions shall be taken to prevent particulate matter from becoming airborne, including, but not limited to, the following provisions:

a. Covering open bodied trucks when used for transportation materials likely to give rise to airborne dust.

b. Installation and use of hoods, fans, and other fabric filters to enclose and vent the handling of dusty materials. Containment methods may be employed during sandblasting and other similar operations.

c. The application of asphalt, oil, water or suitable chemicals to dirt roads, material stockpiles, land clearing, excavation, grading or other surfaces which can give rise to airborne dusts.

d. The prompt removal of earth or other material from paved streets onto which earth or other material for earth moving equipment, erosion by water, or other means has been deposited.

4.0 IMPACT ANALYSIS

Short-term (daily) and long-term (annual) air quality impacts related to the operation of the proposed project were evaluated. The analysis focuses on daily and annual emissions from operational (mobile, area, stationary, and fugitive sources) activities. The proposed project could affect air quality during proposed project operations. Construction activities would be minimal as it is a modification of the annual production levels for existing equipment.

Regulatory requirements such as fugitive dust measures are incorporated into the impact analysis. Regulatory models used to estimate air quality impacts include:

- CARB EMFAC[13] emissions inventory model. EMFAC is the latest emission inventory model that calculates emission inventories and emission rates for motor vehicles operating on roads in California. This model reflects CARB's current understanding of how vehicles travel and how much they emit. EMFAC can be used to show how California motor vehicle emissions have changed over time and are projected to change in the future.
- CARB OFFROAD[14] emissions inventory model. OFFROAD is the latest emission inventory model that calculates emission inventories and emission rates for off-road equipment such as loaders, excavators, and off-road haul trucks operating in California. This model reflects CARB's current understanding of how equipment operates and how much they emit. OFFROAD can be used to show how California off-road equipment emissions have changed over time and are projected to change in the future.
- USEPA AP-42, Compilation of Air Pollutant Emission Factors, has been published since 1972 as the primary compilation of USEPA's emission factor information. It contains emission factors and process information for more than 200 air pollution source categories. A source category is a specific industry sector or group of similar emitting sources. The emission factors have been developed and compiled from source test data, material balance studies, and engineering estimates.[15]
- AERMOD (American Meteorological Society/USEPA Regulatory Model, Version 19191) is an atmospheric dispersion model which can simulate point, area, volume, and line emissions sources and has the capability to include simple, intermediate, and complex terrain along with meteorological conditions and multiple receptor locations.[16,17]

[13] California Air Resources Board, *EMFAC2017 User's Guide*, March 1, 2018, Accessed January 15, 2021, https://ww3.arb.ca.gov/msei/downloads/emfac2017-volume-i-users-guide.pdf and https://www.arb.ca.gov/emfac/2017/

[14] California Air Resources Board, *Mobile Source Emissions Inventory Documentation – Off Road Diesel Equipment*, Accessed January 15, 2021, https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-documentation-road and https://ww3.arb.ca.gov/msei/ordiesel/ordas_ef_fcf_2017.pdf

[15] US Environmental Protection Agency, AP 42, Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume I, Accessed January 26, 2021, https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors

[16] US Environmental Protection Agency, Preferred/Recommended Models, *AERMOD Modeling System*, Accessed January 26, 2021, https://www3.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod

[17] Title 40 CFR Part 51, *Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions; Final Rule,* Accessed January 26, 2021, http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf

AERMOD is commonly executed to yield 1-hour maximum and annual average concentrations (in $\mu g/m^3$) at each receptor.

Threshold of Significance

The significance of potential impacts was determined based on State CEQA Guidelines, Appendix G. Using Appendix G evaluation thresholds, the proposed project would be considered to have significant air quality impacts if it were to:

A. Conflict with or obstruct implementation of the applicable air quality plan;

B. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard;

C. Expose sensitive receptors to substantial pollutant concentrations; or

D. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The thresholds of significance applied to assess project-level health impacts are: exposure of persons by siting a new source or a new sensitive receptor to substantial levels of TAC resulting in (a) a cancer risk level greater than 10 in one million, and (b) a noncancerous risk (chronic or acute) hazard index greater than 1.0. For this threshold, sensitive receptors include residential uses, schools, parks, daycare centers, nursing homes, and medical centers. Lassen County does not contain thresholds of significance for cumulative health impacts. Therefore, it is appropriate to use the project-level thresholds because the project-level threshold identifies project's incremental contribution to health impacts. Project impacts which are below the project-level thresholds would be presumed to contribute a less than significant health impact to the cumulative condition (i.e., less than cumulatively considerable net increase). Lastly, Lassen County does not contain thresholds of significance related to $PM_{2.5}$ concentrations associated with project emissions.[18]

Lassen County Rules and Regulations include general provisions and rules for APCD-issued permits, fees, prohibitions (including but not limited to nuisance, particulate matter, specific air contaminants, open burning, gasoline storage, reduction of odorous matter, fugitive dust emissions, and equipment breakdown), procedures, new source siting, and Title V permits.

[18] The Bay Area Air Quality Management District has a $PM_{2.5}$ concentration threshold for health impacts and a cumulative threshold for health impacts and the South Coast Air Quality Management District has PM_{10} and $PM_{2.5}$ concentration thresholds. These thresholds have been adopted by these air districts, in part, due to the region's nonattainment status with regard to these pollutions. Lassen County is in attainment/unclassified for federal and state PM_{10} and $PM_{2.5}$ standards as well as ozone. It is not required that Lassen County implement thresholds of significance that other air districts have deemed necessary for their air pollution situation.

Operation of the project would be implemented in compliance with the Lassen County APCD Air Quality Rules and Regulations. The proposed project would be required to modify its air quality permit.

Lassen County APCD has a nuisance rule which implicitly regulates pollutants other than those for which criteria standards have been adopted. Rule 4:2 states that a person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business and property. Rule 4:2 may be interpreted to restrict ambient concentrations of pollutants, such as toxic and hazardous pollutants, until other standards are in place.

Lassen County APCD Rule 4:18 states that reasonable precautions shall be taken to prevent particulate matter from becoming airborne and allows for the application of asphalt, oil, water, or suitable chemicals to dirt roads, material stockpiles, land clearing, excavation, grading or other surfaces which can give rise to airborne dusts.

Additionally, the Lassen County APCD Rule 6:4 includes the following Best Available Control Technology (BACT) Emission thresholds: An applicant shall apply BACT to a new source or modification of an existing source, except cargo carriers, for each affected pollutant emitted, including halogenated hydrocarbons, under the following conditions:

1). A new stationary source emits more than 150 pound per day of ROG, NO_x, PM_{10}, or $PM_{2.5}$; or 550 pounds per day of CO. These hourly thresholds are equivalent to 27 tons per year and 100 tons per year, respectively, based on 365 days per year.

2). A modification of an existing stationary source will result in a net emission increase of an affected pollutant by an amount more than any of the limits above.

3). A new source or modification subject to BACT for any pollutant subject to this section shall apply BACT for any other affected pollutant emitted from the new source or modification, if the Air Pollution Control Officer should so require.

Air Emission Estimates

The air quality analysis focuses on pollutant (combustion and fugitive dust) emissions associated with the aggregate processing operations, blasting operations, and supporting equipment (i.e., diesel generators associated with crushing and wash plant and offroad equipment such as loaders, excavators, and dozers).

Table 1 displays the daily emissions for the existing conditions. **Table 2** displays the daily emissions for the proposed project. **Table 3** displays the incremental daily (proposed project

minus existing condition) emissions for the proposed project. The only incremental daily emissions change is related to the blasting operations due to greater blasting zone size. The daily processing rates would not change and thus, the associated daily emissions would not change.

TABLE 1
Existing Conditions Daily Emissions (pounds)

Emission Source	ROG	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Onsite Equipment	0.94	9.23	6.13	0.03	0.22	0.21
Generator - Crushing Plant	1.34	14.8	200	123	1.75	1.75
Generator - Portable Plant	0.71	13.0	87.5	13.2	1.50	1.50
Generator - Wash Plant	0.70	12.9	86.4	13.0	1.48	1.48
Aggregate Plant	-	-	-	-	16.5	2.48
Wash Plant	-	-	-	-	4.12	0.62
Sand Plant	-	-	-	-	9.38	1.41
Unpaved Travel	-	-	-	-	22.2	3.33
Material Handling	-	-	-	-	2.33	0.35
Blasting	-	-	-	-	4.04	0.61
Haul Trucks	0.73	7.61	91.6	0.39	0.43	0.41
Total	**4.43**	**57.6**	**471**	**150**	**64.0**	**14.1**

Source: RCH Group, 2021.

TABLE 2
Proposed Project Daily Emissions (pounds)

Emission Source	ROG	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Onsite Equipment	0.94	9.23	6.13	0.03	0.22	0.21
Generator - Crushing Plant	1.34	14.8	200	123	1.75	1.75
Generator - Portable Plant	0.71	13.0	87.5	13.2	1.50	1.50
Generator - Wash Plant	0.70	12.9	86.4	13.0	1.48	1.48
Aggregate Plant	-	-	-	-	16.5	2.48
Wash Plant	-	-	-	-	4.12	0.62
Sand Plant	-	-	-	-	9.38	1.41
Unpaved Travel	-	-	-	-	22.2	3.33
Material Handling	-	-	-	-	2.33	0.35
Blasting	-	-	-	-	7.42	1.11
Haul Trucks	0.73	7.61	91.6	0.39	0.43	0.41
Total	**4.43**	**57.6**	**471**	**150**	**67.3**	**14.6**

Source: RCH Group, 2021.

TABLE 3
Daily Increment Emissions (pounds)

Emission Source	ROG	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Existing Condition	4.43	57.6	471	150	64.0	14.1
Proposed Project	4.43	57.6	471	150	67.3	14.6
Project Increment	**0.52**	**5.71**	**77.1**	**47.6**	**12.3**	**2.42**
Significance Threshold	150	550	150	-	150	150
Significant (Yes/No)	No	No	No	-	No	No

Source: RCH Group, 2021.

Table 4 displays the annual emissions for the existing conditions. **Table 5** displays the annual emissions for the proposed project. **Table 6** displays the incremental annual (proposed project minus existing condition) emissions for the proposed project. The incremental annual emissions would be greater due to the proposed project as a result of the greater annual production rates.

TABLE 4
Existing Conditions Annual Emissions (tons)

Emission Source	ROG	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Onsite Equipment	0.03	0.34	0.23	<0.01	0.01	0.01
Generator - Crushing Plant	0.18	2.01	27.2	16.8	0.24	0.24
Generator - Portable Plant	0.10	1.78	11.9	1.80	0.20	0.20
Generator - Wash Plant	0.10	1.76	11.8	1.78	0.20	0.20
Aggregate Plant	-	-	-	-	0.23	0.03
Wash Plant	-	-	-	-	0.07	0.01
Sand Plant	-	-	-	-	0.07	0.01
Unpaved Travel	-	-	-	-	1.33	0.20
Material Handling	-	-	-	-	0.14	0.02
Blasting	-	-	-	-	0.01	0.00
Haul Trucks	0.01	0.11	1.35	0.01	0.01	0.01
Total	**0.42**	**6.00**	**52.5**	**20.4**	**2.51**	**0.94**

Source: RCH Group, 2021.

TABLE 5
Proposed Project Annual Emissions (tons)

Emission Source	ROG	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Onsite Equipment	0.06	0.61	0.39	<0.01	0.01	0.01
Generator - Crushing Plant	0.23	2.50	33.9	20.9	0.30	0.30
Generator - Portable Plant	0.10	1.78	11.9	1.80	0.20	0.20
Generator - Wash Plant	0.10	1.76	11.8	1.78	0.20	0.20
Aggregate Plant					0.47	0.07

Wash Plant					0.07	0.01
Sand Plant					0.07	0.01
Unpaved Travel					2.00	0.30
Material Handling					0.21	0.03
Blasting					0.03	0.00
Haul Trucks	0.01	0.11	1.35	0.01	0.01	0.01
Total	**0.49**	**6.76**	**59.3**	**24.5**	**3.55**	**1.15**

Source: RCH Group, 2021.

TABLE 6
Annual Increment Emissions (pounds)

Emission Source	ROG	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Existing Condition	0.42	6.00	52.5	20.4	2.51	0.94
Proposed Project	0.49	6.76	59.3	24.5	3.55	1.15
Project Increment	**0.07**	**0.77**	**6.80**	**4.10**	**1.04**	**0.21**
Significance Threshold	27	100	27	-	27	27
Significant (Yes/No)	No	No	No	-	No	No

Source: RCH Group, 2021.

Notably, the existing emissions are in compliance via the permit to operate (PTO-19-140: expiration date March 31, 2024) for onsite equipment. This analysis is focused on the incremental emissions (proposed project minus existing condition) compared to the thresholds of significance.

The incremental daily emissions of ROG, CO, NOx, PM_{10}, and $PM_{2.5}$ are less than the significance thresholds. The incremental annual emissions of ROG, CO, NOx, PM_{10}, and $PM_{2.5}$ are less than the significance thresholds. The incremental change in emissions is solely related to the project elements associated with the aggregate plant and supporting activities (generator, unpaved travel, material handling, and blasting). The supporting information, methodology, assumptions, and results used in the air quality analysis are provided in **Attachment A: Air Quality Calculations**.

Health Impacts

The proposed project would constitute an emission source of DPM due to operations associated with generators, offroad equipment, and haul trucks. Studies have demonstrated that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic health risk.

Health effects from carcinogenic air toxics are usually described in terms of individual cancer risk. Individual cancer risk is the likelihood that a person exposed to air toxic concentrations

over a 70-year lifetime will contract cancer, based on the use of standard risk-assessment methodology. The maximally exposed individual represents the worst–case risk estimate, based on a theoretical person continuously exposed for a lifetime at the point of highest compound concentration in the air. This is a highly conservative assumption, since most people do not remain at home all day and on average residents change residences every 11 to 12 years. In addition, this assumption assumes that residents are experiencing outdoor concentrations for the entire exposure period.

This HRA analyzes the incremental cancer risks to sensitive receptors in the vicinity of the proposed project, using emission rates (in pounds per hour) from USEPA AP-42, *Compilation of Air Pollutant Emission Factors*, and vender specifications. DPM emission rates were input into the USEPA's AERMOD atmospheric dispersion model to calculate ambient air concentrations at receptors in the proposed project vicinity. This HRA is intended to provide a worst–case estimate of the increased exposure by employing a standard emission estimation program, an accepted pollutant dispersion model, approved toxicity factors, and conservative exposure parameters.

In accordance with OEHHA *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, this HRA was accomplished by applying the highest estimated concentrations of TAC at the receptors analyzed to the established cancer potency factors and acceptable reference concentrations for non-cancer health effects. Increased cancer risks were calculated using the modeled DPM concentrations and OEHHA-recommended methodologies for both a child exposure (3rd trimester through 2 years of age) and adult exposure. The cancer risk calculations were based on applying the OEHHA-recommended age sensitivity factors and breathing rates, as well as fraction of time at home and an exposure duration of 30 years, to the DPM concentration exposures. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing air pollutants. The supporting methodology and assumptions used in this HRA are provided in **Attachment B: Health Risk Assessment Methodology, Assumptions, and Results**.

These conservative methodologies overestimate both non-carcinogenic and carcinogenic health risk, possibly by an order of magnitude or more. Therefore, for carcinogenic risks, the actual probabilities of cancer formation in the populations of concern due to exposure to carcinogenic pollutants are likely to be lower than the risks derived using the HRA methodology. The extrapolation of toxicity data in animals to humans, the estimation of concentration prediction methods within dispersion models; and the variability in lifestyles, fitness and other confounding factors of the human population also contribute to the overestimation of health impacts. Therefore, the results of this HRA are highly overstated.

The following describes the HRA results associated with existing receptors due to existing condition and proposed project activities. The maximum cancer risk from existing condition emissions for a residential-adult receptor would be 0.17 per million and for a residential-child receptor would be 1.35 per million. The maximum cancer risk from proposed project emissions for a residential-adult receptor would be 0.52 per million and for a residential-child receptor would be 1.91 per million.

Therefore, the incremental cancer risk for a residential-adult receptor would be 0.35 per million and for a residential-child receptor would be 0.56 per million. Thus, the cancer risk due to project operations would be below the significance threshold of 10 per million and would be a less-than-significant health impact. The HRA results reflect the increased DPM emissions as a result of the proposed project (greater annual usage of offroad equipment to extract additional aggregate materials (i.e., 200,000 vs 100,000 tons) but also the location in which that materials would be extracted (i.e., within the 78.6 acres which are located further from nearby sensitive receptors) and the additional 20 years of activities.

Non-Cancer Health Hazard

Both acute (short-term) and chronic (long-term) adverse health impacts unrelated to cancer are measured against a hazard index (HI), which is defined as the ratio of the predicted incremental DPM exposure concentration from the proposed project to a reference exposure level (REL) that could cause adverse health effects. The REL are published by OEHHA based on epidemiological research. The ratio (referred to as the Hazard Quotient [HQ]) of each non-carcinogenic substance that affects a certain organ system is added to produce an overall HI for that organ system. The overall HI is calculated for each organ system. The impact is considered to be significant if the overall HI for the highest-impacted organ system is greater than 1.0.

The chronic reference exposure level for DPM was established by the California OEHHA[19] as 5 $\mu g/m^3$. Thus, the proposed project-related annual concentration of DPM cannot exceed 5.0 $\mu g/m^3$; resulting in a chronic acute HI of greater than 1.0 (i.e., DPM annual concentration/5.0 $\mu g/m^3$). The chronic HI would be less than 0.01. The chronic HI would be below the significance threshold of 1 and the impact of the proposed project would therefore be less than significant.

Cumulative Health Impacts

As shown, project-related health impacts would be less than significant. Therefore, the proposed project would not contribute significantly to cumulative health impacts. Because there is no substantial evidence of a project-specific potentially significant health impact, it is reasonable to

[19] California Office of Environmental Health Hazards Assessment - Acute, 8-hour, and Chronic Reference Exposure Levels, June 2014, Accessed January 26, 2021, http://www.oehha.ca.gov/air/allrels.html

determine that the effects of the proposed project would be a less than significant cumulative impacts and no further analysis is required.

Odor Impacts

Though offensive odors from stationary and mobile sources rarely cause any physical harm, they still remain unpleasant and can lead to public distress, generating citizen complaints to local governments. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

Eight homes are located on parcels from 10 to 80 acres in size to the west and south along Ward Lake Road. The nearest residence is approximately 875 feet from the western property line of the Project Site. Shaffer Elementary School is located 2.4 miles to the southeast of the Project Site. There are approximately 24 residences abutting Highway 395 and Center Road. Traveling farther west along Center Road, toward the California State Correctional Center, there are approximately six additional residences.

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, there are no quantitative or formulaic methodologies to determine the presence of a significant odor impact. Rather, often air districts recommend that odor analyses strive to fully disclose all pertinent information. The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. For example, San Joaquin Valley Unified Air Pollution Control District has identified some common types of facilities that have been known to produce odors.[20]

Land uses and industrial operations that typically are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, solid waste transfer stations, rendering plants, dairies, and fiberglass molding. The proposed project would not fall into any of these categories. Operation of the proposed project would result in fugitive dust and combustion emissions, which would not be expected to generate odors.

Notably, the primary wind direction is from the west and south. Therefore, the primary wind direction is from the residences towards the project site. Odor emissions are highly dispersive, especially in areas with higher average wind speeds. However, odors disperse less quickly during inversions or during calm conditions, which hamper vertical mixing and dispersion.

[20] San Joaquin Valley Unified Air Pollution Control District, Final Draft Guidance for Assessing and Mitigating Air Quality Impacts, March 19, 2015, https://www.valleyair.org/transportation/GAMAQI-2015/FINAL-DRAFT-GAMAQI.PDF

A majority of the proposed project operations would occur from April through October which is not typically the season associated with inversion conditions (i.e., occur during wintertime). Inversion conditions may also result in odor impacts due to air stagnation. Given that the proposed project would not operate during the months when inversion condition is more common, the likelihood of odor impacts due to the proposed project would be reduced.

Lastly, based on information obtained from the Lassen County APCD, no complaints were filed related to odor issues (including the existing asphalt plant) in the past five years. Given the previous information, odor impacts associated with the location of the proposed project would be less than significant.

6.0 GREENHOUSE GAS ANALYSIS

"Global warming" and "global climate change" are the terms used to describe the increase in the average temperature of the earth's near-surface air and oceans since the mid-20th century and its projected continuation. Warming of the climate system is now considered to be unequivocal, with global surface temperature increasing approximately 1.33 degrees Fahrenheit (°F) over the last 100 years. Continued warming is projected to increase global average temperature between 2 and 11°F over the next 100 years.

Natural processes and human actions have been identified as the causes of this warming. The International Panel on Climate Change (IPCC) concludes that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward.[21] After 1950, however, increasing GHG concentrations resulting from human activity such as fossil fuel burning and deforestation have been responsible for most of the observed temperature increase. These basic conclusions have been endorsed by more than 45 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. Since 2007, no scientific body of national or international standing has maintained a dissenting opinion.

Increases in GHG concentrations in the earth's atmosphere are thought to be the main cause of human-induced climate change. The IPCC is now 95 percent certain that humans are the main cause of current global warming.[22] GHG naturally trap heat by impeding the exit of solar radiation that has hit the earth and is reflected back into space. Some GHG occur naturally and

[21] IPCC, *2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Accessed January 26, 2021, https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_AR5_FINAL_full_wcover.pdf

[22] IPCC, *2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Accessed January 26, 2021, https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_AR5_FINAL_full_wcover.pdf

are necessary for keeping the earth's surface inhabitable. However, increases in the concentrations of these gases in the atmosphere during the last 100 years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature.

Gases that trap heat in the atmosphere are referred to as GHG because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse does. The accumulation of GHG has been implicated as the driving force for global climate change. The primary GHG are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), ozone, and water vapor.

While the presence of the primary GHG in the atmosphere are naturally occurring, CO_2, CH_4, and N_2O are also emitted from human activities, accelerating the rate at which these compounds occur within earth's atmosphere. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas methane results from off-gassing associated with agricultural practices, coal mines, and landfills. Other GHG include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, and are generated in certain industrial processes.

CO_2 is the reference gas for climate change because it is the predominant GHG emitted. The effect that each of the aforementioned gases can have on global warming is a combination of the mass of their emissions and their global warming potential (GWP). GWP indicates, on a pound-for-pound basis, how much a gas is predicted to contribute to global warming relative to how much warming would be predicted to be caused by the same mass of CO_2. CH_4 and N_2O are substantially more potent GHG than CO_2, with GWP of 28 and 265 times that of CO_2, respectively.[23]

In emissions inventories, GHG emissions are typically reported in terms of pounds or metric tons (MT) of CO_2 equivalents (CO_2e). CO_2e are calculated as the product of the mass emitted of a given GHG and its specific GWP. While CH_4 and N_2O have much higher GWP than CO_2, CO_2 is emitted in such vastly higher quantities that it accounts for the majority of GHG emissions in CO_2e.

Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO_2 emissions (and thus substantial increases in atmospheric concentrations of CO_2). In pre-industrial times (c. 1860), concentrations of atmospheric CO_2 were approximately 280 parts per million (ppm). By November 2020,

[23] IPCC, *2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Accessed January 26, 2021, https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_AR5_FINAL_full_wcover.pdf

atmospheric CO_2 concentrations had increased to 413 ppm, 48 percent above pre-industrial concentrations.[24]

There is international scientific consensus that human-caused increases in GHGs have and will continue to contribute to global warming. Potential global warming impacts in California may include, but are not limited to, loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. Secondary effects are likely to include a global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity.[25]

Regulatory Setting

California Assembly Bill (AB) 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction is in the process of being accomplished by enforcing a statewide cap on GHG emissions that was phased in starting in 2012. Towards this progress, in 2018, California emitted approximately 425 million metric tons of CO_2e, six million metric tons of CO_2e below the 2020 GHG limit of 431 million metric tons of CO_2e and two million metric tons of CO2e below the 1990 GHG limit of 427 million metric tons of CO_2e. To effectively implement the cap, CARB develops and implements regulations to reduce statewide GHG emissions from stationary sources. California has taken these measures, because no project individually could have a major impact (either positively or negatively) on the global concentration of GHG.

AB 32 required CARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclosed how it arrived at the cap; instituted a schedule to meet the emissions cap; and developed tracking, reporting, and enforcement mechanisms to ensure that the state reduced GHG emissions enough to meet the cap. AB 32 also included guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers were not unfairly affected by the reductions. Using these criteria to reduce statewide GHG emissions to 1990 levels by 2020 represented an approximate 25 to 30 percent reduction in emissions levels. However, CARB had discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as compared to other sectors that were not anticipated to significantly increase emissions.

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[24] National Oceanographic and Atmospheric Administration - Earth System Research Laboratory, *Recent Monthly Mean CO2 at Mauna Loa*, Accessed January 26, 2021, www.esrl.noaa.gov/gmd/ccgg/trends/

[25] California Environmental Protection Agency, *Final Climate Action Team Report to the Governor and Legislature, March 2006*, Accessed January 26, 2021, http://documents.cityofdavis.org/Media/CityCouncil/Documents/PDF/CDD/Planning/Subdivisions/West-Davis-Active-Adult-Community/Reference-Documents/CalEPA_2006_Climate_Action_Team_Report_to_Gov-and_Leg.PDF

AB 32 required CARB to develop a Scoping Plan that describes the approach California will take to reduce GHGs to achieve the goal of reducing emissions to 1990 levels by 2020. The Scoping Plan was first approved by CARB in 2008 and must be updated every five years. The initial AB 32 Scoping Plan contained the main strategies for California to reduce the GHG. The initial Scoping Plan had a range of GHG reduction actions which included direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 program implementation fee regulation to fund the program. In August 2011, the initial Scoping Plan was approved by CARB.

The 2013 Scoping Plan Update built upon the initial Scoping Plan with new strategies and recommendations. The 2013 Update identified opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The 2013 Update defined climate change priorities for the subsequent five years and set the groundwork to reach California's long-term climate goals set forth in Executive Order S-3-05.[26] The 2013 Scoping Plan Update highlighted California progress toward meeting the near-term 2020 GHG emission reduction goals defined in the initial Scoping Plan. In the 2013 Update, nine key focus areas were identified (energy, transportation, agriculture, water, waste management, and natural/working lands, along with short-lived climate pollutants, green buildings, and the cap-and-trade program). On May 22, 2014, the First Update to the Climate Change Scoping Plan was approved by CARB.

On April 29, 2015, Executive Order No. B-30-15 was issued to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The new plan, outlined in SB 32, involves increasing renewable energy use, putting more electric cars on the road, improving energy efficiency, and curbing emissions from key industries. It is designed so State agencies do not fall behind the pace of reductions necessary to reach the existing 2050 reduction goal. Executive Order No. B-30-15 orders "All State agencies with jurisdiction over sources of GHG emissions shall implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 targets." The Executive Order also states that "CARB shall update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent." On November 30, 2017, the Second Update to the Climate Change Scoping Plan was approved by the CARB.

[26] In 2005, in recognition of California's vulnerability to the effects of climate change, then-Governor Arnold Schwarzenegger established Executive Order S-3-05, which sets forth the following target dates by which statewide GHG emissions would be progressively reduced: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Greenhouse Gas Regional Emission Estimates

Worldwide emissions of GHG in 2017 were estimated at 48.4 billion metric tons of CO_2e.[27] This value includes ongoing emissions from industrial and agricultural sources but excludes emissions from land use changes.

In 2018, the United States emitted about 6,677 million metric tons of CO_2. Emissions increased from 2017 to 2018 by 3.1 percent. The increase in 2018 was largely driven by an increase in emissions from fossil fuel combustion, which was a result of multiple factors, including more electricity use greater due to greater heating and cooling needs due to a colder winter and hotter summer in 2018 in comparison to 2017.[28] GHG emissions in 2018 (after accounting for sequestration from the land sector) were 10.2 percent below 2005 levels.

In 2018, California emitted approximately 425 million metric tons of CO_2e, 0.8 million metric tons of CO_2e higher than 2017 levels and six million metric tons of CO_2e below the 2020 GHG limit of 431 million metric tons of CO_2e).[29] Consistent with recent years, these reductions have occurred while California's economy has continued to grow and generate jobs. The transportation sector remains the largest source of GHG emissions in the state with 40 percent of the emissions in 2018 but saw a decrease in emissions compared to 2017.[30]

Emissions from the electricity sector account for 15 percent of the inventory and showed a slight increase in 2018 due to less hydropower. California in 2018 used more electricity from zero-GHG sources (for the purpose of the GHG inventory, these include hydro, solar, wind, and nuclear energy) than from GHG-emitting sources for both in-state generation and total (in-state plus imports) generation. The industrial sector has seen steady emissions in the past few years and remains at 21 percent of the inventory.[31]

Thresholds of Significance

At this time, neither the Lassen County APCD nor the County itself has adopted numerical thresholds of significance for GHG emissions that would apply to the proposed project. Lassen County recommends that all projects subject to CEQA review be considered in the context of GHG emissions and climate change impacts, and that CEQA documents include a

[27] World Resources Institute, *Climate Analysis Indicator Tool – Global Historical GHG Emissions*, Accessed January 26, 2021, https://www.climatewatchdata.org/ghg-emissions?end_year=2017&start_year=1990

[28] United States Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, April 13, 2020, Accessed January 26, 2021, https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

[29] California Air Resources Board, *Emissions Trends Report 2000-2018 (2020 Edition)*, Accessed January 26, 2021, https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf

[30] California Air Resources Board, *Emissions Trends Report 2000-2018 (2020 Edition)*, Accessed January 26, 2021, https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf

[31] California Air Resources Board, *Emissions Trends Report 2000-2018 (2020 Edition)*, Accessed January 26, 2021, https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf

quantification of GHG emissions from all project sources, as well as minimize and mitigate GHG emissions as feasible. The proposed project would generate GHG emissions through long-term operational activities.

Considering the lack of established GHG emissions thresholds that would apply to the proposed project, CEQA allows lead agencies to identify thresholds of significance applicable to a project that are supported by substantial evidence. Substantial evidence is defined in the CEQA statute to mean "facts, reasonable assumptions predicated on facts, and expert opinion supported by facts" (14 CCR 15384(b)).[32] Substantial evidence can be in the form of technical studies, agency staff reports or opinions, expert opinions supported by facts, and prior CEQA assessments and planning documents. Therefore, to establish additional context in which to consider the order of magnitude of the proposed project's GHG emissions, this analysis accounts for the following considerations by other government agencies and associations about what levels of GHG emissions constitute a cumulatively considerable incremental contribution to climate change:

- Sacramento Metropolitan Air Quality Management District (SMAQMD) established thresholds, including 1,100 metric tons of CO_2e per year for the construction or operational phase of land use development projects, or 10,000 direct metric tons of CO_2e per year from stationary source projects.[33]
- Placer County Air Pollution Control District (PCAPCD) recommends a tiered approach to determine if a project's GHG emissions would result in a significant impact. First, project GHG emissions are compared to the de minimis level of 1,100 metric tons of CO_2e per year. If a project does not exceed this threshold, it does not have significant GHG emissions. If the project exceeds the de minimis level and does not exceed the 10,000 metric tons of CO_2e per year bright line threshold, then the project's GHG emissions can be compared to the efficiency thresholds. These thresholds are 4.5 metric tons of CO_2e per-capita for residential projects in an urban area, and 5.5 metric tons of CO_2e per-capita for residential projects in a rural area. For nonresidential development,

[32] 14 CCR 15384 provides the following discussion: "Substantial evidence" as used in the Guidelines is the same as the standard of review used by courts in reviewing agency decisions. Some cases suggest that a higher standard, the so called "fair argument standard" applies when a court is reviewing an agency's decision whether or not to prepare an EIR. Public Resources Code section 21082.2 was amended in 1993 (Chapter 1131) to provide that substantial evidence shall include "facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts." The statute further provides that "argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly inaccurate or erroneous, or evidence of social or economic impacts which do not contribute to, or are not caused by, physical impacts on the environment, is not substantial evidence."

[33] Sacramento Metropolitan Air Quality Management District, Guide to Air Quality Assessment in Sacramento County, May 2018, Accessed January 26, 2021, http://www.airquality.org/Residents/CEQA-Land-Use-Planning/CEQA-Guidance-Tools

the thresholds are 26.5 metric tons of CO_2e per 1,000 square feet for projects in urban areas, and 27.3 metric tons of CO_2e per 1,000 square feet for projects in rural areas. The PCAPCD bright-line GHG threshold of 10,000 metric tons of CO_2e per year is also applied to land use projects' construction phase and stationary source projects' construction and operational phases. Generally, GHG emissions from a project that exceed 10,000 metric tons of CO_2e per year would be deemed to have a cumulatively considerable contribution to global climate change.[34]

- Bay Area Air Quality Management District (BAAQMD) has adopted 1,100 metric tons of CO_2e per year as a project-level bright-line GHG significance threshold that would apply to operational emissions from mixed land-use development projects, a threshold of 10,000 metric tons of CO_2e per year as the significance threshold for operational GHG emissions from stationary-source projects, and an efficiency threshold of 4.6 metric tons of CO_2e per service population per year.[35]
- South Coast Air Quality Management District (SCAQMD) formed a GHG CEQA Significance Threshold Working Group to work with SCAQMD staff on developing GHG CEQA significance thresholds until statewide significance thresholds or guidelines are established. The SCAQMD adopted an interim 10,000 metric tons of CO_2e per-year screening level threshold for stationary source/industrial projects for which the SCAQMD is the lead agency (SCAQMD Resolution No. 08-35, December 5, 2008).

As described, the 10,000 metric tons of CO_2e per year threshold is used by SMAQMD, PCAPCD, BAAQMD, and SCAQMD for industrial and/or stationary source GHG emissions. Since the proposed project is an industrial project that includes stationary sources (i.e., diesel generators), the proposed project's GHG emissions were compared to the 10,000 metric tons of CO_2e per year quantitative threshold. The substantial evidence for this GHG emissions threshold is based on the expert opinion of various California air districts, which have applied the 10,000 metric tons of CO_2e per year threshold in numerous CEQA documents where those air districts were the lead agency.

GHG Emission Estimates

The existing condition and proposed project's estimated operational GHG emissions are presented in **Table 7**. The estimated incremental GHG emissions would be approximately 416 metric tons of CO_2e, which is well below the significance threshold of 10,000 metric tons of

[34] Placer County Air Pollution Control District, 2017 CEQA Handbook – Chapter 2, Thresholds of Significance, Accessed January 26, 2021, https://placerair.org/DocumentCenter/View/2047/Chapter-2-Thresholds-of-Significance-PDf

[35] Bay Area Air Quality Management District, CEQA Air Quality Guidelines, May 2017, Accessed January 26, 2021, http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

CO_2e. Therefore, the proposed project would have a less-than-significant impact on GHG emissions. Based on the GHG emission calculations and using standard fuel consumption estimates, existing conditions operational activities would require 385,520 gallons of diesel fuel and the proposed project operational activities would require 426,548 gallons of diesel fuel. The incremental increase in fuel usage would be 41,027 gallons of diesel fuel.[36]

TABLE 7
Annual Greenhouse Gas Emissions (metric tons)

Emission Source	Existing Condition	Proposed Project	Project Increment
Onsite Equipment	94	155	61
Generator - Crushing Plant	1,456	1,811	355
Generator - Portable Plant	914	914	-
Generator - Wash Plant	903	903	-
Haul Trucks	546	546	-
Total	**3,913**	**4,329**	**416**
Significance Threshold			10,000
Exceeds Threshold?			No

Source: RCH Group, 2021.

[36] Fuel usage is estimated using the CalEEMod output for CO2, and a 10.15 kg-CO2/gallon conversion factor, as cited in the *U.S. Energy Information Administration Voluntary Reporting of Greenhouse Gases Program*, https://www.eia.gov/environment/pdfpages/0608s(2009)index.php

Attachment A

Air Quality Calculations

The air quality analysis includes a review of criteria pollutant[1] emissions such as carbon monoxide (CO)[2], nitrogen oxides (NO_x)[3], sulfur dioxide (SO_2)[4], volatile organic compounds (VOC) as reactive organic gases (ROG)[5], particulate matter less than 10 micrometers (coarse or PM_{10}), particulate matter less than 2.5 micrometers (fine or $PM_{2.5}$).[6] Regulatory models used to estimate air quality impacts include:

- CARB EMFAC[7] emissions inventory model. EMFAC is the latest emission inventory model that calculates emission inventories and emission rates for motor vehicles operating on roads in California. This model reflects CARB's current understanding of how vehicles travel and how much they emit. EMFAC can be used to show how California motor vehicle emissions have changed over time and are projected to change in the future.

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1 Criteria air pollutants refer to those air pollutants for which the USEPA and CARB has established National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) under the Federal Clean Air Act (CAA).

2 CO is a non–reactive pollutant that is a product of incomplete combustion of organic material, and is mostly associated with motor vehicle traffic, and in wintertime, with wood–burning stoves and fireplaces.

3 When combustion temperatures are extremely high, as in aircraft, truck and automobile engines, atmospheric nitrogen combines with oxygen to form various oxides of nitrogen (NO_x). Nitric oxide (NO) and NO_2 are the most significant air pollutants generally referred to as NO_x. Nitric oxide is a colorless and odorless gas that is relatively harmless to humans, quickly converts to NO_2 and can be measured. Nitrogen dioxide has been found to be a lung irritant capable of producing pulmonary edema.

4 SO_2 is a combustion product of sulfur or sulfur–containing fuels such as coal and diesel. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter, and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

5 VOC means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions and thus, a precursor of ozone formation. ROG are any reactive compounds of carbon, excluding methane, CO, CO_2 carbonic acid, metallic carbides or carbonates, ammonium carbonate, and other exempt compounds. The terms VOC and ROG are often used interchangeably.

6 PM_{10} and $PM_{2.5}$ consists of airborne particles that measure 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs, causing adverse health effects.

7 California Air Resources Board, *EMFAC2017 User's Guide*, March 1, 2018, https://ww3.arb.ca.gov/msei/downloads/emfac2017-volume-i-users-guide.pdf and https://www.arb.ca.gov/emfac/2017/

- CARB OFFROAD[8] emissions inventory model. OFFROAD is the latest emission inventory model that calculates emission inventories and emission rates for off-road equipment such as loaders, excavators, and off-road haul trucks operating in California. This model reflects CARB's current understanding of how equipment operates and how much they emit. OFFROAD can be used to show how California off-road equipment emissions have changed over time and are projected to change in the future.
- USEPA Compilation of Air Pollutant Emission Factors (AP-42), has been published since 1972 as the primary compilation of USEPA's emission factor information. It contains emission factors and process information for more than 200 air pollution source categories. A source category is a specific industry sector or group of similar emitting sources. The emission factors have been developed and compiled from source test data, material balance studies, and engineering estimates.[9]

Air Emission Calculation Methodology

The proposed project could affect air quality during project operations (including aggregate processing plant and other processing equipment such as loaders, excavators, diesel generators, vehicular traffic on unpaved roads, basting operations, soil disturbance, and haul trucks).

On-Road Vehicles

Vehicular emissions were computed using the CARB's emission factor model, EMFAC, to estimate on-road emissions. Foreman pickup trucks used on-site were modeled as gasoline and diesel light heavy-duty trucks. Haul trucks were modeled using the diesel T7 single construction haul truck classification, which is a heavy-heavy duty truck emission factor for public vehicles. Criteria pollutant emissions associated with on-road vehicles were calculated by combining the activity information with emissions factors, in grams per mile, derived using the EMFAC emissions model. Emissions calculations were based on **Equation 1**. The EMFAC emissions factors were developed for employee vehicles and haul trucks. **Table A-1** displays the emission factors for haul trucks.

Haul truck volumes would not change as a result of the proposed project and is currently limited by the following condition of approval: haul trucks (loaded or empty) associated with the mining operation shall not exceed a daily average of 26 round trips (26 arriving and 26 departing) throughout the calendar year and shall not exceed a daily maximum of 275 round

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[8] California Air Resources Board, *Mobile Source Emissions Inventory Documentation – Off Road Diesel Equipment*, https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-documentation-road and https://ww3.arb.ca.gov/msei/ordiesel/ordas_ef_fcf_2017.pdf

[9] US Environmental Protection Agency, AP 42, Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume I, https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors

trips (275 arriving and 275 departing), with a maximum of 173 total trips occurring between the hours of 10:00 p.m. and 7:00 a.m., excluding personal employee vehicles and light-duty trucks assigned to employees. The maximum number of annual truck trips would continue to be 8,112. The number of employees would remain at 14.

Equation 1

*Emission Rate (tons/year) = Emission Factor (gram/mile) * trips per day * miles per trip * days/year * (453.59/2000 tons/gram)*

*Emission Rate (pounds/day) = Emission Factor (gram/mile) * trips per day * miles per trip * (1/453.59 pounds/gram)*

TABLE A-1
EMISSIONS FACTORS (g/mile) FOR ON-ROAD VEHICLES

Vehicle Type	Year	VOC	CO	NO_x	CO_2	SO_2	PM_{10}	$PM_{2.5}$
Haul Truck	2021	0.09	0.30	3.15	1,218	0.01	0.02	0.02
Haul Truck	2025	0.05	0.25	2.84	1,204	0.01	0.01	0.01
Haul Truck	2030	0.02	0.21	2.52	1,121	0.01	0.01	0.01
Haul Truck	2035	0.02	0.21	2.57	1,086	0.01	0.01	0.01
Haul Truck	2040	0.02	0.21	2.53	1,038	0.01	0.01	0.01
Haul Truck	2045	0.02	0.21	2.51	996	0.01	0.01	0.01
Haul Truck	2050	0.02	0.21	2.50	968	0.01	0.01	0.01

Source: CARB EMFAC Emissions Model.

Off-Road Equipment

Operation of the proposed project would require the use of heavy-duty equipment, such as loaders and excavators. This equipment would be used to load and unload material. Emission factors from the OFFROAD emissions model were used. Emissions from offroad equipment activities were estimated based on the projected activity schedule, the number of vehicles/pieces of equipment, the types of equipment/type of fuel used, vehicle/equipment utilization rates, equipment horsepower, and the calendar year.

This information was applied to criteria pollutant emissions factors, in grams per horsepower-hour, derived using the OFFROAD emissions model. **Equation 2** outlines how off-road construction equipment emissions were computed, and the emissions factors used in this assessment are summarized, by equipment type within **Table A-2.**

Onsite offroad equipment include four off-highway truck (376 horsepower), two excavator (337 horsepower), five front-end loaders (84 horsepower), and one dozer (365 horsepower) operating onsite to move materials. On average, for the existing condition, the loaders would operate 480

hours per year, the excavators would operate 450 hours per year, the onsite haul trucks would operate 350 hours per year, and the dozer would operate 500 hours per year. On average, for the proposed project, the loaders would operate 1,200 hours per year, the excavators would operate 675 hours per year, the onsite haul trucks would operate 525 hours per year, and the dozer would operate 750 hours per year.

Equation 2

*Emission Rate (tons/year) = Emission Factor (gram/hp-hour) * size (hp) * hours of operation per year * Load Factor * (453.59/2000 tons/gram)*

*Emission Rate (pounds/day) = Emission Factor (gram/hp-hour) * size (hp) * hours of operation per day * Load Factor * (1/453.59 pounds/gram)*

TABLE A-2
EMISSIONS FACTORS (g/hp-hour) FOR OFFROAD EQUIPMENT

Vehicle Type	VOC	CO	NO_x	CO_2	SO_2	PM_{10}	$PM_{2.5}$	CH_4
Diesel Excavator	0.04	0.40	0.20	201	<0.01	0.01	0.01	<0.01
Diesel Off-Highway Trucks	0.06	0.44	0.30	202	<0.01	0.01	0.01	<0.01
Diesel Dozer	0.13	1.06	1.10	210	<0.01	0.05	0.05	<0.01
Diesel Loaders	0.06	1.29	0.62	195	<0.01	0.01	0.01	<0.01

Source: CARB OFFROAD Emissions Model.

Handling and Storage

Fugitive particulate matter emissions are expected from the handling and storage of raw materials from aggregate processing. The methodology for the calculation of particulate emissions from the handling and storage of raw materials is described in Section 13.2.4 of USEPA's AP-42 for aggregate handling and storage piles. The quantity of dust emissions from aggregate handling and storage operations varies with the volume of aggregate passing through the storage cycle. The emission factor for the quantity of emissions per quantity of material was estimated using the following equation:

$$E = [0.00112*(\{[G/5]^{1.3}\}/\{[H/2]^{1.4}\})]*[I/J]$$

where:

G = Mean wind speed in miles per hour, 13 mph

H = Moisture Content of soil, 2.0 (dry)

I = pounds of material handled

J = 2,000 (conversion factor, pounds to tons)

The emission factor used in the analysis for handling and storage activities was 0.00388 pounds of PM_{10} per ton of material processed (uncontrolled) and 0.00116 pounds of PM_{10} per ton of material processed (controlled). The $PM_{2.5}$ emissions were assumed to be 15 percent of the PM_{10} emissions (based on AP-42). To account for emission controls, a control efficiency of 80 percent (based on AP-42) from watering was also applied.

Unpaved Vehicle Movement

When a vehicle travels over an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. Additionally, the turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed. The following is the equation used to develop the emission factor is:

$$EF = k\,(S/30)^{a}\,(W/3)^{b}\,[(365-p)/365]\,(1-CE)$$

where:

$k\ (PM_{10})$ = 2.1 (empirical constant)

s = Silt content of 8.3 percent (use whole number value)

W = Mean vehicle weight, 33 tons unloaded and 69 tons loaded

p = Number of days with measurable precipitation (59 days)

a = 0.7 (empirical constant)

b = 0.45 (empirical constant)

CE = Control efficiency rate of 80 percent

The uncontrolled emission factor for unpaved roads was 5.6 and 4.0 pounds per vehicle mile for loaded and unloaded trucks, respectively. The controlled emission factor for unpaved roads was 1.0 and 0.8 pounds per vehicle mile for loaded and unloaded trucks, respectively. The $PM_{2.5}$ emissions were assumed to be 15 percent of the PM_{10} emissions (based on AP-42). To account for emission controls, a control efficiency of 80 percent (based on AP-42 Section 13.2.2) from watering was also applied. Finally, each vehicle was assumed to travel a distance of ¼ of a mile on unpaved area prior to the haul truck access road.

Aggregate Processing

In the general aggregate processing, rock and crushed stone are loosened by drilling and blasting, loaded by front-end loader into large haul trucks that transport the material to the processing operations. Processing operations include crushing, screening, size classification, conveyance, material handling and storage operations. Air emissions include PM_{10} and $PM_{2.5}$.

Fugitive dust sources include the transfer of aggregate, truck loading and unloading, and wind erosion from aggregate storage piles. The amount of fugitive emissions generated during the transfer of the aggregate depends primarily on the surface moisture content of these materials.

The air emission calculations accounted for the production level, the number, types, and size of equipment, the type of material processed, and emission controls. The emission factors were determined using the methodology found in Section 11.19 of USEPA's AP-42. **Table A-3** presents the emission factors for the aggregate processing operations. A ratio of 0.15 is applied to determine the amount of $PM_{2.5}$ per mass of PM_{10} based on AP-42. Emissions control is based on periodic watering.

The aggregate processing plant is rated at 250 tons per hour. The average daily production is 3,000 tons and the annual production is 100,000 tons for the existing condition. The aggregate processing plant has one jaw crusher, two cone crushers, two deck conveyors, and seven secondary conveyers. For the proposed project, the annual production would be 200,000 tons.

TABLE A-3
EMISSIONS FACTORS (pounds/tons or material) FOR AGGREGATE PROCESSING

	Uncontrolled	Controlled
Emission Point	**PM_{10}**	**PM_{10}**
Jaw Crusher	0.0024	0.00054
Cone Crusher	0.0024	0.00054
Primary Screening	0.0087	0.00074
Deck Conveyor	0.0011	0.000046
Secondary Crusher	0.0024	0.00054
Secondary Conveyor	0.0011	0.000046
Secondary Screen	0.072	0.0022

Source: Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, Section 11.19.2 Crushed Stone Processing, November 2006.

The sand washing plant processes sand from its raw state into products that meet various specifications. The process requirements vary depending on the input and desired output, but the plant typically scrub, liberate, deslime, wash, classify, decontaminate and dewater the sand, as well as process the effluent stream that results. The wash plant has one feeder, one screen, and two conveyors. The sand plant has one feeder, three screens, and eight conveyors. The emission factors were determined using the methodology found in Section 11.19 of USEPA's AP-42. **Table A-4** presents the emission factors for the sand and wash plant operations. A ratio of 0.15 is applied to determine the amount of $PM_{2.5}$ per mass of PM_{10} based on AP-42. The lime plant and sand washing plant would not increase production levels as a result of the proposed project.

TABLE A-4
EMISSIONS FACTORS (pounds/tons of material) FOR SAND WASH PLANT

	Uncontrolled	Controlled
Emission Point	**PM_{10}**	**PM_{10}**
Feeder	0.0024	0.00054
Primary Screening	0.0087	0.00074
Conveyor	0.0011	0.000046

Source: Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, Section 11.19.2 Crushed Stone Processing, November 2006.

Blasting Operations

Air emissions from blasting include PM_{10} and $PM_{2.5}$. The emission factor for the quantity of emissions (in pounds) per blast event was estimated using the following equation from Section 11.9 of USEPA's AP-42:

$$EF = 0.000014 * (A)^{1.5}$$

where:

EF = PM_{30} emission factor (pounds/blast)

A = blast area (6,750 or 10,125 square feet)

A ratio of 0.52 was applied to determine the amount of PM_{10} per PM_{30} based on AP-42. A ratio of 0.15 was applied to determine the amount of $PM_{2.5}$ per mass PM_{10} based on AP-42. The PM_{10} emission factor used in the analysis was 4.0 pounds per blast event. Currently, the project site conducts blasting operations about three to seven times per year. The proposed project would conduct the same number of blasting operations, but the basting operations would be larger. Blasting operations only during daylight hours, normally middle of the day. During the existing conditions, approximately ½ acre is blasted annually (approximately 6,750 square feet per blasting event). Under the proposed project, approximately one acre would be blasted annually (approximately 10,125 square feet per blasting event).

Diesel Generators

The Lassen County APCD requires permits for proposed construction, alteration or replacement of equipment or facilities which may cause the issuance of air contaminants. The Ward Lake Pit maintains a permit to operate (PTO-19-140: expiration date March 31, 2024) for onsite equipment such as a hot mix asphalt plant, a lime slurry mix plant, a concrete plant, a crushing plant, and a sand wash plant. As of the permit issuance, the facility has five diesel generators with the following upgrades or replacements planned:

- One 750 horsepower (hp) diesel generator associated with the asphalt plant, which has been switched to line power.
- One 750 hp diesel generator associated with the aggregate plant, which will be switched to line power by January of 2022.
- One 755 hp diesel generator associated with the aggregate plant, which will be updated with Air District approved Tier 4 engine[10] or switched to line power by January of 2023.
- One 475 hp diesel generator associated with the lime plant, which will be updated with Air District approved Tier 4 engine or switched to line power by January of 2024.
- One 470 hp diesel generator associated with the wash plant, which will be updated with Air District approved Tier 4 engine or switched to line power by January of 2025.

All reciprocating internal combustion engines operate by the same basic process. A combustible mixture is first compressed in a small volume between the head of a piston and its surrounding cylinder. The mixture is then ignited, and the resulting high-pressure products of combustion push the piston through the cylinder. This movement is converted from linear to rotary motion by a crankshaft. The piston returns, pushing out exhaust gases, and the cycle is repeated. The emission factors were based on information contained within the manufacturer's specification sheet and USEPA's AP-42 Section 3.4 and Ward Lake Facility Permit to Operate from Lassen County APCD (PTO-19-140). **Table A-5** presents the emission factors for the diesel generators.

TABLE A-5
EMISSIONS FACTORS (pounds/hp-hour) FOR DIESEL GENERATORS

Pollutant	470&475 hp	750&755 hp
NOx	0.01	0.02
CO	2.03E-03	1.46E-03
SOx	2.05E-03	0.01
PM10/PM2.5	2.34E-04	1.72E-04
CO_2	1.15	1.16
TOC (ROG)	1.10E-04	1.32E-04

Source: Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, Section 3.4, Large Stationary Diesel And All Stationary Dual-fuel Engines, October 1996 and Ward Lake Facility Permit to Operate from Lassen County APCD (PTO-19-140.

[10] USEPA has implemented regulations and a tiering system to reduce emissions from off-road equipment with increasing combustion efficiency (i.e., decreasing emissions) where Tier 1 is the least efficient (greatest emissions) and Tier 4 is the most efficient (least emissions). The regulations have been implemented over time such that Tier 1 was phased out in the 1990's and Tier 2 was required, followed by implementation of Tier 3 and Tier 4 by 2015 with a phase out of Tier 2.

Attachment A

Emission Calculations

- Diesel Generators – Existing Condition
- Diesel Generators – Proposed Project
- Onsite Offroad Equipment – Existing Condition
- Onsite Offroad Equipment – Proposed Project
- Aggregate Processing Plant - Existing Condition
- Aggregate Processing Plant - Proposed Project
- Wash Plant - Existing Condition
- Wash Plant - Proposed Project
- Sand Plant - Existing Condition
- Sand Plant - Proposed Project
- Fugitive Dust Emissions - Existing Condition
- Fugitive Dust Emissions - Proposed Project

District-Approved Emissions for Diesel Generators - Existing Condition

Pollutants	EF (lb/hp-hr)	HP	Annual Emissions (tons)	Daily Emissions (lbs)
NOx	0.02	750	27.2	200
CO	1.46E-03	750	2.01	14.8
SOx	0.01	750	16.8	123
PM10/PM2.5	1.72E-04	750	0.24	1.75
CO2	1.16	750	1,605	11,778
TOC (ROG)	1.32E-04	750	0.18	1.34

Pollutants	EF (lb/hp-hr)	HP	Annual Emissions (tons)	Daily Emissions (lbs)
NOx	0.01	475	11.9	87.5
CO	2.03E-03	475	1.78	13.0
SOx	2.05E-03	475	1.80	13.2
PM10/PM2.5	2.34E-04	475	0.20	1.50
CO2	1.15	475	1,008	7,395
TOC (ROG)	1.10E-04	475	0.10	0.71

Pollutants	EF (lb/hp-hr)	HP	Annual Emissions (tons)	Daily Emissions (lbs)
NOx	0.01	469	11.8	86.4
CO	2.03E-03	469	1.76	12.9
SOx	2.05E-03	469	1.78	13.0
PM10/PM2.5	2.34E-04	469	0.20	1.48
CO2	1.15	469	996	7,308
TOC (ROG)	1.10E-04	469	0.10	0.70

Pollutants	Annual Emissions (tons)	Daily Emissions (lbs)
NOx	50.9	374
CO	5.55	40.7
SOx	20.4	149
PM10/PM2.5	0.65	4.73
CO2	3,609	26,481
TOC (ROG)	0.38	2.75

District-Approved Emissions for Diesel Generators - Proposed Project

Pollutants	EF (lb/hp-hr)	HP	Annual Emissions (tons)	Daily Emissions (lbs)
NOx	0.02	750	33.9	200
CO	1.46E-03	750	2.50	14.8
SOx	0.01	750	20.9	123
PM10/PM2.5	1.72E-04	750	0.30	1.75
CO2	1.16	750	1,997	11,778
TOC (ROG)	1.32E-04	750	0.23	1.34

Pollutants	EF (lb/hp-hr)	HP	Annual Emissions (tons)	Daily Emissions (lbs)
NOx	0.01	475	11.9	87.5
CO	2.03E-03	475	1.78	13.0
SOx	2.05E-03	475	1.80	13.2
PM10/PM2.5	2.34E-04	475	0.20	1.50
CO2	1.15	475	1,008	7,395
TOC (ROG)	1.10E-04	475	0.10	0.71

Pollutants	EF (lb/hp-hr)	HP	Annual Emissions (tons)	Daily Emissions (lbs)
NOx	0.01	469	11.8	86.4
CO	2.03E-03	469	1.76	12.9
SOx	2.05E-03	469	1.78	13.0
PM10/PM2.5	2.34E-04	469	0.20	1.48
CO2	1.15	469	996	7,308
TOC (ROG)	1.10E-04	469	0.10	0.70

Pollutants	Annual Emissions (tons)	Daily Emissions (lbs)
NOx	57.6	374
CO	6.04	40.7
SOx	24.5	149
PM10/PM2.5	0.70	4.73
CO2	4,000	26,481
TOC (ROG)	0.42	2.75

Onsite Offroad Equipment - Existing Conditions

	Emission Factor (g/hp-hr)									Number of	Load	Daily	Annual	Daily Emissions (lbs/day)						Annual Emissions (tons/year)							
Source Type	ROG	CO	NOx	CO2	SOx	PM10	PM2.5	CH4	HP	Equipment	Factor	Hours	Hours	ROG	CO	NOx	SOx	PM10	PM2.5	ROG	CO	NOx	CO2	SOx	PM10	PM2.5	CH4
Diesel Excavator	0.04	0.40	0.20	201	0.00	0.01	0.01	0.00	**337**	**2**	0.38	**6**	**450**	**0.14**	**1.35**	**0.67**	**0.01**	**0.02**	**0.02**	**0.01**	**0.05**	**0.03**	**25.6**	**0.00**	**0.00**	**0.00**	**0.00**
Diesel Off-Highway Trucks	0.06	0.44	0.30	202	0.00	0.01	0.01	0.00	**376**	**4**	0.38	**5**	**350**	**0.41**	**2.77**	**1.87**	**0.01**	**0.07**	**0.06**	**0.01**	**0.10**	**0.07**	**44.6**	**0.00**	**0.00**	**0.00**	**0.00**
Diesel Dozer	0.13	1.06	1.10	210	0.00	0.05	0.05	0.00	**365**	**1**	0.40	**6**	**500**	**0.25**	**2.04**	**2.12**	**0.00**	**0.10**	**0.09**	**0.01**	**0.09**	**0.09**	**17.0**	**0.00**	**0.00**	**0.00**	**0.00**
Diesel Loaders	0.06	1.29	0.62	195	0.00	0.01	0.01	0.00	**84**	**5**	0.37	**7**	**480**	**0.15**	**3.08**	**1.47**	**0.00**	**0.04**	**0.03**	**0.01**	**0.11**	**0.05**	**16.0**	**0.00**	**0.00**	**0.00**	**0.00**
												24	450	0.94	9.23	6.13	0.03	0.22	0.21	0.03	0.34	0.23	103	0.00	0.01	0.01	0.00

Onsite Offroad Equipment - Proposed Project

	Emission Factor (g/hp-hr)												Daily Emissions (lbs/day)								Annual Emissions (tons/year)					
Source Type	ROG	CO	NOx	CO2	SOx	PM10	PM2.5	CH4	HP	Number of Equipment	Load Factor	Daily Hours	Annual Hours	ROG	CO	NOx	SOx	PM10	PM2.5	ROG	CO	NOx	CO2	SOx	PM10	PM2.5	CH4
Diesel Excavator	0.04	0.40	0.20	201	0.00	0.01	0.01	0.00	**337**	**2**	0.38	**6**	**675**	**0.14**	**1.35**	**0.67**	**0.01**	**0.02**	**0.02**	**0.01**	**0.08**	**0.04**	**38.4**	**0.00**	**0.00**	**0.00**	**0.00**
Diesel Off-Highway Trucks	0.06	0.44	0.30	202	0.00	0.01	0.01	0.00	**376**	**4**	0.38	**5**	**525**	**0.41**	**2.77**	**1.87**	**0.01**	**0.07**	**0.06**	**0.02**	**0.15**	**0.10**	**66.9**	**0.00**	**0.00**	**0.00**	**0.00**
Diesel Dozer	0.13	1.06	1.10	210	0.00	0.05	0.05	0.00	**365**	**1**	0.40	**6**	**750**	**0.25**	**2.04**	**2.12**	**0.00**	**0.10**	**0.09**	**0.02**	**0.13**	**0.13**	**25.4**	**0.00**	**0.01**	**0.01**	**0.00**
Diesel Loaders	0.06	1.29	0.62	195	0.00	0.01	0.01	0.00	**84**	**5**	0.37	**7**	**1,200**	**0.15**	**3.08**	**1.47**	**0.00**	**0.04**	**0.03**	**0.01**	**0.26**	**0.13**	**39.9**	**0.00**	**0.00**	**0.00**	**0.00**
												24	816	0.94	9.23	6.13	0.03	0.22	0.21	0.06	0.61	0.39	171	0.00	0.01	0.01	0.00

Aggregate Procesing Plant - Existing Conditions

Operating Assumptions

Hourly Process Rate (ton)	250		
Daily Process Rate (ton)	3,000		
Annual Process Rate (ton)	100,000	1,440	hours/year

						Controlled				Uncontrolled			
Equipment	Process Rate (ton/hr)	Number of Transfers	Daily Operation (hours)	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	PM10 Daily (lb/day)	PM10 Annual (ton/yr)	PM2.5 Daily (lb/day)	PM2.5 Annual (ton/yr)	PM10 Daily (lb/day)	PM10 Annual (ton/yr)	PM2.5 Daily (lb/day)	PM2.5 Annual (ton/yr)
Jaw Crusher	250	1	12	0.0024	0.00054	1.62	0.03	0.24	0.00	7.20	0.12	1.08	0.02
Cone Crusher	250	2	12	0.0024	0.00054	3.24	0.03	0.49	0.00	14.4	0.12	2.16	0.02
Primary Screening	250	1	12	0.0087	0.00074	2.22	0.04	0.33	0.01	26.1	0.44	3.92	0.07
Deck Conveyor	250	2	12	0.0011	0.000046	0.28	0.00	0.04	0.00	6.60	0.06	0.99	0.01
Secondary Crusher	250	1	12	0.0024	0.00054	1.62	0.03	0.24	0.00	7.20	0.12	1.08	0.02
Secondary Conveyor	250	7	12	0.0011	0.000046	0.97	0.00	0.14	0.00	23.1	0.06	3.47	0.01
Secondary Screen	250	1	12	0.072	0.0022	6.60	0.11	0.99	0.02	216	3.60	32.4	0.54
Total Aggregate Processing Plant Emissions						***16.5***	***0.23***	***2.48***	***0.03***	***301***	***4.51***	***45.1***	***0.68***

Wash Plant - Existing Conditions

Operating Assumptions

Hourly Process Rate (ton)	250		
Daily Process Rate (ton)	3,000		
Annual Process Rate (ton)	100,000	1,440	hours/year

						Controlled				Uncontrolled			
Equipment	**Process Rate (ton/hr)**	**Number of Transfers**	**Daily Operation (hours)**	**Uncontrolled Emission Factor (lb/ton)**	**Controlled Emission Factor (lb/ton)**	**PM10 Daily (lb/day)**	**PM10 Annual (ton/yr)**	**PM2.5 Daily (lb/day)**	**PM2.5 Annual (ton/yr)**	**PM10 Daily (lb/day)**	**PM10 Annual (ton/yr)**	**PM2.5 Daily (lb/day)**	**PM2.5 Annual (ton/yr)**
Feeder	250	1	12	0.0024	0.00054	1.62	0.03	0.24	0.00	7.20	0.12	1.08	0.02
Primary Screening	250	1	12	0.0087	0.00074	2.22	0.04	0.33	0.01	26.1	0.44	3.92	0.07
Conveyor	250	2	12	0.0011	0.000046	0.28	0.00	0.04	0.00	6.60	0.06	0.99	0.01
Total Wash Plant Emissions						***4.12***	***0.07***	***0.62***	***0.01***	***39.9***	***0.61***	***5.99***	***0.09***

Sand Plant - Existing Conditions

Operating Assumptions

Hourly Process Rate (ton)	250		
Daily Process Rate (ton)	3,000		
Annual Process Rate (ton)	100,000	1,440	hours/year

						Controlled				Uncontrolled			
Equipment	Process Rate (ton/hr)	Number of Transfers	Daily Operation (hours)	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	PM10 Daily (lb/day)	PM10 Annual (ton/yr)	PM2.5 Daily (lb/day)	PM2.5 Annual (ton/yr)	PM10 Daily (lb/day)	PM10 Annual (ton/yr)	PM2.5 Daily (lb/day)	PM2.5 Annual (ton/yr)
Feeder	250	1	12	0.0024	0.00054	1.62	0.03	0.24	0.00	7.2	0.12	1.08	0.02
Primary Screening	250	3	12	0.0087	0.00074	6.66	0.04	1.00	0.01	78.3	0.44	11.7	0.07
Conveyor	250	8	12	0.0011	0.000046	1.10	0.00	0.17	0.00	26.4	0.06	3.96	0.01
Total Sand Plant Emissions						***9.38***	***0.07***	***1.41***	***0.01***	***112***	***0.61***	***16.8***	***0.09***

Aggregate Procesing Plant - Proposed Project

Operating Assumptions

Hourly Process Rate (ton)	250		
Daily Process Rate (ton)	3,000		
Annual Process Rate (ton)	200,000	2,160	hours/year

						Controlled				Uncontrolled			
Equipment	Process Rate (ton/hr)	Number of Transfers	Daily Operation (hours)	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	PM10 Daily (lb/day)	PM10 Annual (ton/yr)	PM2.5 Daily (lb/day)	PM2.5 Annual (ton/yr)	PM10 Daily (lb/day)	PM10 Annual (ton/yr)	PM2.5 Daily (lb/day)	PM2.5 Annual (ton/yr)
Jaw Crusher	250	1	12	0.0024	0.00054	1.62	0.05	0.24	0.01	7.20	0.24	1.08	0.04
Cone Crusher	250	2	12	0.0024	0.00054	3.24	0.05	0.49	0.01	14.4	0.24	2.16	0.04
Primary Screening	250	1	12	0.0087	0.00074	2.22	0.07	0.33	0.01	26.1	0.87	3.92	0.13
Deck Conveyor	250	2	12	0.0011	0.000046	0.28	0.00	0.04	0.00	6.60	0.11	0.99	0.02
Secondary Crusher	250	1	12	0.0024	0.00054	1.62	0.05	0.24	0.01	7.20	0.24	1.08	0.04
Secondary Conveyor	250	7	12	0.0011	0.000046	0.97	0.00	0.14	0.00	23.1	0.11	3.47	0.02
Secondary Screen	250	1	12	0.072	0.0022	6.60	0.22	0.99	0.03	216	7.20	32.4	1.08
Total Aggregate Processing Plant Emissions						***16.5***	***0.47***	***2.48***	***0.07***	***301***	***9.01***	***45.1***	***1.35***

Wash Plant - Proposed Project

Operating Assumptions

Hourly Process Rate (ton)	250		
Daily Process Rate (ton)	3,000		
Annual Process Rate (ton)	100,000	2,160	hours/year

Equipment	Process Rate (ton/hr)	Number of Transfers	Daily Operation (hours)	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	Controlled PM10 Daily (lb/day)	Controlled PM10 Annual (ton/yr)	Controlled PM2.5 Daily (lb/day)	Controlled PM2.5 Annual (ton/yr)	Uncontrolled PM10 Daily (lb/day)	Uncontrolled PM10 Annual (ton/yr)	Uncontrolled PM2.5 Daily (lb/day)	Uncontrolled PM2.5 Annual (ton/yr)
Feeder	250	1	12	0.0024	0.00054	1.62	0.03	0.24	0.00	7.20	0.12	1.08	0.02
Primary Screening	250	1	12	0.0087	0.00074	2.22	0.04	0.33	0.01	26.1	0.44	3.92	0.07
Conveyor	250	2	12	0.0011	0.000046	0.28	0.00	0.04	0.00	6.60	0.06	0.99	0.01
Total Wash Plant Emissions						***4.12***	***0.07***	***0.62***	***0.01***	***39.9***	***0.61***	***5.99***	***0.09***

Sand Plant - Proposed Project

Operating Assumptions

Hourly Process Rate (ton)	250		
Daily Process Rate (ton)	3,000		
Annual Process Rate (ton)	100,000	2,160	hours/year

						Controlled				Uncontrolled			
Equipment	Process Rate (ton/hr)	Number of Transfers	Daily Operation (hours)	Uncontrolled Emission Factor (lb/ton)	Controlled Emission Factor (lb/ton)	PM10 Daily (lb/day)	PM10 Annual (ton/yr)	PM2.5 Daily (lb/day)	PM2.5 Annual (ton/yr)	PM10 Daily (lb/day)	PM10 Annual (ton/yr)	PM2.5 Daily (lb/day)	PM2.5 Annual (ton/yr)
Feeder	250	1	12	0.0024	0.00054	1.62	0.03	0.24	0.00	7.20	0.12	1.08	0.02
Primary Screening	250	3	12	0.0087	0.00074	6.66	0.04	1.00	0.01	78.3	0.44	11.7	0.07
Conveyor	250	8	12	0.0011	0.000046	1.10	0.00	0.17	0.00	26.4	0.06	3.96	0.01
Total Sand Plant Emissions						***9.38***	***0.07***	***1.41***	***0.01***	***112***	***0.61***	***16.8***	***0.09***

Fugitive PM Emissions - Existing Conditions

Fugitive PM from Trucks on Unpaved Surfaces

Operating Assumptions

Haul road length =	0.25	mile	3,000	tons/day		
Trucks/day =	23		2,000	cy/day		
VMT =	12	miles/day	100,000	tons/year		
Days/year	120	days	66,667	cy/year	1,440	hours/year

Calculated Emission Factor for travel on unpaved roads
PM10 EF = 2.1*(S/12)^0.7*(W/3)^0.45*[(365-K)/365]
S = Silt content, 8.3%
W = Mean vehicle weight, 33 tons unloaded, 69 tons loaded
K = Mean # of days with rain above 0.01 inches, 59

Loaded Emission Factor =	5.58	pounds pm10/vmt
Unloaded Emission Factor =	4.00	pounds pm10/vmt

	PM10 Uncontrolled	PM10 Controlled	PM2.5 Uncontrolled	PM2.5 Controlled
Unpaved Fugitive Emissions (pounds/day)	111	22.2	16.6	3.33
Unpaved Fugitive Emissions (tons/year)	6.65	1.33	1.00	0.20

Fugitive PM Eissions from Material Handling

E = [0.00112*({[G/5]^1.3}/{[H/2]^1.4})]*[I/J]

G = Mean wind speed in miles per hour, 13 mph
H = Moisture Content of soil, 2.0 (dry)
I = lbs of material handled
J = 2,000 (conversion factor, lbs to tons)

	PM10 Uncontrolled	PM10 Controlled	PM2.5 Uncontrolled	PM2.5 Controlled
Material Handling Fugitive Emissions (pounds/day)	11.6	2.33	1.75	0.35
Material Handling Fugitive Emissions (tons/year)	0.70	0.14	0.10	0.02

Blasting

E = 0.000014 (A)^1.5 from AP-42 11.9

E= PM30 emissions
A = horizontal area

PM -10 emissions = 0.52 x E

Two areas of adjacent benches with shots 15' apart
Approx area = 6,750 sf

E=	7.76	pounds of TSP/blast	
PM10 =	**4.04**	**pounds/blast**	
	28.3	pounds/year	7 blasts/year
PM2.5 =	**0.61**	**pounds/blast**	
	4.24	pounds/year	

Fugitive PM Emissions - Proposed Project

Fugitive PM from Trucks on Unpaved Surfaces

Operating Assumptions

Haul road length =	0.25	mile	3,000	tons/day		
Trucks/day =	23		2,000	cy/day		
VMT =	12	miles/day	200,000	tons/year		
Days/year	180	days	133,333	cy/year	2,160	hours/year

Calculated Emission Factor for travel on unpaved roads
PM10 EF = 2.1*(S/12)^0.7*(W/3)^0.45*[(365-K)/365]
S = Silt content, 8.3%
W = Mean vehicle weight, 33 tons unloaded, 69 tons loaded
K = Mean # of days with rain above 0.01 inches, 59

Loaded Emission Factor =	5.58	pounds pm10/vmt
Unloaded Emission Factor =	4.00	pounds pm10/vmt

	PM10 Uncontrolled	PM10 Controlled	PM2.5 Uncontrolled	PM2.5 Controlled
Unpaved Fugitive Emissions (pounds/day)	111	22.2	16.6	3.33
Unpaved Fugitive Emissions (tons/year)	9.98	2.00	1.50	0.30

Fugitive PM Eissions from Material Handling

E = [0.00112*({[G/5]^1.3}/{[H/2]^1.4})]*[I/J]

G = Mean wind speed in miles per hour, 13 mph
H = Moisture Content of soil, 2.0 (dry)
I = lbs of material handled
J = 2,000 (conversion factor, lbs to tons)

	PM10 Uncontrolled	PM10 Controlled	PM2.5 Uncontrolled	PM2.5 Controlled
Material Handling Fugitive Emissions (pounds/day)	11.6	2.33	1.75	0.35
Material Handling Fugitive Emissions (tons/year)	1.05	0.21	0.16	0.03

Blasting

E = 0.000014 (A)^1.5 from AP-42 11.9

E= PM30 emissions
A = horizontal area

PM -10 emissions = 0.52 x E

Two areas of adjacent benches with shots 15' apart
Approx area = 10,125 sf

E=	14.3	pounds of TSP/blast	
PM10 =	**7.42**	**pounds/blast**	
	51.9	pounds/year	7 blasts/year
PM2.5 =	**1.11**	**pounds/blast**	
	7.79	pounds/year	

Attachment B

Health Risk Assessment Methodology, Assumptions, and Results

A health risk assessment (HRA) is accomplished in four steps: 1) hazards identification, 2) exposure assessment, 3) toxicity assessment, and 4) risk characterization. These steps cover the estimation of air emissions, the estimation of the air concentrations resulting from a dispersion analysis, the incorporation of the toxicity of the pollutants emitted, and the characterization of the risk based on exposure parameters such as breathing rate, age adjustment factors, and exposure duration; each depending on receptor type (i.e., residence, school, daycare centers, hospitals, senior care facilities, recreational areas, adult, infant, child).

This HRA was conducted in accordance with technical guidelines developed by federal, state, and regional agencies, including U.S. Environmental Protection Agency (USEPA), California Environmental Protection Agency (CalEPA), and California Office of Environmental Health Hazard Assessment (OEHHA) *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*.[1] This HRA addresses the diesel particulate matter (DPM) emissions from generators and haul trucks.

According to CalEPA, a HRA should not be interpreted as the expected rates of cancer or other potential human health effects, but rather as estimates of potential risk or likelihood of adverse effects based on current knowledge, under a number of highly conservative assumptions and the best assessment tools currently available.

TERMS AND DEFINITIONS

As the practice of conducting a HRA is particularly complex and involves concepts that are not altogether familiar to most people, several terms and definitions are provided that are considered essential to the understanding of the approach, methodology and results:

Acute effect – a health effect (non-cancer) produced within a short period of time (few minutes to several days) following an exposure to toxic air contaminants (TAC).

Cancer risk – the probability of an individual contracting cancer from a lifetime (i.e., 70 year) exposure to TAC such as DPM in the ambient air.

Chronic effect – a health effect (non-cancer) produced from a continuous exposure occurring over an extended period of time (weeks, months, years).

[1] Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, March 6, 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html.

Hazard Index (HI) – the unitless ratio of an exposure level over the acceptable reference dose. The HI can be applied to multiple compounds in an additive manner.

Hazard Quotient (HQ) – the unitless ratio of an exposure level over the acceptable reference dose. The HQ is applied to individual compounds.

Toxic Air Contaminants – any air pollutant that is capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). The current California list of TAC lists approximately 200 compounds, including particulate emissions from diesel-fueled engines.

Human Health Effects - comprise disorders such as eye watering, respiratory or heart ailments, and other (i.e., non-cancer) related diseases.

Health Risk Assessment – an analysis designed to predict the generation and dispersion of TAC in the outdoor environment, evaluate the potential for exposure of human populations, and to assess and quantify both the individual and population-wide health risks associated with those levels of exposure.

Incremental – under CEQA, the net difference (or change) in conditions or impacts when comparing the baseline to future year project conditions.

Maximum exposed individual (MEI) – an individual assumed to be located at the point where the highest concentrations of TAC, and therefore, health risks are predicted to occur.

Non-cancer risks – health risks such as eye watering, respiratory or heart ailments, and other non-cancer related diseases.

Receptors – the locations where potential health impacts or risks are predicted (i.e., schools, residences, and recreational sites).

LIMITATIONS AND UNCERTAINTIES

There are a number of important limitations and uncertainties commonly associated with a HRA due to the wide variability of human exposures to TAC, the extended timeframes over which the exposures are evaluated, and the inability to verify the results. Limitations and uncertainties associated with the HRA and identified by the CalEPA include: (a.) lack of reliable monitoring data; (b.) extrapolation of toxicity data in animals to humans; (c.) estimation errors in calculating TAC emissions; (d.) concentration prediction errors with dispersion models; and (e.) the variability in lifestyles, fitness and other confounding factors of the human population. This HRA was performed using the best available data and methodologies, notwithstanding the following uncertainties:

- There are uncertainties associated with the estimation of emissions from project activities. Where project-specific data, such as emission factors, are not available, default assumptions in emission models were used.
- The limitations of the air dispersion model provide a source of uncertainty in the estimation of exposure concentrations. According to USEPA, errors due to the limitation of the algorithms implemented in the air dispersion model in the highest estimated concentrations of +/- 10 percent to 40 percent are typical.[2]
- The source parameters used to model emission sources add uncertainty. For all emission sources, the source parameters used source-specific, recommended as defaults, or expected to produce more conservative results. Discrepancies might exist in actual emissions characteristics of an emission source and its representation in the dispersion model.
- The exposure duration estimates do not take into account that people do not usually reside at the same location for 30 years and that other exposures (i.e., school children) are also of much shorter durations than was assumed in this HRA. This exposure duration is a highly conservative assumption, since most people do not remain at home all day and on average residents change residences every 11 to 12 years. In addition, this assumption adopts that residents are experiencing outdoor concentrations for the entire exposure period.
- For the risk and hazards calculations as well as the cumulative health impact, numerous assumptions must be made in order to estimate human exposure to pollutants. These assumptions include parameters such as breathing rates, exposure time and frequency, exposure duration, and human activity patterns. While a mean value derived from scientifically defensible studies is the best estimate of central tendency, most of the exposure variables used in this HRA are high-end estimates. The combination of several high-end estimates used as exposure parameters may substantially overestimate pollutant intake. The excess lifetime cancer risks calculated in this HRA are therefore likely to be higher than may be required to be protective of public health.
- The Cal/EPA cancer potency factor for DPM was used to estimate cancer risks associated with exposure to DPM emissions from construction activities. However, the cancer potency factor derived by Cal/EPA for DPM is highly uncertain in both the estimation of response and dose. In the past, due to inadequate animal test data and epidemiology data on diesel exhaust, the International Agency for Research on Cancer (IARC), a branch of the World Health Organization, had classified DPM as Probably Carcinogenic

[2] United States Environmental Protection Agency, *Guideline on Air Quality Models (Revised), 40 Code of Federal Regulations, Part 51, Appendix W,* November 2005, https://www3.epa.gov/scram001/guidance/guide/appw_05.pdf

to Humans (Group 2); the USEPA had also concluded that the existing data did not provide an adequate basis for quantitative risk assessment.[3] However, based on two recent scientific studies,[4] IARC recently re-classified DPM as Carcinogenic to Humans to Group 1,[5] which means that the agency has determined that there is "sufficient evidence of carcinogenicity" of a substance in humans and represents the strongest weight-of-evidence rating in IARC's carcinogen classification scheme. This determination by the IARC may provide additional impetus for the USEPA to identify a quantitative dose-response relationship between exposure to DPM and cancer.

In summary, the estimated health impacts are based primarily on a series of conservative assumptions related to predicted environmental concentrations, exposure, and chemical toxicity. The use of conservative assumptions tends to produce upper-bound estimates of risk. USEPA acknowledges this uncertainty by stating: "the methods used [to estimate risk] are conservative, meaning that the real risks from the source may be lower than the calculations, but it is unlikely that they will be higher." The USEPA notes that the conservative assumptions used in a HRA are intended to assure that the estimated risks do not underestimate the actual risks posed by a site and that the estimated risks do not necessarily represent actual risks experienced by populations at or near a site.[6]

HAZARDS IDENTIFICATION

California Air Resources Board (CARB) has developed a list of TAC, where a TAC is "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health (California Health and Safety Code Section 39655). All USEPA hazardous air pollutants are TAC. CARB administers the Air Toxics "Hot Spots" program under Assembly Bill 2588 "Hot Spots" Information and Assessment Act, which requires periodic local review of facilities which emit TAC. Local air agencies periodically must prioritize stationary sources of TAC and prepare health risk assessments for high-priority sources.

Diesel exhaust is a complex mixture of numerous individual gaseous and particulate compounds emitted from diesel-fueled combustion engines. Diesel particulate matter is formed

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[3] United States Environmental Protection Agency, *Health Assessment Document for Diesel Engine Exhaust*, May 2002, https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=29060

[4] Attfield MD, Schleiff PL, Lubin JH, Blair A, Stewart PA, Vermeulen R, Coble JB, Silverman DT, *The Diesel Exhaust in Miners Study: A Nested Case-Control Study of Lung Cancer and Diesel Exhaust*, June 2012, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3369553/

[5] International Agency for Research on Cancer, *Diesel Engine Exhaust Carcinogenic*, June 2012, https://www.iarc.fr/en/media-centre/pr/2012/pdfs/pr213_E.pdf

[6] United States Environmental Protection Agency, *Risk Assessment Guidance for Superfund Human Health Risk Assessment*, December 1989, https://www.epa.gov/sites/production/files/2015-09/documents/rags_a.pdf

primarily through the incomplete combustion of diesel fuel. DPM is removed from the atmosphere through physical processes including atmospheric fall-out and washout by rain. Humans can be exposed to airborne DPM by deposition on water, soil, and vegetation; although the main pathway of exposure is inhalation. Cal/EPA has concluded that potential cancer risk from inhalation exposure to whole diesel exhaust outweigh the multi-pathway cancer risk from the speciated components.

In August 1998, the CARB identified DPM as an air toxic. CARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel- Fueled Engines and Vehicles* and *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines* and approved these documents on September 28, 2000.[7,8] The documents represent proposals to reduce DPM emissions, with the goal of reducing emissions and the associated health risk by 75 percent in 2010 and by 85 percent in 2020. The program aimed to require the use of state-of-the-art catalyzed DPM filters and ultra-low-sulfur diesel fuel.

In 2001, CARB assessed the state-wide health risks from exposure to diesel exhaust and to other toxic air contaminants. It is difficult to distinguish the health risks of diesel emissions from those of other air toxics, since diesel exhaust contains approximately 40 different TAC. The CARB study detected diesel exhaust by using ambient air carbon soot measurements as a surrogate for diesel emissions. The study reported that the state-wide cancer risk from exposure to diesel exhaust was about 540 per million population as compared to a total risk for exposure to all ambient air toxics of 760 per million. This estimate, which accounts for about 70 percent of the total risk from TAC, included both urban and rural areas in the state. The estimate can also be considered an average worst-case for the state, since it assumes constant exposure to outdoor concentrations of diesel exhaust and does not account for expected lower concentrations indoors, where most of time is spent. Based on 2012 estimates of California statewide exposure, DPM is estimated to increase statewide cancer risk by 520 cancers per million residents exposed over a lifetime.[9]

Exposure to DPM results in a greater incidence of chronic non-cancer health effects, such as cough, labored breathing, chest tightness, wheezing, and bronchitis. Individuals particularly vulnerable to DPM are children, whose lung tissue is still developing, the elderly and people with illnesses who may have other serious health problems that can be aggravated by exposure to DPM. In general, children are more vulnerable than adults to air pollutants because they

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[7] California Air Resources Board, *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*, October 2000, http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf

[8] California Air Resources Board, *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines*, October 2000, https://www.arb.ca.gov/diesel/documents/rmgFinal.pdf

[9] California Air Resources Board, *Summary: Diesel Particulate Matter Health Impacts*, April 12, 2016, https://www.arb.ca.gov/research/diesel/diesel-health_summ.htm

have higher inhalation rates, narrower airways, and less mature immune systems. In addition, children with allergies may have an enhanced allergic response when exposed to diesel exhaust).

EXPOSURE ASSESSMENT

Dispersion is the process by which atmospheric pollutants disseminate due to wind and vertical stability. The results of a dispersion analysis are used to assess pollutant concentrations at or near an emission source. The results of an analysis allow predicted concentrations of pollutants to be compared directly to air quality standards and other criteria such as health risks based on modeled concentrations.

A rising pollutant plume reacts with the environment in several ways before it levels off. First, the plume's own turbulence interacts with atmospheric turbulence to entrain ambient air. This mixing process reduces and eventually eliminates the density and momentum differences that cause the plume to rise. Second, the wind transports the plume during its rise and entrainment process. Higher winds mix the plume more rapidly, resulting in a lower final rise. Third, the plume interacts with the vertical temperature stratification of the atmosphere, rising as a result of buoyancy in the unstable-to-neutrally stratified mixed layer. However, after the plume encounters the mixing lid and the stably stratified air above, its vertical motion is dampened.

Molecules of gas or small particles injected into the atmosphere will separate from each other as they are acted on by turbulent eddies. The Gaussian mathematical model such as AERMOD simulates the dispersion of the gas or particles within the atmosphere. The formulation of the Gaussian model is based on the following assumptions:

- The predictions are not time-dependent (all conditions remain unchanged with time)
- The wind speed and direction are uniform, both horizontally and vertically, throughout the region of concern
- The rate of diffusion is not a function of position
- Diffusion in the direction of the transporting wind is negligible when compared to the transport flow

Dispersion Modeling Approach

Air dispersion modeling was performed to estimate the downwind dispersion of DPM exhaust emissions resulting from construction activities. The following sections present the fundamental components of an air dispersion modeling analysis including air dispersion model selection and options, receptor locations, meteorological data, and source exhaust parameters.

Model Selection and Options

AERMOD (Version 19191)[10] was used for the dispersion analysis. AERMOD is the USEPA preferred atmospheric dispersion modeling system for general industrial sources. The model can simulate point, area, volume, and line sources. AERMOD is the appropriate model for this analysis based on the coverage of simple, intermediate, and complex terrain. It also predicts both short-term and long-term (annual) average concentrations. The model was executed using the regulatory default options (stack-tip downwash, buoyancy-induced dispersion, and final plume rise), default wind speed profile categories, default potential temperature gradients, and assuming no pollutant decay.

The selection of the appropriate dispersion coefficients depends on the land use within three kilometers (km) of the project site. The types of land use were based on the classification method defined by Auer (1978); using pertinent United States Geological Survey (USGS) 1:24,000 scale (7.5 minute) topographic maps of the area. If the Auer land use types of heavy industrial, light-to-moderate industrial, commercial, and compact residential account for 50 percent or more of the total area, the USEPA *Guideline on Air Quality Models* recommends using urban dispersion coefficients; otherwise, the appropriate rural coefficients can be used. Based on observation of the area surrounding the project site, rural (urban is only designated within dense city centers such as downtown San Francisco) dispersion coefficients were applied within AERMOD.

Receptor Locations

Some receptors are considered more sensitive to air pollutants than others, because of preexisting health problems, proximity to the emissions source, or duration of exposure to air pollutants. Land uses such as primary and secondary schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also considered sensitive to poor air quality because people in residential areas are often at home for extended periods. Recreational land uses are moderately sensitive to air pollution because vigorous exercise associated with recreation places having a high demand on respiratory system function.

Sensitive receptors were placed at existing residences to estimate health impacts due to proposed project construction on existing receptors. The Project Site is surrounded by open grazing lands. Immediate adjacent to and south of the site, a smaller aggregate mine is located on Bureau of Land management (BLM)-administered land. Other BLM land is located to the east and south and the Wells Ranch is located directly to the north. The character of the area surrounding

[10] United States Environmental Protection Agency, AERMOD Modeling System, https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models

the Project site is rural residential with homes on large, agricultural-sized parcels. Eight homes are located on parcels from 10 to 80 acres in size to the west and south along Ward Lake Road. The nearest residence is approximately 875 feet from the western property line of the Project Site. Shaffer Elementary School is located 2.4 miles to the southeast of the Project Site. There are approximately 24 residences abutting Highway 395 and Center Road. Traveling farther west along Center Road, toward the California State Correctional Center, there are approximately six additional residences. **Figure 1** displays the location of the sensitive receptors used in this HRA. Receptors were placed at a height of 1.8 meters (typical breathing height). Terrain elevations for receptor locations were used based on available USGS information for the area.

Meteorological Data

Hourly meteorological data from Alturas Municipal Airport, located approximately 100 miles to the north the proposed project, were used in the dispersion modeling analysis.[11] Meteorological data from 2009 through 2013 were used.[12] **Figure 2** displays the annual wind rose. Wind directions are predominately from the west or south with a high frequency of calm wind speed conditions (over 40 percent), as shown in **Figure 3**. The average annual wind speed is 5.44 miles per hour.

Source Release Characteristics

Offroad equipment was treated as area sources located within the boundary of the mining operations. These sources were assigned a release height of 3.05 meters and an initial vertical dimension of 4.15 meters, which reflects the height of the equipment plus an additional height of the exhaust plume above the exhaust point to account for plume rise due to buoyancy and momentum. Haul trucks were treated as a line source (i.e., volume sources placed at regular intervals) located along an access road. The haul trucks were assigned a release height of 3.05 meters and an initial vertical dimension of 4.15 meters, which accounts for dispersion from the movement of vehicles.[13]

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[11] Redding is located approximately 110 miles to the west of the Project Site. However, the meteorological conditions at Redding would not be representative of the Project Site given the elevation and proximity to mountainous terrain. The Project Site is at 4,365 feet in elevation, Alturas is at 4,375 feet, while Redding is at 500 feet. Redding's wind rose exhibit a south-north wind direction familiar to wide valley flow. Therefore, the Alturas is the most representative meteorological data readily available.

[12] California Air Resources Board, Air Quality Planning and Science Division, Meteorological Files, October 5, 2015, https://www.arb.ca.gov/toxics/harp/metfiles2.htm

[13] While haul truck emissions contribute substantially to overall project emissions, they are spread over many miles. Hence, the portion of trucking emissions that would impact one receptor is much smaller than the emissions that the generator activity at the project site would impact a receptor near the site.

FIGURE 1
HEALTH RISK ASSESSMENT RECEPTORS



FIGURE 2
ANNUAL WINDROSE

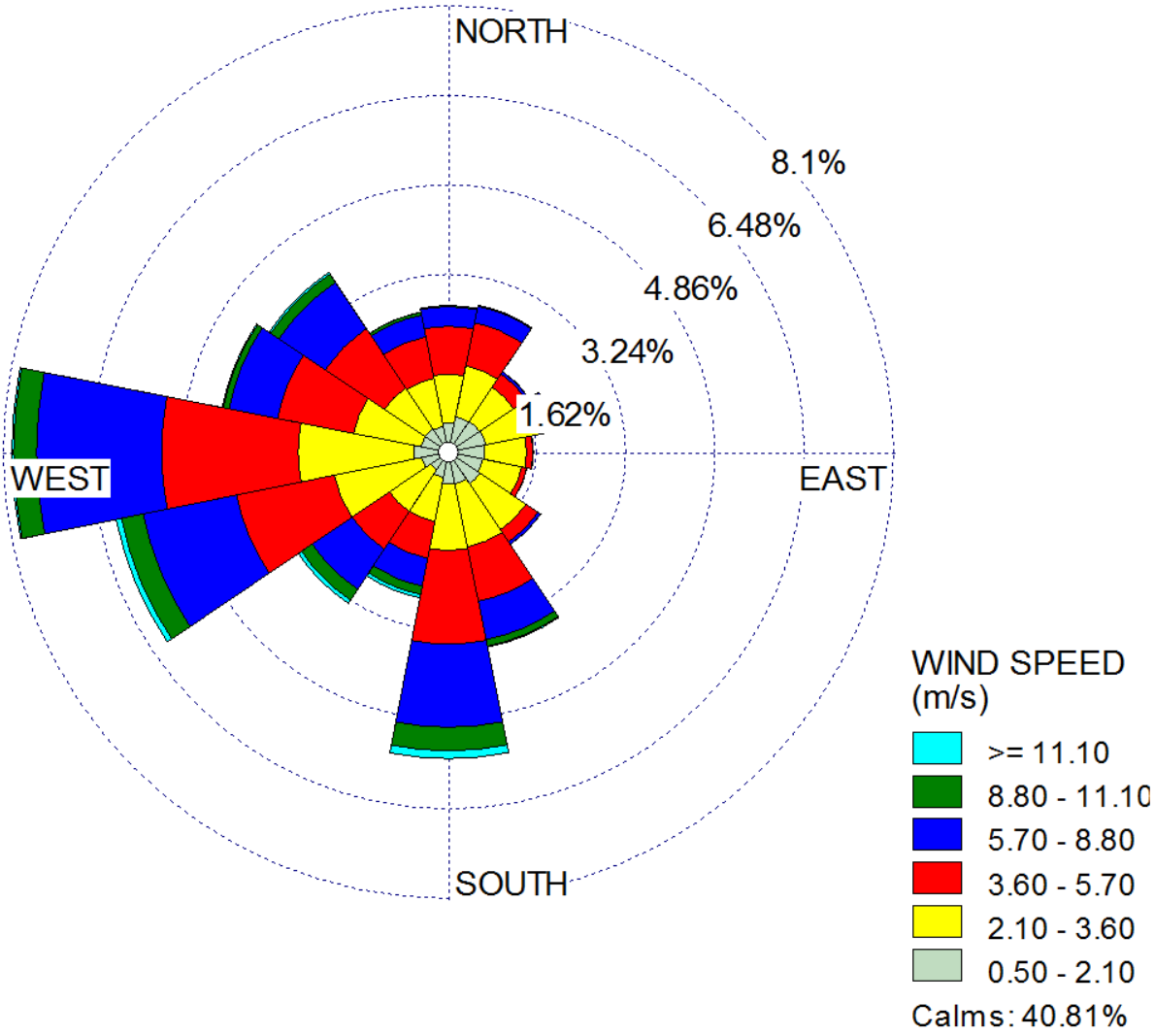
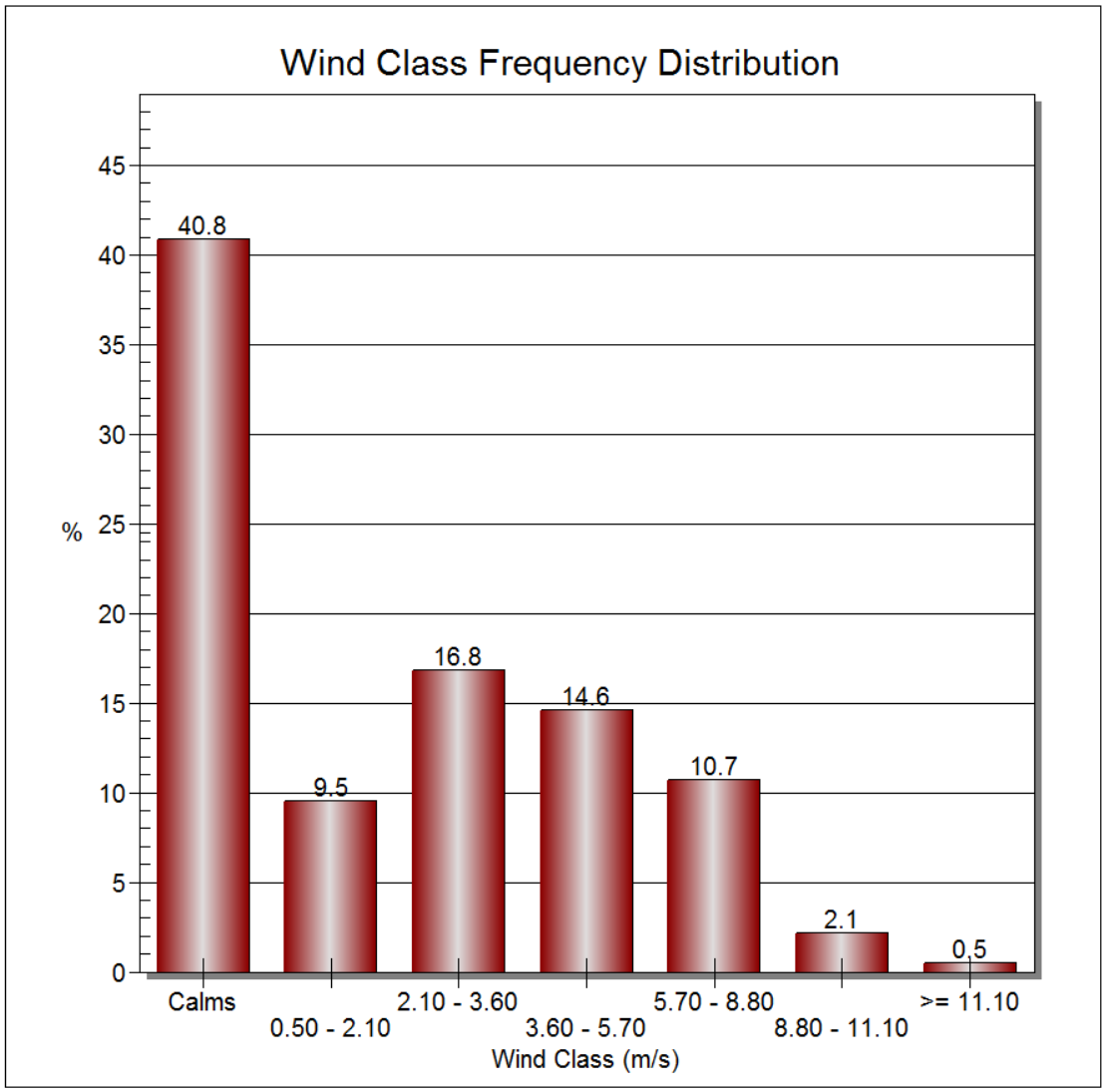


FIGURE 3
ANNUAL WIND SPEED DISTRIBUTION



The Ward Lake Pit maintains a permit to operate (PTO-19-140: expiration date March 31, 2024) for onsite equipment such as a hot mix asphalt plant, a lime slurry mix plant, a concrete plant, a crushing plant, a wash plant, a sand plant, and five diesel generators (one 750 horsepower [hp] generator associated with the crushing plant[14], one 475 hp generator associated with the portable plant[15], and one 469 hp generator associated with the wash plant.[16] The release height of the generators was assumed to be 3.05 meters (10 feet), while the exhaust temperature, exit diameter, exhaust flow rate were based on manufacturer specifications.[17]

Terrain elevations for emission source locations were used based on available USGS information for the area. AERMAP (Version 18081)[18] was used to develop the terrain elevations.

EXPOSURE PARAMETERS

This HRA was conducted following methodologies in OEHHA's *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*.[19] This was accomplished by applying the estimated concentrations at the receptors analyzed to the established cancer risk estimates and acceptable reference concentrations for non-cancer health effects.

OEHHA's revisions to its *Guidance Manual* were primarily designed to ensure that the greater sensitivity of children to cancer and other health risks is reflected in HRAs. For example, OEHHA now recommends that risks be analyzed separately for multiple age groups, focusing especially on young children and teenagers, rather than the past practice of analyzing risks to the general population, without distinction by age. OEHHA also now recommends that statistical "age sensitivity factors" be incorporated into a HRA, and that children's relatively high breathing rates be accounted for. On the other hand, the *Guidance Manual* revisions also include some changes that would reduce calculated health risks. For example, under the former guidance, OEHHA recommended that residential cancer risks be assessed by assuming 70 years of exposure at a residential receptor; under the *Guidance Manual*, this assumption is lessened to 30 years.

OEHHA has developed exposure factors (e.g., daily breathing rates) for six age groups including the last trimester to birth, birth to 2 years, 2 to 9 years, 2 to 16 years, 16 to 30 years,

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[14] To be removed or replaced by January 2023 with Air District approved engine.

[15] To be removed or replaced by January 2024 with Air District approved engine.

[16] To be removed or replaced by January 2025 with Air District approved engine.

[17] Caterpillar 3412 Generator Specification Sheets, https://www.cat.com/en_US/articles/configurations/ep-genset-ratings/3516b1.html and Caterpillar 3406 Generator Specification Sheets, https://www.cat.com/en_IN/articles/configurations/ep-genset-ratings/3406c.html

[18] US Environmental Protection Agency, AERMAP, https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models

[19] Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, March 6, 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html

and 16 to 70 years. These age bins allow for more refined exposure information to be used when estimating exposure and the potential for developing cancer over a lifetime. This means that exposure variates are needed for the third trimester, ages zero to less than two, ages two to less than nine, ages two to less than 16, ages 16 to less than 30, and ages 16 to 70. Residential receptors utilize the 95th percentile breathing rate values. The breathing rates are age-specific and are 1,090 liters per kilogram-day for ages less than 2 years, 745 liters per kilogram-day for ages 2 to 16 years, 335 liters per kilogram-day for ages 16 to 30 years, and 290 liters per kilogram-day for ages 30 to 70 years. A school child breathing rate is 520 liters per kilogram-day and an off-site worker breathing rate is 230 liters per kilogram-day.

OEHHA developed age sensitivity factors (ASF) to take into account the increased sensitivity to carcinogens during early-in-life exposures. OEHHA recommends that cancer risks be weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age, and by a factor of 3 for exposures from 2 years through 15 years of age.

Based on OEHHA recommendations, the cancer risk to residential receptors assumes exposure occurs 24 hours per day for 350 days per year while accounting for a percentage of time at home. OEHHA evaluated information from activity pattern databases to estimate the fraction of time at home (FAH) during the day. This information was used to adjust exposure duration and cancer risk based on the assumption that a person is not present at home continuously for 24 hours and therefore exposure to emissions is not occurring when a person is away from their home. In general, the FAH factors are age-specific and are 0.85 for ages less than 2 years, 0.72 for ages 2 to 16 years, and 0.73 for ages 30 to 70 years.

OEHHA has decreased the exposure duration currently being used for estimating cancer risk at the maximum exposed individual resident from 70 years to 30 years. This is based on studies showing that 30 years is a reasonable estimate of the 90th to 95th percentile of residency duration in the population. Additionally, OEHHA recommends using the 9 and 70-year exposure duration to represent the potential impacts over the range of residency periods.

Given the exposure durations of less than 24 hours, sensitive recreational receptors were evaluated for acute impacts only. Based on OEHHA recommendations, for children at school sites, exposure is assumed to occur 10 hours per day for 180 days (or 36 weeks) per year. Cancer risk estimates for children at school sites are calculated based on 9 year exposure duration. School sites also include teachers and other adult staff which are treated as off-site workers.

RISK CHARACTERIZATION

Cancer risk is defined as the lifetime probability of developing cancer from exposure to carcinogenic substances. Cancer risks are expressed as the chance in one million of getting cancer (i.e., number of cancer cases among one million people exposed). The cancer risks are assumed to occur exclusively through the inhalation pathway. The cancer risk can be estimated

by using the cancer potency factor (milligrams per kilogram of body weight per day [mg/kg-day]), the 30-year annual average concentration (microgram per cubic meter [$\mu g/m^3$]), and the lifetime exposure adjustment.

Following guidelines established by OEHHA, the incremental cancer risks attributable to the proposed project were calculated by applying exposure parameters to modeled DPM concentrations in order to determine the inhalation dose (mg/kg-day) or the amount of pollutants inhaled per body weight mass per day. The cancer risks occur exclusively through the inhalation pathway; therefore, the cancer risks can be estimated from the following equation:

$$\text{Dose-inh} = \frac{C_{air} * \{DBR\} * A * ASF * FAH * EF * ED * 10^{-6}}{AT}$$

where:

Dose-inh	= Dose of the toxic substance through inhalation in mg/kg-day
10^{-6}	= Micrograms to milligrams conversion, Liters to cubic meters conversion
C_{air}	= Concentration in air in microgram (μg)/cubic meter (m^3)
{DBR}	= Daily breathing rate in liter (L)/kg body weight – day
A	= Inhalation absorption factor, 1.0
ASF	= Age Sensitivity Factor
EF	= Exposure frequency (days/year)
ED	= Exposure duration (years)
FAH	= Fraction of Time at Home
AT	= Averaging time period over which exposure is averaged in days (25,550 days for a 70 year cancer risk)

To determine incremental cancer risk, the estimated inhalation dose attributed to the proposed project was multiplied by the cancer potency slope factor (cancer risk per mg/kg-day). The cancer potency slope factor is the upper bound on the increased cancer risk from a lifetime exposure to a pollutant. These slope factors are based on epidemiological studies and are different values for different pollutants. This allows the estimated inhalation dose to be equated to a cancer risk.

Non-cancer adverse health impacts, acute (short-term) and chronic (long-term), are measured against a hazard index (HI), which is defined as the ratio of the predicted incremental exposure concentration from the proposed project to a published reference exposure level (REL) that could cause adverse health effects as established by OEHHA. The ratio (referred to as the

Hazard Quotient [HQ]) of each non-carcinogenic substance that affects a certain organ system is added to produce an overall HI for that organ system. The overall HI is calculated for each organ system. If the overall HI for the highest-impacted organ system is greater than one, then the impact is considered to be significant.

The HI is an expression used for the potential for non-cancer health effects. The relationship for the non-cancer health effects is given by the annual concentration (in $\mu g/m^3$) and the REL (in $\mu g/m^3$). The acute hazard index was determined using the "simple" concurrent maximum approach, which tends to be conservative (i.e., overpredicts).

The relationship for the non-cancer health effects is given by the following equation:

$$HI = C/REL$$

Where:

HI = Hazard index; an expression of the potential for non-cancer health effects.

C = Annual average concentration ($\mu g/m^3$) during the 70 year exposure period.

REL = Concentration at which no adverse health effects are anticipated.

The chronic REL for DPM was established by the California OEHHA as 5 $\mu g/m^3$.[20]

[20] Office of Environmental Health Hazards Assessment - Acute, 8-hour, and Chronic Reference Exposure Levels, November 4, 2019, http://www.oehha.ca.gov/air/allrels.html

Health Risk Assessment Assumptions

5	Chronic Reference Exposure Level (ug/m3) for DPM
1.1	Cancer Potency Slope Factor (cancer risk per mg/kg-day) for DPM
350	days per year
25,550	days per lifetime
1090	95th Percentile Daily Breathing Rates (0<2 Years
861	95th Percentile Daily Breathing Rates (2<9 Years
745	95th Percentile Daily Breathing Rates (2<16 Years
335	95th Percentile Daily Breathing Rates (16<30 Years
290	95th Percentile Daily Breathing Rates (30<70 Years
0.85	fraction of 0<2 Years
0.72	fraction of 2<16 Years
0.73	fraction of 16<70 Years

Project:	Ward Lake Pit Expansion
Date:	January 25, 2021
Condition:	Proposed Project
Receptor:	Existing Residence

Exposure Year	Calender Year	Annual PM2.5 Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2021	2.77E-03	1,090	10.0	0.85	0.39
2	2022	2.77E-03	1,090	10.0	0.85	0.39
3	2023	2.77E-03	745	4.75	0.72	0.11
4	2024	2.77E-03	745	3.00	0.72	0.07
5	2025	2.77E-03	745	3.00	0.72	0.07
6	2026	2.77E-03	745	3.00	0.72	0.07
7	2027	2.77E-03	745	3.00	0.72	0.07
8	2028	2.77E-03	745	3.00	0.72	0.07
9	2029	2.77E-03	745	3.00	0.72	0.07
10	2030	2.77E-03	745	3.00	0.72	0.07

0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
1.35	Cancer Risk (Child)
10	Significance Threshold
No	Significant?
0.17	Cancer Risk (Adult)
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

5	Chronic Reference Exposure Level (ug/m3) for DPM
1.1	Cancer Potency Slope Factor (cancer risk per mg/kg-day) for DPM
350	days per year
25,550	days per lifetime
1090	95th Percentile Daily Breathing Rates (0<2 Years
861	95th Percentile Daily Breathing Rates (2<9 Years
745	95th Percentile Daily Breathing Rates (2<16 Years
335	95th Percentile Daily Breathing Rates (16<30 Years
290	95th Percentile Daily Breathing Rates (30<70 Years
0.85	fraction of 0<2 Years
0.72	fraction of 2<16 Years
0.73	fraction of 16<70 Years

Project:	Ward Lake Pit Expansion
Date:	August 27, 2021
Condition:	Proposed Project
Receptor:	Existing Residence

Exposure Year	Calender Year	Annual PM2.5 Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2021	2.78E-03	1,090	10.0	0.85	0.39
2	2022	2.78E-03	1,090	10.0	0.85	0.39
3	2023	2.78E-03	745	4.75	0.72	0.11
4	2024	2.78E-03	745	3.00	0.72	0.07
5	2025	2.78E-03	745	3.00	0.72	0.07
6	2026	2.78E-03	745	3.00	0.72	0.07
7	2027	2.78E-03	745	3.00	0.72	0.07
8	2028	2.78E-03	745	3.00	0.72	0.07
9	2029	2.78E-03	745	3.00	0.72	0.07
10	2030	2.78E-03	745	3.00	0.72	0.07
11	2031	2.78E-03	745	3.00	0.72	0.07
12	2032	2.78E-03	745	3.00	0.72	0.07
13	2033	2.78E-03	745	3.00	0.72	0.07
14	2034	2.78E-03	745	3.00	0.72	0.07
15	2035	2.78E-03	745	3.00	0.72	0.07
16	2036	2.78E-03	745	3.00	0.72	0.07
17	2037	2.78E-03	335	1.70	0.73	0.02
18	2038	2.78E-03	335	1.00	0.73	0.01
19	2039	2.78E-03	335	1.00	0.73	0.01
20	2040	2.78E-03	335	1.00	0.73	0.01
21	2041	2.78E-03	335	1.00	0.73	0.01
22	2042	2.78E-03	335	1.00	0.73	0.01
23	2043	2.78E-03	335	1.00	0.73	0.01
24	2044	2.78E-03	335	1.00	0.73	0.01
25	2045	2.78E-03	335	1.00	0.73	0.01
26	2046	2.78E-03	335	1.00	0.73	0.01
27	2047	2.78E-03	335	1.00	0.73	0.01
28	2048	2.78E-03	335	1.00	0.73	0.01
29	2049	2.78E-03	335	1.00	0.73	0.01
30	2050	2.78E-03	335	1.00	0.73	0.01

0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
1.91	Cancer Risk (Child)
10	Significance Threshold
No	Significant?
0.52	Cancer Risk (Adult)
10	Significance Threshold
No	Significant?

BIOLOGICAL RESOURCES ASSESSMENT

WARD LAKE QUARRY PROPOSED MINE BOUNDARY EXPANSION
LASSEN COUNTY, CALIFORNIA

Prepared for

Hat Creek Construction & Materials, Inc.

Prepared by

VESTRA Resources Inc.
5300 Aviation Drive
Redding, California 96002

OCTOBER 2020
REVISED JANUARY 2022

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1.0 INTRODUCTION

This biological assessment evaluates the impacts to plant and wildlife species of a proposed Reclamation Plan Amendment to expand the mining boundary for the Ward Lake Quarry to include approximately 78.6 acres to the north of the already-approved reclamation boundary. In addition, the Reclamation Plan Amendment includes extension of the life of the mine from 2030 to 2050 and increases in the volume of material extracted annually from 100,000 to 200,000 tons.

1.1 Project Location

The Ward Lake Quarry is located approximately three miles east of Ward Lake, off of Ward Lake Road, in Lassen County. The quarry is located in Section 32, Township 30 North, Range 14 East, MDBM. The latitude and longitude at the center of the existing quarry are 40.414478° and - 120.417222°. The general site location is shown on Figure 1.

The mine is located in a rural area of Lassen County. The site is bound by rural residential, large-parcel open space and cropland to the south and southwest and undeveloped open space to the west, north, and east.

1.2 Ownership

The project area includes an active mine operation area, area of proposed reclamation, area of proposed expansion, and buffer areas. TNT Enterprises owns approximately 682 acres in two parcels. Currently, mine operations occur on 138 acres of the property. The proposed Reclamation Plan Amendment would add an additional 78.6 acres of mine quarry area. The remaining 464.4 acres are undisturbed open space. The current processing and stockpile areas would remain. Previous quarry areas will be reclaimed. Site layout is shown on Figure 2.

Adjacent property ownership is shown on Figure 3, noting large, undeveloped parcels owned by the Bureau of Land Management (BLM) to the west, north, and east.

1.3 Topography

The topography of the study area is gentle slopes and rocky ridges. The property occurs at elevations between approximately 4200 feet to 4500 feet above sea level. Slope of the landscape drains to the west and north to the seasonal feature, Secret Creek, located north of the current operation. Current site topography is shown on Figure 4.

Precipitation occurs as rain and snow. Annual rainfall is estimated at 15 inches (Susanville Municipal Airport Station ID 048702, years of record 1893-2016).

1.4 Vegetation Communities

1.4.1 Regional Vegetation Communities

The site is located in a rural area of Lassen County dominated by sagebrush-steppe communities. The northeastern portion of the area has been mapped under the Vegetation Classification and

Mapping Program (VegCAMP) using associations and alliances based on a Manual of California Vegetation. The southwestern portion of the region around the site has yet to be mapped using the new system and only Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) mapping is available. The VegCAMP associations and CALVEG habitat units are included for a ten-mile radius around the site on Figure 5.

The VegCAMP and CALVEG specific associations and types are included by acreage in Table 1.

Table 1
VegCAMP AND CALVEG ASSOCIATIONS AND TYPES BY ACREAGE
10-MILE RADIUS OF PROPOSED EXPANSION AREA

Map Unit	Acres
VegCAMP	
Anthropogenic Areas of Little or No Vegetation	83.4
Artemisia arbuscula / *Bromus tectorum* Ruderal Shrubland	1,571.0
Artemisia arbuscula / *Poa secunda*	12,875.6
Artemisia cana (ssp. *bolanderi*, ssp. *viscidula*) / *Poa secunda* Wet Shrubland	144.1
Artemisia nova / *Poa secunda*	1.0
Artemisia tridentata - Grayia spinosa Shrubland	1,041.0
Artemisia tridentata – (Ericameria nauseosa) / *Bromus tectorum* Ruderal Shrubland	6,068.9
Artemisia tridentata – Ephedra spp. Shrubland	1,532.0
Artemisia tridentata / *Distichlis spicata* Provisional	235.3
Artemisia tridentata Shrubland	10,519.3
Artemisia tridentata ssp. *vaseyana – Symphoricarpos oreophilus* / *Bromus carinatus* Shrubland	705.6
Artemisia tridentata ssp. *vaseyana* / *Festuca idahoensis* Shrub Grassland	215.6
Atriplex confertifolia - Picrothamnus desertorum / *Krascheninnikovia lanata*	2.8
Bromus tectorum – Elymus caput-medusae Ruderal Annual Grassland Alliance	1,492.3
Bromus tectorum Ruderal Grassland	5,360.2
Built-up & Urban Disturbance	109.2
Californian Annual Grassland & Forb Meadow Group	19.3
Californian Vernal Pool Group	28.2
Carex aquatilis – Carex lenticularis	9.9
Cercocarpus ledifolius – Artemisia tridentata ssp. *vaseyana*	29.0
Columbia Plateau cliff, scree and rock mapping unit	48.5
Danthonia unispicata – Poa secunda Wet Meadow	70.8
Eleocharis macrostachya Vernal Pool Provisional	2.6
Elymus caput-medusae Intermontane Provisional	35.3
Elymus cinereus Bottomland Wet Meadow	30.0
Elymus spicatus – Poa secunda Grassland	3,790.9
Elymus triticoides – Poa secunda Wet Meadow	8.9
Ephedra nevadensis - Lycium andersonii - Grayia spinosa	129.2
Ericameria nauseosa / *Bromus tectorum* Ruderal Shrubland	6,044.8
Ericameria nauseosa Shrubland	6,327.3
Eriogonum sphaerocephalum / *Poa secunda* Dwarf-shrub Grassland	1.3
Juncus balticus Wet Meadow	67.0
Juniperus occidentalis – Pinus jeffreyi / *(Purshia tridentata, Prunus virginiana*)	1,287.3
Juniperus occidentalis / *Artemisia arbuscula* / *Poa secunda*	2,539.8
Juniperus occidentalis / *Artemisia tridentata – Purshia tridentata*	5,411.7
Juniperus occidentalis / *Cercocarpus ledifolius*	174.6
Juniperus occidentalis / *Pseudoroegneria spicata* Wooded Grassland	141.4
Juniperus occidentalis / *Purshia tridentata* / *Festuca idahoensis – Pseudoroegneria spicata*	21.6
Krascheninnikovia lanata Steppe & Dwarf-shrubland Alliance	6.6

Table 1 VegCAMP AND CALVEG ASSOCIATIONS AND TYPES BY ACREAGE 10-MILE RADIUS OF PROPOSED EXPANSION AREA	
Map Unit	**Acres**
Non-woody Row and Field Agriculture	152.3
Perennial Stream Channel (Open Water)	1.4
Pinus jeffreyi – Pinus washoensis Mixed Conifer Woodland Alliance	834.5
Planted Trees and Shrubs	3.9
Populus tremuloides / Symphoricarpos rotundifolius	2.2
Prunus emarginata Sierran Chaparral Shrubland	1,132.6
Prunus virginiana / Leymus cinereus Shrubland	633.5
Purshia tridentata - Artemisia tridentata Mesic Steppe & Shrubland Alliance	2,525.0
Purshia tridentata – Artemisia tridentata	11,426.5
Purshia tridentata – Artemisia tridentata – Tetradymia canescens	8,349.7
Purshia tridentata – Artemisia tridentata / Achnatherum hymenoides	277.3
Quercus kelloggii	2.9
Salix exigua / Mesic Forbs Shrubland	17.3
Salix lasiolepis – Rosa woodsii / Mixed Herbs Shrubland	36.9
Sarcobatus vermiculatus – Artemisia tridentata Shrubland	5,041.6
Schoenoplectus americanus Western Marsh	31.2
Small Earthen-dammed Ponds & Natural Lakes	1.5
Symphoricarpos oreophilus Shrubland	3.1
Taraxia tanacetifolia – Iva axillaris Provisional	2,626.8
Tetradymia canescens Provisional	1,015.5
Typha domingensis Western Marsh	12.3
Vancouverian – Rocky Mountain Montane Wet Meadow & Marsh Group	156.1
Water	62.4
Western North American Ruderal Marsh, Wet Meadow & Shrubland Group	300.8
Western North American Sparsely Vegetated Rivershore mapping unit	15.7
Western North American Temperate Freshwater Aquatic Vegetation Group	10.8
Total	**102,857.1**
CALVEG	
CWHR_TYPE	**Acres**
AGS: Annual Grassland	3,031.1
ASC: Alkali Desert Scrub	4,642.6
ASP: Aspen	3.1
BAR: Barren	407.9
BBR: Bitterbrush	407.4
CRP: Cropland	35,760.1
EPN: Eastside Pine	1,422.2
JUN: Juniper	787.0
LAC: Lacustrine	6,768.5
LSG: Low Sage	243.9
MCP: Montane Chaparral	41.7
MHC: Montane Hardwood-Conifer	3.8
MRI: Montane Riparian	613.3
PGS: Perennial Grassland	279.7
SGB: Sagebrush	45,893.7
SMC: Sierran Mixed Conifer	19.2
URB: Urban	3.0
WTM: Wet Meadow	7,751.9
Total	**108,080.1**

In order to simplify the associated discussion, the VegCAMP data crosswalk to CALVEG type was used to show CALVEG-consistent vegetation types within the regional area of the site (see Figure 6), showing the areas to the west, north, and east generally owned and managed by BLM as being dominated by sagebrush communities.

1.4.2 Project Area Vegetation Communities

The site-specific vegetation communities have been mapped and are included in the VegCAMP database. The communities are shown on Figure 7. The western portion of the site has not been mapped to association, so CALVEG communities are included separately.

The associations presented within (the mapped) expansion area along with acreage for each association are included in Table 2.

Table 2
VegCAMP ASSOCIATIONS BY ACREAGE
PROPOSED EXPANSION AREA

Map Unit	Acres
Artemisia tridentata – (Ericameria nauseosa) / Bromus tectorum Ruderal Shrubland	13.7
Ericameria nauseosa / Bromus tectorum Ruderal Shrubland	0.2
Purshia tridentata – Artemisia tridentata	0.9
Salix exigua / Mesic Forbs Shrubland	0.1
Californian Annual Grassland & Forb Meadow Group	1.8
Purshia tridentata – Artemisia tridentata – Tetradymia canescens	17.0
Artemisia tridentata Shrubland	2.1
Purshia tridentata – Artemisia tridentata – Tetradymia canescens	14.7
Artemisia tridentata – (Ericameria nauseosa) / Bromus tectorum Ruderal Shrubland	17.7
Artemisia tridentata Shrubland	8.3
Purshia tridentata – Artemisia tridentata	2.3
Anthropogenic Areas of Little or No Vegetation	0.0
Total	**78.6**

As shown, the dominant associations represent sagebrush-steppe ecological systems dominated by *Artemisia* and *Purshia* species.

Sagebrush habitat borders the quarry operations area along the western and eastern edges. The proposed expansions area supports basin big sage (*Artemisia tridentata* ssp. *tridentata*). Within the expansion area, shrubs exhibit dense cover with very little bare ground in between and in some places the canopy overlaps, leaving little opportunity for forbs and grasses. Slopes surrounding the expansion area exhibit less dense cover. This supports a mix of basin big sage and mountain big sage (*A. tridentata. vaseyana*). Openings between shrubs here have sparse to no ground cover; in areas with some ground cover present, forbs and grasses were present.

1.4.3 Sensitive Habitats

The California Sensitive Natural Communities List published on August 18, 2021, was reviewed due to the fact that big sage subspecies (*Artemisia tridentata* ssp.) are components of natural

communities that are listed as S1, S2, and S3, and therefore warrant consideration under CEQA. None of the California Sensitive Natural Communities listed are present within the proposed expansion area. Mountain big sage (*Artemisia tridentata* ssp. *vaseyana*) and Idaho fescue (*Festuca idahoensis*) are present in the surrounding area; these would not be disturbed by proposed activities. Additionally, the current mine area will be planted with these two species during reclamation, which will increase the presence of this community in the long term.

Portions of the mine site and the expansion areas have been identified as critical winter habitat for mule deer (Figure 8) and critical winter range habitat for pronghorn antelope (Figure 9).

1.5 Waters of the State/United States

The existing quarry contains several artificial ponds near the northern boundary of the existing mining area as well as near the entrance to the quarry. These ponds have been constructed to retain water from gravel washing and to capture stormwater runoff from the existing mining area. These ponds are not waters of the United States according to the *Navigable Waters Protection Rule: Definition of "Waters of the United States"* and are not waters of the State according to the State Wetland definition.

1.6 Previous Mitigation Considerations

No blasting, grading, or excavation is allowed from January 1 to March 31.

An Environmental Impact Report (EIR) was prepared in 1997 for an expansion of the Ward Lake Quarry (Oberholtzer 1997). The EIR focused on potential effects on deer and antelope herds. The project area falls within Deer Hunt Zone X5a, which is a zone within the greater Deer Assessment Unit (DAU) 2 – northeastern California; and the project is within Pronghorn Hunt Zone 4 – Lassen. The project area is on the edge of California Department of Fish and Wildlife (CDFW)-designated critical winter-range habitat for mule deer and winter-range habitat for pronghorn antelope (see Figures 8 and 9, respectively).

Mule deer numbers have increased since the 1997 EIR. In 1996, the population for DAU 2 was estimated to be 25,000; in 2017, the estimated population was 29,289 (CDFG et al. 1998; CDFW 2017). More specific to the project location, the mule deer population within Hunt Zone X5a has increased, with an estimated 544 animals in 2013 and 942 in 2017.

The 1997 EIR also addressed effects to Swainson's hawk and golden eagle. Potential effects of the project on these species were discounted because it involved only the removal of 40 acres of foraging habitat, but no nesting habitat removal. These effects to foraging habitat are determined to be mitigated through the required reclamation practices. Effects to other wildlife species were not discussed in detail but were deemed to be significant, although mitigatable, through the required reclamation practices.

An additional EIR (VESTRA 2019) was conducted in 2019 to address an increase in operating hours and nighttime operations. Mitigations included in the EIR were limiting nighttime operations from January 1 to March 31, no nighttime blasting, installation of noise barriers, limitation of Jake brake usage, and modification to lighting feature design to minimize the effects of artificial lighting during the nighttime periods. The County also requested limitation of

roadway speed, driver education, and signage for possible impacts to wildlife on roadways during nighttime operations.

1.7 Proposed Operations

Although the overall mine area increase will result in disturbance of 78.6 acres, the area will be mined in sections progressing north from the quarry area. Sections will be reclaimed when exhausted. Therefore, the total impacted acreage at any given time will be much less than 78.6 acres.

2.0 REGULATORY FRAMEWORK FOR BIOLOGICAL RESOURCES

This section describes the federal and state regulation of special-status species, waters of the United States, and other sensitive biological resources.

2.1 Federal Regulations

2.1.1 Federal Endangered Species Act

Section 9 of the federal Endangered Species Act of 1973 (ESA) prohibits acts that result in the "take" of threatened or endangered species. As defined by the federal ESA, "endangered" refers to any species that is in danger of extinction throughout all or a significant portion of its current range. The term "threatened" is applied to any species likely to become endangered within the foreseeable future throughout all or a significant portion of its current range. "Take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Sections 7 and 10 of the federal ESA provide methods for permitting otherwise lawful actions that may result in "incidental take" of a federally listed species. Incidental take refers to take of a listed species that is incidental to, but not the primary purpose of, an otherwise lawful activity. Incidental take is permitted under Section 7 for projects on federal land or involving a federal action; Section 10 provides a process for non-federal actions. The act is administered by the USFWS for terrestrial species.

2.1.2 Clean Water Act

The objective of the Clean Water Act (1977, as amended) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Discharge of dredged or fill material into waters of the United States, including jurisdictional wetlands, is regulated by the Corps under Section 404 of the Clean Water Act (33 USC 1251-1376) under a permitting process. Applicants for Section 404 permits are also required to obtain water quality certification or waiver through the local Regional Water Quality Control Board under Section 401 of the Clean Water Act (33 USC 1341).

Corps regulations implementing Section 404 define waters of the United States to include intrastate waters, including lakes, rivers, streams, wetlands, and natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce. Wetlands are defined for regulatory purposes as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3; 40 CFR 230.3). To comply with the Corps policy of no net loss of wetlands, discharge into wetlands must be avoided and minimized to the extent practicable. For unavoidable impacts, compensatory mitigation is typically required to replace the loss of wetland functions in the watershed.

Because the project will not result in impacts on waters of the United States, which would require authorization under Section 404, an Army Corps 404 permit and Section 401 water quality certification will not be required.

2.1.3 Migratory Bird Treaty Act

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Mitigation measures can be identified to avoid or minimize adverse effects on migratory birds. Nesting habitat is present throughout the study area in juniper and willow trees, shrubs, ground, and other structures.

2.2 State Regulatory Requirements

2.2.1 California Endangered Species Act

The California Endangered Species Act (CESA) lists species of plants and animals as threatened or endangered. Projects that may have adverse effects on State-listed species require formal consultation with CDFW. "Take" of protected species incidental to otherwise lawful activities may be authorized under Section 2081 of the California Fish and Game Code. Authorization from the CDFW is in the form of an Incidental Take Permit which can identify measures to minimize take. CDFW Species of Special Concern are considered under the CESA. Species of Special Concern have the potential to occur within the project area.

2.2.2 Streambed Alteration Agreement

A Lake or Streambed Alteration Agreement (Sections 1600-1616 of the California Fish and Game Code) requires an entity to notify CDFW prior to commencing any activity that may substantially obstruct the natural flow or use any material from a river, stream, or lake, or deposit or dispose of debris where it may pass into any river, stream, or lake. The notification requirement applies to any ephemeral or perennial river, stream, or lake in California. The project will not occur within any river, stream, or lake and is not subject to a Lake or Streambed Alteration Agreement.

2.2.3 Birds of Prey

Under Section 3503.5 of the California Fish and Game Code, it is unlawful to take, possess, or destroy any birds in the orders of Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird, except as otherwise provided by this code or any regulation adopted pursuant thereto. Project features will be implemented to protect nesting migratory birds and birds of prey to comply with this code.

2.2.4 Migratory Birds

The California Fish and Game Code Section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA. Project features will be implemented to protect nesting migratory birds and birds of prey to comply with this code.

2.2.5 Fully Protected Species

California statutes also accord "fully protected" status to a number of specifically identified birds, mammals, reptiles, amphibians, and fish. These species cannot be "taken," even with an incidental take permit (California Fish and Game Code, Sections 3505, 3511, 4700, 5050, and 5515). No "fully protected species," are expected to occur in the study area.

2.2.6 Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act of 1975 (SMARA, Public Resources Code, Sections 2710-2796) provides a comprehensive surface mining and reclamation policy with the regulation of surface mining operations to assure that adverse environmental impacts are minimized and mined lands are reclaimed to a usable condition. SMARA requires that all surface mines in California have an approved Reclamation Plan and ensure financial assurance for the completion of reclamation activities upon closure of a mine site.

3.0 BIOLOGICAL SITE SURVEY

3.1 Pre-Survey Review

Special-status plant and animal species and sensitive habitats that have the potential to occur within the project area were determined, in part, by reviewing agency databases, literature, and other relevant sources. The following information sources were reviewed to aid this determination:

- Litchfield, California, USGS 7.5-minute quadrangle;
- Aerial photography of the project area and vicinity;
- The U.S. Fish and Wildlife Service (USFWS) official list of endangered and threatened species that may occur, or be affected by, projects, as provided by the Klamath, Sacramento, and Yreka Fish and Wildlife Office (Consultation Code 08ESMF00-2020-E-03301), included in Appendix B;
- CDFW California Natural Diversity Database (CNDDB) (Nelson 2020) records for the Litchfield, California, USGS 7.5-minute quadrangle and the eight surrounding quadrangles;
- The California Native Plant Society (CNPS) online Inventory of Rare and Endangered Plants (California Native Plant Society 2015) records for the Litchfield, California, USGS 7.5-minute quadrangle and the eight surrounding quadrangles;
- California Wildlife Habitat Relationships (CWHR) System (California Department of Fish and Game 2020) including listing of species likely to occur.
- GIS shapefiles of designated critical habitat from the USFWS Critical Habitat Portal website;
- CDFW publications including State and Federally Listed Endangered, Threatened and Rare Plants of California (CDFW 2020a); State and Federally Listed and Threatened Animals of California (CDFW 2020b); and Special Animals List (CDFW 2020c); and
- Pertinent biological literature including Bird Species of Special Concern in California.

The CWHR database was used to generate a list of likely inhabitants within the vegetation types present in the vicinity of the site. CWHR types are shown on Figure 10. A list of likely inhabitants is included in Appendix A.

3.2 Animal Survey Methods and Results

Numerous pedestrian surveys have been completed onsite during site review for permitting and compliance purposes. Pedestrian transect surveys were completed in spring 2018 and spring 2020 to determine the habitat types present onsite and to detect any potential habitat for special-status flora or fauna.

3.2.1 Animal Field Survey Methods

2018 Survey
Previous surveys have been completed onsite during previous environmental review for the quarry.

A pedestrian survey was conducted on the night of April 24, 2018, from 1830 to 2300 hours and morning of April 25, 2018, from 0430 to 0900 hours to assess impacts of 24-hour mining work on diurnal and nocturnal wildlife, due to changes to the quarry's operating hours. During this survey, the entire current mine area was covered by walking transects spaced for full visual coverage of the site. Then, observations were made from select vantage points onsite. Simultaneously, a game camera was deployed at the northern end of the current mine area (now the southern end of the proposed expansion area) during the night to document nocturnal wildlife entering the site.

2020 Surveys
A protocol-level burrowing owl survey was completed on April 1, 2020, from 0815 to 1530 hours to determine the presence of burrows onsite. The area included the proposed expansion area and surrounding area to account for the standard burrowing owl buffer zone. Phase one of the survey protocol was completed, which consists of searching for burrows; transects were spaced to achieve full visual coverage throughout the surveys area. Transects were closer together when a site feature (i.e., berm or stockpile) presented a barrier to the surveyor's perception, or when an area required further observation.

A biological site assessment was completed on April 1, 2020, to determine the presence of special-status species or their habitat within the proposed expansion area as well as the surrounding areas that could be impacted indirectly by the proposed expansion. Visual and auditory observations were recorded following the pedestrian transects. Transects were walked at a slow pace with pauses for visual and auditory observation at points ranging from 0.15 to 0.25 miles apart. All wildlife and habitat characteristics were documented.

3.2.2 Animal Survey Results – April 24-25, 2018

Mammalian species observed or where sign was observed within or adjacent to the proposed project and expansion areas included:

- Striped skunk (*Mephitis mephitis*) *observed on game camera
- Black-tailed jackrabbit (*Lepus californicus*)
- Common raven (*Corvus corax*)
- Black-tailed deer *(Odocoileus hemious)*
- Coyote (*Canis latrans*)
- Western fence lizard (*Sceloporus occidentalis*)
- Cottontail rabbit (*Sylbilagus bachmani*)

Amphibians observed included:

- Sierran treefrog (*Pseudacris sierrae*)
- American bullfrog (*Lithobates catesbeianus*)

Amphibians were observed at dusk and through the night in the northern and southern settling ponds. It was apparent by the number of frog calls that a larger population inhabits the southern settling ponds. Sierran treefrog populations are considered to have a stable conservation status. American bullfrogs are a non-native invasive species in western North America.

Bird species observed within or adjacent to the project area:

- Mourning dove (*Zenaida macroura*)
- Black-billed magpie (*Pica hudsonia*)
- California quail (*Callipepla californica*)
- Canada goose (*Branta candensis*)
- Mallard (*Anas platyrhynchos*)
- Rock wren (*Salpinctes obsoletus*)
- House wren (*Troglodytes aedon*)
- Yellow-rumped warbler (*Setophaga coronata*)
- Red-winged blackbird (*Agelaius phoeniceus*)
- Great horned owl (*Bubo virginianus*)
- Killdeer (*Charadrius vociferus*)
- House sparrow (*Passer domesticus*)
- Turkey vulture (*Cathartes aura*)
- Barn swallow (*Hirundo rustica*)
- Western wood-pewee *(Contopus sordidulus)*

3.2.3 Animal Survey Results – April 1, 2020

Wildlife species presence was confirmed onsite if observations of the animal, or sign of the animal was observed onsite. The following species were determined to be present onsite:

- Black-tailed deer *(Odocoileus hemious)*
- Coyote (*Canis latrans*)
- Western fence lizard (*Sceloporus occidentalis*)

The pair of great horned owls (GHO) observed in 2018 was not observed in 2020. The owls had been nesting in an abandoned water tower located to the west of the shop and concrete plant. Bird nests were again observed in willow trees next to one of the settling ponds.

No burrowing owl burrows, or owls, were found during the survey. The findings are shown in a Burrowing Owl Survey Report, included as Appendix B.

3.3 Plant Survey Methods and Results

3.3.1 Plant Survey Methods

Plant surveys completed onsite included a protocol-level rare plant survey completed outside of the proposed expansion area in 2018, transect pedestrian surveys completed within the proposed

expansion area in 2020, and vegetation characteristic data collection completed in support of the site Reclamation Plan in 2019.

2018
No protocol-level rare plant surveys have been completed within the proposed expansion area.

A protocol-level rare plant survey was completed within a different previously proposed expansion area on June 11, 2018, to determine the potential impacts of the expansion. The survey area is located adjacent to the current quarry's eastern boundary. The description of this survey is included herein this report due to the positive identification of Susanville beardtongue (*Penstemon sudans*) and spiny milkwort *(Polygala subspinosa).*

2019
The baseline survey was conducted on April 18, 2019, using Division of Mine Reclamation (DMR)-established protocol for measuring vegetation percent cover, density, and species richness of the natural vegetation community (DOC 2003). Data was collected using a $1m^2$ quadrat. The initial plot location was determined by random point projection within an undisturbed reference area using a GPS device and subsequent plot end points were systematically placed 1m apart. Transects progressed in a northeast direction. Methods were repeated fourteen times via systematic sampling to achieve adequate confidence in results (>80 percent).

2020
During the biological site assessment completed on April 1, 2020, the vegetation communities and habitat types were classified onsite. Vegetation communities were compared to the CWHR map.

3.3.2 Plant Survey Results

2018
Susanville beardtongue (*Penstemon sudans*) was observed during the survey that was completed to the east of the current mining operations. The observed populations are well outside of the proposed expansion area and would not be affected by the proposed expansion through direct or indirect impacts.

2019
The initial plot start point was at coordinates 40.411800, -120.41357. Percent cover was quantified for the entire plant community (mean=86.42 percent) and for each growth type (shrub [mean=7.73%], forb [mean=4%], annual grass [mean=24.64%], and perennial grass [mean=6.19%]). The percent cover of the entire vegetative community is greater than the summated percent cover of each growth type due to overlap in canopy layers. Species richness was quantified within each plot (mean=4). For reclamation purposes the percentage of annual grass has been removed from the percent cover assessment as the annual grasses are both considered non-native invading species. The baseline data and reclamation success standards are included in the site reclamation plan.

The following plant species were observed during the baseline surveys:

- Antelope bitterbrush *(Purshia tridentata)*
- Rubber rabbitbrush (*Ericameria nauseosa*)
- Big sage brush *(Artemisia tridentata* spp.*)*
- Western juniper *(Juniperus occidentalis)*
- Mormon tea *(Ephedra viridis)*
- Hooker's balsamroot *(Balsamorhiza hookeri)*
- Bristly fiddleneck *(Amsinckia tesselata)*
- Redstem stork's bill *(Erodium cicutarium)*
- Medusahead (*Elymus caput medausa)*
- Cheatgrass *(Bromus tectorum)*
- Bluebunch wheatgrass *(Pseudoreogneria spicata)*
- Common wooly sunflower (*Eriophyllum lanatum*)

4.0 POTENTIAL IMPACTS TO BIOLOGICAL RESOURCES

4.1 Special-Status Species

For each special-status wildlife species, habitat and other ecological requirements were evaluated and compared to the habitats in the study area and immediate vicinity to assess the presence of potential habitat. The habitat assessment is provided in Table 3. The CNDDB query results are included as Figure 11.

4.1.1 Special Status Wildlife Species

An assessment of special-status species was conducted for the proposed amendment to examine potential effects of expanding the project area. Special-status species considered in this assessment meet one of the following criteria:

- Listed, proposed for listing, or candidates for listing as threatened or endangered under the Federal ESA (50 Code of Federal Regulations [CFR] Part 17.12 [listed plants], 50 CFR Part 17.11 [listed animals], 67 Federal Register [FR] 40657 [candidate species]);
- Listed or proposed for listing by the State of California as threatened or endangered under the CESA (CDFW 2017a);
- Identified by the CDFW as fully protected species, including fish and wildlife that do not have State or Federal threatened or endangered status but may still be threatened with extinction (CDFW 2017b); and
- California Species of Special Concern: vertebrate species that have been designated as "species of special concern" by the CDFW because declining population levels, limited range, and/or continuing threats have made them vulnerable to extinction (CDFW 2017b);

A list and summary of wildlife species identified by a CNDDB search within five miles of the project, CWHR analysis or literature review, and descriptions of their potential to occur within the project area are included in Table 3. Federally listed species which may occur in the project area was obtained from the USFWS.

Table 3
POTENTIALLY OCCURRING SPECIAL-STATUS WILDLIFE SPECIES

Common and Scientific Names	Status Fed/State	Preferred Habitats	Known and Potential Occurrence in Project Area
Invertebrates			
Carson wandering skipper *Pseudocopaeodes eunus obscurus*	FE/--	Occurs east of the Sierra Nevada at elevation less than 5,000 feet; presence of salt grass; near nectar sources; near springs or other water bodies; and possibly near geothermal activity	No potential for occurrence due to lack of suitable habitat; habitat known nearby at Honey Lake (alkali flat that supports salt grass); alkali soils and geothermal activity not present onsite

Table 3 POTENTIALLY OCCURRING SPECIAL-STATUS WILDLIFE SPECIES			
Common and Scientific Names	**Status Fed/State**	**Preferred Habitats**	**Known and Potential Occurrence in Project Area**
Monarch Butterfly *Danaus plexippus*	CE/--	Migratory; overwinter in central to south CA coast; breed through summer; breed throughout CA only where milkweed is found.	Potential for occurrence due to potential habitat for milkweed (*Asclepias* spp.)
Amphibians			
Foothill yellow-legged frog *Rana boylii*	--/CSC	Slow-moving, gravelly streams and rivers with sunny banks in forests and chaparral	No potential for occurrence due to lack of gravelly streams or water bodies
Birds			
Tricolored blackbird *Agelaius tricolor*	--/CE	Nest near fresh water in adjacent vegetation, especially near marshes. Forage in grasslands and croplands	No potential for occurrence due to lack of suitable habitat
Golden eagle *Aquila chrysaetos*	--/CFP	Needs open terrain for hunting – grassland, desert, savannah, shrub. Nests on cliffs and in large trees	Potential for occurrence due to suitable foraging habitat
Northern harrier *Circus cyaneus*	--/CSC	Grasslands, fields, and marshes	Potential for occurrence due to suitable foraging habitat
Swainson's hawk *Buteo swainsoni*	--/CT	Large, open grasslands in riparian systems	Potential for occurrence due to some suitable foraging habitat
Greater sandhill crane *Grus canadensis tabida*	--/CT	Shortgrass plains, grain fields and open wetlands for foraging. Nests in wetlands	No potential for occurrence due to lack of suitable habitat
Greater sage-grouse *Centrocercus urophasianus*	--/CSC	Open, continuous sagebrush communities	Potential for occurrence due to suitable habitat
Burrowing owl *Athene cunicularia*	--/CSC	Open, dry grassland, desert, and shrub	None found during April 2020 survey. Potential for occurrence due to suitable habitat
Long-eared owl *Asio otus*	--/CSC	Roost in dense vegetation and forage in open grasslands or shrublands	Potential for occurrence due to suitable foraging habitat
Short-eared owl *Asio flammeus*	--/CSC	Large, open areas with low vegetation including prairie, grassland, shrubsteppe, agricultural areas	Potential for occurrence due to suitable habitat
Loggerhead shrike *Lanius ludovicianus*	--/CSC	Open areas with short vegetation and well-spaced shrubs or low trees	Potential for occurrence due to suitable habitat
Mammals			
Pallid bat *Antrozous pallidus*	--/CSC	Forages over many habitats; roosts in buildings, trees, rocky outcrops and crevices in mines and caves; also in oak and pine forested areas, usually near a source of water	Potential for occurrence due to suitable habitat
Townsend's big-eared bat *Corynorhinus townsendii*	--/CSC	Found in all but subalpine and alpine habitats. Requires mines, caves, rock piles, and lava tubes for roosting	No potential for occurrence due to lack of suitable habitat

Table 3 POTENTIALLY OCCURRING SPECIAL-STATUS WILDLIFE SPECIES			
Common and Scientific Names	**Status Fed/State**	**Preferred Habitats**	**Known and Potential Occurrence in Project Area**
Gray wolf *Canis lupus*	FE/CE	Highly variable	No records in project vicinity in 93 years; has been located recently in other areas of Lassen County
North American wolverine *Gulo gulo luscus*	PFT/CT	Arctic, boreal, and alpine habitats. South of the Canadian border, restricted to high mountain environments near the treeline	No potential for occurrence due to lack of suitable habitat
American badger *Taxidea taxus*	--/CSC	Dry, open stages of shrub and forest with friable soils	Potential for occurrence due to suitable habitat
Pygmy rabbit *Brachylagus idahoensis*	--/CSC	Sagebrush, bitterbrush, and pinyon-juniper	Potential for occurrence due to suitable habitat
White-tailed jackrabbit *Lepus townsendii townsendii*	--/CSC	Sagebrush, subalpine conifer, juniper, alpine dwarf-shrub, and perennial grassland	Potential for occurrence due to suitable habitat
Key: Federally Endangered (FE), Proposed Federally Endangered (PFE); Federally Threatened (FT); Proposed Federally Threatened (PFT); California Endangered (CE); California Threatened (CT); California Fully Protected (CFP); California Species of Special Concern by DFG (CSC)			

Special-status wildlife species that are known to occur, or have the potential to occur, within the project area include:

- Monarch Butterfly (*Danaus plexippus)*
- Golden eagle (*Aquila chrysaetos*)
- Northern harrier (*Circus cyaneus*)
- Swainson's hawk (*Buteo swainsoni*)
- Greater sage-grouse (*Centrocercus urophasianus*)
- Burrowing owl (*Athene cunicularia*)
- Long-eared owl (*Asio otus*)
- Short-eared owl (*Asio flammeus*)
- Loggerhead shrike (*Lanius ludovicianus*)
- Gray wolf (*Canis lupus*)
- American badger (*Taxidea taxus*)
- Pallid bat *(Antrozous pallidus)*
- Pygmy rabbit (*Brachylagus idahoensis*)
- White-tailed jackrabbit (*Lepus townsendii townsendii*)

Of the 19 special-status species evaluated, 13 were determined to have a potential to occur, while the rest were determined to have no potential to occur. Species determined to have potential to occur within the project area are discussed below, while species that were determined to be absent are not discussed further.

Invertebrates

Monarch Butterfly
Danaus plexippus
Candidate ESA
Monarch butterflies have several life forms that make up their life history: egg, caterpillar (larvae), chrysalis, and adult stage. This species is migratory, with a well-known migratory path that can extend as far as 3,000 miles. Monarch butterflies in Western North America overwinter in California, with most occurring along the central coast from Santa Cruz south to San Diego, California. Monarchs rely on their host plant species, milkweed (*Asclepias* sp.). These plants can grow in a variety of habitats. There is potential for milkweed to occur in grassy openings within shrubland. There is little open grassland in the proposed expansion area. However, there is potential for recruitment following vegetation removal. If milkweed is observed onsite, mitigation measures in Section 5.4 will be implemented such that impacts will be reduced to less than significant.

Birds

Golden Eagle
Aquila chrysaetos
California Fully Protected
The golden eagle is listed by the State of California as Fully Protected, which prohibits take or possession of the species. Golden eagles are short-distance migrants, particularly in the western United States. This species is a year-round resident throughout California; limited migration occurs to the Central Valley during the winter. These birds typically hunt over the open terrain of grasslands, deserts, savannah, shrub, and early successional forests. They nest on cliffs of variable heights and in large trees in open habitats where perches on rock ledges, trees, or other tall objects provide good vantage for hunting. Common prey for golden eagles includes small mammals, birds, and reptiles. They sometimes take advantage of carrion, in such cases they can outcompete other scavengers for carcasses. Threats to this species include loss of foraging areas, loss of nesting habitat, pesticide poisoning, and collision with man-made structures such as wind turbines.

The site was assessed for potential nesting habitat as described in the USFWS "Protocol for Golden Eagle Occupancy and Reproduction Assessment". No golden eagles were observed onsite. No trees occur onsite that could provide nesting habitat for golden eagles where the active nest indicators would be observed. Potential foraging habitat exists in the open sagebrush areas of the project area. Golden eagles have been observed (per CNDDB) within five miles of the site.

There is foraging habitat within the expansion area as the sagebrush onsite is inhabited by prey species. The proposed expansion would result in the loss of portions of sagebrush habitat during the life of the mine until reclamation is completed in 2050. A total of 78 acres will be impacted; however, with scheduled reclamation, the actual acres impacted at any time should be less than ten: five acres reclaimed and returned to mature sage community and five acres undergoing initial reclamation. Mine areas will be reclaimed when removal is complete in five-acre increments (see Mitigation Measure MM-6), reducing potential impacts to foraging raptors. In

addition, the juvenile plants in reclaimed areas will likely attract more prey species (i.e. rabbit, hare, and squirrel). Mitigation measure (MM-7) will limit the area of disturbed foraging habitat. Based on the large regional expanse of suitable habitats, the loss of foraging habitat is not likely to be significant assuming reclamation is conducted in a timely manner to reduce foraging habitat impacts. Mitigation has been recommended to require reclamation within two years of final mineral removal and to be completed in a minimum acreage of 5 acres.

The areas that will be reclaimed within the current mine boundary will be reclaimed to the following palette:

Common Name	Scientific Name	Growth Habit	Broadcast Seed Rate (lbs PLS per acre)	Plug Planting Rate (plugs per acre)
Quarry Face and Bench Areas				
Sagebrush	*Artemisia tridentata*	Shrub	1.5	--
Bitterbrush	*Purshia tridentata*	Shrub	--	26
Rabbitbrush	*Ericameria nauseosa*	Shrub	3	--
Bluebunch wheatgrass	*Pseudoreogneria spicata*	Grass	3	--
Bottlebrush squirreltail	*Elymus elymoides*	Grass	10	--
Green ephedra	*Ephedra viridis*	Shrub/Subshrub	1	--
Remainder of Site				
Sagebrush	*Artemisia tridentata*	Shrub	2	--
Bitterbrush	*Purshia tridentata*	Shrub	--	26
Rabbitbrush	*Ericameria nauseosa*	Shrub	4	--

Northern Harrier
Circus cyaneus
State Species of Special Concern
The northern harrier is listed by the State of California as a Species of Special Concern. This species is a common winter resident and occurs in greater numbers in California during migration and winter, as many populations travel farther north to breed. Some populations remain in California and the historic breeding range extended from the Modoc Plateau south to San Diego. Breeding in California has greatly declined due to loss of suitable wetland habitats. Although most suitable habitat has been destroyed or degraded, the Central Valley still supports the majority of nesting in California. Northern harriers inhabit a variety of open habitats that provide vegetative cover including grasslands, coastal ponds/sloughs, coastal marshes, coastal wetlands, salt marshes, and sagebrush areas.

The proposed project area is not a known foraging or breeding location for northern harriers; according to CNDDB, there are no known occurrences within five miles of the proposed expansion area. Potential foraging habitat for northern harriers exists in the proposed expansion area. Disturbance of an additional 78.6 acres of land may result in the loss of foraging area for this species.

There is potential foraging habitat within the expansion area as the sagebrush onsite is inhabited by prey species. The proposed expansion would result in the loss of portions of sagebrush habitat during the life of the mine until reclamation is completed in 2050. Mine areas will be reclaimed when removal is complete, reducing potential impacts to foraging raptors. In addition, the juvenile plants in reclaimed areas will likely attract more prey species (i.e. rabbit, hare, and

squirrel). Based on the large regional expanse of suitable habitats, the loss of foraging habitat is not likely to be significant assuming reclamation is conducted in a timely manner to reduce foraging habitat impacts. Mitigation (MM-6) has been recommended to require reclamation within two years of final mineral removal and to be completed in a minimum acreage of 5 acres. Mitigation (MM-7) has also been included to minimize the area of ground disturbance.

Swainson's Hawk
Buteo swainsoni
State Threatened
The Swainson's hawk was listed as a threatened species in 1983. This species breeds in the western United States and Canada and winters in isolated areas in California, Mexico, and Central and South America, though only a small number have been documented to overwinter in California. Historically found throughout California except in the Sierra Nevada, North Coast Ranges and Klamath Mountains, loss of suitable habitat has now restricted breeding areas to the Great Basin and the Central Valley. Nesting Swainson's hawks require large open areas of grassland for foraging adjacent to riparian forests or corridors, juniper-sage flats, or oak savannah for nesting. The main cause of the decline of this species in California is the significant loss and degradation of open areas, such as agricultural lands and grasslands, due to urban development.

There are no records of Swainson's hawks within the project area in the CNDDB, but there are three records of nesting hawks within five miles of the project area. All of these records are located in irrigated farmland; there is no irrigated agricultural habitat suitable for nesting within the project area. Disturbance of an additional 78.6 acres of land may result in the loss of foraging habitat for this species.

There is potential foraging habitat within the expansion area as the sagebrush onsite is inhabited by prey species. The proposed expansion would result in the loss of portions of sagebrush habitat during the life of the mine until reclamation is completed in 2050. Mine areas will be reclaimed when removal is complete, reducing potential impacts to foraging raptors. In addition, the juvenile plants in reclaimed areas will likely attract more prey species (i.e. rabbit, hare, and squirrel). Based on the large regional expanse of suitable habitats, the loss of foraging habitat is not likely to be significant assuming reclamation is conducted in a timely manner to reduce foraging habitat impacts. Mitigation (MM-6) has been recommended to require reclamation within two years of final mineral removal and to be completed in a minimum acreage of 5 acres. Mitigation (MM-7) has also been included to minimize the area of ground disturbance.

Greater Sage-Grouse
Centrocercus urophasianus
State Species of Special Concern
The greater sage-grouse is listed by the State of California as a Species of Special Concern. The species was considered for listing under the ESA as Endangered or Threatened in 2015, but the USFWS found that listing was not warranted. This species is a permanent resident in northeastern California and ranges from the Oregon border along the east side of the Cascade Range and Sierra Nevada to northern Inyo County. Lassen and Mono Counties have the most stable populations in California. Greater sage-grouse inhabit open areas with a combination of sagebrush, perennial grassland and wet meadow; large, continuous tracts of sagebrush habitat are

required for courtship displays. Declining population numbers are due mostly to habitat loss, impacts of non-native invasive species, and overgrazing.

There are no records of greater sage-grouse within five miles of the project area in the CNDDB; the closest record is 58 miles to the north. Potential breeding and nesting habitat exists in the open sagebrush areas of the project area. Although there are no nearby records, there is suitable habitat within the project area and surrounding areas. Disturbance of an additional 78.6 acres of land may result in the loss of habitat for this species. No leks or signs of sage grouse activity were observed in the proposed project area.

No adverse project impacts to greater sage-grouse are anticipated; however, there is potential foraging habitat within the expansion area as the sagebrush onsite is inhabited by prey species. The proposed expansion would result in the loss of portions of sagebrush habitat during the life of the mine until reclamation is completed in 2050. Mine areas will be reclaimed when removal is complete, reducing potential impacts to foraging raptors. In addition, the juvenile plants in reclaimed areas will likely attract more prey species (i.e. rabbit, hare, and squirrel). Based on the large regional expanse of suitable habitats, the loss of foraging habitat is not likely to be significant assuming reclamation is conducted in a timely manner to reduce foraging habitat impacts. Mitigation (MM-6) has been recommended to require reclamation within two years of final mineral removal and to be completed in a minimum acreage of 5 acres. Mitigation (MM-7) has also been included to minimize the area of ground disturbance.

Burrowing Owl
Athene cunicularia
State Species of Special Concern
The burrowing owl (BUOW) is listed by the State of California as a Species of Special Concern. This species is a permanent resident in the central valley and southern California. These birds inhabit northeastern California during the summer breeding season. Burrowing owl habitat typically consists of open grasslands and shrublands with perches for hunting and burrows for nesting. Nesting usually occurs in vacant mammal burrows but, where burrows are scarce, these owls may use human structures or dig their own burrows in soft soil. This species exhibits strong site fidelity. These owls forage at all hours of the day and night. Populations are still stable but have been declining, mostly due to habitat loss from agriculture and development and poisoning of ground squirrels.

There are no records of BUOW within five miles of the project area in the CNDDB. During previous consultation with CDFW regarding the Ward Lake Quarry, CDFW recommended BUOW surveys because potentially suitable habitat for the species exists within the current mine site. No BUOW burrows or individual owls were detected during the resulting survey completed in 2019.

Similarly, potential habitat for BUOW was considered to be potentially present during review of the proposed expansion area. A protocol-level survey was completed in 2020; the survey followed the *Burrowing Owl Survey Protocol and Mitigation Guidelines,* published by the California Burrowing Owl Consortium. The first step of the protocol consists of searching for burrow structures that may be inhabited by owls. The survey found that no burrows that meet the characteristics for BUOW habitat are present onsite. Due to ongoing potential for recruitment,

mitigation measures designed to avoid nesting birds prior to new area disturbance will be implemented to minimize any disturbance if burrowing owls are ever observed onsite.

Long-Eared Owl
Asio otus
State Species of Special Concern
The long-eared owl is listed by the State of California as a Species of Special Concern. This species is a permanent resident throughout California, except the central valley and southern California. Long-eared owls roost and nest in dense vegetation, typically live oak thickets and other dense tree stands, especially in riparian areas. These owls hunt in open grasslands and shrublands. This species does not build their own nests; nesting usually occurs in old bird and squirrel nests. These are nocturnal owls that forage during nighttime hours. Resident populations have been slowly declining since the 1940s due mainly to habitat loss and fragmentation.

There are no records of long-eared owls within five miles of the project area in the CNDDB. Although there are no nearby records, there is suitable foraging habitat within the project area and surrounding areas. The project area will likely disturb foraging habitat for this species. There are currently no known nesting sites located in or near the project area, and there is no suitable dense nesting vegetation for the long-eared owl in the area.

No project impacts to long-eared owls are anticipated; however, there is potential foraging habitat within the expansion area as the sagebrush onsite is inhabited by prey species. The proposed expansion would result in the loss of portions of sagebrush habitat during the life of the mine until reclamation is completed in 2050. Mine areas will be reclaimed when removal is complete, reducing potential impacts to foraging raptors. In addition, the juvenile plants in reclaimed areas will likely attract more prey species (i.e. rabbit, hare, and squirrel). Based on the large regional expanse of suitable habitats, the loss of foraging habitat is not likely to be significant assuming reclamation is conducted in a timely manner to reduce foraging habitat impacts. Mitigation (MM-6) has been recommended to require reclamation within two years of final mineral removal and to be completed in a minimum acreage of 5 acres. Mitigation (MM-7) has also been included to minimize the area of ground disturbance.

Short-Eared Owl
Asio flammeus
State Species of Special Concern
The short-eared owl is listed by the State of California as a Species of Special Concern. This species is a permanent resident in northeastern California and a widespread winter migrant in the central valley and western Sierra Nevada. Short-eared owls roost on the ground in dense, low vegetation, typically tall grasses, brush, or wetlands. Nests are made on dry ground concealed in vegetation. These owls hunt in open areas including annual and perennial grasslands, shrublands, marshes, and agricultural fields; grasslands are most preferred. Short-eared owls are active mostly at twilight and nighttime hours, but are often active during the day in the breeding season. There is not a lot of available data on short-eared owl populations, but populations appear to be declining over most of the range because of habitat loss and fragmentation, and overgrazing.

There are no records of short-eared owls within five miles of the project area in the CNDDB. Although there are no nearby records, there is some suitable habitat within the open shrubland of the project area and surrounding areas. There are currently no known nesting sites located in or near the project area, and there is not enough suitable grassland within the area for nesting.

No project impacts to short-eared owls are anticipated; however, there is potential foraging habitat within the expansion area as the sagebrush onsite is inhabited by prey species. The proposed expansion would result in the loss of portions of sagebrush habitat during the life of the mine until reclamation is completed in 2050. Mine areas will be reclaimed when removal is complete, reducing potential impacts to foraging raptors. In addition, the juvenile plants in reclaimed areas will likely attract more prey species (i.e. rabbit, hare, and squirrel). Based on the large regional expanse of suitable habitats, the loss of foraging habitat is not likely to be significant assuming reclamation is conducted in a timely manner to reduce foraging habitat impacts. Mitigation (MM-6) has been recommended to require reclamation within two years of final mineral removal and to be completed in a minimum acreage of 5 acres. Mitigation (MM-7) has also been included to minimize the area of ground disturbance.

Loggerhead Shrike
Lanius ludovicianus
State Species of Special Concern
The loggerhead shrike is listed by the State of California as a Species of Special Concern. This species is a permanent resident and winter migrant in lowland and foothill areas throughout California. This species typically inhabits open areas with scattered shrubs, trees and perches, including agricultural fields, pastures, orchards, scrublands, and riparian areas. These birds roost and nest in shrubs or small trees. Loggerhead shrikes are diurnally active. Populations in the Pacific states have remained fairly stable, but numbers have declined elsewhere in their range. Declines are likely due to increased use of pesticides.

There are no records of loggerhead shrikes within five miles of the project area in the CNDDB. Although there are no nearby records, there is suitable habitat within the open shrubland of the project area and surrounding areas. There are currently no known nest occurrences located in or near the project area, and nesting birds will likely avoid the area to utilize adjacent undisturbed sagebrush habitat.

No project impacts to loggerhead shrikes are anticipated; however, there is potential foraging habitat within the expansion area as the sagebrush onsite is inhabited by prey species. The proposed expansion would result in the loss of portions of sagebrush habitat during the life of the mine until reclamation is completed in 2050. Mine areas will be reclaimed when removal is complete, reducing potential impacts to foraging raptors. In addition, the juvenile plants in reclaimed areas will likely attract more prey species (i.e. rabbit, hare, and squirrel). Based on the large regional expanse of suitable habitats, the loss of foraging habitat is not likely to be significant assuming reclamation is conducted in a timely manner to reduce foraging habitat impacts. Mitigation (MM-6) has been recommended to require reclamation within two years of final mineral removal and to be completed in a minimum acreage of 5 acres. Mitigation (MM-7) has also been included to minimize the area of ground disturbance.

Mammals

Gray Wolf
Canis lupus
Federally Endangered; California Endangered
The gray wolf was listed as endangered on March 9, 1978 (USDI FWS 1978). Gray wolves are habitat generalists and can potentially occur in a wide range of habitats including temperate forest, mountains, tundra, taiga, and grasslands, so long as there is suitable prey. Prey species primarily include ungulates, such as moose, caribou, deer, and elk, but they will also take smaller prey such as beaver and small mammals and will readily scavenge.

This species is highly territorial and defends territories in packs. Territory size is a function of prey density and can range from 25 to 1,500 square miles. Both male and female wolves disperse at equal rate and equal distances, sometimes more than 600 miles. Gray wolves once ranged throughout the northern hemisphere, but widespread trapping and extermination efforts severely reduced their distribution and caused dramatic population declines. Current threats to the gray wolf include continued conflict with humans, primarily resulting from livestock depredation, and habitat loss, degradation and fragmentation due to land development.

The last recorded observation of gray wolf in the project vicinity was in 1924 near Litchfield, California. However, it has a large home range and range expansion is documented and could result in wolves reinhabiting the area at some point. CDFW has collected evidence (GPS tracking collar and remote trail camera images in 2016) that suggests that a small number of wolves have traveled into Lassen County (CDFW 2017).

Due to the small project footprint relative to the large home range size of the gray wolf, the proposed project will not alter an amount of habitat significant enough to have any impact on the species. Further, gray wolves are highly mobile and capable of avoiding project-related disturbance. Therefore, the proposed expansion will have no effect on the gray wolf.

American Badger
Taxidea taxus
State Species of Special Concern
The American badger is listed by the State of California as a Species of Special Concern. These animals are permanent residents throughout most of California, except for the far northern North Coast area. Suitable habitat for this species is characterized by herbaceous, shrub, and open stages of most habitats with dry, friable soils. Dry, friable soils, often sandy, are required because badgers eat mostly fossorial (i.e., occurring underground) rodents, and they also take cover and reproduce in burrows. Badgers are active both day and night, and they may undergo periods of torpor in the winter. Populations are considered fairly stable but have declined due to historical trapping, conversion of habitat to intensive agriculture, and rodent poisoning.

There are no records of American badgers within five miles of the project area in the CNDDB; however, there is suitable habitat within the open shrubland of the project area and surrounding areas. No American badgers, signs of badgers, or burrows were observed during the site surveys. Due to sensitivity to noise, badgers in surrounding areas likely avoid the project area due to a close proximity to ongoing operations in the current mining area. Project impacts to American badgers are anticipated to be less than significant.

Pygmy Rabbit
Brachylagus idahoensis
State Species of Special Concern
The pygmy rabbit is listed by the State of California as a Species of Special Concern. In California, this species is uncommon in the Great Basin areas of Modoc, Lassen, and Mono Counties; however, these rabbits can be found in sagebrush, bitterbrush, and pinyon-juniper habitats, and they prefer big sagebrush because it makes up the majority of their winter diet. Pygmy rabbits dig burrow for food storage and reproduction. This species is crepuscular and sometimes active during the day. Populations exhibit patchy distributions and are extremely varied across the species range. Because the species is dependent on big sagebrush it is vulnerable to habitat loss and fragmentation from habitat conversion and fire.

There are no CNDDB records of these rabbits within five miles of the project area; however, there is suitable sagebrush habitat for this species, so they could potentially occur. No pygmy rabbits were observed during site surveys. Prior to new ground disturbance and annually thereafter, additional mammal surveys should be implemented to determine the presence of pygmy rabbits onsite. Project operations would result in temporary loss of additional habitat for pygmy rabbits, although this would be restored upon site reclamation. See additional mitigation included in Section 5.4 for reclamation schedule.

White-Tailed Jackrabbit
Lepus townsendii townsendii
State Species of Special Concern
The white-tailed jackrabbit is listed by the State of California as a Species of Special Concern. This species is an uncommon, permanent resident of northeastern California and the upper eastern slopes of the Sierra Nevada. These rabbits prefer open areas with scattered shrubs, including sagebrush, subalpine conifer, juniper, alpine dwarf-shrub, and perennial grassland, but are also found in wet meadow habitat and early successional stages of conifer forests. These animals move seasonally from higher to lower elevations in winter. Sagebrush is an important part of the winter diet. This species is primarily nocturnal and sometimes crepuscular. There is little available data on the status of populations in California, but evidence indicates sharp declines. It is thought that white-tailed jackrabbits may now be absent from large tracts of its previous range. Overgrazing is thought to be the main cause of habitat fragmentation.

There are no CNDDB records of these rabbits within five miles of the project area; however, there is suitable sagebrush habitat for this species, so they could potentially occur. The disturbance of an additional 78.6 acres could result in the loss of habitat for this species. No white-tailed jackrabbits were observed during site surveys. Prior to new ground disturbance and annually thereafter, additional mammal surveys should be implemented to determine the presence of white-tailed jackrabbits onsite. Project operations would result in temporary loss of additional habitat for white-tailed jackrabbits; however, this would be restored upon site reclamation. See additional mitigation included in Section 5.4 for reclamation schedule.

Pallid Bat
Antrozous pallidus
State Species of Special Concern
The pallid bat is listed by the State of California as a Species of Special Concern. These are crevice-roosting bats of arid and semi-arid regions across much of the American west. They are

a locally common species of low elevations. This species is not known to migrate long distances and they likely hibernate close to summer roosts. They are found in a variety of habitats such as grasslands, shrublands, and woodlands, but are most common in open, dry regions with rocky outcroppings or sparsely vegetated grasslands. Water must be available close by to all sites. They typically will use three different types of roosts: a day roost which can be a warm, horizontal opening such as in attics, shutters or crevices; the night roost is in the open, but with foliage nearby; and the hibernation roost mentioned above, which is often in buildings, caves, or cracks in rocks (Brylski et al. 1998). These bats are very sensitive to roosting site disturbance.

There are no records of pallid bats within five miles of the project area in the CNDDB; however, there is suitable foraging habitat within the open shrubland of the project area and surrounding areas and rock outcroppings in the proposed project area could provide roosting habitat. No bats or sign of bats were observed in rock outcroppings during the site survey. No other potential habitat was identified onsite. No project impacts to pallid bats are anticipated.

4.1.2 Other Mammals

Potential Effects to Deer and Pronghorn

The sagebrush habitat surrounding the project area provides habitat for mule deer (*Odocoileus hemionus*) and American pronghorn (*Antilocapra americana)*. The project area falls within Deer Hunt Zone X5a, which is a zone within the greater DAU 2 – encompassing northeastern California; and the project is within Pronghorn Hunt Zone 4 – Lassen. The project area is on the edge of CDFW-designated critical winter-range habitat for mule deer (Figure 8) and winter-range habitat for pronghorn antelope (Figure 9). The mule deer population within Hunt Zone X5a has increased, with an estimated 544 animals in 2013 and 942 in 2017. Previous mitigation measures were discussed in Section 5.4.

Site visit found potential noise impacts due to proximity to a canyon which leads to kidding grounds. The project boundary was designed to keep a natural berm at that end of the quarry in order to minimize noise impacts to the pronghorn kidding grounds. Noise should be contained within Ball's Canyon, approximately 4 miles south of the kidding grounds (see Figure 9). The project could result in direct impacts mule deer and American pronghorn from direct loss of habitat and displacement due to mining operations and the associated, noise, vibration, and light occurring over a larger area. Mitigation measures relating to reclamation schedule and additional area disturbance should reduce impacts to less than significant.

4.1.3 Raptors and Migratory Birds

Raptor species (birds of prey) and migratory birds may nest in trees and other vegetation located within or in the immediate vicinity of the study area. All raptors and migratory birds, including common species and their nests, are protected from "take" under the California Fish and Game Code, Section 3503 and 3503.5, and the Federal Migratory Bird Treaty Act. Large trees onsite and in the surrounding forest provide potential nesting habitat for raptors and migratory birds.

Implementation of the conservation measures described in Section 5.4 would reduce potential impacts on nesting migratory birds and raptors. Mining activities during the nesting season (February 1 through August 31), such as tree removal and blasting activities that disturb a nesting bird or destroy active nests, could result in impacts to nesting birds. Should a site survey detect nesting raptors in close proximity to the project area, appropriate spatial and temporal

buffers will be implemented. Based on mitigation measures for reclamation schedule and residual habitat protection, the project is not anticipated to have a direct effect on raptors or migratory birds or their habitat.

4.1.4 Special-Status Plants

Special-status plant species include plants that are (1) designated as rare by CDFW or USFWS or are listed as threatened or endangered under the CESA or ESA; (2) proposed for designation as rare or listing as threatened or endangered; (3) designated as state or federal candidate species for listing as threatened or endangered; and/or (4) ranked as California Rare Plant Rank (RPR) 1A, 1B, 2A, 2B, or 3. A list of regionally occurring special-status plant species was compiled based on a review of pertinent literature, the results of the field surveys, and a review of the USFWS species list and CNDDB and a nine-quad search (Tunnison Mountain, Petes Valley, Karlo, Johnstonville, Litchfield, Shaffer Mountain, Janesville, Standish, and Wendel Hot Springs) of CNPS database records.

The results of a habitat assessment is provided in Table 4. Six plants ranked 1B or 2B by the CNPS California Rare Plant Ranking (CRPR) are recorded in the CNDDB within five miles of the proposed expansion area. Plant species listed on the CNPS CRPR are considered during this assessment as they meet the definition of Threatened or Endangered under sections 2062 and 2067 of the California Fish and Game code (CRPR listed as 1, 2, or 3 meet definition of Threatened/Endangered under CESA). The six CRPR plants species and a summary of their potential to occur within the proposed project area are included in Table 4. Consultations found no records of Federally or State-listed threatened or endangered plant species within five miles of the project area.

Table 4
POTENTIALLY OCCURRING SPECIAL-STATUS PLANT SPECIES

Species	CRPR Status	Flowering Period	Habitat	Potentially Occurring
Winged dock (*Rumex venosus*)	2B.3	May-June	Great Basin scrub (sandy); 1200-1800 m	No
Western seablite (*Suaeda occidentalis)*	2B.3	July-September	Great Basin scrub (alkaline, mesic); usually in wetlands; 1200-1500 m	No
Playa phacelia (*Phacelia inundata*)	1B.3	May-August	Usually in wetlands; sagebrush scrub, lower montane coniferous forest; 1350-2000 m	No
Ornate dalea (*Dalea ornata*)	2B.1	June	Pinion-Juniper woodland; 1365-1700 m	Yes
Spiny milkwort (*Polygala subspinosa*)	2B.2	May-August	Sagebrush scrub, Pinion-Juniper woodland, gravelly, rocky; 1330-1705 m	Yes
Susanville beardtongue (*Penstemon sudans*)	4.3	June-July	Great Basin scrub, lower montane coniferous forest (openings), Pinyon-Juniper woodland; volcanic, rocky, sometimes roadsides; 1200-2425 m	Yes

Key: 1B.2: "moderately" rare, threatened, or endangered in California and elsewhere; **1B.3**: "not very" rare, threatened, or endangered in California and elsewhere; **2B.1**: "seriously" rare, threatened, or endangered in California but more common elsewhere; **2B.2**: "moderately" rare, threatened, or endangered in California but more common elsewhere; **2B.3**: "not very" rare, threatened, or endangered in California but more common elsewhere.

Susanville Beardtongue
Penstemon sudans
CRPR 4.3
Susanville beardtongue is a perennial herb/subshrub that is native to California and is also found in Nevada. It is adapted to open rocky, igneous soils in sagebrush scrub and montane forest habitats between 1200 and 2200 meters. The species is ranked by the CNPS as 4.3, plants of limited distribution in California. The nearest documented observation of Susanville beardtongue was approximately seven miles from the Ward Lake Quarry, on the northeast side of Shaffer Mountain. This species has the potential to occur within the proposed additional project area due to the rocky slopes within the appropriate elevation range.

A site survey was completed during preliminary biological surveys within an area located to the east of the existing quarry in August 2019. Susanville beardtongue was observed during this survey. The observed populations are well outside of the proposed expansion area and would not be affected by the proposed expansion through direct or indirect impacts.

A survey was completed within the proposed expansion area in the spring of 2020. The survey focused on the plant in its vegetative state since the survey was not conducted during the flowering period (June-July) for this species. The off-season survey was possible due to its perennial growth habit. Other than the off-season timing, the botanical survey for this species conducted in accordance with CDFW protocols. Additional surveying will be conducted according to CDFW protocol prior to new areas of disturbance in appropriate habitat within the expansion area to determine if this species is present. If detected, measures implemented in Section 5.4 will be implemented.

Spiny Milkwort
Polygala subspinosa
CRPR 2B.2
Spiny milkwort is a perennial herb native to California, though original observations were in the Southwestern United States. It grows in gravelly or rocky soils found in desert scrub and volcanic mesas from 1350 to 2285 meters in elevation. This species is ranked by the CNPS as 2B.2, classified as moderately rare, threatened or endangered in California but more common elsewhere. The nearest documented observation of this plant was in a gravelly wash located six miles east of the Ward Lake Quarry. Spiny milkwort has the potential to occur within the project area due to the gravelly and rocky soils that exist in the proposed expansion area.

The 2019 site survey determined the presence of spiny milkwort (*Polygala subspinosa*) due east of the current operations. The plant was observed growing on a southwest-facing slope along the southern border of the site near the BLM property. The observed habitat was on steep, rocky slopes growing among other vegetation including perennial grasses and annual forbs. The species was not detected in 2019 or 2020 surveys. A botanical survey for this species in accordance with CDFW protocols will be conducted prior to vegetation removal activities within the expansion area to determine the presence of this species. If detected, measures implemented in Section 5.4 will be implemented.

Ornate Dalea
Dalea ornata
CRPR 2B.1
Ornate dalea is a perennial forb that is native to California that commonly grows on open, rocky hillsides at elevations between 1365 and 1700 meters. This species is known to occur on the Modoc Plateau. The 2018 survey conducted for ornate dalea found no observations of the species. The nearest sighting was approximately two miles from the proposed expansion area. Previous observations of ornate dalea have occurred within one mile of hydrological drainages. Ornate dalea was not observed within the proposed project area or surrounding areas during the site survey. A botanical survey for this species conducted in accordance with CDFW protocols will be conducted prior to vegetation removal activities within the expansion area to determine if this species is present. If detected, measures implemented in Section 5.4 will be implemented.

5.0 POTENTIAL EFFECTS

The proposed Reclamation Plan Amendment would expand the project area to include an additional 78.6 acres of land to be used as a rock quarry, extend the life of the quarry to 2050, and increase activities within the existing quarry area. Potential effects to biological resources will be addressed through avoidance and mitigation measures to minimize adverse impacts to special-status species and their habitat.

5.1 Direct Effects

Direct effects of the proposed project are those immediate impacts resulting from the proposed expansion. Potential direct effects of the proposed project to special-status wildlife species are the loss of habitat due to ground disturbance, vegetation removal, blasting, and operation of heavy equipment.

The proposed quarry will involve disturbance of native vegetation and reconfiguration of slopes within the proposed project area. Such a change in topography will cause a loss of habitat in portions of the area for the 30-year duration of the project. A portion of the proposed expansion area has historically been disturbed; the grading from an old access road, possibly from public land use, is observable through aerial imagery and onsite. Otherwise, vegetation onsite is intact and currently provides foraging and migration habitat for wildlife species.

5.1.1 Direct Effects to Birds

The proposed expansion will result in the loss of 78.6 acres of available sagebrush habitat over the course of the project. Bird species which utilize sagebrush shrub habitat for foraging or nesting will likely avoid the site and seek adjacent areas with undisturbed land. However, there is potential for direct mortality or injury to occur if nests are present in the expansion area during initial vegetation removal and ground-disturbing activities. Measures to avoid impacts to nesting birds are included in Section 5.4.

Areas of the quarry will be reclaimed upon mineral removal which will restore habitats. As described in the Reclamation Plan, reclamation is to be completed at the time of mine closure unless possible to conduct concurrently with mining operations. Reclamation of the mine area will allow for recruitment of bird species once foraging opportunities are restored. The quarry floor and benches in the expansion area will be seeded with a mix of sagebrush (*Artemisia tridentata ssp.*), rabbitbrush (*Ericameria nauseosa*), bitterbrush (*Purshia tridentata*) and blue bunch wheat grass (*Elymus spicatus*). The existing mining area will be seeded with a mix of sagebrush, rabbitbrush, bitterbrush, bluebunch wheatgrass, bottlebrush squirreltail (*Elymus elymoides*), and green ephedra (*Ephedra viridis*). Additional mitigation requiring an increased schedule of reclamation and protection of undisturbed areas during the mine period will result in no significant effects to birds as a result of the proposed site expansion. See Section 5.4.

5.1.2 Direct Effects to Mammals

The proposed expansion will result in the loss of 78.6 acres of available sagebrush habitat during the course of the project. This could mean a loss of foraging and breeding habitats. Mammalian

species which utilize sagebrush shrub habitat will likely avoid the site and seek adjacent undisturbed open space which consists of large expanses of sage brush habitat. Areas of the current quarry will be reclaimed, which will restore the cover and food source for mammals. In addition, habitat enhancement and non-native species control will be undertaken in non-disturbed areas. No significant effects to special-status mammals are expected as a result of the project site expansion.

The sagebrush habitat surrounding the project area provides habitat for mule deer (*Odocoileus hemionus*) and American pronghorn (*Antilocapra americana)*. The project includes spatial expansion of the existing mining boundary that would physically disturb and reduce an additional 78.6 acres of important winter habitat and important vegetation for mule deer and pronghorn antelope. As discussed in the Deer Impact Analysis prepared for the 1997 EIR, loss of vegetation would be non-significant with an appropriate reclamation plan including re-planting with bitterbrush, sagebrush, and native grasses, all from local sources, and protection from grazing and browsing by both wildlife and livestock until the plants are well established, as well as monitoring to ensure compliance.

Following mining activities, the site will be reclaimed and the habitat will be restored. The seed mix proposed for reclamation in the expansion area is similar to the seed mix approved by CDFW for the existing quarry and includes essential forage species. Reclamation of the mining area following mining activities will restore the sagebrush habitat and provide forage for mule deer and American pronghorn. Additional mitigation requiring an increased schedule of reclamation and protection of undisturbed areas during the mine period will result in no significant effects to mule deer and American pronghorn as a result of the proposed site expansion. Impacts related to temporary habitat loss will be reduced by mitigation measures to mandate reclamation in five-acre sections (see Section 5.4).

5.1.3 Direct Effects to Plants

A loss of vegetation within the proposed expansion area will occur during the course of the project. The project site contains suitable habitat for three special-status plant species that are known to occur in the project vicinity. These include ornate dalea (*Dalea ornata*), spiny milkwort (*Polygala subspinosa*), and Susanville beardtongue (*Penstemon sudans*). Ground disturbance within the expansion area will result in elimination of habitat for these species prior to reclamation. Surveys of the project site were conducted outside of the bloom period for some species. Protocol-level botanical surveys will be completed within proposed disturbance areas prior to vegetation removal. If no special-status plants are observed during the recommended botanical surveys, no additional measures are recommended. If special-status plant species are identified within the expansion area, mitigation measures included in Section 5.4 will be implemented to avoid or reduce such impacts to the plant populations.

5.2 Indirect Effects

Indirect effects are those that are caused by or will result from the proposed action and are expected to occur later in time. Effects could be both short- and/or long-term in nature. Material extraction and possible use of a portable crusher will result in increased noise in the expansion area as well as the surrounding areas. The increase in processing at the site will require

increased use of the primary crusher (estimated 33 percent annual increase in use). The project will also extend the life of the mine to 2050 which will increase the duration of impacts from the existing mining operation. The project will result in an increase in human presence within the area for a 30-year period, which could potentially result in increased disturbance or stress to special-status wildlife. Increased human presence, noise and vibration from equipment operation, and light within the project area could result in displacement of wildlife from the project site and surrounding areas for the duration of the project.

Measures included in Section 5.4 include continued seasonal operating restriction and light and noise reductions (as included in previous use permits for operations at the project site), additional surveys, increased schedule of reclamation, and protection of unmined areas. These operational limits and restrictions will be applied within the existing quarry as well as mining activities within the 78.6-acre expansion area and will reduce the indirect impacts of the project.

5.2.1 Indirect Effects to Birds

Noise and vibrations generated by heavy equipment operation may cause a disturbance to nesting and foraging birds. However, noise and vibrations associated with mining work already occur in the active project area and any birds in the area are likely acclimated to these noise levels. Foraging birds will avoid the site by changing flight patterns while project work occurs. The proposed quarry expansion would likely result in the loss of potential foraging habitat for passerines and raptors. This would be a temporary but significant impact. A total of 78 acres will be impacted; however, with scheduled reclamation, the actual acres impacted at any time should be less than ten: five acres reclaimed and returned to mature sage community and five acres undergoing initial reclamation. Mine areas will be reclaimed when removal is complete in five-acre increments (see Mitigation Measure MM-6), reducing potential impacts to foraging raptors. In addition, the juvenile plants in reclaimed areas will likely attract more prey species (i.e. rabbit, hare, and squirrel). Mitigation measure (MM-7) will limit the area of disturbed foraging habitat.

5.2.2 Indirect Effects to Mammals

Noise and vibrations generated by heavy equipment operation may cause a disturbance to mammals. Expansion of the mining area by an additional 78.6 acres will increase the area over which light and noise impacts will occur. However, noise and vibrations associated with mining work already occur in the active project area and any many mammals in the area are likely acclimated to these noise levels.

The project would cause additional displacement of mule deer and American pronghorn from noise and human activity. As discussed in the 1997 Deer Impact Analysis, human activity in the project area would displace animals escaping mid-winter snow as well as taking advantage of late-winter and early spring plant phonology or the spring green-up due to noise and activity at the site. The project will result in these impacts occurring over a larger area than the current mining operation and for a longer duration (until 2050). Mule deer commonly use the areas around the mine site.

The project will continue to comply with the conditions of approval for Use Permit Amendment #2018-003 limiting mining activities from January 1 to March 31 each year, limiting activities occurring during nighttime hours, as well as requiring lighting to be downward facing and fully-

shielded. These operating conditions will decrease the lighting and noise impacts within the expansion area. However, as discussed in previous CEQA review for the Project, a seasonal closure from at least December through March was determined to be necessary to reduce the impacts due to displacement from noise and human activity to a less than significant level. The Project will result in additional disturbance to pronghorn and mule deer. Human disturbance during a time of particular nutritional stress may effectively remove a portion of their winter range (Kucera, 1999). See mitigation in Section 5.4. Because several hundred deer would potentially be affected and impacts will last for an additional 30 years (until 2050), this is a significant and unavoidable impact.

5.2.3 Indirect Effects to Sensitive Natural Communities

The California Sensitive Natural Communities List published on August 18, 2021, was reviewed due to the fact that big sage subspecies (*Artemisia tridentata* ssp.) are components of natural communities that are listed as S1, S2, and S3, and therefore warrant consideration under CEQA. None of the California Sensitive Natural Communities listed are present within the proposed expansion area. Mountain big sage (*Artemisia tridentata* ssp. *vaseyana*) and Idaho fescue (*Festuca idahoensis*) are present in the surrounding area but these plant species would not be disturbed by proposed activities. Additionally, the current mine area will be planted with these two species during reclamation, which will increase the presence of this community in the long term.

5.3 Cumulative Effects

Cumulative effects include the total impact on a resource due to past, present, and future activities. The Ward Lake Quarry has been in operation since 1980 for rock, sand, and gravel removal and processing operations. The project area is zoned as an upland conservation/resource management district by Lassen County, so this consistent disturbance is anticipated. These previous uses have changed the topography and vegetation of the site, thus changing available habitat within the project area on an annual basis. The proposed expansion would cause additional ground disturbance but would enhance the brush communities, including sagebrush, bitterbrush, and rabbitbrush, on the site following conclusion of the project and site reclamation. Many of the surrounding parcels are zoned as open space or upland conservation district, so reclamation of the site will create contiguous open space and wildlife habitat.

5.4 Mitigation Measures

The following measures are recommended in order to avoid and minimize potential impacts of the project.

Monarch Butterfly

MM-1 Throughout the life of the mine, if milkweed (*Asclepias* spp.*)* is observed onsite during breeding season/pupae development season (spring-summer), the plant should be inspected for caterpillars. If developing monarch caterpillars are present, the plant should be avoided until butterflies have emerged and the plant is no longer in use.

Birds

MM-2 Bird nest avoidance. Vegetation will be removed outside of the bird nesting season to (February through August) to the extent possible to avoid impacts to nesting birds.

MM-3 Nesting bird surveys. If activities that may cause adverse impacts to potential breeding habitat for any shrub or ground nesting bird species occurs during the nesting season (March 1 through August 21) a survey for active bird nests will be completed. If any active nests are observed, CDFW will be consulted to determine the appropriate buffer. Buffers can range from fifty to three hundred or more feet, depending on the sensitivity of the species. The nest should be monitored until young birds have fledged and the nest is considered to be no longer active.

MM-4 Burrowing owl surveys (*A. cunicularia*) will be completed prior to additional ground disturbance and annually during nesting season.

MM-5 If burrowing owl is ever observed within the project area, CDFW should be contacted to determine avoidance measures and determine if nest burrows occur onsite.

MM-6 To reduce foraging habitat loss, a condition will be added to the use permit to require reclamation of each 5 acres of mine area. Reclamation as referenced in the Mine Reclamation Plan will be required to be initiated within two years on each 5-acre area in order to minimize the total area disturbed at any given time. This includes seeding the quarry floor and benches with a mix of sagebrush (*Artemisia tridentat*e) at two pounds of PLS per acre, rabbitbrush (*Ericameria nauseosa*) at four pounds of PLS per acre, bitterbrush (*Purshia tridentate*) at one pound of pure seed per acre, and blue bunch wheat grass (*Elymus spicatus*) at three pounds per acre.

MM-7 To ensure no additional foraging habitat loss, all remaining areas of the mine parcels will remain undisturbed for the duration of mining. This includes remaining portions of APN 109-100-59 and APN 109-100-60.

Mammals

MM-8 Limits on operation. The operator shall continue limits on operations from January 1 to March 31. Impacts can be lessened through continuing seasonal operating restrictions included in the Condition of Approval for Use Permit No. 96056, which states "*Except in a state of emergency, as declared by the local Emergency Services Director and/or the Board of Supervisors and/or the City of Susanville, no grading, excavating, or blasting on the site shall be allowed between January 1 and March 31 Annually";*

MM-9 Operating conditions of Use Permit #2018-003. The operator shall continue the Conditions of Approval for Use Permit Amendment #2018-003. Indirect impacts of the project can be lessened with the seasonal operating restrictions and light and noise reductions included in the Conditions of Approval for Use Permit Amendment No. 2018-003. The Conditions of approval are as follow:

- *Operator shall conduct no nighttime operations (7:00 p.m. to 6:00 a.m.) during the period of January 1 to March 31. Applying the existing operational restrict to the proposed nighttime operations would eliminate additional disturbance/displacement of pronghorn antelope and mule deer utilizing the winter habitat during the winter months.*

- *Year-round nighttime restrictions. No grading, blasting, or excavating shall be allowed onsite between the hours of 6:00 p.m. and 7:00 a.m.*

- *Lighting fixture design. To minimize the effects of lighting of artificial light on wildlife, lighting fixtures associated with nighttime project work shall be downward facing and fully shielded. Lighting equipment should be designed and installed to minimize light pollution.*

- *Noise reduction barriers. Adverse effects from noise may be reduced through installation of noise berms constructed around the project area where heavy machinery is in use. Barriers can eliminate or minimize the impacts of vibrations that may result from nighttime operations.*

- *No "jake brake" usage. This option can significantly reduce the noise impacts from the increased traffic volume. "No use of jake brake" signs shall be posted on the access road and at the Center Road (A27) and Ward Lake Road intersection.*

- *Wildlife crossing signage on roadways. This option would educate drivers about the potential for wildlife encounters on roads during the nighttime hours. Signage will be permanent. This measure can prevent direct mortalities to nocturnal wildlife. Signs will be added along Center Road and Ward Lake Road with County approval.*

- *Reduce traffic speed on roadways. This mitigation would reduce the speed limit in order to minimize traffic impacts to wildlife. "Reduce speed to 25 MPH" signs would reduce the speed limit on Ward Lake Road during nighttime hours, granting a longer reaction time should any wildlife be encountered on a roadway.*

- *Driver education. Hat Creek Construction will conduct education events to increase driver awareness to avoid wildlife vehicle impacts.*

MM-10 Pygmy rabbit surveys should be completed prior to additional ground disturbance and annually during breeding season (February to May).

MM-11 White-tailed jackrabbit transect surveys will be completed prior to additional ground disturbance.

Special-Status Plant Species and Sensitive Plant Communities

MM-12 Prior to vegetation removal activities within previously undisturbed areas, appropriately timed surveys for special-status plant species with potential to occur on the project site (*Dalea ornate*, *Polygala subspinosa*, *Penstemon sudans*) will be conducted before soil disturbance. Surveys will be conducted in accordance with CDFW's "Protocols for Surveying and Evaluating Impacts to Special Status Native, Plant Populations, and Sensitive Natural Communities." Rare plants detected during these surveys shall be flagged and avoided. If rare plants cannot be avoided, the applicant shall provide compensatory mitigation as deemed appropriate by CDFW.

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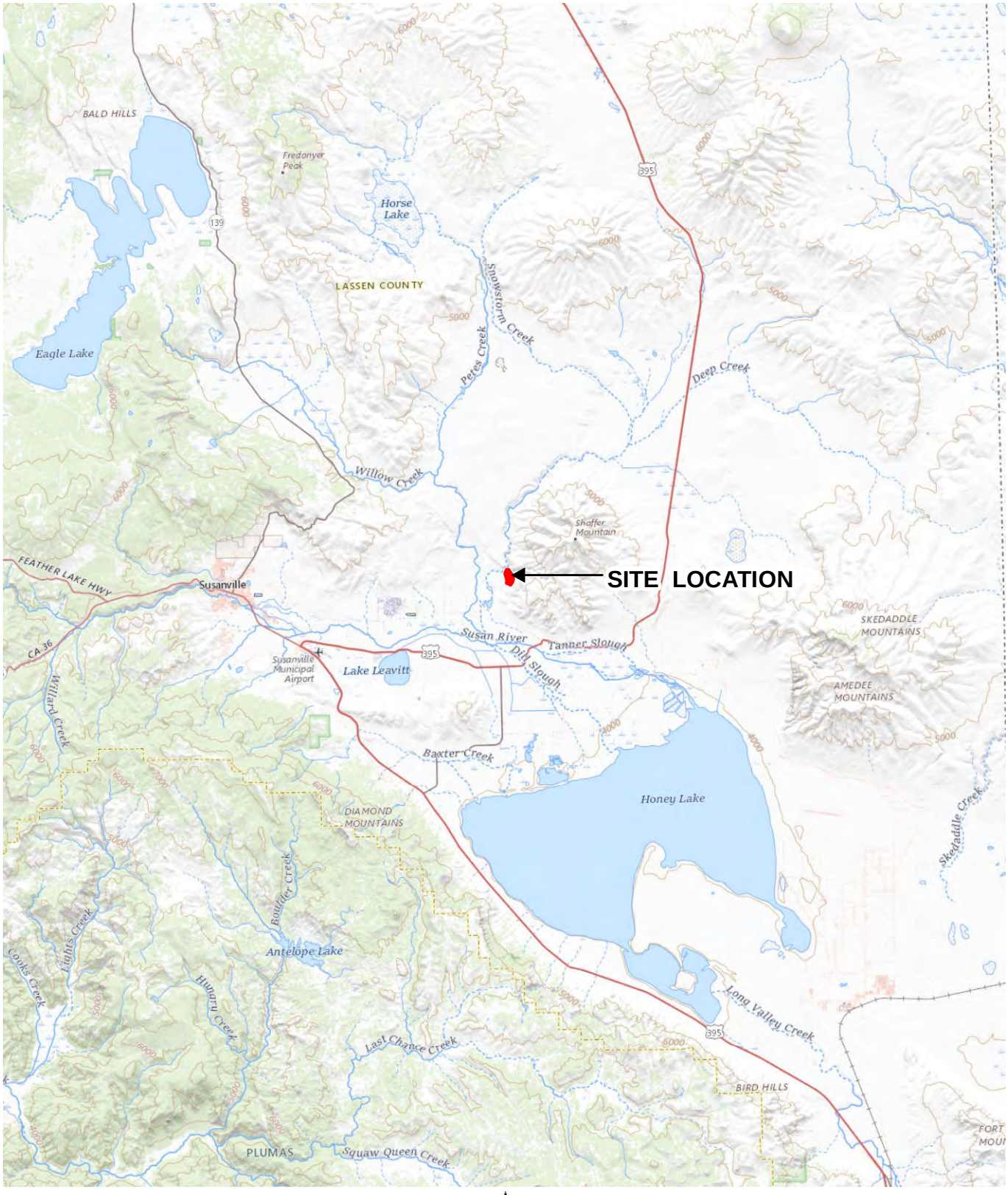
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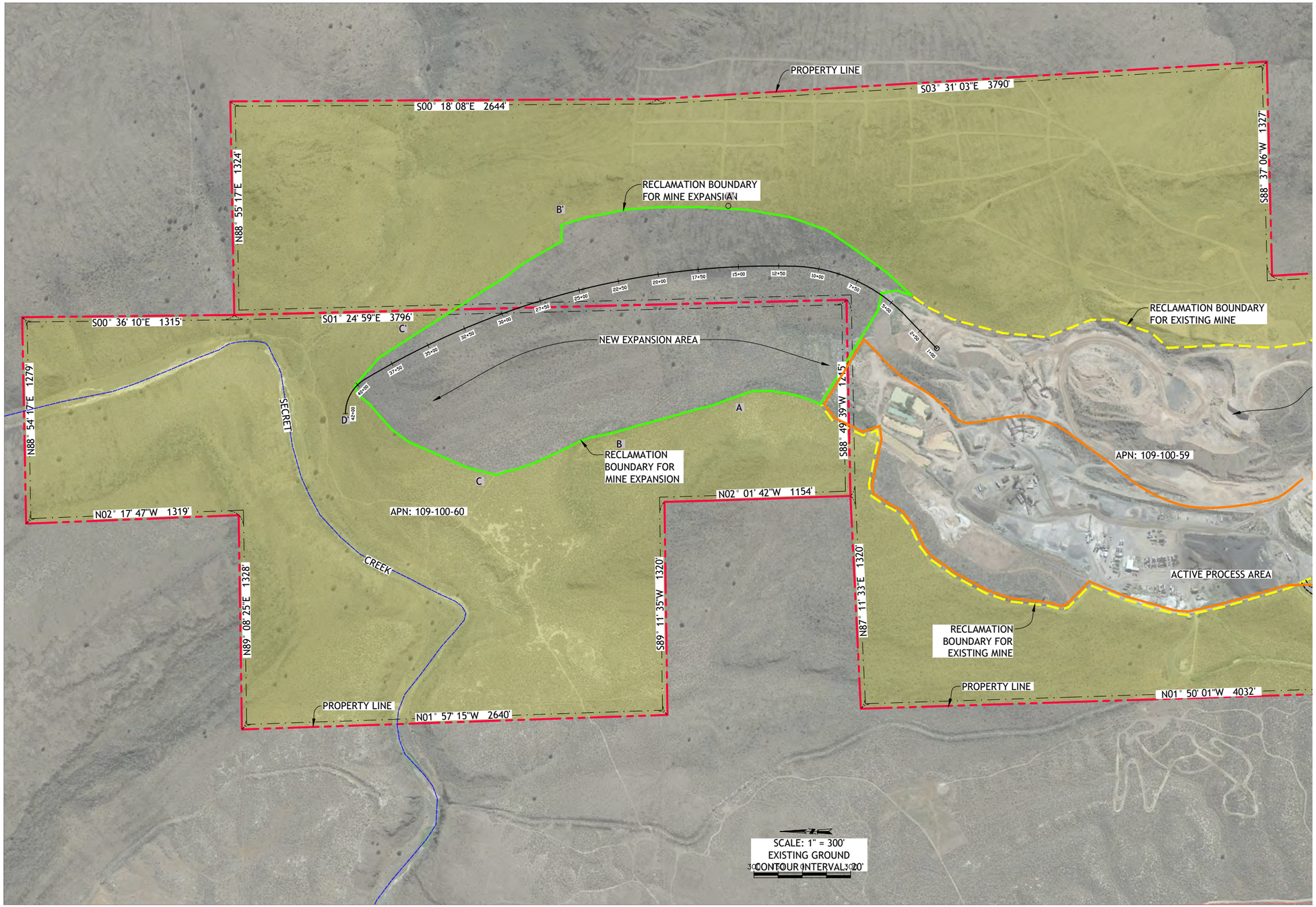
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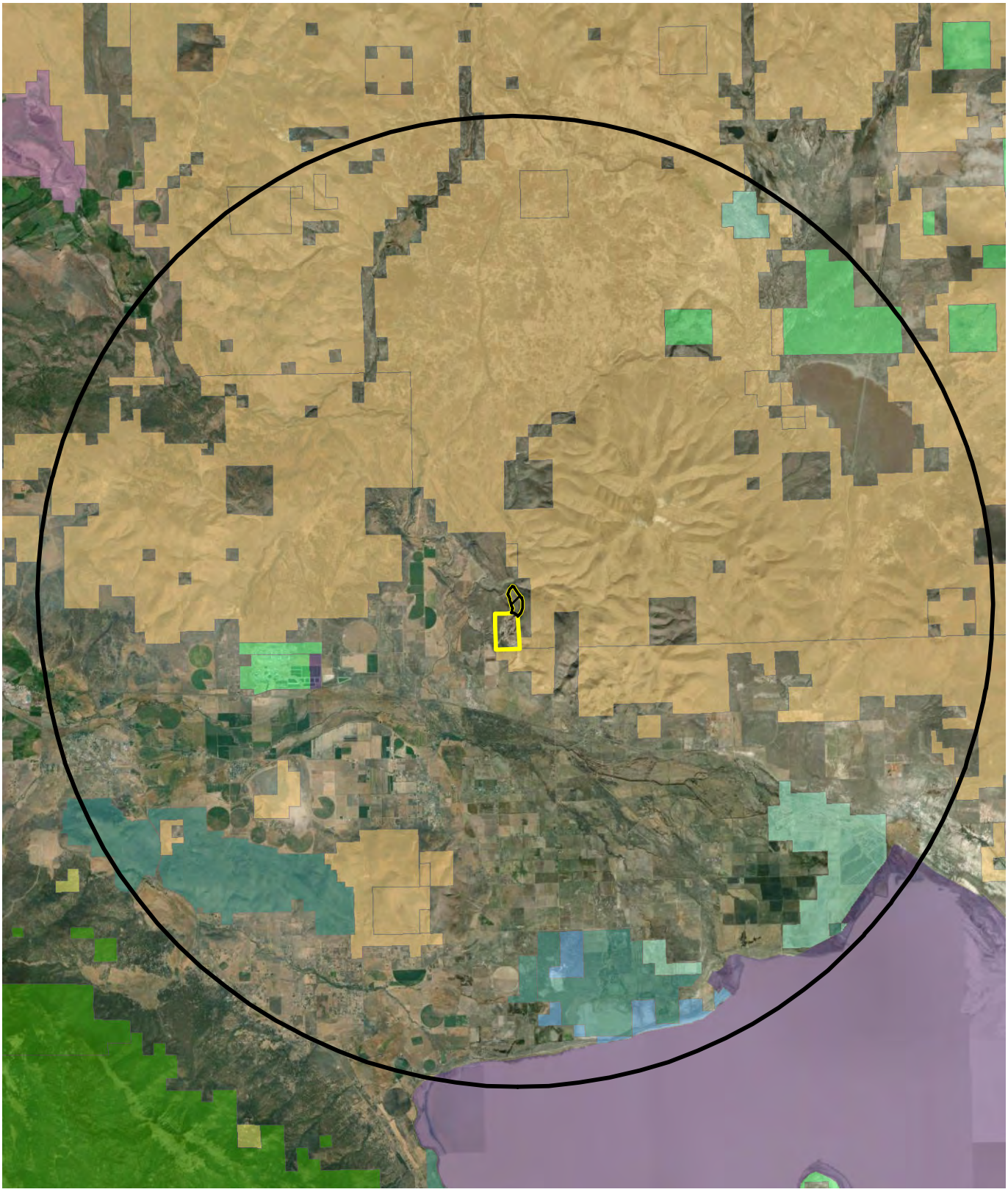
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FIGURE 1
GENERAL SITE LOCATION
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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SOURCE: BLM 2018

FIGURE 3
GOVERNMENT OWNERSHIP
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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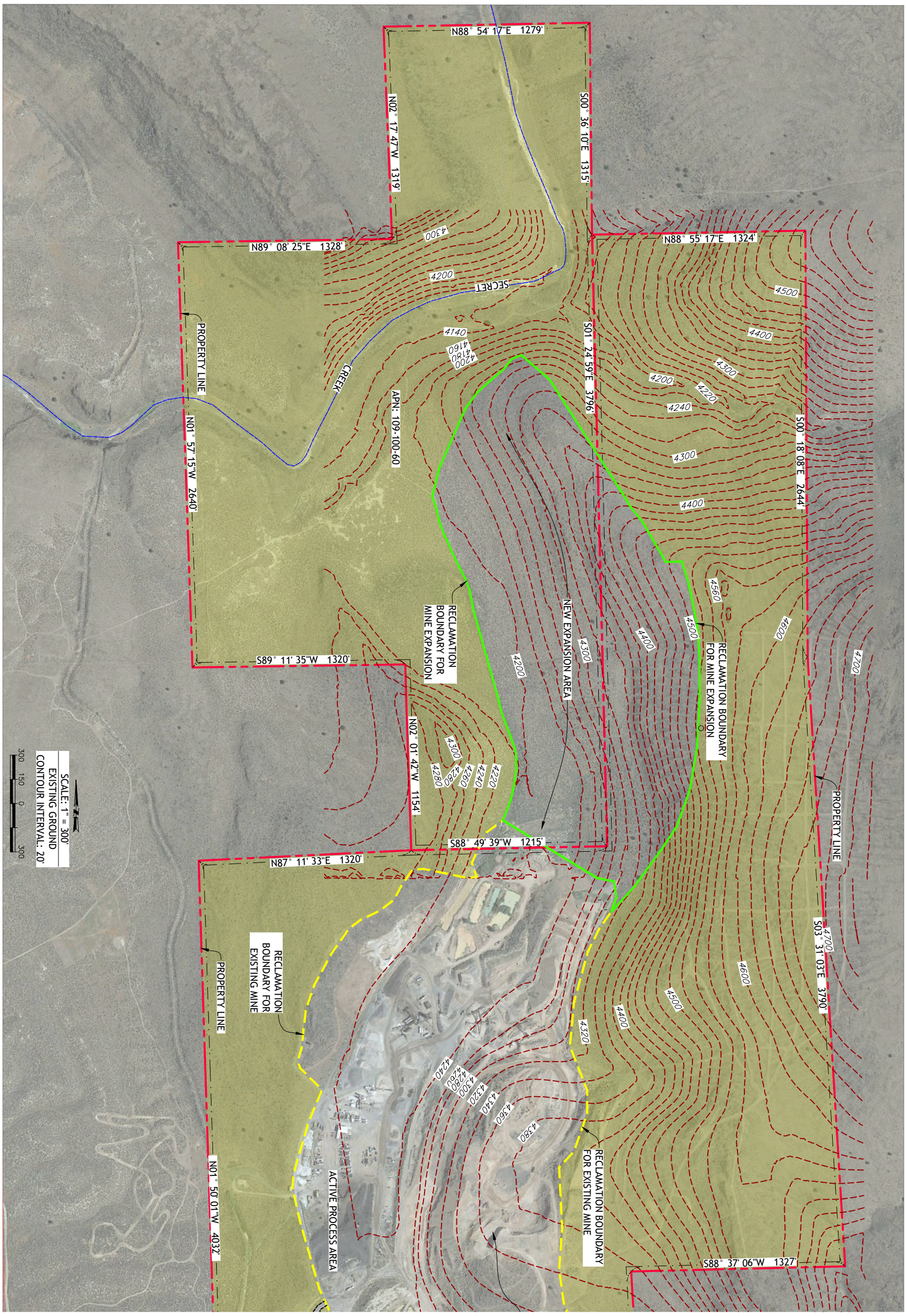
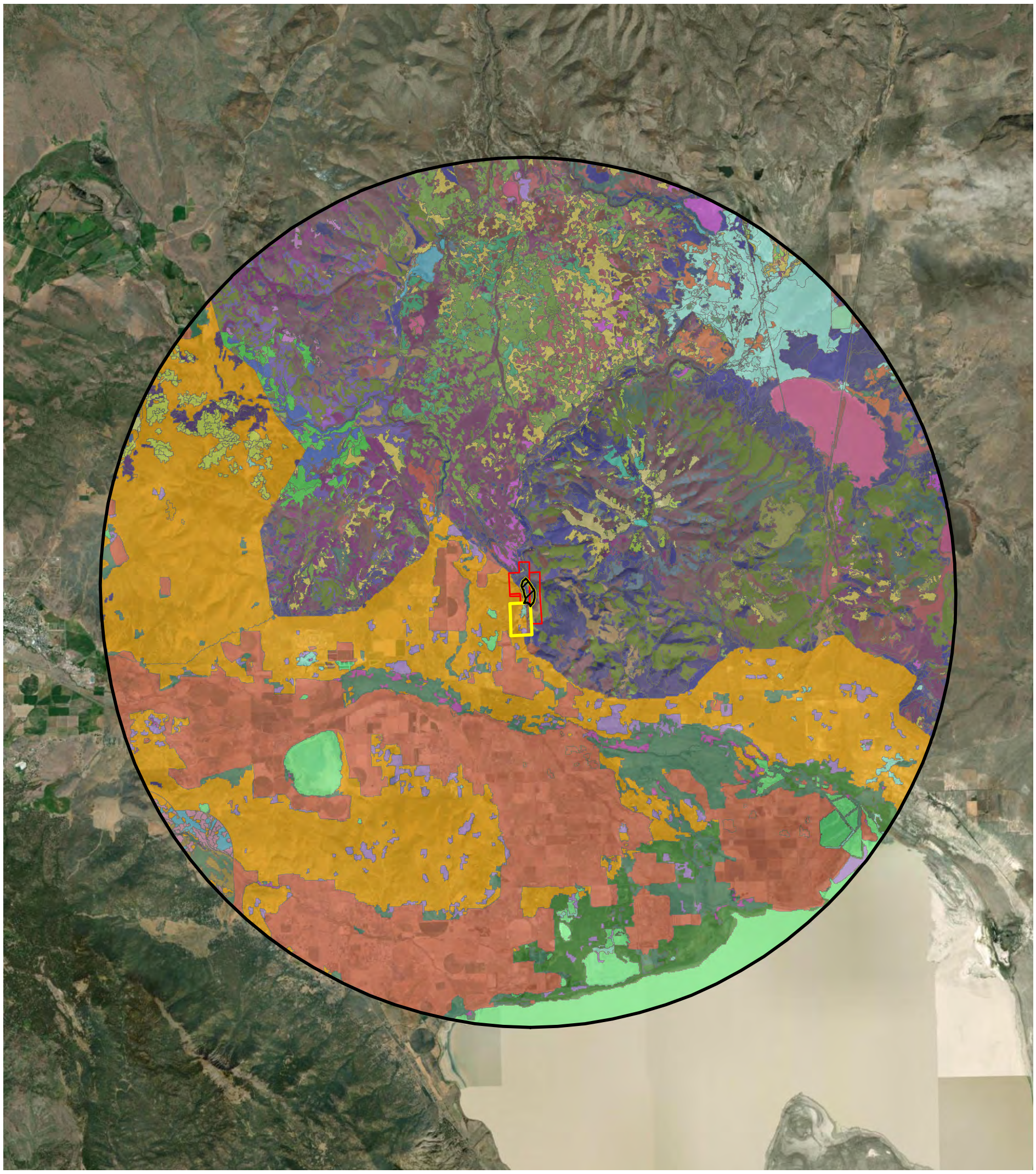


FIGURE 4



Proposed Expansion Area
Project Site
10-Mile Buffer Around Proposed Expansion Area
Approximate Parcel Boundary

Vegetation Classification and Mapping Program

- Anthropogenic Areas of Little or No Vegetation
- Artemisia arbuscula / Bromus tectorum Ruderal Shrubland
- Artemisia arbuscula / Poa secunda
- Artemisia cana (ssp. bolanderi, ssp. viscidula) / Poa secunda Wet Shrubland
- Artemisia nova / Poa secunda
- Artemisia tridentata - Grayia spinosa Shrubland
- Artemisia tridentata / Distichlis spicata Provisional
- Artemisia tridentata Shrubland
- Artemisia tridentata ssp. vaseyana / Festuca idahoensis Shrub Grassland
- Artemisia tridentata ssp. vaseyana - Symphoricarpos oreophilus / Bromus carinatus Shrubland
- Artemisia tridentata - (Ericameria nauseosa) / Bromus tectorum Ruderal Shrubland
- Artemisia tridentata - Ephedra spp. Shrubland
- Atriplex confertifolia - Picrothamnus desertorum / Krascheninnikovia lanata
- Bromus tectorum Ruderal Grassland
- Bromus tectorum - Elymus caput-medusae Ruderal Annual Grassland Alliance
- Built-up & Urban Disturbance
- Californian Annual Grassland & Forb Meadow Group
- Californian Vernal Pool Group
- Carex aquatilis - Carex lenticularis
- Cercocarpus ledifolius - Artemisia tridentata ssp. vaseyana
- Columbia Plateau cliff, scree and rock mapping unit
- Danthonia unispicata - Poa secunda Wet Meadow
- Eleocharis macrostachya Vernal Pool Provisional
- Elymus caput-medusae Intermontane Provisional
- Elymus cinereus Bottomland Wet Meadow
- Elymus spicatus - Poa secunda Grassland
- Elymus triticoides - Poa secunda Wet Meadow
- Ephedra nevadensis - Lycium andersonii - Grayia spinosa
- Ericameria nauseosa / Bromus tectorum Ruderal Shrubland
- Ericameria nauseosa Shrubland
- Eriogonum sphaerocephalum / Poa secunda Dwarf-shrub Grassland
- Juncus balticus Wet Meadow
- Juniperus occidentalis / Artemisia arbuscula / Poa secunda
- Juniperus occidentalis / Artemisia tridentata - Purshia tridentata
- Juniperus occidentalis / Cercocarpus ledifolius
- Juniperus occidentalis / Pseudoroegneria spicata Wooded Grassland
- Juniperus occidentalis / Purshia tridentata / Festuca idahoensis - Pseudoroegneria spicata
- Juniperus occidentalis - Pinus jeffreyi / (Purshia tridentata, Prunus virginiana)
- Krascheninnikovia lanata Steppe & Dwarf-shrubland Alliance
- Non-woody Row and Field Agriculture
- Perennial Stream Channel (Open Water)
- Pinus jeffreyi - Pinus washoensis Mixed Conifer Woodland Alliance
- Planted Trees and Shrubs
- Populus tremuloides / Symphoricarpos rotundifolius
- Prunus emarginata Sierran Chaparral Shrubland
- Prunus virginiana / Leymus cinereus Shrubland
- Purshia tridentata - Artemisia tridentata Mesic Steppe & Shrubland Alliance
- Purshia tridentata - Artemisia tridentata
- Purshia tridentata - Artemisia tridentata / Achnatherum hymenoides
- Purshia tridentata - Artemisia tridentata - Tetradymia canescens
- Quercus kelloggii
- Salix exigua / Mesic Forbs Shrubland
- Salix lasiolepis - Rosa woodsii / Mixed Herbs Shrubland
- Sarcobatus vermiculatus - Artemisia tridentata Shrubland
- Schoenoplectus americanus Western Marsh
- Small Earthen-dammed Ponds & Natural Lakes
- Symphoricarpos oreophilus Shrubland
- Taraxia tanacetifolia - Iva axillaris Provisional
- Tetradymia canescens Provisional
- Typha domingensis Western Marsh
- Vancouverian - Rocky Mountain Montane Wet Meadow & Marsh Group
- Water
- Western North American Ruderal Marsh, Wet Meadow & Shrubland Group
- Western North American Sparsely Vegetated Rivershore mapping unit
- Western North American Temperate Freshwater Aquatic Vegetation Group

Calveg Data

- AGS: Annual Grassland
- ASC: Alkali Desert Scrub
- ASP: Aspen
- BAR: Barren
- BBR: Bitterbrush
- CRP: Cropland
- EPN: Eastside Pine
- JUN: Juniper
- LAC: Lacustrine
- LSG: Low Sage
- MCP: Montane Chaparral
- MHC: Montane Hardwood-Conifer
- MRI: Montane Riparian
- PGS: Perennial Grassland
- SGB: Sagebrush
- SMC: Sierran Mixed Conifer
- WTM: Wet Meadow

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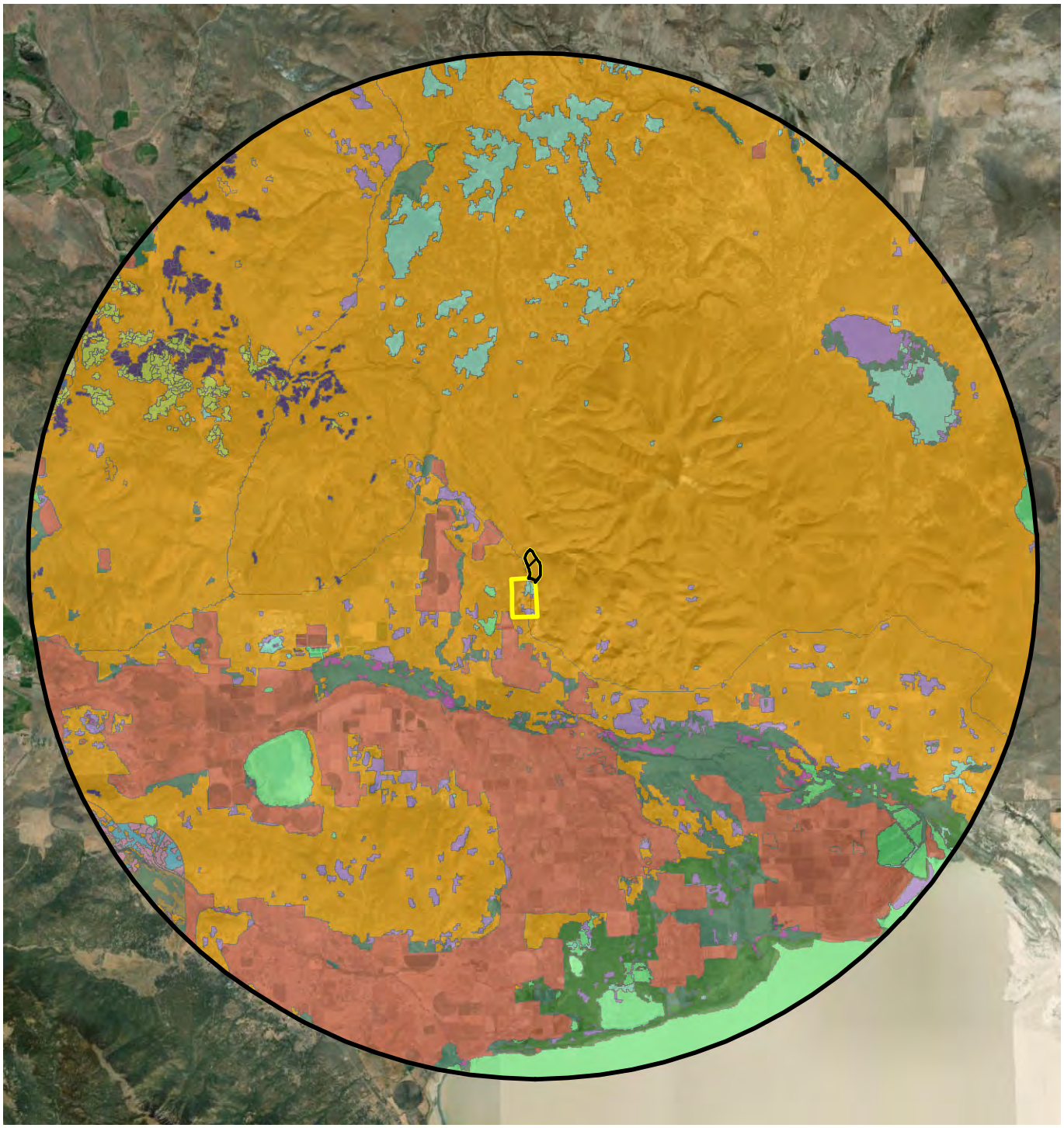
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SOURCE: CDFW 2021; USFS 2014

FIGURE 5
VEGCAMP/CALVEG WITHIN
10-MILE RADIUS
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

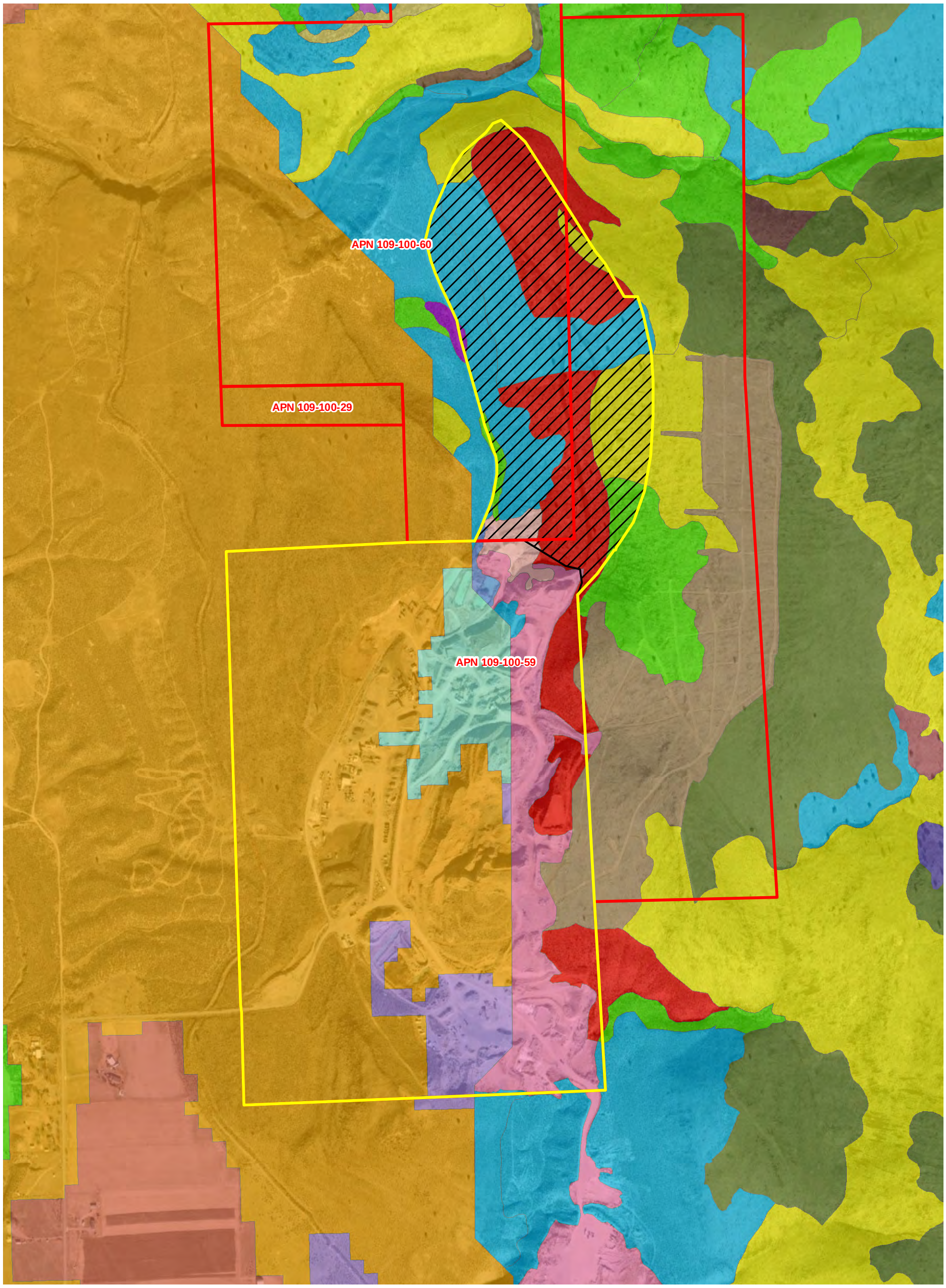
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SOURCE: USFS 2014

FIGURE 6
REGIONAL CALVEG
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

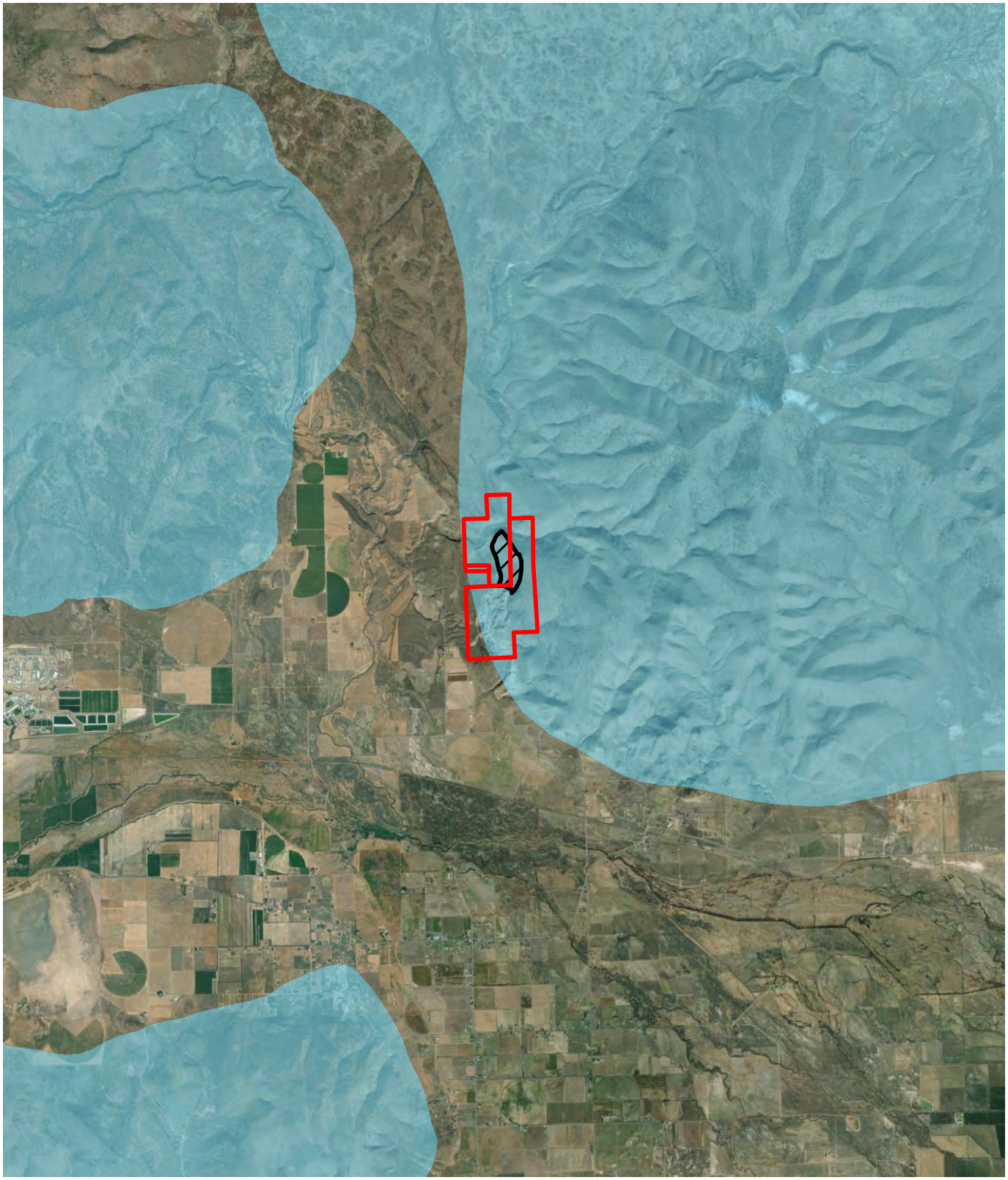
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SOURCE: CDFW 2021; USFS 2014

FIGURE 7
VEGCAMP COMMUNITIES
IN PROJECT AREA
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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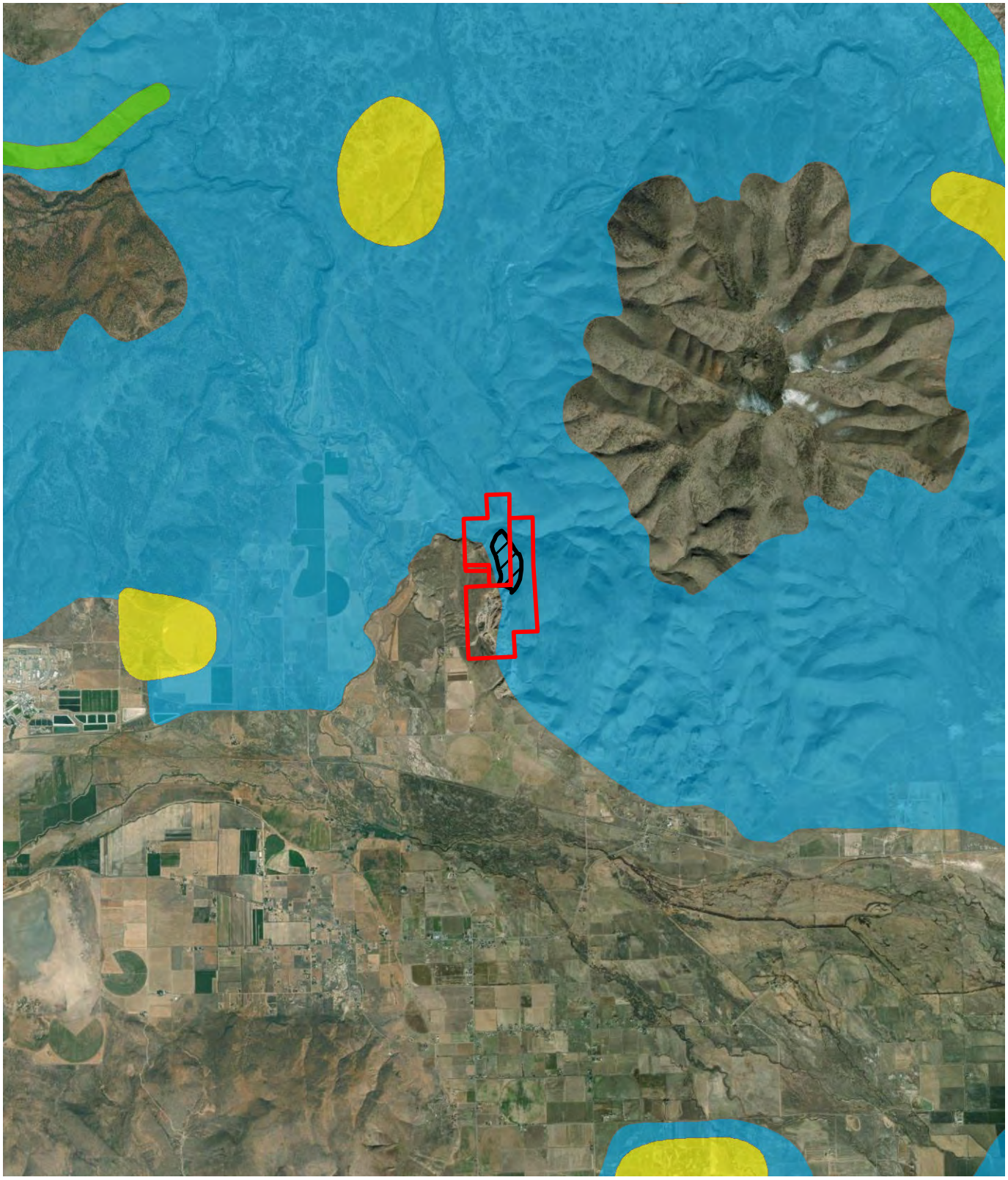


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SOURCE: USDA NAIP 2016 AERIAL PHOTOGRAPH; USFS 2009

FIGURE 8
MULE DEER HABITAT
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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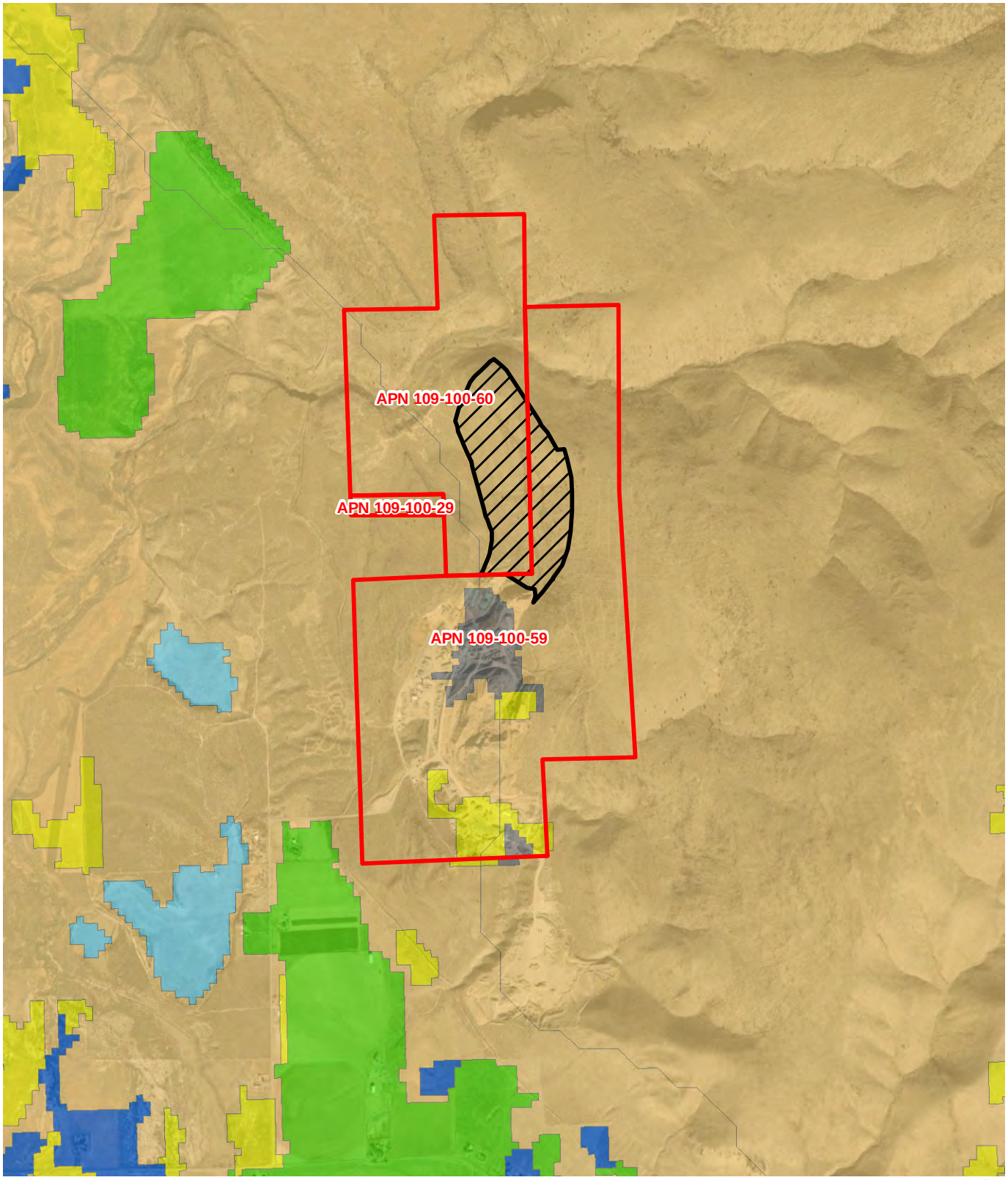


VESTRA

SOURCE: USDA NAIP 2016 AERIAL PHOTOGRAPH; USFS 2009

FIGURE 9
PRONGHORN ANTELOPE HABITAT
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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Approximate Parcel Boundary
Proposed Expansion Area
Annual Grassland
Barren
Cropland
Lacustrine
Sagebrush
Wet Meadow

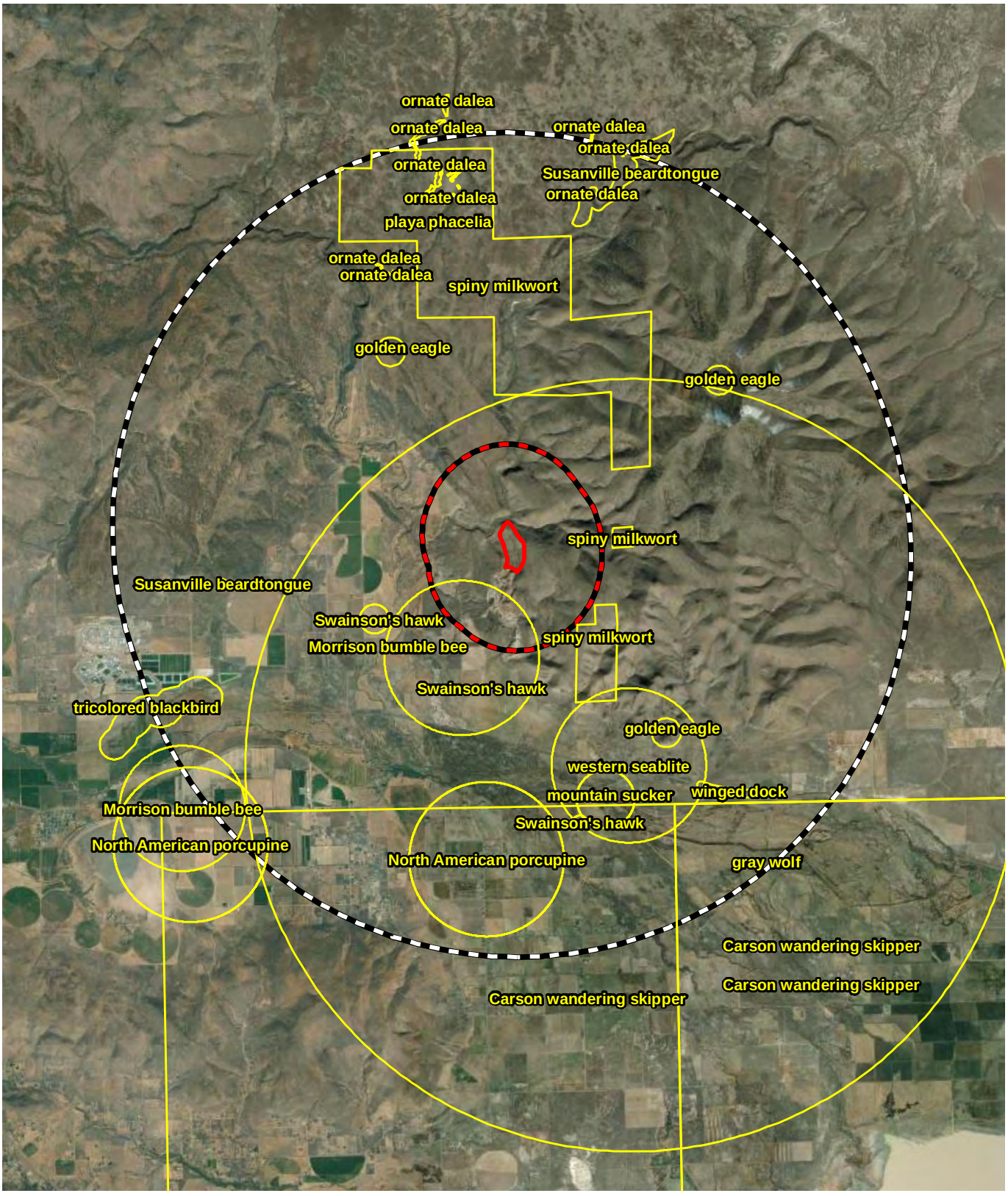
VESTRA

0 1,000 2,000 4,000 Feet

SOURCE: USDA NAIP 2016 AERIAL PHOTOGRAPH; USFS 2009

FIGURE 10
CWHR HABITAT TYPES
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

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CNDDB Occurrence

Proposed Expansion Area

1-Mile Buffer Around Proposed Expansion Area

5-Mile Buffer Around Proposed Expansion Area

VESTRA

0 0.75 1.5 3 Miles

FIGURE 11
CNDDB OCCURRENCES
WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

SOURCE: MAXAR 2019 AERIAL PHOTOGRAPH; CNDDB AUGUST 2020

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Appendix A

Common Inhabitants

CWHR ID	NAME	SCI_NAME
A029	GREAT BASIN SPADEFOOT	*Spea intermontana*
A032	WESTERN TOAD	*Anaxyrus boreas*
A046	AMERICAN BULLFROG	*Lithobates catesbeianus*
A077	SIERRAN TREEFROG	*Pseudacris sierra*
B006	PIED-BILLED GREBE	*Podilymbus podiceps*
B009	EARED GREBE	*Podiceps nigricollis*
B010	WESTERN GREBE	*Aechmophorus occidentalis*
B042	AMERICAN WHITE PELICAN	*Pelecanus erythrorhynchos*
B049	AMERICAN BITTERN	*Botaurus lentiginosus*
B051	GREAT BLUE HERON	*Ardea herodias*
B053	SNOWY EGRET	*Egretta thula*
B059	BLACK-CROWNED NIGHT HERON	*Nycticorax nycticorax*
B067	TUNDRA SWAN	*Cygnus columbianus*
B070	GREATER WHITE-FRONTED GOOSE	*Anser albifrons*
B071	SNOW GOOSE	*Chen caerulescens*
B072	ROSS' S GOOSE	*Chen rossii*
B075	CANADA GOOSE	*Branta canadensis*
B077	GREEN-WINGED TEAL	*Anas crecca*
B079	MALLARD	*Anas platyrhynchos*
B080	NORTHERN PINTAIL	*Anas acuta*
B082	BLUE-WINGED TEAL	*Anas discors*
B083	CINNAMON TEAL	*Anas cyanoptera*
B084	NORTHERN SHOVELER	*Anas clypeata*
B085	GADWALL	*Anas strepera*
B087	AMERICAN WIGEON	*Anas americana*
B089	CANVASBACK	*Aythya valisineria*
B090	REDHEAD	*Aythya americana*
B091	RING-NECKED DUCK	*Aythya collaris*
B094	LESSER SCAUP	*Aythya affinis*
B101	COMMON GOLDENEYE	*Bucephala clangula*
B103	BUFFLEHEAD	*Bucephala albeola*
B104	HOODED MERGANSER	*Lophodytes cucullatus*
B105	COMMON MERGANSER	*Mergus merganser*
B107	RUDDY DUCK	*Oxyura jamaicensis*
B108	TURKEY VULTURE	*Cathartes aura*
B113	BALD EAGLE	*Haliaeetus leucocephalus*
B114	NORTHERN HARRIER	*Circus cyaneus*
B115	SHARP-SHINNED HAWK	*Accipiter striatus*
B116	COOPER'S HAWK	*Accipiter cooperii*
B117	NORTHERN GOSHAWK	*Accipiter gentilis*
B121	SWAINSON'S HAWK	*Buteo swainsoni*
B123	RED-TAILED HAWK	*Buteo jamaicensis*
B124	FERRUGINOUS HAWK	*Buteo regalis*
B125	ROUGH-LEGGED HAWK	*Buteo lagopus*
B126	GOLDEN EAGLE	*Aquila chrysaetos*
B127	AMERICAN KESTREL	*Falco sparverius*
B128	MERLIN	*Falco columbarius*
B129	PEREGRINE FALCON	*Falco peregrinus*
B131	PRAIRIE FALCON	*Falco mexicanus*

B132	CHUKAR	*Alectoris chukar*
B133	RING-NECKED PHEASANT	*Phasianus colchicus*
B137	GREATER SAGE-GROUSE	*Centrocercus urophasianus*
B140	CALIFORNIA QUAIL	*Callipepla californica*
B145	VIRGINIA RAIL	*Rallus limicola*
B146	SORA	*Porzana carolina*
B149	AMERICAN COOT	*Fulica americana*
B150	SANDHILL CRANE	*Grus canadensis*
B158	KILLDEER	*Charadrius vociferus*
B163	BLACK-NECKED STILT	*Himantopus mexicanus*
B164	AMERICAN AVOCET	*Recurvirostra americana*
B168	WILLET	*Tringa semipalmata*
B170	SPOTTED SANDPIPER	*Actitis macularius*
B173	LONG-BILLED CURLEW	*Numenius americanus*
B199	WILSON'S SNIPE	*Gallinago delicata*
B200	WILSON'S PHALAROPE	*Phalaropus tricolor*
B214	RING-BILLED GULL	*Larus delawarensis*
B215	CALIFORNIA GULL	*Larus californicus*
B227	CASPIAN TERN	*Hydroprogne caspia*
B233	FORSTER'S TERN	*Sterna forsteri*
B235	BLACK TERN	*Chlidonias niger*
B250	ROCK PIGEON	*Columba livia*
B255	MOURNING DOVE	*Zenaida macroura*
B262	BARN OWL	*Tyto alba*
B265	GREAT HORNED OWL	*Bubo virginianus*
B269	BURROWING OWL	*Athene cunicularia*
B272	LONG-EARED OWL	*Asio otus*
B273	SHORT-EARED OWL	*Asio flammeus*
B276	COMMON NIGHTHAWK	*Chordeiles minor*
B277	COMMON POORWILL	*Phalaenoptilus nuttallii*
B286	BLACK-CHINNED HUMMINGBIRD	*Archilochus alexandri*
B289	CALLIOPE HUMMINGBIRD	*Selasphorus calliope*
B293	BELTED KINGFISHER	*Megaceryle alcyon*
B294	LEWIS' S WOODPECKER	*Melanerpes lewis*
B298	RED-NAPED SAPSUCKER	*Sphyrapicus nuchalis*
B299	RED-BREASTED SAPSUCKER	*Sphyrapicus ruber*
B303	DOWNY WOODPECKER	*Picoides pubescens*
B307	NORTHERN FLICKER	*Colaptes auratus*
B319	GRAY FLYCATCHER	*Empidonax wrightii*
B323	SAY'S PHOEBE	*Sayornis saya*
B326	ASH-THROATED FLYCATCHER	*Myiarchus cinerascens*
B333	WESTERN KINGBIRD	*Tyrannus verticalis*
B334	EASTERN KINGBIRD	*Tyrannus tyrannus*
B340	VIOLET-GREEN SWALLOW	*Tachycineta thalassina*
B341	NORTHERN ROUGH-WINGED SWALLOW	*Stelgidopteryx serripennis*
B342	BANK SWALLOW	*Riparia riparia*
B343	CLIFF SWALLOW	*Petrochelidon pyrrhonota*
B344	BARN SWALLOW	*Hirundo rustica*
B348	WESTERN SCRUB-JAY	*Aphelocoma californica*
B349	PINYON JAY	*Gymnorhinus cyanocephalus*

B351	BLACK-BILLED MAGPIE	*Pica hudsonia*
B353	AMERICAN CROW	*Corvus brachyrhynchos*
B354	COMMON RAVEN	*Corvus corax*
B358	OAK TITMOUSE	*Baeolophus inornatus*
B360	BUSHTIT	*Psaltriparus minimus*
B366	ROCK WREN	*Salpinctes obsoletus*
B368	BEWICK'S WREN	*Thryomanes bewickii*
B370	PACIFIC WREN	*Troglodytes pacificus*
B372	MARSH WREN	*Cistothorus palustris*
B375	GOLDEN-CROWNED KINGLET	*Regulus satrapa*
B376	RUBY-CROWNED KINGLET	*Regulus calendula*
B381	MOUNTAIN BLUEBIRD	*Sialia currucoides*
B382	TOWNSEND'S SOLITAIRE	*Myadestes townsendi*
B389	AMERICAN ROBIN	*Turdus migratorius*
B393	NORTHERN MOCKINGBIRD	*Mimus polyglottos*
B394	SAGE THRASHER	*Oreoscoptes montanus*
B404	AMERICAN PIPIT	*Anthus rubrescens*
B407	CEDAR WAXWING	*Bombycilla cedrorum*
B409	NORTHERN SHRIKE	*Lanius excubitor*
B410	LOGGERHEAD SHRIKE	*Lanius ludovicianus*
B411	EUROPEAN STARLING	*Sturnus vulgaris*
B430	YELLOW WARBLER	*Setophaga petechia*
B435	YELLOW-RUMPED WARBLER	*Setophaga coronata*
B461	COMMON YELLOWTHROAT	*Geothlypis trichas*
B471	WESTERN TANAGER	*Piranga ludoviciana*
B475	BLACK-HEADED GROSBEAK	*Pheucticus melanocephalus*
B477	LAZULI BUNTING	*Passerina amoena*
B483	SPOTTED TOWHEE	*Pipilo maculatus*
B489	CHIPPING SPARROW	*Spizella passerina*
B491	BREWER'S SPARROW	*Spizella breweri*
B494	VESPER SPARROW	*Pooecetes gramineus*
B495	LARK SPARROW	*Chondestes grammacus*
B496	BLACK-THROATED SPARROW	*Amphispiza bilineata*
B497	BELL'S SPARROW	*Artemisiospiza belli*
B499	SAVANNAH SPARROW	*Passerculus sandwichensis*
B504	FOX SPARROW	*Passerella iliaca*
B505	SONG SPARROW	*Melospiza melodia*
B509	GOLDEN-CROWNED SPARROW	*Zonotrichia atricapilla*
B510	WHITE-CROWNED SPARROW	*Zonotrichia leucophrys*
B512	DARK-EYED JUNCO	*Junco hyemalis*
B514	LAPLAND LONGSPUR	*Calcarius lapponicus*
B519	RED-WINGED BLACKBIRD	*Agelaius phoeniceus*
B520	TRICOLORED BLACKBIRD	*Agelaius tricolor*
B521	WESTERN MEADOWLARK	*Sturnella neglecta*
B522	YELLOW-HEADED BLACKBIRD	*Xanthocephalus xanthocephalus*
B524	BREWER'S BLACKBIRD	*Euphagus cyanocephalus*
B528	BROWN-HEADED COWBIRD	*Molothrus ater*
B532	BULLOCK'S ORIOLE	*Icterus bullockii*
B537	CASSIN'S FINCH	*Haemorhous cassinii*
B538	HOUSE FINCH	*Haemorhous mexicanus*

B543	LESSER GOLDFINCH	*Spinus psaltria*
B545	AMERICAN GOLDFINCH	*Spinus tristis*
B546	EVENING GROSBEAK	*Coccothraustes vespertinus*
B547	HOUSE SPARROW	*Passer domesticus*
B548	CLARK'S GREBE	*Aechmophorus clarkii*
B552	JUNIPER TITMOUSE	*Baeolophus ridgewayi*
B648	BAIRD'S SANDPIPER	*Calidris bairdii*
B773	AMERICAN REDSTART	*Setophaga ruticilla*
B798	WHITE-THROATED SPARROW	*Zonotrichia albicollis*
B799	HARRIS'S SPARROW	*Zonotrichia querula*
B809	INDIGO BUNTING	*Passerina cyanea*
M013	MERRIAM'S SHREW	*Sorex merriami*
M021	LITTLE BROWN BAT	*Myotis lucifugus*
M023	YUMA MYOTIS	*Myotis yumanensis*
M025	LONG-EARED MYOTIS	*Myotis evotis*
M026	FRINGED MYOTIS	*Myotis thysanodes*
M027	LONG-LEGGED MYOTIS	*Myotis volans*
M028	CALIFORNIA MYOTIS	*Myotis californicus*
M029	SMALL-FOOTED MYOTIS	*Myotis ciliolabrum*
M030	SILVER-HAIRED BAT	*Lasionycteris noctivagans*
M032	BIG BROWN BAT	*Eptesicus fuscus*
M034	HOARY BAT	*Lasiurus cinereus*
M036	SPOTTED BAT	*Euderma maculatum*
M037	TOWNSEND'S BIG-EARED BAT	*Corynorhinus townsendii*
M038	PALLID BAT	*Antrozous pallidus*
M039	BRAZILIAN FREE-TAILED BAT	*Tadarida brasiliensis*
M044	PYGMY RABBIT	*Brachylagus idahoensis*
M046	NUTTALL'S COTTONTAIL	*Sylvilagus nuttallii*
M050	WHITE-TAILED JACKRABBIT	*Lepus townsendii*
M051	BLACK-TAILED JACKRABBIT	*Lepus californicus*
M054	LEAST CHIPMUNK	*Tamias minimus*
M066	YELLOW-BELLIED MARMOT	*Marmota flaviventris*
M067	WHITE-TAILED ANTELOPE GROUND SQUIRREL	*Ammospermophilus leucurus*
M069	PIUTE GROUND SQUIRREL	*Urocitellus mollis*
M072	CALIFORNIA GROUND SQUIRREL	*Ostospermophilus beecheyi*
M081	BOTTA'S POCKET GOPHER	*Thomomys bottae*
M082	TOWNSEND'S POCKET GOPHER	*Thomomys townsendii*
M083	NORTHERN POCKET GOPHER	*Thomomys talpoides*
M088	GREAT BASIN POCKET MOUSE	*Perognathus parvus*
M091	LONG-TAILED POCKET MOUSE	*Chaetodipus formosus*
M097	DARK KANGAROO MOUSE	*Microdipodops megacephalus*
M099	ORD'S KANGAROO RAT	*Dipodomys ordii*
M100	CHISEL-TOOTHED KANGAROO RAT	*Dipodomys microps*
M112	AMERICAN BEAVER	*Castor canadensis*
M113	WESTERN HARVEST MOUSE	*Reithrodontomys megalotis*
M117	DEER MOUSE	*Peromyscus maniculatus*
M118	CANYON MOUSE	*Peromyscus crinitus*
M119	BRUSH MOUSE	*Peromyscus boylii*
M120	PINYON MOUSE	*Peromyscus truei*
M121	NORTHERN GRASSHOPPER MOUSE	*Onychomys leucogaster*

M126	DESERT WOODRAT	*Neotoma lepida*
M128	BUSHY-TAILED WOODRAT	*Neotoma cinerea*
M133	MONTANE VOLE	*Microtus montanus*
M138	SAGEBRUSH VOLE	*Lemmiscus curtatus*
M139	COMMON MUSKRAT	*Ondatra zibethicus*
M142	HOUSE MOUSE	*Mus musculus*
M145	COMMON PORCUPINE	*Erethizon dorsatum*
M146	COYOTE	*Canis latrans*
M153	RACCOON	*Procyon lotor*
M157	LONG-TAILED WEASEL	*Mustela frenata*
M160	AMERICAN BADGER	*Taxidea taxus*
M161	WESTERN SPOTTED SKUNK	*Spilogale gracilis*
M162	STRIPED SKUNK	*Mephitis mephitis*
M165	MOUNTAIN LION	*Puma concolor*
M166	BOBCAT	*Lynx rufus*
M174	FERAL HORSE	*Equus caballus*
M181	MULE DEER	*Odocoileus hemionus*
M182	PRONGHORN	*Antilocapra americana*
R004	WESTERN POND TURTLE	*Actinemys marmorata*
R017	GREAT BASIN COLLARED LIZARD	*Crotaphytus bicinctores*
R018	LONG-NOSED LEOPARD LIZARD	*Gambelia wislizenii*
R022	WESTERN FENCE LIZARD	*Sceloporus occidentalis*
R023	COMMON SAGEBRUSH LIZARD	*Sceloporus graciosus*
R024	COMMON SIDE-BLOTCHED LIZARD	*Uta stansburiana*
R030	DESERT HORNED LIZARD	*Phrynosoma platyrhinos*
R036	WESTERN SKINK	*Plestiodon skiltonianus*
R039	TIGER WHIPTAIL	*Aspidoscelis tigris*
R051	NORTH AMERICAN RACER	*Coluber constrictor*
R054	STRIPED WHIPSNAKE	*Coluber taeniatus*
R055	WESTERN PATCH-NOSED SNAKE	*Salvadora hexalepis*
R057	GOPHERSNAKE	*Pituophis catenifer*
R060	LONG-NOSED SNAKE	*Rhinocheilus lecontei*
R061	COMMON GARTERSNAKE	*Thamnophis sirtalis*
R062	TERRESTRIAL GARTERSNAKE	*Thamnophis elegans*
R076	WESTERN RATTLESNAKE	*Crotalus oreganus*

Appendix B

USFWS Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Reno Fish And Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, NV 89502-7147
Phone: (775) 861-6300 Fax: (775) 861-6301
http://www.fws.gov/nevada/

In Reply Refer To:
Consultation Code: 08ENVD00-2018-SLI-0675
Event Code: 08ENVD00-2018-E-01540
Project Name: Ward Lake Expansion

June 29, 2018

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The attached species list indicates threatened, endangered, proposed, and candidate species and designated or proposed critical habitat that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act of 1973, as amended (ESA, 16 U.S.C. 1531 *et seq.*), for projects that are authorized, funded, or carried out by a Federal agency. Candidate species have no protection under the ESA but are included for consideration because they could be listed prior to the completion of your project. Consideration of these species during project planning may assist species conservation efforts and may prevent the need for future listing actions. For additional information regarding species that may be found in the proposed project area, visit http://www.fws.gov/nevada/es/ipac.html.

The purpose of the ESA is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the ESA and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or

designated or proposed critical habitat. Guidelines for preparing a Biological Assessment can be found at: http://www.fws.gov/midwest/endangered/section7/ba_guide.html.

If a Federal action agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species, and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this species list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally listed, proposed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally, as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation, for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the attached list.

The Nevada Fish and Wildlife Office (NFWO) no longer provides species of concern lists. Most of these species for which we have concern are also on the Animal and Plant At-Risk Tracking List for Nevada (At-Risk list) maintained by the State of Nevada's Natural Heritage Program (Heritage). Instead of maintaining our own list, we adopted Heritage's At-Risk list and are partnering with them to provide distribution data and information on the conservation needs for at-risk species to agencies or project proponents. The mission of Heritage is to continually evaluate the conservation priorities of native plants, animals, and their habitats, particularly those most vulnerable to extinction or in serious decline. In addition, in order to avoid future conflicts, we ask that you consider these at-risk species early in your project planning and explore management alternatives that provide for their long-term conservation.

For a list of at-risk species by county, visit Heritage's website (http://heritage.nv.gov). For a specific list of at-risk species that may occur in the project area, you can obtain a data request form from the website (http://heritage.nv.gov/get_data) or by contacting the Administrator of Heritage at 901 South Stewart Street, Suite 5002, Carson City, Nevada 89701-5245, (775) 684-2900. Please indicate on the form that your request is being obtained as part of your coordination with the Service under the ESA. During your project analysis, if you obtain new information or data for any Nevada sensitive species, we request that you provide the information to Heritage at the above address.

Furthermore, certain species of fish and wildlife are classified as protected by the State of Nevada (http://www.leg.state.nv.us/NAC/NAC-503.html). You must first obtain the appropriate license, permit, or written authorization from the Nevada Department of Wildlife (NDOW) to take, or possess any parts of protected fish and wildlife species. Please visit http://www.ndow.org or contact NDOW in northern Nevada (775) 688-1500, in southern Nevada (702) 486-5127, or in eastern Nevada (775) 777-2300.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the Service's wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

The Service's Pacific Southwest Region developed the *Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Wind Energy Facilities* (Interim Guidelines). This document provides energy facility developers with a tool for assessing the risk of potential impacts to wildlife resources and delineates how best to design and operate a bird- and bat-friendly wind facility. These Interim Guidelines are available upon request from the NFWO. The intent of a Bird and Bat Conservation Strategy is to conserve wildlife resources while supporting project developers through: (1) establishing project development in an adaptive management framework; (2) identifying proper siting and project design strategies; (3) designing and implementing pre-construction surveys; (4) implementing appropriate conservation measures for each development phase; (5) designing and implementing appropriate post-construction monitoring strategies; (6) using post-construction studies to better understand the dynamics of mortality reduction (*e.g.*, changes in blade cut-in speed, assessments of blade "feathering" success, and studies on the effects of visual and acoustic deterrents) including efforts tied into Before-After/Control-Impact analysis; and (7) conducting a thorough risk assessment and validation leading to adjustments in management and mitigation actions.

The template and recommendations set forth in the Interim Guidelines were based upon the Avian Powerline Interaction Committee's Avian Protection Plan template (http://www.aplic.org/) developed for electric utilities and modified accordingly to address the unique concerns of wind energy facilities. These recommendations are also consistent with the Service's wind energy guidelines. We recommend contacting us as early as possible in the planning process to discuss the need and process for developing a site-specific Bird and Bat Conservation Strategy.

The Service has also developed guidance regarding wind power development in relation to prairie grouse leks (sage-grouse are included in this). This document can be found at: http://www.fws.gov/southwest/es/Oklahoma/documents/te_species/wind%20power/prairie%20grouse%20lek%205%20mile%20public.pdf.

Migratory Birds are a Service Trust Resource. Based on the Service's conservation responsibilities and management authority for migratory birds under the Migratory Bird Treaty Act of 1918, as amended (MBTA; 16 U.S.C. 703 *et seq.*), we recommend that any land clearing or other surface disturbance associated with proposed actions within the project area be timed to

avoid potential destruction of bird nests or young, or birds that breed in the area. Such destruction may be in violation of the MBTA. Under the MBTA, nests with eggs or young of migratory birds may not be harmed, nor may migratory birds be killed. Therefore, we recommend land clearing be conducted outside the avian breeding season. If this is not feasible, we recommend a qualified biologist survey the area prior to land clearing. If nests are located, or if other evidence of nesting (*i.e.*, mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) should be delineated and the entire area avoided to prevent destruction or disturbance to nests until they are no longer active.

Guidance for minimizing impacts to migratory birds for projects involving communications towers (*e.g.*, cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

If wetlands, springs, or streams are are known to occur in the project area or are present in the vicinity of the project area, we ask that you be aware of potential impacts project activities may have on these habitats. Discharge of fill material into wetlands or waters of the United States is regulated by the U.S. Army Corps of Engineers (ACOE) pursuant to section 404 of the Clean Water Act of 1972, as amended. We recommend you contact the ACOE's Regulatory Section regarding the possible need for a permit. For projects located in northern Nevada (Carson City, Churchill, Douglas, Elko, Esmeralda, Eureka, Humboldt, Lander, Lyon, Mineral, Pershing, Storey, and Washoe Counties) contact the Reno Regulatory Office at 300 Booth Street, Room 3060, Reno, Nevada 89509, (775) 784-5304; in southern Nevada (Clark, Lincoln, Nye, and White Pine Counties) contact the St. George Regulatory Office at 321 North Mall Drive, Suite L-101, St. George, Utah 84790-7314, (435) 986-3979; or in California along the eastern Sierra contact the Sacramento Regulatory Office at 650 Capitol Mall, Suite 5-200, Sacramento, California 95814, (916) 557-5250.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

The table below outlines lead FWS field offices by county and land ownership/project type. Please refer to this table when you are ready to coordinate (including requests for section 7 consultation) with the field office corresponding to your project, and send any documentation regarding your project to that corresponding office. Therefore, the lead FWS field office may not be the office listed above in the letterhead.

Lead FWS offices by County and Ownership/Program

County	Ownership/Program	Species	Office Lead*

Alameda	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Alameda	All ownerships but tidal/estuarine	All	SFWO
Alpine	Humboldt Toiyabe National Forest	All	RFWO
Alpine	Lake Tahoe Basin Management Unit	All	RFWO
Alpine	Stanislaus National Forest	All	SFWO
Alpine	El Dorado National Forest	All	SFWO
Colusa	Mendocino National Forest	All	AFWO
Colusa	Other	All	By jurisdiction (see map)
Contra Costa	Legal Delta (Excluding ECCHCP)	All	BDFWO
Contra Costa	Antioch Dunes NWR	All	BDFWO
Contra Costa	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Contra Costa	All ownerships but tidal/estuarine	All	SFWO
Del Norte	All	All	AFWO
El Dorado	El Dorado National Forest	All	SFWO
El Dorado	LakeTahoe Basin Management Unit		RFWO
Glenn	Mendocino National Forest	All	AFWO
Glenn	Other	All	By jurisdiction (see map)
Humboldt	All except Shasta Trinity National Forest	All	AFWO

Humboldt	Shasta Trinity National Forest	All	YFWO
Lake	Mendocino National Forest	All	AFWO
Lake	Other	All	By jurisdiction (see map)
Lassen	Modoc National Forest	All	KFWO
Lassen	Lassen National Forest	All	SFWO
Lassen	Toiyabe National Forest	All	RFWO
Lassen	BLM Surprise and Eagle Lake Resource Areas	All	RFWO
Lassen	BLM Alturas Resource Area	All	KFWO
Lassen	Lassen Volcanic National Park	All (includes Eagle Lake trout on all ownerships)	SFWO
Lassen	All other ownerships	All	By jurisdiction (see map)
Marin	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Marin	All ownerships but tidal/estuarine	All	SFWO
Mendocino	Russian River watershed	All	SFWO
Mendocino	All except Russian River watershed	All	AFWO
Modoc	Modoc National Forest	All	KFWO
Modoc	BLM Alturas Resource Area	All	KFWO
Modoc	Klamath Basin National Wildlife Refuge Complex	All	KFWO
Modoc	BLM Surprise and Eagle Lake Resource Areas	All	RFWO

Modoc	All other ownerships	All	By jurisdiction (See map)
Mono	Inyo National Forest	All	RFWO
Mono	Humboldt Toiyabe National Forest	All	RFWO
Napa	All ownerships but tidal/estuarine	All	SFWO
Napa	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Nevada	Humboldt Toiyabe National Forest	All	RFWO
Nevada	All other ownerships	All	By jurisdiction (See map)
Placer	Lake Tahoe Basin Management Unit	All	RFWO
Placer	All other ownerships	All	SFWO
Sacramento	Legal Delta	Delta Smelt	BDFWO
Sacramento	Other	All	By jurisdiction (see map)
San Francisco	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
San Francisco	All ownerships but tidal/estuarine	All	SFWO
San Mateo	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
San Mateo	All ownerships but tidal/estuarine	All	SFWO
San Joaquin	Legal Delta excluding San Joaquin HCP	All	BDFWO

San Joaquin	Other	All	SFWO
Santa Clara	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
Santa Clara	All ownerships but tidal/estuarine	All	SFWO
Shasta	Shasta Trinity National Forest except Hat Creek Ranger District (administered by Lassen National Forest)	All	YFWO
Shasta	Hat Creek Ranger District	All	SFWO
Shasta	Bureau of Reclamation (Central Valley Project)	All	BDFWO
Shasta	Whiskeytown National Recreation Area	All	YFWO
Shasta	BLM Alturas Resource Area	All	KFWO
Shasta	Caltrans	By jurisdiction	SFWO/AFWO
Shasta	Ahjumawi Lava Springs State Park	Shasta crayfish	SFWO
Shasta	All other ownerships	All	By jurisdiction (see map)
Shasta	Natural Resource Damage Assessment, all lands	All	SFWO/BDFWO
Sierra	Humboldt Toiyabe National Forest	All	RFWO
Sierra	All other ownerships	All	SFWO
Siskiyou	Klamath National Forest (except Ukonom District)	All	YFWO
Siskiyou	Six Rivers National Forest and Ukonom District	All	AFWO
Siskiyou	Shasta Trinity National Forest	All	YFWO

Siskiyou	Lassen National Forest	All	SFWO
Siskiyou	Modoc National Forest	All	KFWO
Siskiyou	Lava Beds National Volcanic Monument	All	KFWO
Siskiyou	BLM Alturas Resource Area	All	KFWO
Siskiyou	Klamath Basin National Wildlife Refuge Complex	All	KFWO
Siskiyou	All other ownerships	All	By jurisdiction (see map)
Solano	Suisun Marsh	All	BDFWO
Solano	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Solano	All ownerships but tidal/estuarine	All	SFWO
Solano	Other	All	By jurisdiction (see map)
Sonoma	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Sonoma	All ownerships but tidal/estuarine	All	SFWO
Tehama	Mendocino National Forest	All	AFWO
Tehama	Shasta Trinity National Forest except Hat Creek Ranger District (administered by Lassen National Forest)	All	YFWO
Tehama	All other ownerships	All	By jurisdiction (see map)
Trinity	BLM	All	AFWO
Trinity	Six Rivers National Forest	All	AFWO
Trinity	Shasta Trinity National Forest	All	YFWO

Trinity	Mendocino National Forest	All	AFWO
Trinity	BIA (Tribal Trust Lands)	All	AFWO
Trinity	County Government	All	AFWO
Trinity	All other ownerships	All	By jurisdiction (See map)
Yolo	Yolo Bypass	All	BDFWO
Yolo	Other	All	By jurisdiction (see map)
All	FERC-ESA	All	By jurisdiction (see map)
All	FERC-ESA	Shasta crayfish	SFWO
All	FERC-Relicensing (non-ESA)	All	BDFWO

***Office Leads:**

AFWO=Arcata Fish and Wildlife Office

BDFWO=Bay Delta Fish and Wildlife Office

KFWO=Klamath Falls Fish and Wildlife Office

RFWO=Reno Fish and Wildlife Office

YFWO=Yreka Fish and Wildlife Office

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Reno Fish And Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, NV 89502-7147
(775) 861-6300

Project Summary

Consultation Code: 08ENVD00-2018-SLI-0675

Event Code: 08ENVD00-2018-E-01540

Project Name: Ward Lake Expansion

Project Type: MINING

Project Description: Proposed addition of thirty acres to Ward Lake Mine operations.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/40.41384728734229N120.41205623177353W



Counties: Lassen, CA

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
North American Wolverine *Gulo gulo luscus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5123	Proposed Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Clark's Grebe *Aechmophorus clarkii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Dec 31

NAME	BREEDING SEASON
Golden Eagle *Aquila chrysaetos* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680	Breeds Dec 1 to Aug 31
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-billed Curlew *Numenius americanus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5511	Breeds Apr 1 to Jul 31
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Sage Thrasher *Oreoscoptes montanus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9433	Breeds Apr 15 to Aug 10
Tricolored Blackbird *Agelaius tricolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3910	Breeds Mar 15 to Aug 10
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week

months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ( )
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

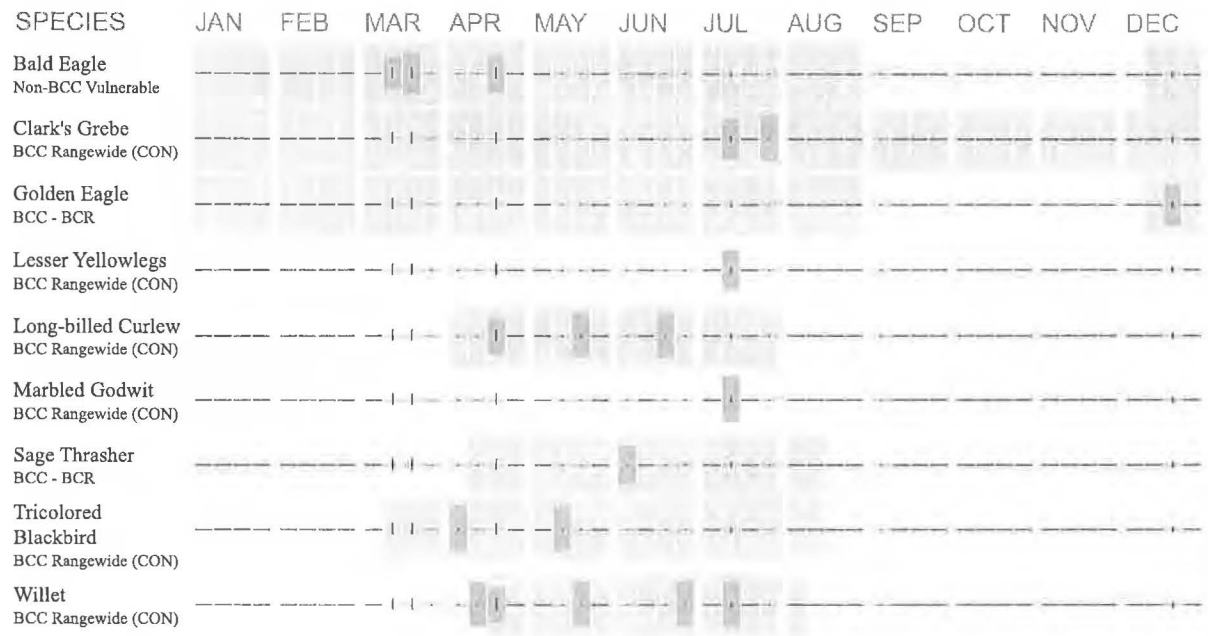
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

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probability of presence breeding season | survey effort – no data



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and

3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell

me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

Appendix C

Burrowing Owl Survey Report

BURROWING OWL SURVEY

WARD LAKE QUARRY
LASSEN COUNTY, CALIFORNIA

Prepared for

Hat Creek Construction & Materials, Inc.

Prepared by

VESTRA Resources, Inc.
5300 Aviation Drive
Redding, California 96002
(530) 223-2585

APRIL 2020

INTRODUCTION

The Ward Lake Quarry is located approximately three miles east of Ward Lake off of Ward Lake Road in Lassen County. The site is located in Section 32, Township 30 North, Range 14 East, MDBM. The coordinates at the center of the project are 40.414478, -120.417222.

The current Ward Lake mine area is approximately 160 acres, 100 acres of which are used for quarry operations. The facility includes the mining of rock, crushing, scales, office, truck shop, cement plant, asphalt plant, settling ponds, fuel storage, and material stockpiles. The project also includes various sediment control structures. The area surrounding the site is used for agriculture, mineral extraction, and open space.

The proposed expansion of Ward Lake Quarry includes the addition of approximately 78.6 acres to the mine boundary, a portion of which would be used for quarry operations. Access roads currently exist within the remaining area. The proposed expansion area is shown in Figure 1.

BURROWING OWL LIFE HISTORY

Burrowing owls (*Athene cunicularia*) inhabit areas of short grasses or other sparse vegetation, but their most basic habitat requirement is a burrow. Burrows provide protection from many predators, a relatively constant microclimate for nesting and thermoregulation, protection from hazardous or inclement weather, and an area in which to cache prey items. Burrowing owls hunt in both day and night. They perch on prairie dog mounds or other high spots on the ground. Prey is either run down on foot or caught by hovering and swooping. Burrowing owls prey on insects, small mammals, lizards, and birds.

Although its status in northeastern California is poorly known, the species appears to be scarce and may have been so historically. Burrowing owls may currently nest in small numbers in the Honey Lake Basin of Lassen County and in the Plumas County portion of Sierra Valley, and they have been reported from most other large valleys in the region, including Big Valley, Lassen and Modoc counties, and at Modoc National Wildlife Refuge and Surprise Valley in Modoc County (Shuford et al. 2008). Nesting generally occurs between March and September.

Intensive agriculture or development results in loss of burrows which leads to reduced prey availability and creation of suboptimal nesting habitat. Decreased density of adequate burrows may lead to reduced chances for unpaired owls to find mates. Loss of habitat has been cited as factor of decline in California. Due to the declining number of burrowing owls, CDFW has listed the species as a Bird Species of Special Concern.

BURROWING OWL SURVEY

The burrowing owl survey was completed according to the *Burrowing Owl Survey Protocol and Mitigation Guidelines* published by the California Burrowing Owl Consortium. This four-phase survey protocol is intended to help evaluate potential utilization of the Action Area by the species. For purposes of this report, the Action Area is defined as the area within which Project operations could impact an owl. At Ward Lake Quarry, the Action Area includes the proposed

expansion area and within 500 feet of the proposed boundary, to account for the standard species buffer for burrowing owls (Figure 1).

Phase I: Habitat Assessment

A desktop pre-survey review of the California Natural Diversity Database (CNDDB) was conducted to determine the potential for burrowing owls to occur within the Action Area. There are two documented occurrences of the burrowing owl in Lassen County; the nearest was approximately ten miles east of the Action Area. There are no previous records of the species within 5 miles of the Action Area.

The Action Area is comprised of grazing land identified through the California Wildlife Habitat Relationships (CWHR) classification as Sagebrush (SGB) habitat type. Sagebrush habitat is typically large, open, and often discontinuous, and stands are dominated by big sagebrush (*Artemisia tridentata*). This habitat occurs over a range of middle and high elevations. Sagebrush is mixed with other similar shrub species, such as rabbitbrush (*Chrysothamnus* spp.), horsebrush (*Tetradymia* spp.), and bitterbrush (*Purshia* spp.). The understory onsite consists of perennial grasses, annual grasses, and forbs. Vegetation observed at Ward Lake Quarry includes the following:

- Rubber rabbitbrush (*Ericameria nauseosa*)
- Sagebrush (*Artemisia tridentata* ssp.)
- Mormon tea (*Ephedra viridis*)
- Hooker's balsamroot (*Balsamorhiza hookeri*)
- Bristly fiddleneck (*Amsinckia tesselata*)
- Redstem stork's bill (*Erodium cicutarium*)
- Cheatgrass (*Bromus tectorum*)
- Bluebunch wheatgrass (*Pseudoreogneria spicata*)
- Common wooly sunflower (*Eriophyllum lanatum*)

Common wildlife generally associated with the sagebrush habitat type include mule deer (*Odocoileus hemionus californicus*), black-tailed deer (*Odocoileus hemionus columbianus*), pronghorn (A*ntilocapra Americana*), coyote (*Canis latrans*), jackrabbit *(Lepus californicus*), and Pacific gopher snake *(Pituophis catenifer).* The following wildlife species, or signs of the species, were observed during the survey:

- Cottontail rabbit (*Sylbilagus bachmani*)
- Chipmunk (*Tamias* sp.)
- Sierran treefrog (*Pseudacris sierrae*)
- Mourning dove (*Zenaida macroura*)
- Black-billed magpie (*Pica hudsonia*)
- California quail (*Callipepla californica*)
- Great horned owl (*Bubo virginianus*)
- Western meadowlark (*Sturnella neglecta*)
- Turkey vulture (*Cathartes aura*)

The habitat assessment found that the Action Area is located within the burrowing owl species range and sagebrush habitat in the area may have the potential to support burrowing owl nesting and foraging. A survey was conducted to assess burrowing owl habitat onsite.

Phase II: Burrow Pedestrian Survey

A pedestrian transect survey was completed throughout the Action Area on March 31, 2020, to determine the presence of burrows onsite. The survey began at 1330 and concluded at 1630. Weather was sunny with approximately 50 percent cloud cover and moderate wind speeds. Ambient temperatures were between 45 and 55 degrees Fahrenheit during the survey period.

Transects were walked within the Action Area in an east-west orientation. Transect spacing was selected to achieve full visual coverage of the ground within any potential burrowing habitat onsite. Habitat quality factors that were considered included topography and soil depth that could potentially support burrows. Transect spacing depended on vegetation density, slope, and the occurrence of large rock outcroppings. Tracks, feathers, pellets, and other sign items that may indicators of a burrow were considered during the survey.

Within the Action Area, soil in areas with slopes between 0 percent and ten percent showed little development with soil depth typically less than three inches and non-friable soils. Slopes greater than ten percent exhibit deep, friable soil with sparse sagebrush shrubs.



Photo: Proposed expansion area (facing east from western boundary)



Photo: Topography of the site (facing NE)



Photo: Shallow soils area



Photo: Deep friable soils area

Results

No burrows were observed that appeared to be able to accommodate an animal the size of a burrowing owl. Several small holes were observed in the ground within the friable soils onsite, though none exceeded 2.5 inches in diameter. The size of the entrance suggests that the burrows were likely created by a snake or chipmunk.

Burrow selection by burrowing owls has been studied by examining global burrowing owl burrow characteristics. The study found that burrowing owls select burrows with an entrance size of 15 centimeters (5.9 inches) or larger in diameter (Johnson et al. 2010). This suggests that the holes observed onsite do not provide habitat for burrowing owls. Additionally, burrowing owls have been observed inhabiting areas with a high density of burrows; this is not the case at the Ward Lake Quarry. Therefore, this assessment finds that no burrowing owl habitat occurs within the Action Area at Ward Lake Quarry.



Photo: Ground hole observed onsite

Phase III: Burrowing Owl Survey, Census, and Mapping

Due to the negative results found in the Phase II of the Burrowing Owl survey, there was no need to implement Phase III of the Burrowing Owl Survey Protocol and Mitigation Guidelines.

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PRELIMINARY GEOTECHNICAL REPORT

Ward Lake Quarry Expansion
Lassen County, California

Submitted To:

Ms. Wendy Johnston
VESTRA RESOURCES, INC.
5300 Aviation Drive
City of Redding, CA 96002

Prepared by:
Bajada Geosciences, Inc.

October 30, 2020
Project No. 2001.0107

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October 30, 2020
2001.0107

Ms. Wendy Johnston
VESTRA RESOURCES, INC.
5300 Aviation Drive
Redding, California 96048

Subject: **Preliminary Geotechnical Report**
Ward Lake Quarry Expansion
Lassen County, California

Dear Ms. Johnston:

Bajada Geosciences, Inc., is pleased to submit this preliminary geotechnical report to VESTRA Resources, Inc., for the expansion of Hat Creek Construction's Ward Lake Quarry located in Lassen County, California. This report is being submitted in accordance with our proposal dated February 25, 2020. This preliminary geotechnical report discusses field mapping and explorations performed, laboratory testing results, subsurface conditions encountered, and preliminary geotechnical analyses and recommendations associated with the study.

We appreciate the opportunity to perform this study. If you have any questions pertaining to this report, or if we may be of further service, please contact us at (530) 638-5263 at your earliest convenience.

Sincerely,
BAJADA GEOSCIENCES, INC.

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Appendix A ..... Laboratory Testing
Appendix B ..... Slope Stability Analyses
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1 INTRODUCTION

BAJADA Geosciences, Inc. (BAJADA), is pleased to submit this preliminary geotechnical study to VESTRA Resources, Inc. (VESTRA), for the proposed expansion of Hat Creek Construction's (HCC) Ward Lake Quarry located in Lassen County, California. The location is shown on Plate 1 – Site Location Map. The following preliminary report discusses our understanding of the project, observations and measurements made within the proposed quarry expansion area, our analyses, and presents our preliminary opinions regarding slope stability at the proposed quarry.

1.1 PROJECT DESCRIPTION

We understand that Hat Creek Construction is proposing to expand their existing Ward Lake Quarry an additional approximately 84 acres. The proposed expansion area is located north of the existing quarry, as shown on Plate 2 – Proposed Quarry Expansion Area. The expansion area is currently fallow and has not been quarried in the past. However, we understand that portions of the expansion area have been explored by HCC using an Air-Track drill rig (an air-percussion drill rig) and we are in receipt of the logs from those explorations along with coordinates of where the explorations occurred. We understand that the materials to be extracted will be predominantly basaltic rock present on site. We also understand that proposed cut slope inclinations/bench slope widths and heights have not yet been established for the expansion area.

We understand that the quarried materials will be used as aggregate for construction and sand materials for various applications. In addition, we understand that these materials will also be used for batching of asphaltic concrete, Portland cement concrete, or other materials. It is anticipated that the materials within the quarry will be excavated using a combination of conventional ripping and hauling methods and through blasting and hauling. It is anticipated that overburden and highly weathered rock will be rippable using single- or double-shank rippers attached to bulldozers. With depth, as materials become harder and less weathered, it is anticipated that controlled blasting will be needed to excavate rock materials. Once ripped or blasted, it is anticipated that excavators will load haul trucks with excavated materials. We understand that overburden and topsoil will be stockpiled within the quarry for later use during reclamation. It is anticipated that these soils could be placed on excavated benches and slopes to help facilitate revegetation.

1.2 PROJECT LOCATION

The parcel on which the quarry expansion is to occur is located at APN 109-100-42-11. The approximate center of the proposed quarry expansion has the following latitude and longitude:

- Latitude: 40° 25' 23.7" (40.423237°)
- Longitude: -120° 24' 53.8" (-120.414953°)

It should be noted that no quarrying has been performed within the proposed expansion area; hence, there are no exposed volcanic rock faces that could be mapped and used for development of recommendations in this study. It should also be noted that drilling and geophysical explorations were not authorized as part of our scope of services for this study; however, BAJADA mapped selected available exposures within the existing quarry area and used those data in preparing this report. As such, this study should be considered preliminary in nature and should be supplemented with future studies to refine recommendations made, herein.

1.3 SCOPE OF SERVICES

Services performed for this study included:

- Reconnaissance of the site surface conditions;
- Review of pertinent, selected regional geological data;
- Observation of exposed geological conditions at the project site. Plate 3 – Geotechnical Map, presents the preliminary geological conditions mapped at the site;
- Collection of samples of surficially available on-site rock and soil materials within the existing quarry that were suitable for laboratory testing;
- Performance of laboratory testing on samples obtained from the site to estimate rock strength characteristics for use in stability analyses. Results of the laboratory testing are presented in Appendix A – Laboratory Testing;
- Performance of limit-equilibrium evaluations of the gross stability for the proposed highwall. Results of those evaluations are presented in Appendix B – Slope Stability Analyses;
- Preparation of this report, which includes:
    - A description of the proposed project;
    - A summary of our field observation and laboratory testing programs;
    - A description of site surface conditions encountered during our field investigation; and
    - Our preliminary opinion regarding slope stability.

1.4 FIELD EXPLORATION

Field exploration performed by Bajada for this study consisted of reconnaissance-level geologic mapping of the study area, field measurement of discontinuity data (fractures, joints, flow bands, bedding planes, etc.) and rock mass characteristics at selected locations within the existing quarry. Field exploration occurred on March 4, 2020.

Subsurface exploration was not authorized as part of our services.

1.5 PREVIOUS WORK PERFORMED

We know of no site specific geologic or geotechnical studies that have been performed at the site. We understand that HCC used an Air-Track drill rig to advance a number of exploratory holes on site to estimate material types and locations, and those logs were made available to us and are included in Appendix C – Air-Percussion Exploration Hole Data, of this report. Plate 4 – Air-Percussion Explorations, shows the approximate locations of where those explorations were performed.

Geological information has been previously published for the project region and is periodically referred to within this report. References for those data are presented in the References section (Section 8.0) of this report.

2 FINDINGS

2.1 SITE CONDITIONS

2.1.1 Surface Conditions

The proposed expansion site consists of a moderately inclined ridgeline that descends to the southwest and encompasses a relatively flat terrace at its base, as shown in Plate 2. The natural slopes descend at inclinations ranging from about 5 to 20 degrees. The terrace is inclined at about 0 to 5 degrees.

Both terrace and slope are fallow and covered with perennial and seasonal grasses and shrubs. Scattered, isolated trees are present locally across the site.

Drainage occurs as sheet flow to the southwest onto the terrace. Drainage on the terrace occurs as sheetflow towards the northwest into Balls Canyon, which eventually discharges into Willow Creek. Elevations within the proposed quarry expansion area range from about 4,200 to 4,540 feet (VESTRA, 2020).

2.1.2 Subsurface Conditions

Based on observations of the proposed expansion area and the highwall exposures within the active quarry, subsurface conditions consist of sedimentary soils within the terrace deposits and interlayered volcanic rock.

It is anticipated that the sediments within the terrace deposits will be a mixture of sand, silt, and clay with varying amounts of gravel. These materials were estimated to be at least 60 feet deep in explorations 69 and 70, which are shown on Plate 4.

Volcanic Rock was observed to consist of basalt, andesite, and lessor amounts of rhyolite. The basalt was observed within the existing quarry to be weak to hard (International Society of Rock Mechanics [ISRM] Grade R2 to R4), highly to slightly weathered (ISRM Grade II to IV), slightly to highly fractured, with clast shapes ranging from angular and prismatic to platy. The andesite and rhyolite were observed to be very weak to weak (ISRM Garde R1 to R2, completely to moderately weathered (ISRM Grade III to V), and were largely soil-like with cobble to boulder size spheroidally-shaped clasts of weak (ISRM Grade R2) andesite incorporated into the soil matrix. Thus, the andesite and rhyolite are considered block-in-matrix, or bimrock, layers. The volcanic rock materials were not fully penetrated by explorations shown on Plate 4 and are thought to extend deeper than the anticipated quarry excavations.

Four cross sections, A-A' through D-D', were prepared for this site and their locations are shown in plan view on Plate 3. The cross sections are presented as Plates 5.1 through 5.4 –

Geotechnical Cross Sections A-A' through D-D', respectively. Plate 6 – Fence Diagram, illustrates a pseudo three-dimensional perspective of the underlying earth materials.

2.2 GEOLOGIC CONDITIONS

2.2.1 Regional Geology

The project site is located on the margin of the Cascade Range and the Basin and Range geologic/geomorphic provinces of California. The Cascade Range province extends from the northern end of the Sierra Nevada north to the Canadian border. In the project vicinity the Cascade Range province is bounded to the west by the Klamath Mountain province, to the east by the Basin and Range province, to the south by the Sierra Nevada province, and to the north by the Cascade Range extending through Oregon and Washington.

The Cascade Range province consists of a north-northwest-trending, relatively linear belt of active and dormant strata and shield volcanoes. The regional geologic conditions are dominated by andesitic, rhyolitic and andesitic volcanic rocks mantled with surficial deposits consisting of pyroclastic rocks, lahar deposits, alluvium, and local lacustrine sediments (Hinds, 1952).

The Basin and Range province is characterized by interior drainage with lakes and playas, and the typical horst and graben structure (subparallel, fault-bounded ranges separated by down dropped basins). In these basins, moderate to extensive thicknesses of lacustrine (lake) and alluvial deposits are present. Death Valley, the lowest area in the United States (280 feet below sea level at Badwater), is one of these grabens.

2.2.2 Local Geologic Setting

As noted in Section 2.1.2, the site is underlain by Quaternary-age terrace deposits and Pleistocene-age volcanic rocks (Grose et al., 2013; Lydon et al, 1960). The terrace deposits are near-shore emergent lacustrine deposits associated with the ancestral Lake Lahontan, which covered most of the project region (Grose, et al., 2013). The volcanic rocks consist of interlayered basalt, andesite, and rhyolite tuff and flows labeled the Andesite Flows and Pyroclastics of Litchfield (Grose et al., 2013). The mapped relationships of regional geologic conditions are shown on Plate 7 – Regional Geologic Map. Local mapped geologic conditions are shown on Plate 3.

2.2.3 Groundwater

The depth to groundwater beneath the project area was estimated through searching existing groundwater databases and review of well completion logs for nearby sites. A search of regional groundwater data (DWR, 2020a) found one well located about 1.7 miles southeast of the site. Well 29N14E09D001M recorded water depths ranging from 31 to 51 feet between 1980 and 1993. No other relatively close wells on that database were found.

A search for well completion reports was performed through DWR (2020b). That search found one nearby well located about 4,000 feet southwest of the site. The well completion report for that well reported a static water level of 70.5 feet.

In addition, a search of the Geotracker database (Geotracker, 2020) did not indicate the presence of subsurface exploration or data close to the project site.

It is important to note that groundwater elevations at the proposed project location can, and most likely will, fluctuate over time. In general, the depth to groundwater varies throughout the year and from year to year. Intense and long duration precipitation or drought, modification of topography, and cultural land use changes can contribute to fluctuations in groundwater levels. Localized saturated conditions or perched groundwater conditions near the ground surface could be present during and following periods of heavy precipitation or if on-site sources contribute water.

3 GEOLOGICAL HAZARDS

3.1 FAULTING & SEISMICITY

3.1.1 Regulatory Seismic Setting

The State of California designates faults as Holocene-age or Pre-Holocene-age depending on the recency of movement that can be substantiated for a fault. Fault activity is rated as follows:

FAULT ACTIVITY RATINGS		
Fault Activity Rating	**Geologic Period of Last Rupture**	**Time Interval (Years)**
Holocene-Active	Holocene	Within last 11,000 Years[1]
Pre-Holocene	Quaternary & Older	>11,000 Years[1]
Age Undetermined	Unknown	Unknown

[1] – Holocene is defined as 11,700 years before present by the International Commission on Stratigraphy. The California State Mining and Geology Board, which administers the review and application of the Alquist-Priolo Earthquake Fault Zoning Act, currently recognizes the Holocene as 11,000 years before present.

The California Geologic Survey (CGS) evaluates the activity rating of a fault in fault evaluation reports (FERs). FERs compile available geologic and seismologic data and evaluate if a fault should be zoned as Holocene-active, pre-Holocene, or age undetermined. If an FER evaluates a fault as Holocene-active, then it is typically incorporated into a Special Studies Zone in accordance with the Alquist-Priolo Earthquake Fault Zoning Act (AP). AP Special Studies Zones require site-specific evaluation of fault location for structures for human occupancy and require a habitable structure setback if the fault is found traversing a project site.

The Holocene-active Honey Lake and Warm Springs Valley faults have been mapped in the project region, with the project site being north of the mapped trend of the Warm Springs Valley fault, as shown on Plate 8 – Regional Fault Map. Both the Honey Lake and Warm Springs faults exhibit right-lateral displacement and are significant faults within the Walker Lane fault zone (Wills, 1990). The Honey Lake fault is about 35 miles long and capable of generating a M_W 7.0 earthquake (USGS, 2020b). The Warm Springs Valley fault is about 24 miles long and capable of generating a M_W 6.8 earthquake (USGS, 2020b)

The Honey Lake fault is located about 7 miles southwest of the project site. The Warm Springs Valley fault is mapped about 13 miles south of the site. The State's fault location maps do not show the Warm Springs Valley fault projecting north of Honey Lake; however, lineations mapped from aerial photographs of the region and observed faulting within the existing quarry area project north through the quarry area and region with a trend that is coincident with the Warm Springs fault, as shown on Plate 9 – Interpreted Area Fault Map. The quarry site is not within a special studies zone associated with the AP.

3.1.2 CBC Seismic Design Recommendations

The following table presents 2019 California Building Code (CBC) criteria:

CBC SEISMIC DESIGN PARAMETERS		
California Building Code	**Parameter**	**CBC Designation**
Site Coordinates	Latitude	40.423237°
	Longitude	-120.414953°
Section 1613.5.3 Table 1613.5.3(1)	Site Coefficient, F_a	1.2
Section 1613.5.3 Table 1613.5.3(2)	Site Coefficient, F_v	1.5
Section 1613.5.1 Figure 1613.5	Site Class Designation	C
	Seismic Factor, Site Class B at 0.2 Seconds, S_s	0.808g
	Seismic Factor, Site Class B at 1.0 Seconds, S_1	0.286g
Section 1613.5.3	Site Specific Response Parameter for Site Class D at 0.2 Seconds, S_{MS}	0.970g
	Site Specific Response Parameter for Site Class D at 1.0 Seconds, S_{M1}	0.428g
Section 1613.5.4	$S_{DS}=2/3S_{MS}$	0.646g
	$S_{D1}=2/3S_{M1}$	0.286g
Per the 2019 CBC		

Because of the presence of weak to strong rock beneath the site, a Site Class C was used in the evaluation.

3.1.3 Probabilistic Estimates of Strong Ground motion

Probabilistic evaluations of horizontal strong ground motion that could affect the site were performed using attenuation evaluation methods provided by the U.S. Geological Survey (USGS, 2020a). The evaluations were performed using an estimated shear wave velocity in the upper 100 feet of the profile of 537 meters per second. Evaluations were performed for upper-bound (UBE) and design-basis (DBE) probabilistic exposures. The UBE corresponds to horizontal ground accelerations having a 10 percent probability of exceedance in a 100-year exposure period, with a statistical return period of 949 years. The DBE corresponds to horizontal ground accelerations having a 10 percent probability of exceedance in a 50-year, exposure period, with a statistical return period of 475 years. The results of these evaluations are presented in the following table:

PROBABILISTIC GROUND MOTION DATA				
Earthquake Level	**Probabilistic Estimate Exposure Period (years)**	**Probability of Exceedance (%)**	**Return Period (years)**	**Estimated Peak Horizontal Ground Acceleration (g)**
Upper-Bound Ground-Motion	100	10	949	0.296
Design-Basis Ground-Motion	50	10	475	0.215

It should be noted that although the seismic hazard models used for this study predict the probability of exceedance for various levels of acceleration in a given exposure period, the models are not able to account for the effect that the passage of time since past earthquakes has on future earthquake probability. Thus, while time may affect the incipient risk of earthquakes occurring, the UBE and DBE values are based on any 100-year and 50-year exposure period, respectively, regardless of how recently earthquakes have occurred.

3.2 LANDSLIDES

No existing, past, or incipient landslides were observed within the proposed quarry expansion area.

3.3 LIQUEFACTION AND LATERAL SPREADING

Liquefaction is described as the sudden loss of soil shear strength due to a rapid increase of soil pore water pressures caused by cyclic loading from a seismic event. In simple terms, it means that a liquefied soil acts more like a fluid than a solid when shaken during an earthquake. For liquefaction to occur, the following are needed:

- Granular soils (sand, silty sand, sandy silt, and some gravels);
- A high groundwater table; and
- A low density in the granular soils underlying the site.

If those criteria are present, then there is a potential that the soils could liquefy during a seismic event. The adverse effects of liquefaction include local and regional ground settlement, ground cracking and expulsion of water and sand, the partial or complete loss of bearing and confining forces used to support loads, amplification of seismic shaking, and lateral spreading. In general, the effects of liquefaction on the proposed project could include:

- Lateral spreading;
- Vertical settlement; and/or
- The soils surrounding lifelines can lose their strength and those lifelines can become damaged or severed.

Lateral spreading is defined as lateral earth movement of liquefied soils, or soil riding on a liquefied soil layer, down slope toward an unsupported slope face, such as a creek bank, or an inclined slope face. In general, lateral spreading has been observed on low to moderate gradient slopes but has been noted on slopes inclined as flat as one degree.

Most materials located within the proposed quarry area consist of volcanic rock materials and terrace deposits. The volcanic rock materials are not subject to liquefaction. The terrace deposits are thought to contain appreciable fines and groundwater is anticipated to be located at depths below 50 feet, per the exploratory holes advanced with the air-percussion drill rig (see Appendix C). Thus, terrace deposits are considered to have a low potential for liquefaction susceptibility.

3.4 NATURALLY OCCURRING ASBESTOS

3.4.1 Information Regarding Naturally Occurring Asbestos

Ultramafic rock, such as serpentinite, amphibolite, peridotite, dunite, pyroxenite, hornblendite, etc., can contain asbestiform minerals, which are fibrous, silica-rich crystals that can cause lung cancer, mesothelioma, asbestosis, and other health-related issues, if present. Typically, six minerals within ultramafic rocks are responsible for the primary, naturally occurring asbestiform concerns for health-related issues: chrysotile, tremolite, actinolite, anthophyllite, crocidolite, and amosite. These minerals may or may not be present in ultramafic rocks; thus, the presence of ultramafic rock does not automatically indicate that there is a health hazard. The presence of asbestiform minerals can sometimes be discerned in the field based on visual examination of rock exposures but, most often, must be confirmed using laboratory testing.

Naturally occurring asbestos can be hazardous to human health if it is disturbed, becomes airborne and is inhaled. If NOA is not disturbed and fibers are not released into the air, then it is typically not considered a health hazard. Inhalation is the primary exposure route of concern, because breathing asbestos fibers may cause them to become trapped in the lungs. Ingestion is another, albeit less common, pathway of concern, because swallowing asbestos fibers may also cause the fibers to be trapped in body tissues. Asbestos is not absorbed through the skin, so merely touching it does not pose a significant risk to human health. Asbestos fibers are not water soluble and do not move through groundwater to any appreciable extent. Based on studies of other insoluble particles of similar size, the expected migration rate of an asbestos fiber through soils by the forces of groundwater is approximately 1 to 10 centimeters (0.4 to 4 inches) per 3,000 to 40,000 years (New Hampshire DES, 2010). Thus, asbestos is not considered a groundwater contaminant.

As discussed in Section 2.1.2, the highwall should expose volcanic rocks consisting of basalt, andesite, and rhyolite, which are not rock types that typically are considered as generators of NOA. If fibrous rock, or differing rock materials, such as those mentioned above, are encountered during quarrying, we recommend that an assessment of the potential presence of NOA and its associated concentrations be performed.

3.4.2 Site Conditions

Volcanic rocks at the site are typically not considered asbestos bearing, since they do not meet the criteria noted above. Thus, testing was not performed to assess the potential presence of NOA. If such testing is desired, we would be pleased to assist in those services.

4 SLOPE STABILITY

4.1 GENERAL

The following section discusses slope stability evaluations performed for this project. Results of the stability analyses are included in Appendix B. The following section discusses methods used for stability analyses. All evaluations were performed in accordance with Blake et al. (2002) and CGS (2008), as discussed below.

4.2 DISCUSSION REGARDING FACTORS OF SAFETY

Evaluation of slope stability generally takes into consideration a number of soil and rock strength parameters, geologic conditions within the slope, hydrogeologic conditions, and surcharge and seismic loads that could affect the slope. Those parameters are typically modeled using limit-equilibrium methods (and less commonly using finite-element or finite-difference modeling) to estimate a slope inclination that meets or exceeds a target minimum factor of safety (FOS) against failure. The FOS is estimated by calculating the forces resisting slope failure divided by the forces causing slope failure. Thus, a FOS of greater than 1 implies a stable slope, a FOS of less than 1 a slope that is failing, and a FOS of 1, a slope that is creeping and/or on the verge of failure.

Conventional engineered cut or fill slopes typically utilize minimum slope stability FOS thresholds of 1.5 and 1.1 for static and pseudostatic (pseudo-earthquake forces) evaluations, respectively, for acceptable maximum slope inclinations (Blake et al., 2002, CGS, 2008). For open quarry slopes, the FOS for static conditions is often reduced to 1.25 because the risk to structures, people, and improvements is relatively low.

4.3 SURFACE SLOPE GEOMETRY

Surface topography used in our slope stability analyses is based upon topographic information collected for the proposed project (VESTRA, 2020).

4.4 SUBSURFACE PROFILE

Subsurface geological conditions for the proposed quarry expansion were estimated through observation and mapping of site conditions, review of air-percussion exploratory drill holes (see Appendix C), and observations from highwall exposures within the existing quarry. Cross sections presented as Plates 5.1 through 5.4 were developed across the site to depict anticipated subsurface conditions.

4.5 ENGINEERING PROPERTIES USED IN STABILITY ANALYSES

Soil shear strengths used in stability analyses are partially based upon direct shear data obtained from laboratory testing of a selected sample of completely weathered regolithic andesitic soil collected during this study. The shear strength obtained from that test is included in Appendix A and shown in the following tables:

DIRECT SHEAR TEST RESULTS		
Description	**Cohesion (psf)**	**Angle of Internal Friction (Ø)**
Regolithic andesitic soils	442	41.9°

Shear strength of the rock was estimated from laboratory unconfined compression tests (UCS) obtained from rock samples taken from exposures within the existing quarry during this study. Results of the unconfined compression tests are presented in Appendix A, and are as follows:

UNCONFINED COMPRESSION TEST RESULTS			
Sample	**Description**	**Compressive Strength**	
		psi	**Ksf**
1A	Basalt	6,180	889.9
2A	Andesite	5,780	832.3
2B	Andesite	5,710	822.2
3A	Basalt	10,260	1,477.4
3B	Basalt	17,200	2,476.8
	Average:	**9,026**	**1,299.7**

As noted above, the average UCS values for the rock tested from the quarry is 9,026 pounds per square inch (psi). Those intact rock strengths range from medium strong rock to very strong rock (ISRM Grade R3 to R5) with an average classification as strong rock (ISRM Grade R4).

The rock mass strength parameters were derived using the Hoek-Brown failure criterion (Marinos et al., 2005; Marinos et al., 2000). The overall strength of a rock mass is difficult to estimate because of scale issues. Methods of estimating rock mass strength based on the strength of intact rock materials and the lithology, rock mass quality and other factors are used to downgrade the measured intact rock strength to rock mass scale values. Once these strength properties have been estimated, they can be adjusted to account for the expected level of disturbance. Rock mass disturbance is typically caused by blast damage and vertical unloading, as well as strains resulting from stress changes in the quarry walls.

The Geological Strength Index (GSI) is based on the RMR rating system and was introduced by Hoek et al. (1995) to overcome issues with the RMR values for very poor-quality rock masses. For better quality rock masses (GSI>25), the value of GSI can be estimated from Bieniawski's RMR (1989) as GSI=RMR-5. This assumes a groundwater rating set to 15 (dry) and the adjustment for joint orientation set to 0 (very favorable). For this study, the GSI for basalt and andesite/ryholite have been estimated to be 60 and 55, respectively.

Hoek et al, (2002) recommends that the utilized rock mass strengths be downgraded to disturbed

values to account for rock mass disturbance associated with heavy production blasting and vertical stress relief. He indicates that a disturbance factor of 0.7 would be appropriate for a mechanical excavation where no blasting damage is expected. A value of 1.0 is assumed for conventional production blasting. A good controlled production blasting strategy is expected to be between these extremes and consistent with a disturbance factor of 0.85. For this study a disturbance factor of 1.0 was used.

The following table presents a summary of the rock mass strength parameters for the anticipated rock that will be encountered within the quarry walls.

SUMMARY OF ROCK MASS STRENGTH PARAMETERS

Basic Parameter	Symbol	Unit	Values by Sample				
			1A	2A	2B	3A	3B
Rock Type:			Basalt	Andesite	Andesite	Basalt	Basalt
Unit Weight	Γ	pcf	165	165	165	165	165
Intact Unconfined Compressive Strength (UCS)	σ_{ci}	psi	6,180	5,780	5,710	10,260	17,200
Basic Rock Mass Rating (1989)	RMR	-	55	65	65	55	55
Geologic Strength Index	GSI	-	60	60	60	55	55
Petrographic Constant for Intact Rock	m_i	-	25	25	25	25	25
Disturbed Rock Mass (Disturbance Factor D=1.0)							
Hoek-Brown Constant for Rock Mass	m_b	-	1.436	1.436	1.436	0.703	0.703
Hoek-Brown Constant	S	-	0.0013	0.0013	0.0013	0.0002	0.0002
Friction angle of Rock Mass	Ø'	degrees	48.8	48.4	48.3	46.9	50.6
Cohesion of Rock Mass	C'	psf	9,102	8,828	8,780	8,105	10,170
Compressive Strength of Rock Mass	S_{cm}	ksf	31.15	29.13	28.78	21.84	36.61
Deformation Modulus	E_m	ksf	121,216	117,228	116,514	87,829	104,427

Thus, the following ranges for the angle of internal friction (Ø) and cohesion were estimated for the rock materials using the methods of Hoek et al. (2002):

DIRECT SHEAR TEST RESULTS

Description	Range for Cohesion (psf)	Range for Angle of Internal Friction (Ø)
Basalt	9,102 to 15,314	48.8° to 55.6°
Andesite	6,364 to 6,395	42.6°

For basalt, we elected to use a cohesion (C) of 2,000 psf and Ø of 49° for the strength of those rock materials.

As previously noted, the andesite and rhyolite layers consist of soil with cobble- and boulder-size clasts interspersed within the soil mass forming a volcanic mélange, also known as bimrock. Strength evaluations of mélanges and bimrock materials, based on tests performed on groundmass, have shown the laboratory-determined strength values of the groundmass (matrix) to be lower than actual slope strength values because they do not account for the circuitous path around or through cobbles and boulders that shear planes must traverse in order for slope failure to occur (Lindquist, 1994; Medley, 2001).

A methodology for adjusting the angle of internal friction based on mélange characteristics is provided by Medley (2001). That procedure dictates that sufficient mechanical contrast has to be present between the block and matrix materials to realize an adjusted strength benefit. The following equation is used evaluate if that contrast is present:

$$\text{Contrast} = \frac{Tan(Ø)\ of\ weakest\ block}{Tan(Ø)\ of\ matrix}$$

If the contrast exceeds a value of 1.5, then appropriate conditions exist and benefit from that procedure might be realized. If the contrast is below 1.5, then failure surfaces are likely to pass through blocks and no benefit will be obtained. A Ø angle of 42.6° was obtained for the andesite block materials and a Ø angle of 41.9° was obtained for the matrix materials. The contrast ratio for those materials equates to 1.02. Thus, adjustment of strength values as described by Medley (2001) will not benefit this project.

Thus, based on the results of the aforementioned testing and evaluations, we have used the following strength values for materials anticipated to be exposed within highwall slopes:

STRENGTH VALUES USED IN EVALUATIONS

Description	Cohesion (psf)	Angle of Internal Friction (Ø)
Basalt	2,000	49°
Andesite	440	42°

4.6 HYDROGEOLOGIC CONDITIONS

As noted in Section 2.2.3, groundwater is anticipated to be located below the bottom of the proposed quarry excavation. Thus, slope stability at the site was modeled with no piezometric surface influencing the stability.

4.7 PSEUDOSTATIC LOADING CRITERIA

To estimate the appropriate horizontal ground acceleration (pseudostatic loading) to use within our model, we used methods of Blake et al (2002) and CGS (2007). Using a probabilistic horizontal

ground acceleration of 0.22g, which corresponds to a 475-year return period (10% chance of exceedance in 50 years; see Section 3.1.3), we could have reduced that value by 44 percent to obtain a pseudostatic acceleration of 0.09g and been within the standard of practice for these evaluations. However, to be conservative, we utilized a pseudo static acceleration of 0.15g within our model.

4.8 SLOPE STABILITY EVALUATIONS

BAJADA performed a number of slope stability evaluations to estimate the maximum safe slope inclination at the site. As discussed in Sections 2.1.2 and 2.2.2 and as shown on Plates 5.1 through 5.4 and Plate 6, the geologic conditions at the site consist of a layered rock and soil model. This model has competent, hard, fractured basalt flows sandwiched between weak rock and soil that contains cobble- and boulder-size clasts of harder andesite and rhyolite. Thus, the stability of the slope will not be governed by orientations and proliferations of discontinuity orientations of rock within the slope but more so by the stability of the soil interbeds.

Using this model, gross stability evaluations of slopes with varying inclinations and heights were performed. These evaluations consisted of limit-equilibrium analyses performed using the computer program SLIDE 2018 (Rocscience, 2020). Static and pseudostatic analyses results are presented in Appendix B of this report. Stability analyses evaluated the FOS values for highwall slopes ranging in height from 150 to 350 feet tall with slope angles varying from 45 to 60 degrees. The following table presents the results of those analyses:

RESULTS OF STABILITY ANALYSES

Slope Height (feet)	Slope Inclination (degrees)	Loading Condition	Factor of Safety	Acceptable FOS?
150	45	Static	1.55	Yes
		Pseudostatic	NP	NA
	50	Static	1.39	Yes
		Pseudostatic	NP	NA
	55	Static	1.26	Yes
		Pseudostatic	1.02	Yes
	60	Static	1.15	No
		Pseudostatic	NP	NA
200	45	Static	1.47	Yes
		Pseudostatic	NP	NA
	50	Static	1.31	Yes
		Pseudostatic	1.05	Yes
	55	Static	1.19	No
		Pseudostatic	NP	NA
250	45	Static	1.40	Yes
		Pseudostatic	NP	NA
	50	Static	1.25	Yes
		Pseudostatic	1.00	Yes
	55	Static	1.13	No
		Pseudostatic	NP	NA

RESULTS OF STABILITY ANALYSES				
Slope Height (feet)	**Slope Inclination (degrees)**	**Loading Condition**	**Factor of Safety**	**Acceptable FOS?**
300	45	Static	1.36	Yes
		Pseudostatic	1.07	Yes
	50	Static	1.19	No
		Pseudostatic	NP	NA
350	45	Static	1.31	Yes
		Pseudostatic	1.03	Yes
	50	Static	1.16	No
		Pseudostatic	NP	NA
NP – Not performed; NA – Not applicable				

Results of the stability analyses are presented graphically as a curve on Plate 10 – Slope Inclination Versus Height. It should be noted that the curve applies to both static (FOS ≥ 1.25) and pseudostatic (FOS ≥ 1.01) conditions.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 GENERAL

Based on the results of our investigation, it is our opinion that the site is suitable for development of the project provided recommendations presented, herein, are utilized during expansion of the quarry. Specific comments and recommendations regarding the geotechnical aspects of project design and construction are presented in the following sections.

5.1.1 Faulting

As previously noted, the project site is located about 7 miles from the closest State-mapped Holocene-active fault. However, as shown on Plate 9, it appears that possible northerly extensions of the Holocene-active Warm Springs Valley fault may project through the quarry area. It is our opinion that there is risk associated with rupture across the project site from this fault; however, since there are no habitable structures, the potential health risks are relatively low, especially with a relatively long recurrence interval for that fault.

5.1.2 Landslides

It is our opinion that the risk of natural landslides to adversely impact the project site is low. The risks of failure of man-made slopes associated with quarrying is discussed below.

5.1.3 Liquefaction

Based on our observations and the characteristics of materials exposed in the existing quarry during the investigation, it is our opinion that liquefaction and lateral spreading pose a low risk of adversely affecting the proposed quarry expansion project site.

5.1.4 Naturally Occurring Asbestos

Based on our observations at the existing quarry site, it is our opinion that rock materials associated with NOA are not present within the proposed quarry area.

5.2 QUARRY SLOPE DESIGN

The following sections discuss the maximum recommended slope inclinations, slope heights, and bench locations for the proposed disposal stockpile.

5.2.1 Slope Inclination & Height

As noted in Section 4.8, slopes ranging in height from 150 to 350 feet were evaluated to estimate the maximum slope inclination that would provide a minimum FOS value for static and pseudostatic conditions of 1.25 and 1.0, respectively, for those heights. The results are tabulated in Section 4.8 and presented on Plate 10. We recommend that highwall slope inclinations be designed no steeper than those inclinations noted on Plate 10 for the maximum proposed highwall height within the proposed expansion area.

5.2.2 Bench Recommendations

Conventional hard rock quarries have benches separated by near vertical bench faces to create a stepped geometry from top of slope to bottom of quarry. Because this site has relatively strong basalt flows separated by relatively weak andesite and rhyolite layers, conventional benching does not appear to be a viable alternative.

Instead, we recommend that the highwall be graded at an inclination noted in Section 4.8 and that benches to capture and divert drainage and to act as catchment for dislodged rocks, be constructed at vertical intervals across the highwall face. We recommend that benches be designed and constructed at no more than 50-foot vertical intervals. The benches should be a minimum of 12 feet wide, inclined into the slope, and constructed to drain to the margins of the highwall and/or to centralized collection areas that capture and convey drainage to the bottom of the cut slope. In addition, we recommend that a V-ditch or berm be constructed along the top of the highwall to divert water away from the highwall face.

5.3 OPERATIONAL CONSIDERATIONS

5.3.1 Controlled Blasting

Blasting disturbance is one of the controlling factors for rock mass strength and overall slope stability. Slope instabilities are often triggered by the progressive deterioration (raveling) of the wall face and this process is often initiated with the detachment of small rock blocks (key blocks) bounded by the rock mass discontinuities, The preservation of rock mass integrity during mining is critical to reduce the potential of these progressive failures and is required to achieve the steepest bench face angles possible.

Controlled blasting methods will facilitate steeper final quarry slopes by reducing face damage from blasting. Typical controlled blasting strategies utilize small diameter blast holes detonated as a pre-shear line in harder, massive rock (pre-splitting) or as a post-shear (cushion) line in weak or heavily fractured rock. In all cases, it is important that blast hole lengths be staggered so the bottom of the hole does not intercept the crest on the bench below. Otherwise, highly fragmented bench crests will develop leading to increased and possibly unacceptable backbreak.

Interim quarry slopes should incorporate some "controlled blasting" to maintain safety, but the requirements in this situation are less rigorous due to shorter operating life of these walls. The initial quarry can be developed with variable slopes and blast patterns to develop optimal blasting design for final quarry walls. Trial blasts are also recommended wherever there is a substantial change in rock mass characteristics, in order to evaluate and optimize blast performance.

5.3.2 Geotechnical Monitoring

Proactive geotechnical monitoring is recommended for all stages of quarry development. The monitoring program should be implemented as a staged approach and include geotechnical and

tension crack observation and monitoring, as well as implementation of a surface displacement monitoring program.

Detailed geological mapping should be performed following creation of new benches but at a frequency no longer than quarterly to annually, depending on the rate of resource extraction and bench formation. Detailed information to be noted should include orientations, types, persistence, frequency, infilling, and condition of discontinuities exposed during mining operations. In addition, seepage volumes and relative changes in seepage volumes should be noted as those changes might indicate dilation of discontinuities and a change in the hydrogeologic environment.

Observations of tension cracks should be carried out along all newly formed benches. Detailed information to be noted should include the surveyed location, orientation, aperture, and both vertical and lateral extents of all tension cracks. The development of tension cracks should be very carefully observed. The frequency of observations should be commensurate with the rate of development of individual cracks. A map and database of tension crack information should be compiled and updated as new information becomes available. Areas of slope movement that are associated with development of tension cracks should also be monitored with survey and/or instrumentation, which can consist of time domain reflectometry (TDR), inclinometers, borehole and/or surface extensometers, tiltmeters, and piezometers.

6 FUTURE GEOTECHNICAL ASSESSMENTS

This preliminary report was prepared using limited data available from surficial rock exposures at the existing quarry site and data from the Air-Track drill holes advanced by HCC. Thus, it is preliminary in nature. Findings, conclusions, and recommendations made within this report should all be considered preliminary. Because of this, we recommend that future geotechnical assessment of the quarry be performed once rock exposures are made within the quarry highwall and/or once additional subsurface geotechnical exploration is authorized. Those future geotechnical assessments should collect additional discontinuity orientations, rock quality data, rock strength data, groundwater information, and evaluate whether recommendations made within this preliminary geotechnical report are valid or require amendment.

In addition, periodic on-going geotechnical assessment of the quarry geologic and geotechnical conditions should be performed, as discussed in Section 8.3.2 of this report.

7 CLOSURE

This preliminary report has been prepared in substantial accordance with the generally accepted geotechnical engineering and engineering geological practice, as it existed in the site area at the time our services were rendered. No other warranty, either express or implied, is made.

Preliminary conclusions contained in this report are based on the conditions encountered during our field observations and mapping, and are applicable only to those project features described herein (see Section 1.1). Subsurface exploration was not performed for completion of this study. Soil and rock deposits can vary in type, strength, and other geotechnical properties between points of observation and exploration. Additionally, groundwater and soil moisture conditions can also vary seasonally and for other reasons. Therefore, we do not and cannot have a complete knowledge of the subsurface conditions underlying the project site. The preliminary conclusions and recommendations presented in this report are based upon the findings at the points of observation, and interpolation and extrapolation of information between and beyond the points of observation, and are preliminary in nature and subject to confirmation based on the conditions revealed by construction. If conditions encountered during construction differ from those described in this report, or if the scope or nature of the proposed construction changes, we should be notified immediately to review and, if deemed necessary, conduct additional studies.

The scope of services provided by BAJADA for this project did not include the investigation and/or evaluation of toxic substances, or soil or groundwater contamination of any type. If such conditions are encountered during site development, additional studies may be required. Further, services provided by BAJADA for this project did not include the evaluation of the presence of critical environmental habitats or culturally sensitive areas.

This report may be used only by our client and their agents and only for the purposes stated herein, within a reasonable time from its issuance. Land use, site conditions, and other factors may change over time that may require additional studies. In the event significant time elapses between the issuance date of this report and full construction of the quarry, BAJADA shall be notified of such occurrence to review current conditions. Depending on that review, BAJADA may require that additional studies be conducted and that an updated or revised report is issued.

Any party other than our client who wishes to use all or any portion of this report shall notify BAJADA of such intended use. Based on the intended use as well as other site-related factors, BAJADA may require that additional studies be conducted and that an updated or revised report be issued. Failure to comply with any of the requirements outlined above by the client or any other party shall release BAJADA from any liability arising from the unauthorized use of this report.

We appreciate the opportunity to assist with this project. If you have any questions, please do not hesitate to contact our office.



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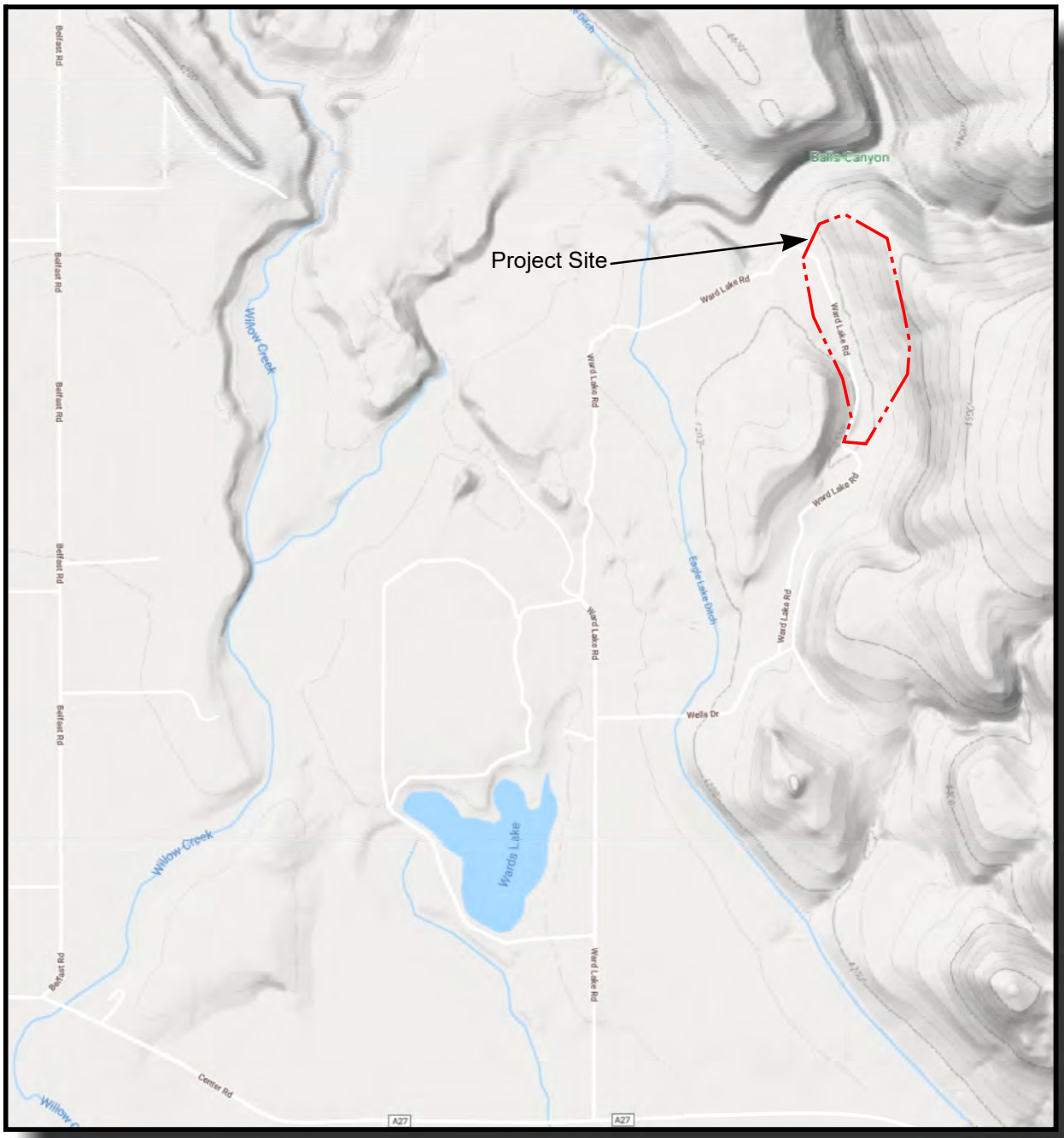
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Base maps from Mapquest. Scale undetermined.

SITE LOCATION MAP

Ward Lake Quarry Expansion Preliminary Geotechnical Study Hat Creek Construction Company Lassen County, California	Plate No. 1
BAJADA Geosciences, Inc.	Project no. 2001.0107



PROPOSED QUARRY EXPANSION AREA

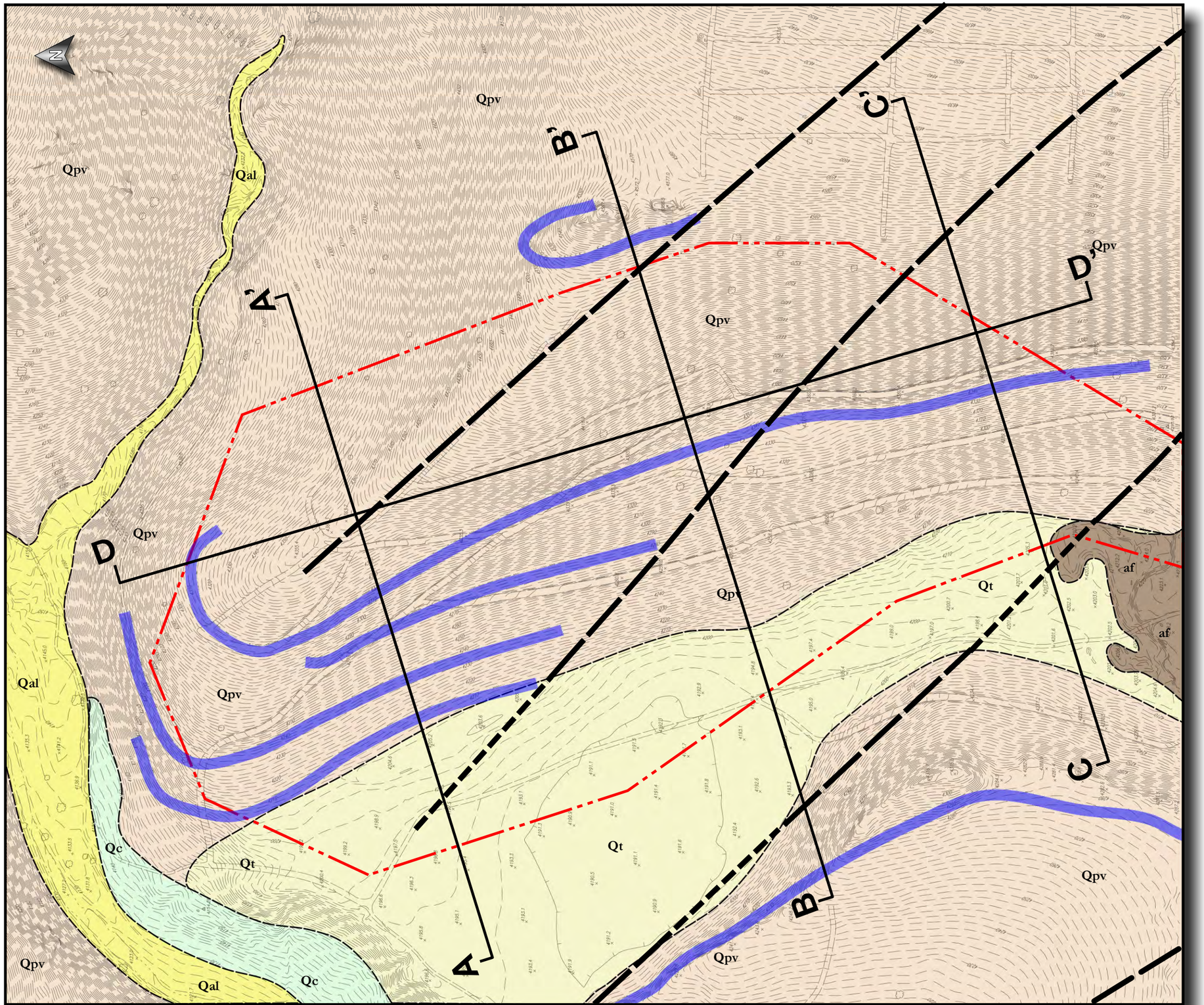
Ward Lake Quarry Expansion
Preliminary Geotechnical Study
Hat Creek Construction Company
Lassen County, California

Plate No. 2

BAJADA Geosciences, Inc.

Project no. 2001.0107

Base maps from Google Maps. Scale undetermined.



af Artificial Fill/Stockpile

Qal Alluvium

Qc Colluvium

Qt Terrace Deposits

Qpv Volcanic Rock
(Basalt & Andesite, with minor Rhyolite)

Geologic Contact,
Dashed where approximate

Fault
Dashed where approximate

D D' Geotechnical Cross Section
See Plate2 5.1 through 5.4 for Sections

Approximate Limits of Quarry Expansion

Approximate Limits of Resistant Strata
Mapped From Aerial Photographs

0 150 300

Scale: 1”=300’
1:3,600
Contour Intervals: 2’

Topographic base map from VESTRA (2020)

GEOTECHNICAL MAP

Ward Lake Quarry Expansion
Preliminary Geotechnical Study
Hat Creek Construction Company
Lassen County, California

Plate No. 3

BAJADA Geosciences, Inc.

Project no. 2001.0107



Exploratory Air-Percussion Hole
90

Approximate Limits of Quarry Expansion

0 150 300

Scale: 1”=300’
1:3,600
Contour Intervals: 2’

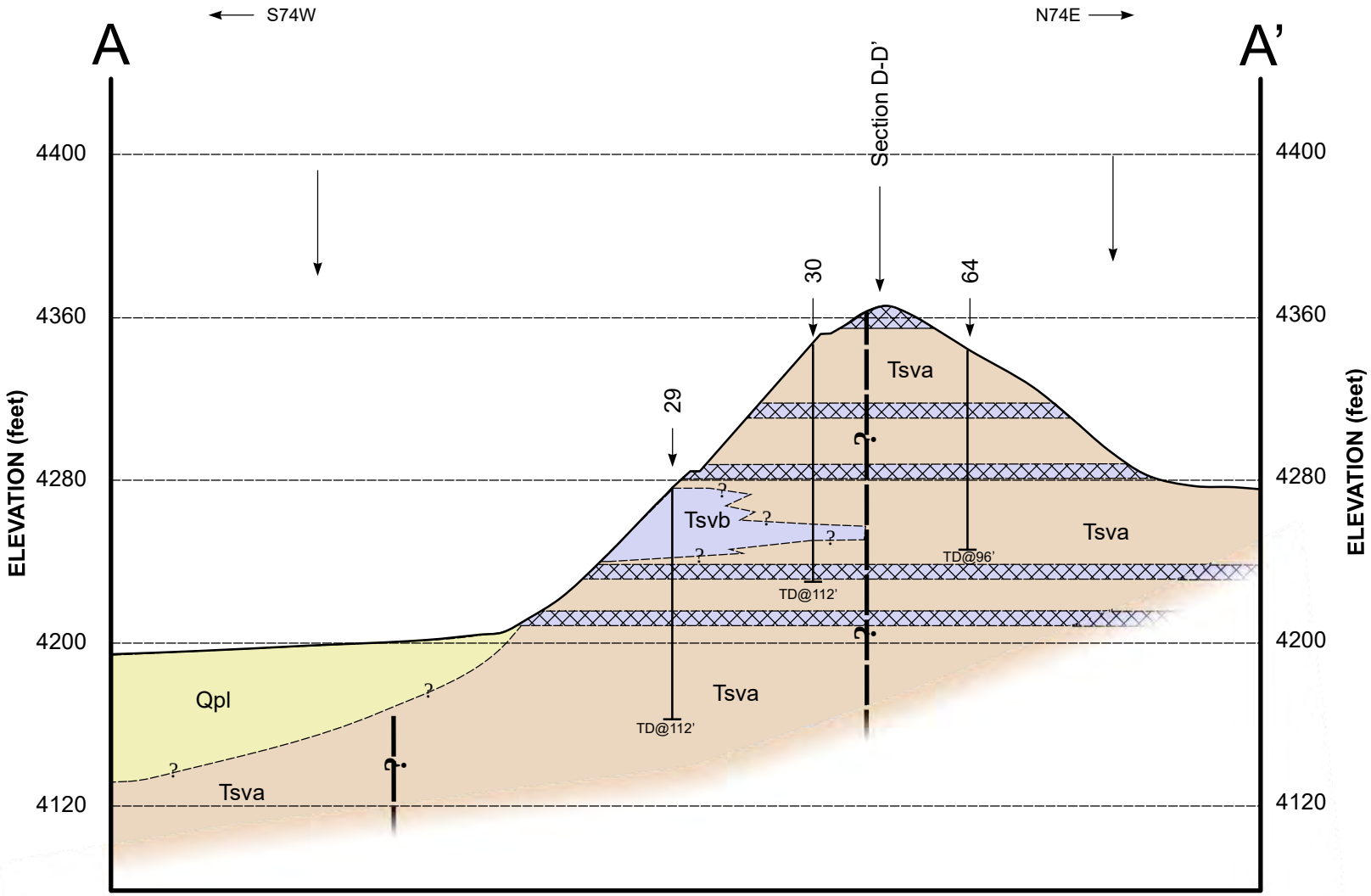
AIR-PERCUSSION EXPLORATIONS

Ward Lake Quarry Expansion
Preliminary Geotechnical Study
Hat Creek Construction Company
Lassen County, California

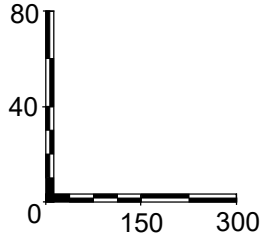
Plate No.
4

BAJADA Geosciences, Inc.

Project no.
2001.0107



Scale:
Horizontal:1"=300'
Vertical: 1"=80'
Vertical Exaggeration 3.75x



See Plate 5.4 for Legend

See Plate 3 for cross section location

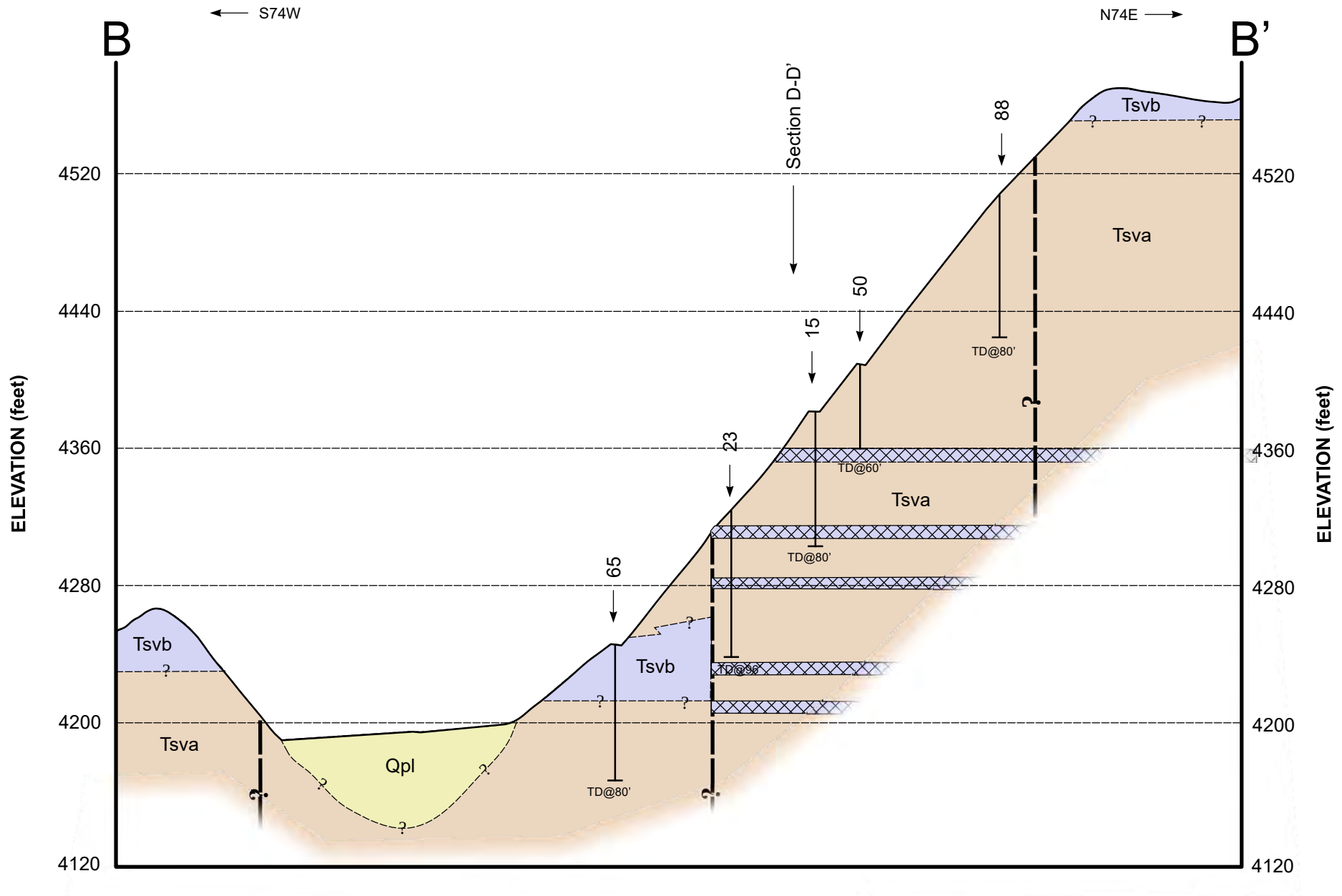
GEOTECHNICAL SECTION A-A'

Ward Lake Quarry Expansion
Preliminary Geotechnical Study
Hat Creek Construction Company
Lassen County, California

Plate No.
5.1

BAJADA Geosciences, Inc.

Project no.
2001.0107



Scale:
Horizontal:1"=300'
Vertical: 1"=80'
Vertical Exaggeration 3.75x

80
40
0
150
300

See Plate 5.4 for Legend

See Plate 3 for cross section location

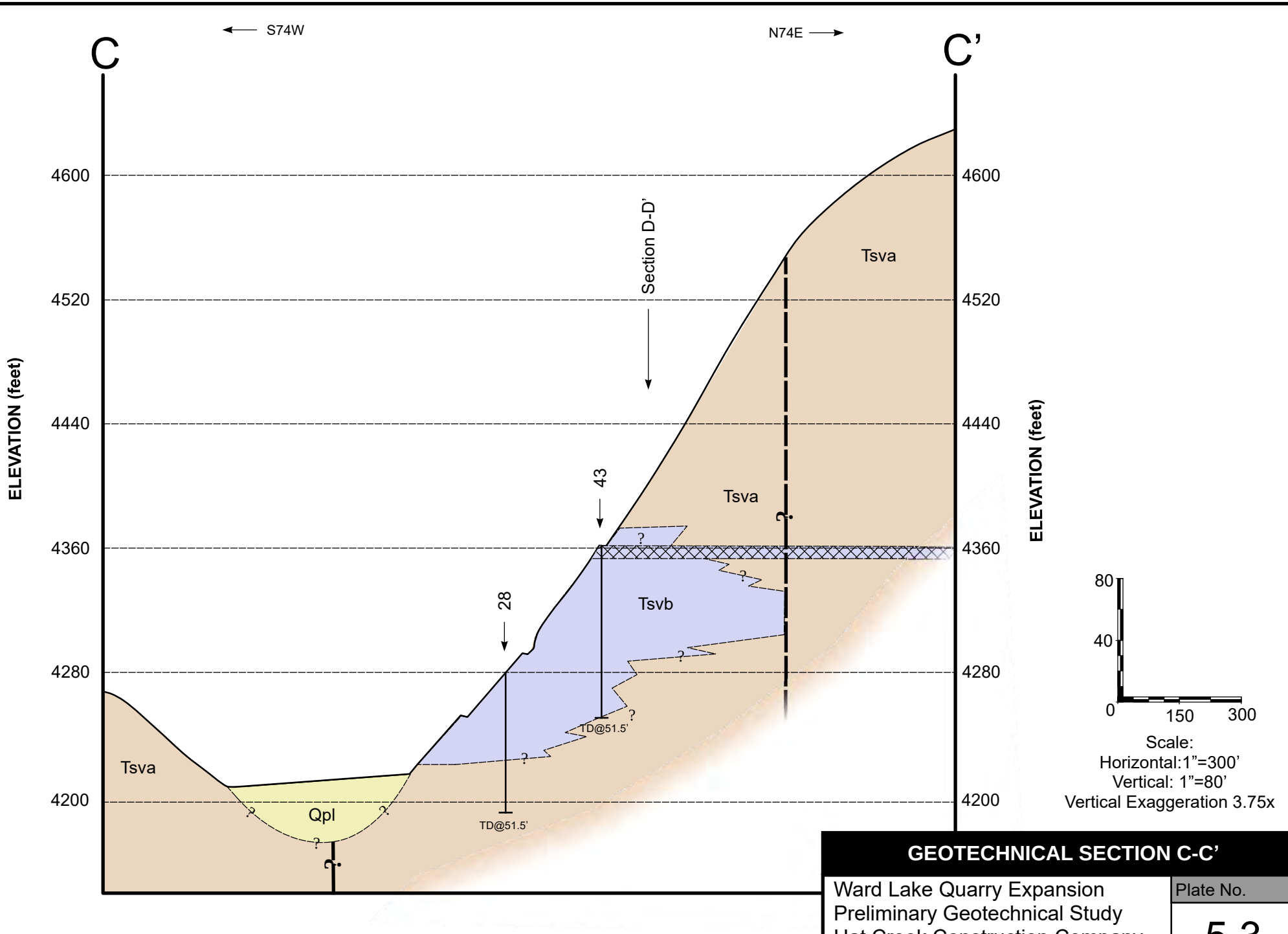
GEOTECHNICAL SECTION B-B'

Ward Lake Quarry Expansion
Preliminary Geotechnical Study
Hat Creek Construction Company
Lassen County, California

Plate No.
5.2

BAJADA Geosciences, Inc.

Project no.
2001.0107



See Plate 5.4 for Legend

See Plate 3 for cross section location

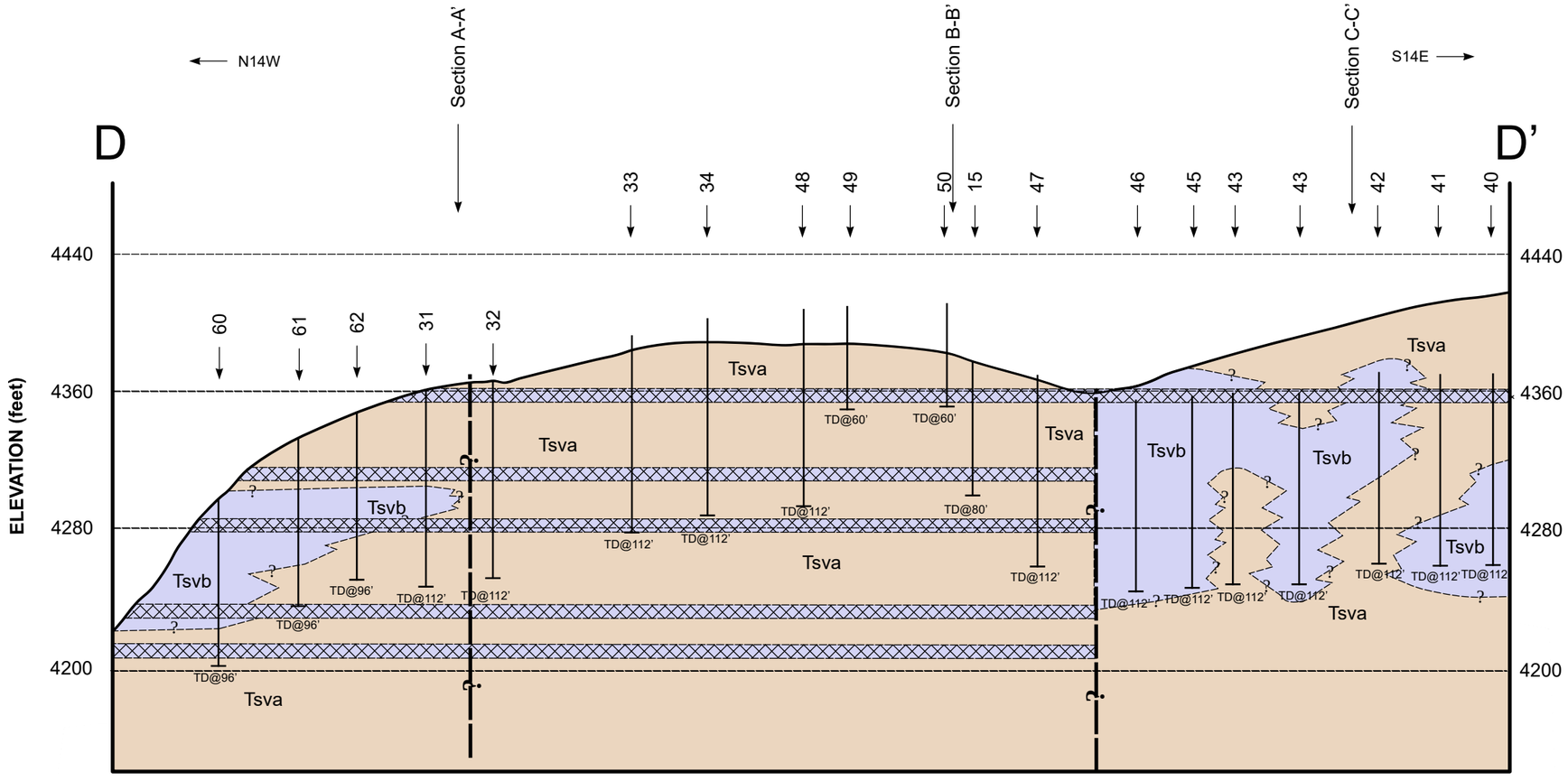
GEOTECHNICAL SECTION C-C'

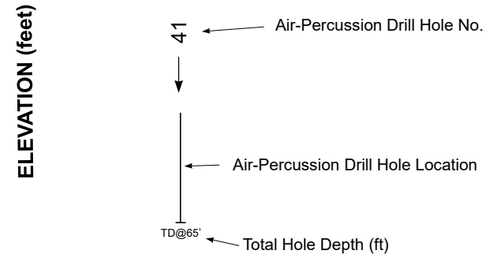
Ward Lake Quarry Expansion
Preliminary Geotechnical Study
Hat Creek Construction Company
Lassen County, California

Plate No. 5.3

BAJADA Geosciences, Inc.

Project no. 2001.0107





Mapped Based on HCC Air-Track Drill Hole Data

- Qpl — Terrace Deposits
- Tsvb — Basalt
- Tsva — Andesite & Rhyolite

Stratification Line of Resistant Layer Visible on Aerial Photographs

Geologic Contact, dashed and queried where uncertain

Fault, dashed and queried where uncertain

80
40
0
150
300

Scale:
Horizontal:1”=300’
Vertical: 1”=80’
Vertical Exaggeration 3.75x

See Plate 3 for cross section location

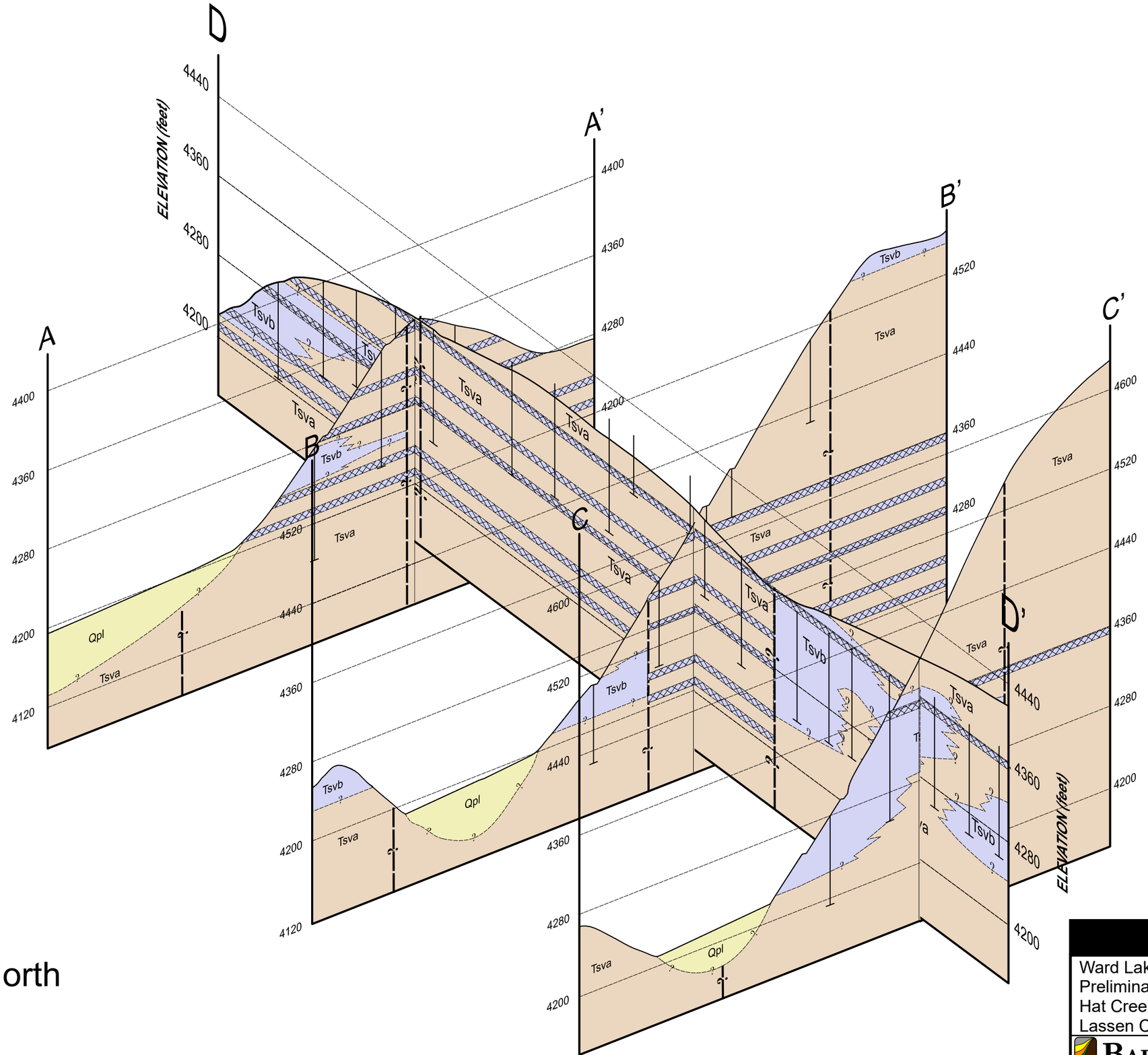
GEOTECHNICAL SECTION D-D’

Ward Lake Quarry Expansion
Preliminary Geotechnical Study
Hat Creek Construction Company
Lassen County, California

Plate No. 5.4

BAJADA Geosciences, Inc.

Project no. 2001.0107



Looking North

Scale undetermined

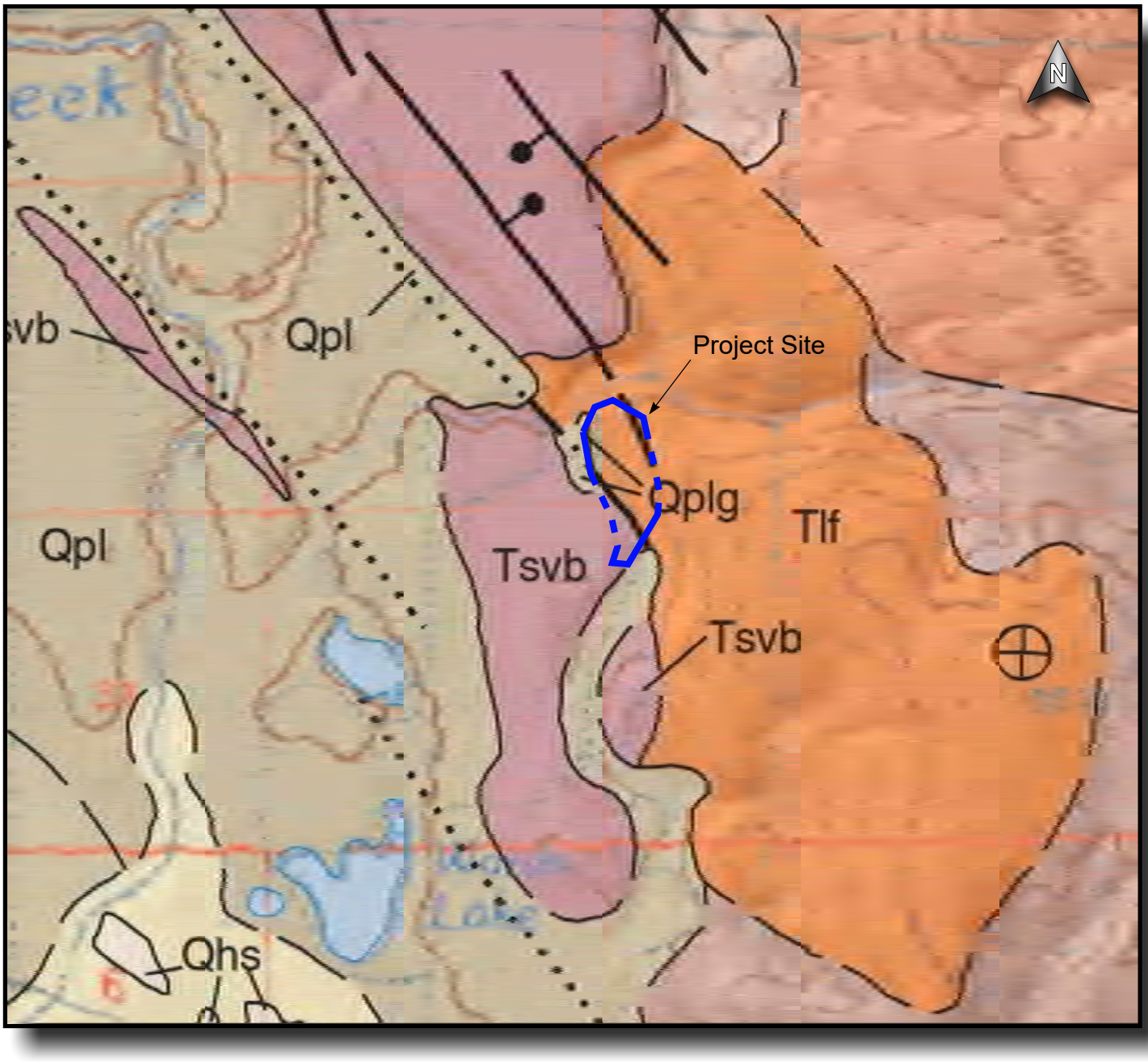
FENCE DIAGRAM

Ward Lake Quarry Expansion
Preliminary Geotechnical Study
Hat Creek Construction Company
Lassen County, California

Plate No. 6

BAJADA Geosciences, Inc.

Project no. 2001.0107



Qpl	Near-shore deposits of Lake Lahontan
Tsvb	Basalt of Secret Valley
Tlf	Andesite flows and pyroclastics of Litchfield
Tsma	Two-pyroxene andesite flows of Shaffer Mountain

Base map from Gross et al. (2013). Scale undetermined.

REGIONAL GEOLOGIC MAP

Ward Lake Quarry Expansion
Preliminary Geotechnical Study
Hat Creek Construction Company
Lassen County, California

Plate No. 7

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Project no. 2001.0107



Active	
Historic Displacement (last 200 years)	Holocene Displacement (last 11,700 years)
Potentially Active	**Inactive**
Late Quaternary Displacement (last 700,000 years)	Quaternary Fault (last 1.6 million years)

Map from USGS Interactive Fault Map

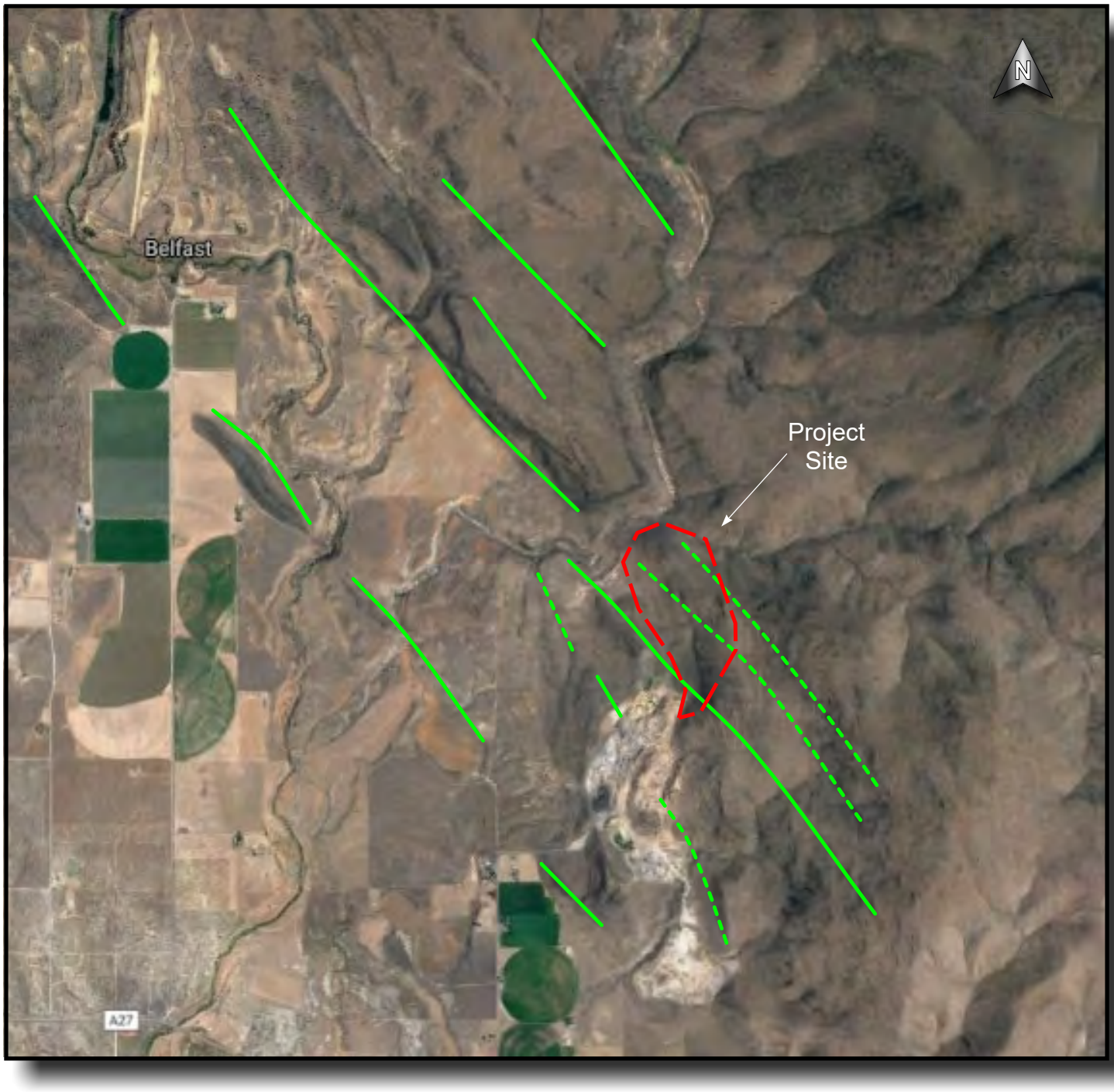
REGIONAL FAULT MAP

Ward Lake Quarry Expansion
Preliminary Geotechnical Study
Hat Creek Construction Company
Lassen County, California

Plate No. 8

BAJADA Geosciences, Inc.

Project no. 2001.0107



Relatively distinct lineation probably indicative of a fault

Relatively distinct lineation possibly indicative of a fault

Base maps from Mapquest. Scale undetermined.

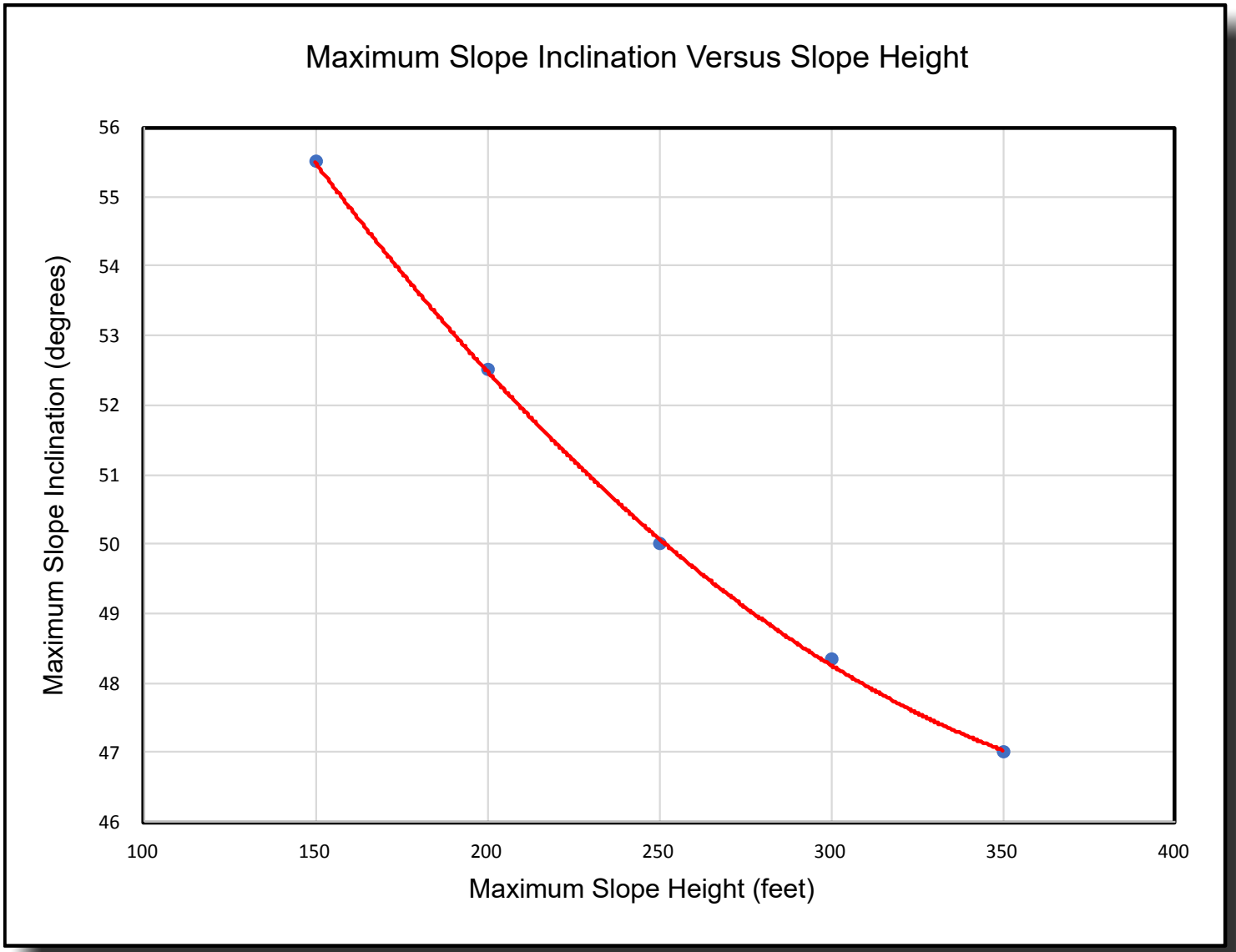
INTERPRETED AREA FAULT MAP

Ward Lake Quarry Expansion
Preliminary Geotechnical Study
Hat Creek Construction Company
Lassen County, California

Plate No. 9

BAJADA Geosciences, Inc.

Project no. 2001.0107



Note: curve satisfies both static (FOS ≥ 1.25) and pseudostatic (FOS ≥ 1.01) conditions.

SLOPE INCLINATION VERSUS HEIGHT

Ward Lake Quarry Expansion
Preliminary Geotechnical Study
Hat Creek Construction Company
Lassen County, California

Plate No. 10

BAJADA Geosciences, Inc.

Project no. 2001.0107

APPENDIX A

Laboratory Testing

APPENDIX A
LABORATORY TESTING

Laboratory Analyses

Laboratory tests were performed on selected bulk soil samples to estimate engineering characteristics of the various earth materials encountered. Testing was performed under procedures described in one of the following references:

- ASTM Standards for Soil Testing, latest revision;
- Lambe, T. William, Soil Testing for Engineers, Wiley, New York, 1951;
- Laboratory Soils Testing, U.S. Army, Office of the Chief of Engineers, Engineering Manual No. 1110-2-1906, November 30, 1970.

Uniaxial Unconfined Compression Test

Uniaxial unconfined compression tests were performed on five rock samples obtained during field evaluations in accordance with standard test method ASTM D7012. The results of the tests are attached as the plate labeled Rock Core Compressive Strength Data.

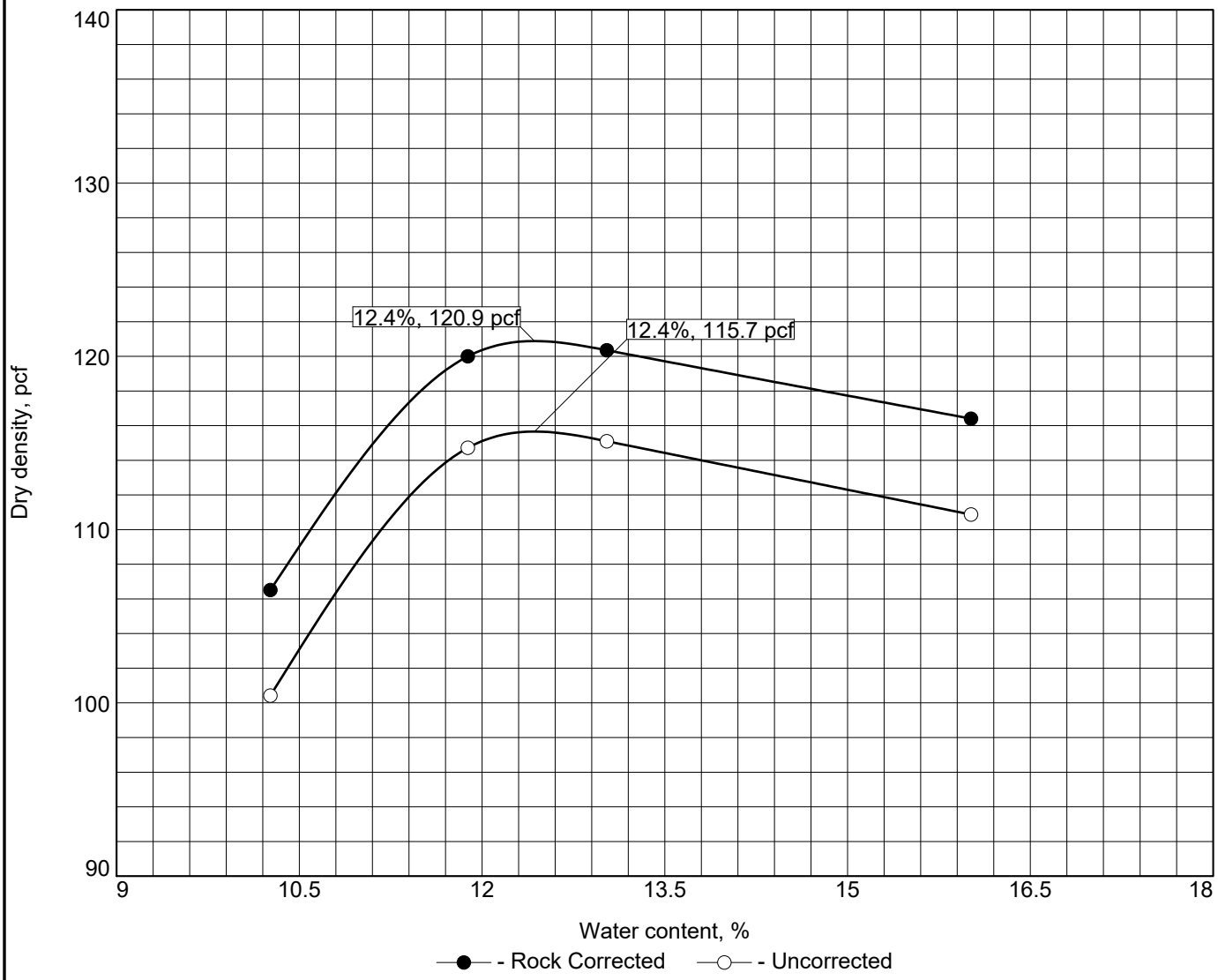
Direct Shear Tests

Direct shear tests were performed on one selected soil samples in accordance with standard test method ASTM D3080. The sample was remolded to 90-percent relative compaction at near optimum moisture content and tested. Results of that test is presented on the attached plate labeled *Consolidated Drained Direct Shear*.

Maximum Density & Optimum Moisture Content

Maximum density and optimum moisture content were evaluated on one selected bulk soil sample in accordance with standard test method ASTM D1557. Results of those tests are presented on the attached plate labeled *Compaction Test Report*.

COMPACTION TEST REPORT



Test specification: ASTM D1557-12 Method C (with uncorrected) Modified
ASTM D4718-15 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
---	CL			2.60			15	

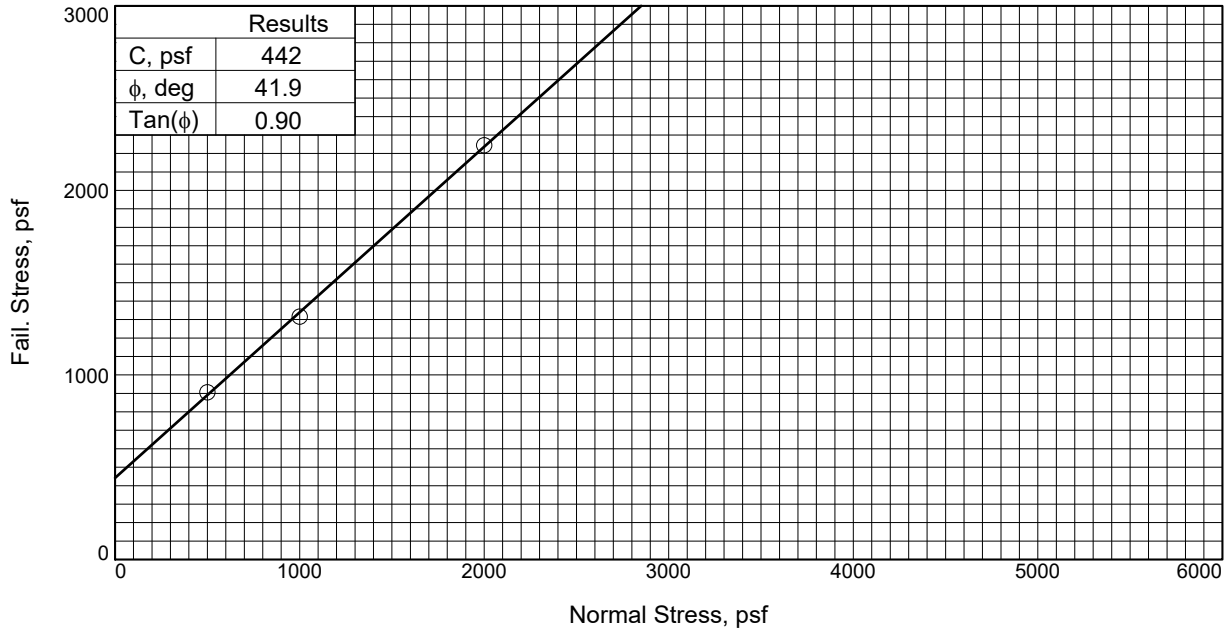
ROCK CORRECTED TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 120.9 pcf Optimum moisture = 12.4 %	Light Red Sandy Clay with Gravel (visual)

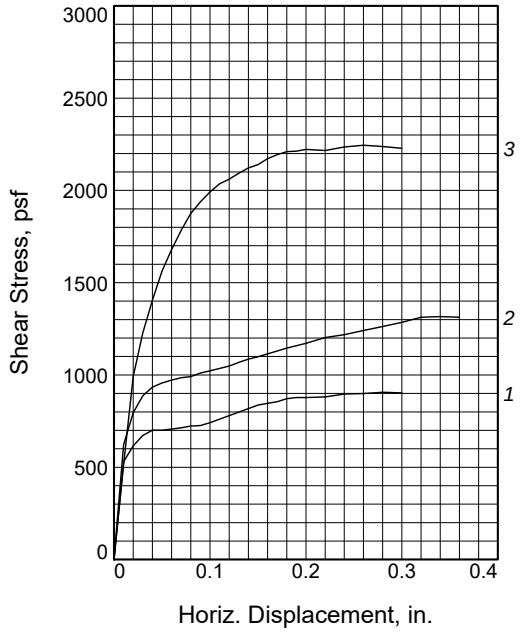
Project No. 3237 **Client:** BAJADA Geosciences, Inc.
Project: Ward Lake Quarry Expansion #2001.0107
Lassen County, California
○ **Location:** B1 **Sample Number:** 1

Remarks:
Curve #1
03/20/2020

Figure 0300-001

Tested By: Jack Bianchin





Sample No.		1	2	3
Initial	Water Content, %	12.4	12.4	12.4
	Dry Density, pcf	104.1	104.1	104.1
	Saturation, %	56.0	56.0	56.0
	Void Ratio	0.5892	0.5892	0.5892
	Diameter, in.	2.41	2.41	2.41
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	24.7	25.7	26.0
	Dry Density, pcf	103.2	98.5	92.9
	Saturation, %	108.6	100.1	88.5
	Void Ratio	0.6034	0.6798	0.7799
	Diameter, in.	2.41	2.41	2.41
	Height, in.	1.01	1.06	1.12
Normal Stress, psf		500	1000	2000
Fail. Stress, psf		906	1316	2244
Displacement, in.		0.28	0.34	0.26
Ult. Stress, psf				
Displacement, in.				
Strain rate, in./min.		0.002	0.002	0.002

Sample Type: remold
Description: Light Red Sandy Clay with Gravel (visual)

Specific Gravity= 2.65
Remarks: Material tested in accordance with ASTM D3080.
Sample remolded to 90% of maximum uncorrected at optimum moisture.
Figure 0300-002

Client: BAJADA Geosciences, Inc.

Project: Ward Lake Quarry Expansion #2001.0107
Lassen County, California
Location: B1
Sample Number: 1 **Depth:** ---
Proj. No.: 3237 **Date Sampled:** 03/11/20

Tested By: Cindy Gooden

Materials Testing, Inc.

8798 Airport Road
Redding, California 96002
(530) 222-1116, fax 222-1611

865 Cotting Lane, Suite A
Vacaville, California 95688
(707) 447-4025, fax 447-4143

Client:	BAJADA Geosciences, Inc.	Date:	03/26/2020
	28301 Inwood Road	Client No:	3237-041
	Shingletown, CA 96088	Report No:	0100-003
Project:	Ward Lake Quarry Expansion #2001.0107	Page:	1 of 2
Location:	Lassen County, California		

ROCK CORE COMPRESSIVE STRENGTH DATA
(ASTM D7012 Method C)

Identification	1-A	2-A	2-B
Material	Basalt	Basalt	Basalt
Date Cut	03/19/20	03/20/20	03/20/20
Date Trimmed	03/19/20	03/23/20	03/23/20
Date Tested	03/24/20	03/24/20	03/24/20
Age in Days	5	5	5
Average Diameter, in	2.0	2.0	2.0
Average X-Section Area, in^2	3.14	3.14	3.14
As Received Length, in	5.5	9.3	9.8
L/D Factor	2.0	2.0	2.0
Maximum Load, lbs.	19,400	18,160	17,930
Compressive Strength, psi	**6,180**	**5,780**	**5,710**
Fracture Pattern, Type	Columnar	Columnar	Columnar

Notes: Specimens prepared in accordance with ASTM D4543.

Tested by Allante Blocker.

The samples were tested according to the referenced standard test procedures and relate only to the items inspected or tested. Results are not transferable and shall not be reproduced, except in full, without written permission from MTI.

Materials Testing, Inc.

8798 Airport Road
Redding, California 96002
(530) 222-1116, fax 222-1611

865 Cotting Lane, Suite A
Vacaville, California 95688
(707) 447-4025, fax 447-4143

Client:	BAJADA Geosciences, Inc.	Revised:	03/26/2020
	28301 Inwood Road	Client No:	3237-041
	Shingletown, CA 96088	Report No:	0100-003
Project:	Ward Lake Quarry Expansion #2001.0107	Page:	2 of 2
Location:	Lassen County, California		

ROCK CORE COMPRESSIVE STRENGTH DATA
(ASTM D7012 Method C)

Identification	3-A	3-B	
Material	Andesite	Andesite	
Date Cut	03/20/20	03/20/20	
Date Trimmed	03/23/20	03/24/20	
Date Tested	03/24/20		
Age in Days	5	4	
Average Diameter, in	2.0	2.0	
Average X-Section Area, in^2	3.14	3.14	
As Received Length, in	7.5	4.3	
L/D Factor	1.5*	1.0*	
Maximum Load, lbs.	32,210	54,020	
Compressive Strength, psi	**10,260**	**17,200**	
Fracture Pattern, Type	Columnar	Shear	

Notes: Specimens prepared in accordance with ASTM D4543.
*Specimens do not meet minimum L/D requirements

Tested by Allante Blocker.

The samples were tested according to the referenced standard test procedures and relate only to the items inspected or tested. Results are not transferable and shall not be reproduced, except in full, without written permission from MTI.

APPENDIX B

Slope Stability Analyses



APPENDIX B
SLOPE STABILITY ANALYSES

METHODS OF ANALYSIS

Computer-aided slope stability analyses were performed using the computer program SLIDE 2018. SLIDE 2018 was developed by Rocscience, Inc. (2020) and offers a wide variety of limit-equilibrium procedures. Those include the Modified Bishop, the Simplified and Corrected Janbu, Corps of Engineers #1 and #2, GLE/Morgenstern-Price, Lowe-Karafiath, and the Spencer methods. Those limit-equilibrium procedures are all "method of slices", but they differ from the Ordinary Method of Slices (Fellenius method – also included within SLIDE 2018) in:

1. The simplifying assumptions that have been made achieve static determinacy; and
2. The particular conditions of equilibrium that are satisfied.

SLIDE 2018 allows the use of any or all of the methods listed above because they better satisfy limit equilibrium conditions. A summary of the equilibrium conditions satisfied by each of these procedures and the type of failure surface for which each is useful is presented in the following table.

EQUILIBRIUM CONDITIONS SATISFIED BY PROCEDURES

Procedure of Analysis	Overall			Individual Slices			
	Moment	Vertical Force	Horizontal Force	Moment	Vertical Force	Horizontal Force	Slip Surface
Ordinary Method of Slices (Fellenius)	Yes	No	No	No	No	No	Circular Arc
Modified Bishop	Yes	(Yes)[1]	No	No	Yes	No	General Shape[2]
Simplified Janbu	No	(Yes)[1]	(Yes)[1]	No	Yes	Yes	General Shape
Spencer	Yes	(Yes)[1]	(Yes)[1]	Yes	Yes	Yes	General Shape

Per Wright (1969); (Yes)[1] - Parentheses indicate that this condition of equilibrium is implicitly satisfied as a result of the direct consideration of other equilibrium conditions; [2] – The original presentation of this procedure was for circular surfaces only.

Ordinary Method of Slices. From the above table, it is apparent that for circular failures, the Ordinary Method of Slices (Fellenius method) satisfies overall moment equilibrium, but does not satisfy individual slice moment equilibrium, or horizontal or vertical force equilibrium. Sherard et al. (1963), have suggested that the Fellenius method of slices might also be applied to non-circular surfaces; however, for noncircular surfaces that method would not, in general, satisfy any of the equilibrium conditions (Wright, 1969).

The Ordinary Method of Slices has been widely used by practicing engineers for many years because

of its simplicity, but it has long been known to grossly underestimate (and in some cases overestimate) the factor of safety. Lambe and Whitman (1969) report that in some cases the Ordinary Method of Slices may underestimate the factor of safety by about 10 to 15 percent, but in other problems (particularly for noncircular slip surfaces) the error may be as much as 60 percent. With the development of high-speed computers, this approximate method has largely been replaced by more accurate methods that better satisfy equilibrium conditions. The Ordinary Method of Slices remains an acceptable method for performing hand-calculated estimates of slope stability for conditions where accurate solutions are not required.

Modified Bishop Method. The Modified Bishop Method assumes that the normal and weight forces act through a point on the center of the base of each slice and that there are no interslice shear forces. The resulting equation can be demonstrated to satisfy vertical force equilibrium as well as overall moment equilibrium for circular shear surfaces. The Modified Bishop Method is relatively simple to perform on a calculator, although the necessary iterations make it more suitable for use on a computer system. In spite of the necessary iterations, the Modified Bishop Method typically converges rapidly, therefore, it requires little computer time to perform.

Fredlund and Krahn (1977) have shown that the Modified Bishop Method typically estimates factors of safety that are typically within a few percent of those obtained from more rigorous methods that satisfy complete moment and force equilibrium.

Simplified Janbu Method. Although the simplifying assumption made in the Simplified Janbu Method is the same as that made for the Modified Bishop Method, the conditions of equilibrium that are satisfied are not the same. The Simplified Janbu Method satisfies vertical and horizontal force equilibrium for individual slices and for the overall shear surface while assuming that there are no interslice shear forces. An advantage of the Simplified Janbu Method is its suitability for the analysis of noncircular failure surfaces. While retaining a rapid computational speed, the Simplified Janbu Method yields factors of safety that are closer to those obtained by more rigorous methods (such as the Spencer Method) than those obtained from the Ordinary Method of Slices.

Spencer Method. The Spencer Method assumes that the normal forces are located at the center of the base of each slice and that all side forces are parallel. The result is an equation that satisfies complete moment and force equilibrium. Although the Spencer Method was directly applicable to a circular shear surface, the procedure may be readily extended to slip surfaces of a general shape (Wright, 1969).

Because of the complexity of the procedure, the Spencer Method is suitable only for computer-aided slope stability analyses. Although the Spencer Method typically yields a relatively accurate estimate of the factor of safety for a slope, its solution requires several iterations. Consequently, considerable time is needed to perform the analyses on a personal computer. Therefore, the Spencer Method is

commonly used to refine the factor of safety for a critical failure plane that has been located by a search, which has used a more time-efficient method of analysis such as the Modified Bishop Method or Simplified Janbu procedure.

ANALYSES PERFORMED

Introduction. Analyses were performed to calculate the stability of the earth materials exposed in the slope. It is necessary to know the: 1) surface and subsurface geometry, 2) soil properties (unit weight and shear strength of the soil materials present), and 3) phreatic water level (groundwater) conditions.

Surface and Subsurface Geometry. Data for the surface geometry of the project area was derived from information presented by VESTRA (2020). Subsurface profiles were derived from air-percussion drilling performed by HCC at the site and interpretation of aerial photographs.

Engineering Properties. A summary and discussion of soil and rock mass strength values is presented in the text of the report.

Piezometric Water Level. The elevations of groundwater beneath the site are discussed in the text of the report.

Results of Analyses. The following table presents the conditions evaluated and results of the stability evaluations:

RESULTS OF STABILITY ANALYSES		
Slope Condition Evaluated	**Factor of Safety**	**File Name**
150-foot tall slope inclined at 55 degrees under static and dry conditions	1.26	150',dry,static,55deg
150-foot tall slope inclined at 55 degrees under pseudostatic and dry conditions	1.02	150',dry,PS,55deg
200-foot tall slope inclined at 50 degrees under static and dry conditions	1.31	200',dry,static,50deg
200-foot tall slope inclined at 50 degrees under pseudostatic and dry conditions	1.05	200',dry,PS,50deg
250-foot tall slope inclined at 50 degrees under static and dry conditions	1.25	250',dry,static,50deg
250-foot tall slope inclined at 50 degrees under pseudostatic and dry conditions	1.00	250',dry,PS,50deg
300-foot tall slope inclined at 45 degrees under static and dry conditions	1.36	300',dry,static,45deg
300-foot tall slope inclined at 45 degrees under pseudostatic and dry conditions	1.07	300',dry,PS,45deg
350-foot tall slope inclined at 45 degrees under static and dry conditions	1.31	350',dry,static,45deg
350-foot tall slope inclined at 45 degrees under pseudostatic and dry conditions	1.03	350',dry,PS,45deg

REFERENCES

Fellenius, W. (1936), Calculation of the Stability of Earth Dams, Transactions of the Second Congress on Large Dams, vol. 4, pp. 445-463.

Frelund, D.G., and Krahn, J. (1977), Comparison of Slope Stability Methods of Analysis, Canadian Geotechnical Journal, vol. 14, pp. 429-439.

Janbu, N., Bjerrum, L., and Kjaernsli, B. (1956), Veiledning ved losning av fundamenterings-oppgaver-2. Stabilitetsberegning for fyllinger, skjaeringer og naturlige skraninger. (Soil Mechanics Applies to Some Engineering Problems – Chapter 2. Stability Calculations for Embankments, Cuts, and Natural Slopes), Publication 16, Norwegian Geotechnical Institute, Oslo, pp. 17-26.

Lambe, T.W., and Whitman, R.V., (1969), Soil Mechanics, John Wiley & Sons, New York, 553 pp.

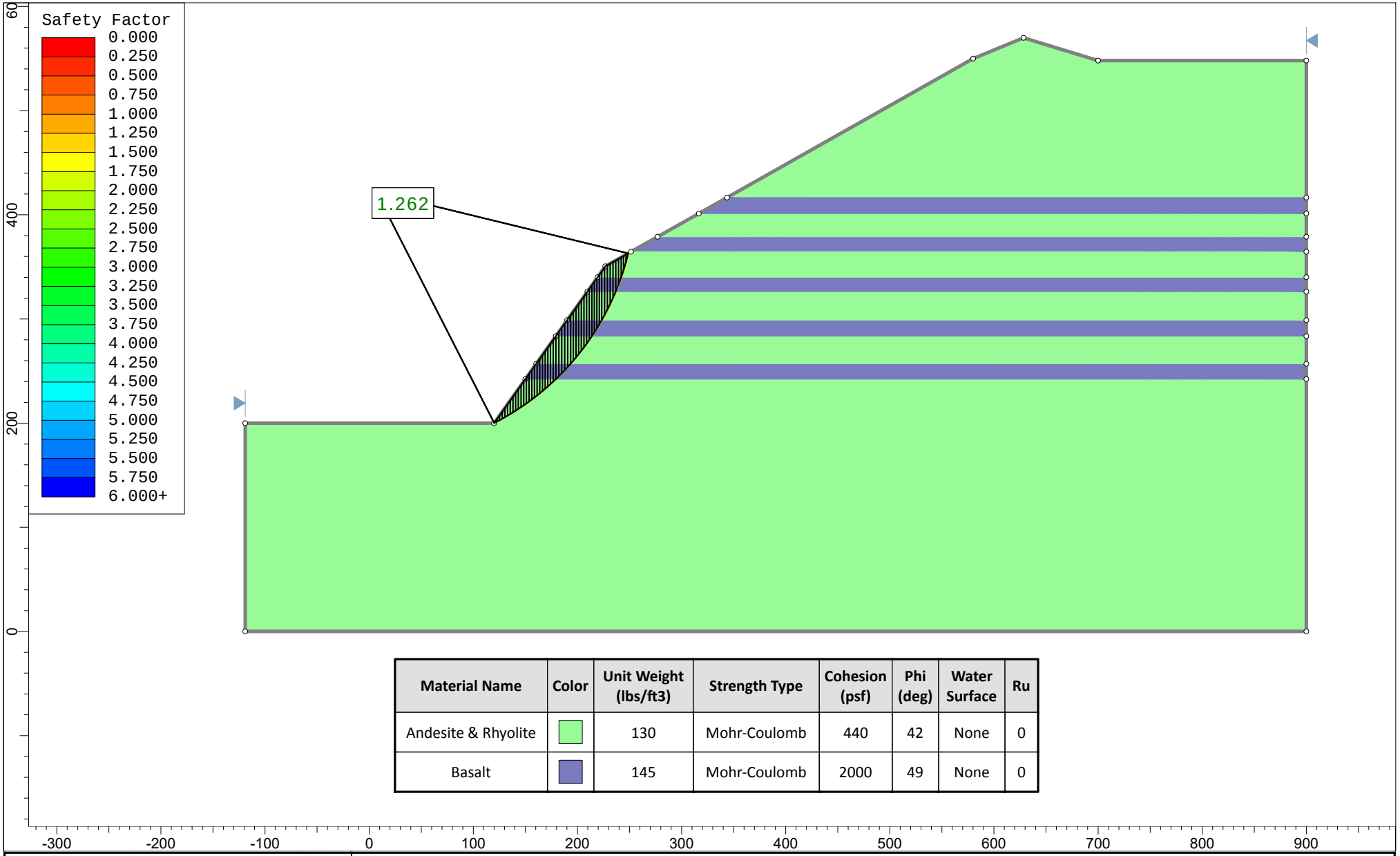
Rocscience (2020), SLIDE 2019, 2D Limit Equilibrium Slope Stability Analysis, Build 8.031, January 29.

Sherard, J.L., Woodward, R.J., Gizienski, S.F., and Clevenger, W.A. (1963), Stability Analyses, Earth and Earth-Rock Dams, 1st Edition, John Wiley & Sons, New York, 345 pp.

Spencer, E. (1967), A Method of Analyses of the Stability of Embankments Assuming Parallel Inter-Slice Forces, Geotechnique, vol. 17, no. 1, pp. 11-26.

VESTRA Resources, Inc. (2020), Hat Creek Construction, Ward Lake Pit, Aerial Topography, dated March 4, Sheet 1 of 1.

Wright, S. (1969), A Study of Slope Stability and the Undrained Shear Strength of Clay Shales, Ph.D. Thesis, University of California, Berkley.



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Andesite & Rhyolite		130	Mohr-Coulomb	440	42	None	0
Basalt		145	Mohr-Coulomb	2000	49	None	0

BAJADA Geosciences, Inc.

SLIDEINTERPRET 8.032

Project	Ward Lake Quarry Expansion			
Analysis Description	150' Slope, dry, static, 55 degree gross slope inclination			
Drawn By	J.Bianchin	Scale	1:1528	Company: Bajada Geosciences, Inc.
Date	4/3/2020, 2:25:57 PM			File Name: 150',dry,ststic,55deg.slim

Slide Analysis Information

Ward Lake Quarry Expansion

Project Summary

Slide Modeler Version:	8.032
Compute Time:	00h:00m:04.239s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical

Analysis Methods Used
Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20

Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Property	Andesite & Rhyolite	Basalt
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	145
Cohesion [psf]	440	2000
Friction Angle [°]	42	49
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: spencer

FS	1.261800
Center:	6.882, 421.822
Radius:	248.957
Left Slip Surface Endpoint:	120.054, 200.076
Right Slip Surface Endpoint:	248.789, 362.997
Resisting Moment:	1.32112e+08 lb-ft
Driving Moment:	1.04701e+08 lb-ft
Resisting Horizontal Force:	336914 lb
Driving Horizontal Force:	267010 lb
Total Slice Area:	4164.8 ft2
Surface Horizontal Width:	128.735 ft
Surface Average Height:	32.3517 ft

Valid/Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	9484
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.2618

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base	Base Material	Base Cohesion [psf]	Base Friction Angle	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress	Pore Pressure [psf]	Effective Normal Stress	Base Vertical Stress	Effective Vertical Stress

			[degrees]			[degrees]			[psf]		[psf]	[psf]	[psf]
1	2.57465	384.809	27.3719	Andesite & Rhyolite	440	42	494.77	624.301	204.687	0	204.687	460.843	460.843
2	2.57465	1148.01	28.0412	Andesite & Rhyolite	440	42	660.517	833.44	436.961	0	436.961	788.773	788.773
3	2.57465	1898.24	28.7147	Andesite & Rhyolite	440	42	817.242	1031.2	656.591	0	656.591	1104.29	1104.29
4	2.57465	2635.26	29.3925	Andesite & Rhyolite	440	42	965.204	1217.89	863.939	0	863.939	1407.64	1407.64
5	2.57465	3358.8	30.0749	Andesite & Rhyolite	440	42	1104.65	1393.84	1059.35	0	1059.35	1699.04	1699.04
6	2.57465	4068.58	30.7621	Andesite & Rhyolite	440	42	1235.8	1559.33	1243.14	0	1243.14	1978.72	1978.72
7	2.57465	4764.32	31.4542	Andesite & Rhyolite	440	42	1358.88	1714.63	1415.62	0	1415.62	2246.85	2246.85
8	2.57465	5445.7	32.1514	Andesite & Rhyolite	440	42	1474.09	1860.01	1577.08	0	1577.08	2503.62	2503.62
9	2.57465	6112.39	32.854	Andesite & Rhyolite	440	42	1581.63	1995.7	1727.78	0	1727.78	2749.18	2749.18
10	2.57465	6764.04	33.5623	Andesite & Rhyolite	440	42	1681.68	2121.94	1867.98	0	1867.98	2983.69	2983.69
11	2.57465	7400.28	34.2763	Andesite & Rhyolite	440	42	1774.41	2238.95	1997.94	0	1997.94	3207.28	3207.28
12	2.57465	8032.01	34.9965	Andesite & Rhyolite	440	42	1862.09	2349.58	2120.8	0	2120.8	3424.48	3424.48
13	2.57465	8751.36	35.7231	Andesite & Rhyolite	440	42	1961.65	2475.21	2260.33	0	2260.33	3671.12	3671.12
14	2.57465	9479.21	36.4564	Andesite & Rhyolite	440	42	2058.05	2596.85	2395.43	0	2395.43	3915.89	3915.89
15	2.57465	10189.9	37.1967	Andesite & Rhyolite	440	42	2146.76	2708.78	2519.74	0	2519.74	4149.02	4149.02
16	2.57465	10875.4	37.9443	Andesite & Rhyolite	440	42	2226.59	2809.51	2631.61	0	2631.61	4367.73	4367.73
17	2.57465	11441.5	38.6997	Andesite & Rhyolite	440	42	2281.94	2879.35	2709.18	0	2709.18	4537.33	4537.33
18	2.57465	11957.4	39.463	Andesite & Rhyolite	440	42	2325.49	2934.3	2770.2	0	2770.2	4684.67	4684.67
19	2.57465	12453.8	40.2349	Andesite & Rhyolite	440	42	2362.76	2981.33	2822.43	0	2822.43	4821.59	4821.59
20	2.57465	12930.3	41.0156	Andesite & Rhyolite	440	42	2393.83	3020.54	2865.98	0	2865.98	4948.05	4948.05
21	2.57465	13386	41.8058	Andesite & Rhyolite	440	42	2418.79	3052.03	2900.95	0	2900.95	5064.04	5064.04
22	2.57465	13820.1	42.6057	Andesite & Rhyolite	440	42	2437.71	3075.9	2927.45	0	2927.45	5169.49	5169.49
23	2.57465	14232	43.4161	Andesite & Rhyolite	440	42	2450.64	3092.22	2945.59	0	2945.59	5264.36	5264.36
24	2.838	16168.3	44.2802	Basalt	2000	49	4134.73	5217.2	2796.66	0	2796.66	6828.78	6828.78
25	2.838	16658.5	45.1998	Basalt	2000	49	4121.14	5200.06	2781.78	0	2781.78	6931.77	6931.77
26	2.838	17110.6	46.1345	Basalt	2000	49	4097.88	5170.71	2756.25	0	2756.25	7019.72	7019.72
27	2.838	17519.8	47.0854	Basalt	2000	49	4064.62	5128.74	2719.77	0	2719.77	7091.59	7091.59
28	2.838	17775.7	48.0536	Basalt	2000	49	4005.56	5054.21	2654.99	0	2654.99	7112	7112
29	2.55083	16167.3	48.9895	Andesite & Rhyolite	440	42	2394.45	3021.32	2866.86	0	2866.86	5620.34	5620.34
30	2.55083	16372.2	49.8925	Andesite & Rhyolite	440	42	2363.77	2982.6	2823.84	0	2823.84	5630.15	5630.15
31	2.55083	16544.6	50.8127	Andesite & Rhyolite	440	42	2327.38	2936.69	2772.86	0	2772.86	5627.8	5627.8
32	2.55083	16682.7	51.7514	Andesite & Rhyolite	440	42	2285.26	2883.54	2713.82	0	2713.82	5612.8	5612.8
33	2.55083	16784.2	52.71	Andesite & Rhyolite	440	42	2237.38	2823.13	2646.75	0	2646.75	5584.8	5584.8
34	2.55083	16846.6	53.6902	Andesite & Rhyolite	440	42	2183.71	2755.41	2571.51	0	2571.51	5543.22	5543.22
35	2.55083	16901.3	54.6938	Andesite & Rhyolite	440	42	2127.9	2684.98	2493.31	0	2493.31	5497.96	5497.96

36	2.55083	17008.7	55.7229	Andesite & Rhyolite	440	42	2076.18	2619.72	2420.82	0	2420.82	5467	5467
37	2.37625	15839.8	56.7427	Basalt	2000	49	3336.5	4209.99	1921.11	0	1921.11	7008.7	7008.7
38	2.37625	15721.8	57.7538	Basalt	2000	49	3232.03	4078.17	1806.53	0	1806.53	6929.73	6929.73
39	2.37625	15520.5	58.7941	Basalt	2000	49	3117.21	3933.3	1680.59	0	1680.59	6826.52	6826.52
40	2.37625	15179.5	59.8665	Basalt	2000	49	2986.34	3768.17	1537.04	0	1537.04	6681.83	6681.83
41	2.68205	16735.8	61.0488	Andesite & Rhyolite	440	42	1659.32	2093.73	1836.65	0	1836.65	4836.16	4836.16
42	2.68205	16087.1	62.3515	Andesite & Rhyolite	440	42	1535.37	1937.33	1662.96	0	1662.96	4593.8	4593.8
43	2.68205	14798.1	63.7135	Andesite & Rhyolite	440	42	1366.55	1724.31	1426.38	0	1426.38	4193.02	4193.02
44	2.68205	13370.1	65.1447	Andesite & Rhyolite	440	42	1196.38	1509.59	1187.9	0	1187.9	3770.55	3770.55
45	2.68205	11805.3	66.6579	Andesite & Rhyolite	440	42	1027.42	1296.4	951.125	0	951.125	3331.95	3331.95
46	2.62094	9739.19	68.2508	Basalt	2000	49	1808.56	2282.05	245.18	0	245.18	4778.57	4778.57
47	2.62094	7630.83	69.9443	Basalt	2000	49	1585.44	2000.5	0.437103	0	0.437103	4343.24	4343.24
48	2.25481	4798.48	71.6479	Andesite & Rhyolite	440	42	537.271	677.929	264.247	0	264.247	1883.86	1883.86
49	2.25481	3068.37	73.3791	Andesite & Rhyolite	440	42	418.567	528.148	97.898	0	97.898	1500.09	1500.09
50	2.25481	1073.94	75.3095	Andesite & Rhyolite	440	42	267.435	337.45	-113.894	0	-113.894	906.195	906.195

Query 1 (spencer) - Safety Factor: 1.2618

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	2.57465	384.809	27.3719	Andesite & Rhyolite	440	42	494.77	624.301	204.687	0	204.687	460.843	460.843
2	2.57465	1148.01	28.0412	Andesite & Rhyolite	440	42	660.517	833.44	436.961	0	436.961	788.773	788.773
3	2.57465	1898.24	28.7147	Andesite & Rhyolite	440	42	817.242	1031.2	656.591	0	656.591	1104.29	1104.29
4	2.57465	2635.26	29.3925	Andesite & Rhyolite	440	42	965.204	1217.89	863.939	0	863.939	1407.64	1407.64
5	2.57465	3358.8	30.0749	Andesite & Rhyolite	440	42	1104.65	1393.84	1059.35	0	1059.35	1699.04	1699.04
6	2.57465	4068.58	30.7621	Andesite & Rhyolite	440	42	1235.8	1559.33	1243.14	0	1243.14	1978.72	1978.72
7	2.57465	4764.32	31.4542	Andesite & Rhyolite	440	42	1358.88	1714.63	1415.62	0	1415.62	2246.85	2246.85
8	2.57465	5445.7	32.1514	Andesite & Rhyolite	440	42	1474.09	1860.01	1577.08	0	1577.08	2503.62	2503.62
9	2.57465	6112.39	32.854	Andesite & Rhyolite	440	42	1581.63	1995.7	1727.78	0	1727.78	2749.18	2749.18
10	2.57465	6764.04	33.5623	Andesite & Rhyolite	440	42	1681.68	2121.94	1867.98	0	1867.98	2983.69	2983.69
11	2.57465	7400.28	34.2763	Andesite & Rhyolite	440	42	1774.41	2238.95	1997.94	0	1997.94	3207.28	3207.28
12	2.57465	8032.01	34.9965	Andesite & Rhyolite	440	42	1862.09	2349.58	2120.8	0	2120.8	3424.48	3424.48
13	2.57465	8751.36	35.7231	Andesite & Rhyolite	440	42	1961.65	2475.21	2260.33	0	2260.33	3671.12	3671.12
14	2.57465	9479.21	36.4564	Andesite & Rhyolite	440	42	2058.05	2596.85	2395.43	0	2395.43	3915.89	3915.89
15	2.57465	10189.9	37.1967	Andesite & Rhyolite	440	42	2146.76	2708.78	2519.74	0	2519.74	4149.02	4149.02
16	2.57465	10875.4	37.9443	Andesite & Rhyolite	440	42	2226.59	2809.51	2631.61	0	2631.61	4367.73	4367.73
17	2.57465	11441.5	38.6997	Andesite & Rhyolite	440	42	2281.94	2879.35	2709.18	0	2709.18	4537.33	4537.33
18	2.57465	11957.4	39.463	Andesite & Rhyolite	440	42	2325.49	2934.3	2770.2	0	2770.2	4684.67	4684.67

19	2.57465	12453.8	40.2349	Andesite & Rhyolite	440	42	2362.76	2981.33	2822.43	0	2822.43	4821.59	4821.59
20	2.57465	12930.3	41.0156	Andesite & Rhyolite	440	42	2393.83	3020.54	2865.98	0	2865.98	4948.05	4948.05
21	2.57465	13386	41.8058	Andesite & Rhyolite	440	42	2418.79	3052.03	2900.95	0	2900.95	5064.04	5064.04
22	2.57465	13820.1	42.6057	Andesite & Rhyolite	440	42	2437.71	3075.9	2927.45	0	2927.45	5169.49	5169.49
23	2.57465	14232	43.4161	Andesite & Rhyolite	440	42	2450.64	3092.22	2945.59	0	2945.59	5264.36	5264.36
24	2.838	16168.3	44.2802	Basalt	2000	49	4134.73	5217.2	2796.66	0	2796.66	6828.78	6828.78
25	2.838	16658.5	45.1998	Basalt	2000	49	4121.14	5200.06	2781.78	0	2781.78	6931.77	6931.77
26	2.838	17110.6	46.1345	Basalt	2000	49	4097.88	5170.71	2756.25	0	2756.25	7019.72	7019.72
27	2.838	17519.8	47.0854	Basalt	2000	49	4064.62	5128.74	2719.77	0	2719.77	7091.59	7091.59
28	2.838	17775.7	48.0536	Basalt	2000	49	4005.56	5054.21	2654.99	0	2654.99	7112	7112
29	2.55083	16167.3	48.9895	Andesite & Rhyolite	440	42	2394.45	3021.32	2866.86	0	2866.86	5620.34	5620.34
30	2.55083	16372.2	49.8925	Andesite & Rhyolite	440	42	2363.77	2982.6	2823.84	0	2823.84	5630.15	5630.15
31	2.55083	16544.6	50.8127	Andesite & Rhyolite	440	42	2327.38	2936.69	2772.86	0	2772.86	5627.8	5627.8
32	2.55083	16682.7	51.7514	Andesite & Rhyolite	440	42	2285.26	2883.54	2713.82	0	2713.82	5612.8	5612.8
33	2.55083	16784.2	52.71	Andesite & Rhyolite	440	42	2237.38	2823.13	2646.75	0	2646.75	5584.8	5584.8
34	2.55083	16846.6	53.6902	Andesite & Rhyolite	440	42	2183.71	2755.41	2571.51	0	2571.51	5543.22	5543.22
35	2.55083	16901.3	54.6938	Andesite & Rhyolite	440	42	2127.9	2684.98	2493.31	0	2493.31	5497.96	5497.96
36	2.55083	17008.7	55.7229	Andesite & Rhyolite	440	42	2076.18	2619.72	2420.82	0	2420.82	5467	5467
37	2.37625	15839.8	56.7427	Basalt	2000	49	3336.5	4209.99	1921.11	0	1921.11	7008.7	7008.7
38	2.37625	15721.8	57.7538	Basalt	2000	49	3232.03	4078.17	1806.53	0	1806.53	6929.73	6929.73
39	2.37625	15520.5	58.7941	Basalt	2000	49	3117.21	3933.3	1680.59	0	1680.59	6826.52	6826.52
40	2.37625	15179.5	59.8665	Basalt	2000	49	2986.34	3768.17	1537.04	0	1537.04	6681.83	6681.83
41	2.68205	16735.8	61.0488	Andesite & Rhyolite	440	42	1659.32	2093.73	1836.65	0	1836.65	4836.16	4836.16
42	2.68205	16087.1	62.3515	Andesite & Rhyolite	440	42	1535.37	1937.33	1662.96	0	1662.96	4593.8	4593.8
43	2.68205	14798.1	63.7135	Andesite & Rhyolite	440	42	1366.55	1724.31	1426.38	0	1426.38	4193.02	4193.02
44	2.68205	13370.1	65.1447	Andesite & Rhyolite	440	42	1196.38	1509.59	1187.9	0	1187.9	3770.55	3770.55
45	2.68205	11805.3	66.6579	Andesite & Rhyolite	440	42	1027.42	1296.4	951.125	0	951.125	3331.95	3331.95
46	2.62094	9739.19	68.2508	Basalt	2000	49	1808.56	2282.05	245.18	0	245.18	4778.57	4778.57
47	2.62094	7630.83	69.9443	Basalt	2000	49	1585.44	2000.5	0.437103	0	0.437103	4343.24	4343.24
48	2.25481	4798.48	71.6479	Andesite & Rhyolite	440	42	537.271	677.929	264.247	0	264.247	1883.86	1883.86
49	2.25481	3068.37	73.3791	Andesite & Rhyolite	440	42	418.567	528.148	97.898	0	97.898	1500.09	1500.09
50	2.25481	1073.94	75.3095	Andesite & Rhyolite	440	42	267.435	337.45	-113.894	0	-113.894	906.195	906.195

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.2618

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	120.054	200.076	0	0	0
2	122.628	201.408	1003.28	802.628	38.6599
3	125.203	202.78	2107.69	1686.15	38.6598

4	127.777	204.19	3289.47	2631.57	38.6597
5	130.352	205.641	4525.98	3620.79	38.6599
6	132.927	207.132	5795.67	4636.53	38.6598
7	135.501	208.664	7077.97	5662.38	38.6598
8	138.076	210.239	8353.35	6682.68	38.6598
9	140.651	211.857	9603.19	7682.55	38.6598
10	143.225	213.52	10809.8	8647.86	38.6599
11	145.8	215.228	11956.5	9565.17	38.6597
12	148.375	216.983	13027.2	10421.8	38.6599
13	150.949	218.785	14007.1	11205.7	38.6599
14	153.524	220.637	14881.3	11905	38.6597
15	156.099	222.539	15633.1	12506.5	38.6599
16	158.673	224.493	16246.5	12997.2	38.6598
17	161.248	226.501	16706.4	13365.1	38.6598
18	163.823	228.563	17003.9	13603.1	38.6598
19	166.397	230.683	17130.2	13704.2	38.6599
20	168.972	232.861	17075.8	13660.7	38.6599
21	171.546	235.101	16832.2	13465.7	38.6597
22	174.121	237.403	16391.5	13113.2	38.6598
23	176.696	239.771	15746.7	12597.3	38.6597
24	179.27	242.207	14891.7	11913.4	38.6599
25	182.108	244.975	18907	15125.6	38.6598
26	184.946	247.833	22673.7	18138.9	38.6597
27	187.784	250.785	26185.8	20948.7	38.6599
28	190.622	253.838	29439.7	23551.7	38.6597
29	193.46	256.996	32443.6	25954.9	38.6598
30	196.011	259.929	30153	24122.4	38.6598
31	198.562	262.957	27641.5	22113.2	38.6598
32	201.113	266.086	24912.5	19930	38.6598
33	203.664	269.322	21970.6	17576.5	38.6598
34	206.215	272.672	18822.3	15057.8	38.6597
35	208.765	276.143	15476	12380.8	38.6598
36	211.316	279.745	11933.1	9546.46	38.6597
37	213.867	283.488	8178.34	6542.67	38.6598
38	216.243	287.111	9159.89	7327.91	38.6598
39	218.62	290.878	10049	8039.24	38.6599
40	220.996	294.8	10877	8701.59	38.6598
41	223.372	298.894	11693.7	9354.94	38.6597
42	226.054	303.742	7247.35	5797.88	38.6598
43	228.736	308.862	2858.76	2287	38.6597
44	231.418	314.292	-1214.69	-971.751	38.6598
45	234.1	320.082	-4877.94	-3902.35	38.6598
46	236.782	326.297	-8028.76	-6423.01	38.6598
47	239.403	332.867	-4890.94	-3912.75	38.6598
48	242.024	340.046	-731.348	-585.079	38.6598
49	244.279	346.843	-1313.88	-1051.1	38.6597
50	246.534	354.397	-1107.89	-886.31	38.6597
51	248.789	362.997	0	0	0

Query 1 (spencer) - Safety Factor: 1.2618

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	120.054	200.076	0	0	0
2	122.628	201.408	1003.28	802.628	38.6599
3	125.203	202.78	2107.69	1686.15	38.6598
4	127.777	204.19	3289.47	2631.57	38.6597
5	130.352	205.641	4525.98	3620.79	38.6599
6	132.927	207.132	5795.67	4636.53	38.6598
7	135.501	208.664	7077.97	5662.38	38.6598
8	138.076	210.239	8353.35	6682.68	38.6598
9	140.651	211.857	9603.19	7682.55	38.6598
10	143.225	213.52	10809.8	8647.86	38.6599

11	145.8	215.228	11956.5	9565.17	38.6597
12	148.375	216.983	13027.2	10421.8	38.6599
13	150.949	218.785	14007.1	11205.7	38.6599
14	153.524	220.637	14881.3	11905	38.6597
15	156.099	222.539	15633.1	12506.5	38.6599
16	158.673	224.493	16246.5	12997.2	38.6598
17	161.248	226.501	16706.4	13365.1	38.6598
18	163.823	228.563	17003.9	13603.1	38.6598
19	166.397	230.683	17130.2	13704.2	38.6599
20	168.972	232.861	17075.8	13660.7	38.6599
21	171.546	235.101	16832.2	13465.7	38.6597
22	174.121	237.403	16391.5	13113.2	38.6598
23	176.696	239.771	15746.7	12597.3	38.6597
24	179.27	242.207	14891.7	11913.4	38.6599
25	182.108	244.975	18907	15125.6	38.6598
26	184.946	247.833	22673.7	18138.9	38.6597
27	187.784	250.785	26185.8	20948.7	38.6599
28	190.622	253.838	29439.7	23551.7	38.6597
29	193.46	256.996	32443.6	25954.9	38.6598
30	196.011	259.929	30153	24122.4	38.6598
31	198.562	262.957	27641.5	22113.2	38.6598
32	201.113	266.086	24912.5	19930	38.6598
33	203.664	269.322	21970.6	17576.5	38.6598
34	206.215	272.672	18822.3	15057.8	38.6597
35	208.765	276.143	15476	12380.8	38.6598
36	211.316	279.745	11933.1	9546.46	38.6597
37	213.867	283.488	8178.34	6542.67	38.6598
38	216.243	287.111	9159.89	7327.91	38.6598
39	218.62	290.878	10049	8039.24	38.6599
40	220.996	294.8	10877	8701.59	38.6598
41	223.372	298.894	11693.7	9354.94	38.6597
42	226.054	303.742	7247.35	5797.88	38.6598
43	228.736	308.862	2858.76	2287	38.6597
44	231.418	314.292	-1214.69	-971.751	38.6598
45	234.1	320.082	-4877.94	-3902.35	38.6598
46	236.782	326.297	-8028.76	-6423.01	38.6598
47	239.403	332.867	-4890.94	-3912.75	38.6598
48	242.024	340.046	-731.348	-585.079	38.6598
49	244.279	346.843	-1313.88	-1051.1	38.6597
50	246.534	354.397	-1107.89	-886.31	38.6597
51	248.789	362.997	0	0	0

Entity Information

External Boundary

X	Y
-119.082	0
900	0
900	242.207
900	256.996
900	283.488
900	298.894
900	326.297
900	340.046
900	364.52
900	378.882
900	401.213
900	416.559
900	548
700	548

628.434	569.928
580	550
343.655	416.559
316.475	401.213
276.924	378.882
251.485	364.52
226.69	350.52
219.266	340.046
209.52	326.297
190.097	298.894
179.177	283.488
160.399	256.996
149.917	242.207
120	200
-119.082	200

Material Boundary

X	Y
149.917	242.207
900	242.207

Material Boundary

X	Y
160.399	256.996
900	256.996

Material Boundary

X	Y
179.177	283.488
900	283.488

Material Boundary

X	Y
190.097	298.894
900	298.894

Material Boundary

X	Y
209.52	326.297
900	326.297

Material Boundary

X	Y
219.266	340.046
900	340.046

Material Boundary

X	Y
251.485	364.52
900	364.52

Material Boundary

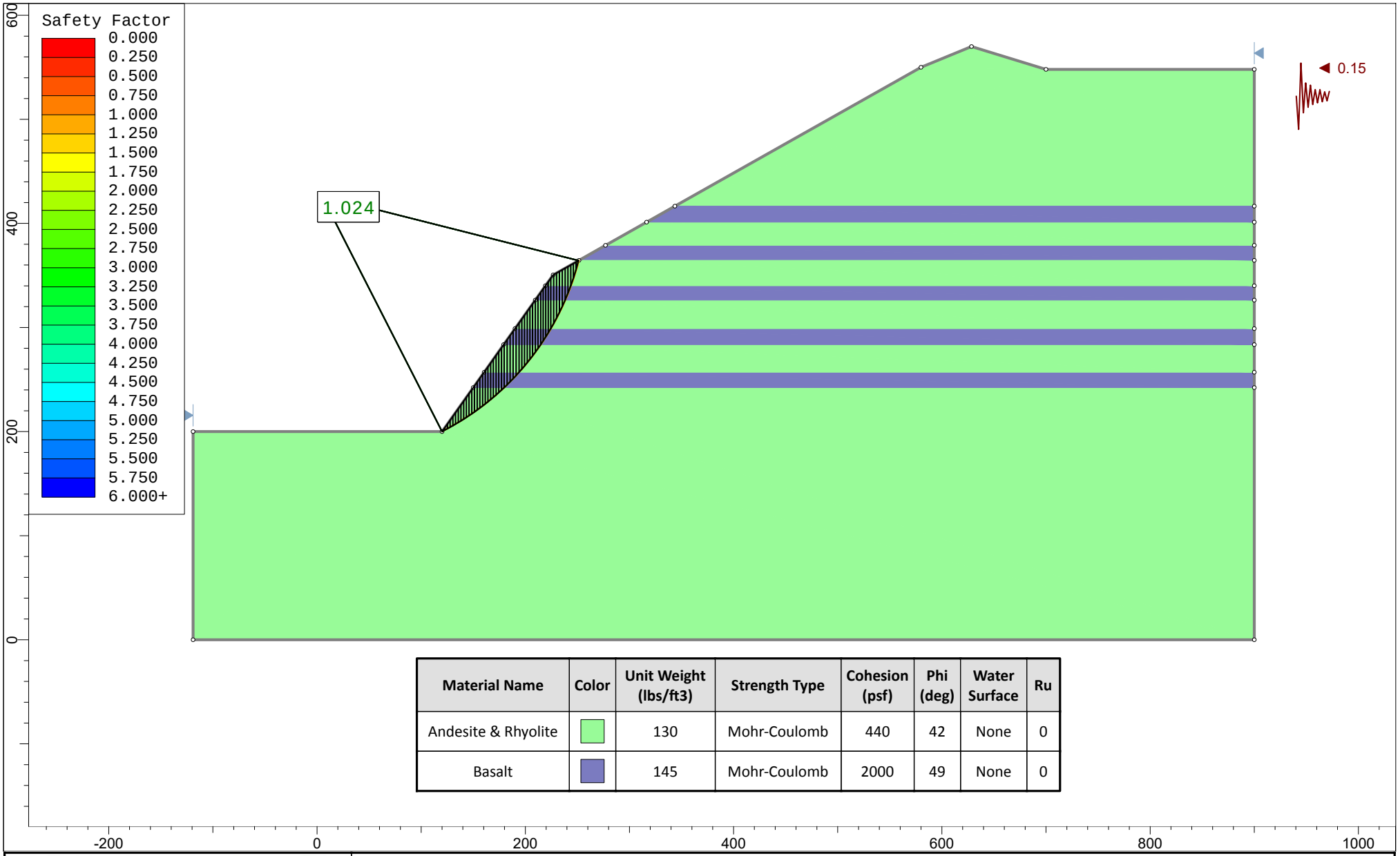
X	Y
276.924	378.882
900	378.882

Material Boundary

X	Y
316.475	401.213
900	401.213

Material Boundary

X	Y
343.655	416.559
900	416.559



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Andesite & Rhyolite		130	Mohr-Coulomb	440	42	None	0
Basalt		145	Mohr-Coulomb	2000	49	None	0

BAJADA Geosciences, Inc.

SLIDEINTERPRET 8.032

Project	Ward Lake Quarry Expansion				
Analysis Description	150' Slope, dry, pseudostatic, 55 degree gross slope inclination				
Drawn By	J.Bianchin	Scale	1:1528	Company	Bajada Geosciences, Inc.
Date	4/3/2020, 2:25:57 PM			File Name	150',dry,PS,55deg.slim

Slide Analysis Information

Ward Lake Quarry Expansion

Project Summary

Slide Modeler Version:	8.032
Compute Time:	00h:00m:03.724s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical

Analysis Methods Used
Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search

Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis: No
Staged pseudostatic analysis: No

Seismic Load Coefficient (Horizontal): 0.15

Materials

Property	Andesite & Rhyolite	Basalt
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	145
Cohesion [psf]	440	2000
Friction Angle [°]	42	49
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: spencer

FS	1.023530
Center:	4.554, 426.537
Radius:	254.248
Left Slip Surface Endpoint:	120.011, 200.015
Right Slip Surface Endpoint:	251.063, 364.281
Resisting Moment:	1.25701e+08 lb-ft
Driving Moment:	1.22812e+08 lb-ft
Resisting Horizontal Force:	321801 lb
Driving Horizontal Force:	314404 lb
Total Slice Area:	4311.47 ft2
Surface Horizontal Width:	131.052 ft
Surface Average Height:	32.8989 ft

Valid/Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	10990
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.02353

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	2.59379	390.893	27.3366	Andesite & Rhyolite	440	42	1151.69	1178.79	820.51	0	820.51	1415.88	1415.88
2	2.59379	1166.26	27.9966	Andesite & Rhyolite	440	42	1350.59	1382.37	1046.61	0	1046.61	1764.63	1764.63
3	2.59379	1928.66	28.6607	Andesite & Rhyolite	440	42	1526.58	1562.5	1246.66	0	1246.66	2081.08	2081.08
4	2.59379	2677.85	29.329	Andesite & Rhyolite	440	42	1681.59	1721.16	1422.87	0	1422.87	2367.66	2367.66
5	2.59379	3413.57	30.0017	Andesite & Rhyolite	440	42	1817.47	1860.23	1577.32	0	1577.32	2626.71	2626.71
6	2.59379	4135.55	30.679	Andesite & Rhyolite	440	42	1935.85	1981.4	1711.9	0	1711.9	2860.37	2860.37
7	2.59379	4843.51	31.3611	Andesite & Rhyolite	440	42	2038.32	2086.28	1828.38	0	1828.38	3070.67	3070.67
8	2.59379	5537.13	32.0482	Andesite & Rhyolite	440	42	2126.28	2176.31	1928.37	0	1928.37	3259.5	3259.5
9	2.59379	6216.09	32.7405	Andesite & Rhyolite	440	42	2201.04	2252.83	2013.35	0	2013.35	3428.59	3428.59
10	2.59379	6880.06	33.4381	Andesite & Rhyolite	440	42	2263.81	2317.08	2084.71	0	2084.71	3579.58	3579.58
11	2.59379	7528.66	34.1415	Andesite & Rhyolite	440	42	2315.7	2370.19	2143.69	0	2143.69	3713.99	3713.99
12	2.59379	8177.27	34.8508	Andesite & Rhyolite	440	42	2360.73	2416.28	2194.88	0	2194.88	3838.73	3838.73
13	2.59379	8916.38	35.5662	Andesite & Rhyolite	440	42	2416.27	2473.12	2258.01	0	2258.01	3985.73	3985.73
14	2.59379	9658.88	36.2881	Andesite & Rhyolite	440	42	2465.42	2523.43	2313.88	0	2313.88	4124.12	4124.12
15	2.59379	10384.3	37.0167	Andesite & Rhyolite	440	42	2505.24	2564.19	2359.15	0	2359.15	4248.12	4248.12
16	2.59379	11079.2	37.7523	Andesite & Rhyolite	440	42	2534.4	2594.03	2392.29	0	2392.29	4354.79	4354.79
17	2.59379	11649.9	38.4954	Andesite & Rhyolite	440	42	2539.18	2598.93	2397.73	0	2397.73	4417.16	4417.16
18	2.59379	12178.8	39.2462	Andesite & Rhyolite	440	42	2534.71	2594.35	2392.65	0	2392.65	4463.32	4463.32
19	2.59379	12688.4	40.0051	Andesite & Rhyolite	440	42	2525.23	2584.65	2381.88	0	2381.88	4501.18	4501.18
20	2.59379	13178.2	40.7726	Andesite & Rhyolite	440	42	2511.11	2570.2	2365.82	0	2365.82	4531.27	4531.27
21	2.59379	13647.5	41.5491	Andesite & Rhyolite	440	42	2492.66	2551.31	2344.85	0	2344.85	4553.98	4553.98
22	2.59379	14095.4	42.3349	Andesite & Rhyolite	440	42	2470.13	2528.25	2319.24	0	2319.24	4569.64	4569.64
23	2.59379	14523.8	43.1308	Andesite & Rhyolite	440	42	2444.03	2501.54	2289.57	0	2289.57	4579.12	4579.12
24	2.8708	16597.8	43.9808	Basalt	2000	49	5713.38	5847.82	3344.85	0	3344.85	8858.5	8858.5
25	2.8708	17112	44.8869	Basalt	2000	49	5567.34	5698.34	3214.91	0	3214.91	8760.31	8760.31
26	2.8708	17588.2	45.8075	Basalt	2000	49	5419.29	5546.81	3083.2	0	3083.2	8657.45	8657.45
27	2.8708	18012.8	46.7436	Basalt	2000	49	5268.17	5392.13	2948.72	0	2948.72	8547.7	8547.7
28	2.8708	18267.6	47.6963	Basalt	2000	49	5099.73	5219.73	2798.87	0	2798.87	8402.67	8402.67
29	2.59009	16691.1	48.6183	Andesite & Rhyolite	440	42	2181.89	2233.23	1991.58	0	1991.58	4468.05	4468.05
30	2.59009	16915.9	49.5093	Andesite & Rhyolite	440	42	2126.77	2176.81	1928.93	0	1928.93	4419.87	4419.87
31	2.59009	17108.1	50.4167	Andesite & Rhyolite	440	42	2067.28	2115.92	1861.3	0	1861.3	4361.7	4361.7
32	2.59009	17266	51.342	Andesite & Rhyolite	440	42	2003.16	2050.29	1788.41	0	1788.41	4292.51	4292.51
33	2.59009	17387.4	52.2863	Andesite &	440	42	1934.1	1979.61	1709.91	0	1709.91	4211.1	4211.1

				Rhyolite									
34	2.59009	17469.9	53.2511	Andesite & Rhyolite	440	42	1859.79	1903.55	1625.44	0	1625.44	4116.1	4116.1
35	2.59009	17584.2	54.2383	Andesite & Rhyolite	440	42	1785.17	1827.18	1540.62	0	1540.62	4019.32	4019.32
36	2.59009	17722.5	55.2497	Andesite & Rhyolite	440	42	1708.57	1748.77	1453.53	0	1453.53	3916.39	3916.39
37	2.42425	16605.1	56.2534	Basalt	2000	49	3867.07	3958.06	1702.11	0	1702.11	7490.34	7490.34
38	2.42425	16506	57.2501	Basalt	2000	49	3735.02	3822.91	1584.63	0	1584.63	7391.4	7391.4
39	2.42425	16278.9	58.2745	Basalt	2000	49	3595.82	3680.43	1460.78	0	1460.78	7277.11	7277.11
40	2.42425	15949.1	59.3295	Basalt	2000	49	3453.3	3534.56	1333.97	0	1333.97	7156.81	7156.81
41	2.75373	17723.3	60.495	Andesite & Rhyolite	440	42	1191.76	1219.8	866.056	0	866.056	2972.05	2972.05
42	2.75373	16768.8	61.7812	Andesite & Rhyolite	440	42	1044.23	1068.8	698.352	0	698.352	2644.3	2644.3
43	2.75373	15434.3	63.1238	Andesite & Rhyolite	440	42	893.452	914.475	526.958	0	526.958	2289.87	2289.87
44	2.75373	13983.5	64.5318	Andesite & Rhyolite	440	42	754.077	771.82	368.523	0	368.523	1951.74	1951.74
45	2.75373	12397.3	66.0168	Andesite & Rhyolite	440	42	632.306	647.184	230.101	0	230.101	1651.4	1651.4
46	2.71541	10381.4	67.5825	Basalt	2000	49	2498.43	2557.22	484.383	0	484.383	6540.78	6540.78
47	2.71541	8215.86	69.2484	Basalt	2000	49	2411.11	2467.84	406.687	0	406.687	6770.16	6770.16
48	2.4746	5519.02	70.967	Andesite & Rhyolite	440	42	506.529	518.448	87.125	0	87.125	1555.44	1555.44
49	2.4746	3531.74	72.7631	Andesite & Rhyolite	440	42	594.045	608.023	186.609	0	186.609	2101.29	2101.29
50	2.4746	1236.78	74.7652	Andesite & Rhyolite	440	42	760.234	778.122	375.523	0	375.523	3166.95	3166.95

Query 1 (spencer) - Safety Factor: 1.02353

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	2.59379	390.893	27.3366	Andesite & Rhyolite	440	42	1151.69	1178.79	820.51	0	820.51	1415.88	1415.88
2	2.59379	1166.26	27.9966	Andesite & Rhyolite	440	42	1350.59	1382.37	1046.61	0	1046.61	1764.63	1764.63
3	2.59379	1928.66	28.6607	Andesite & Rhyolite	440	42	1526.58	1562.5	1246.66	0	1246.66	2081.08	2081.08
4	2.59379	2677.85	29.329	Andesite & Rhyolite	440	42	1681.59	1721.16	1422.87	0	1422.87	2367.66	2367.66
5	2.59379	3413.57	30.0017	Andesite & Rhyolite	440	42	1817.47	1860.23	1577.32	0	1577.32	2626.71	2626.71
6	2.59379	4135.55	30.679	Andesite & Rhyolite	440	42	1935.85	1981.4	1711.9	0	1711.9	2860.37	2860.37
7	2.59379	4843.51	31.3611	Andesite & Rhyolite	440	42	2038.32	2086.28	1828.38	0	1828.38	3070.67	3070.67
8	2.59379	5537.13	32.0482	Andesite & Rhyolite	440	42	2126.28	2176.31	1928.37	0	1928.37	3259.5	3259.5
9	2.59379	6216.09	32.7405	Andesite & Rhyolite	440	42	2201.04	2252.83	2013.35	0	2013.35	3428.59	3428.59
10	2.59379	6880.06	33.4381	Andesite & Rhyolite	440	42	2263.81	2317.08	2084.71	0	2084.71	3579.58	3579.58
11	2.59379	7528.66	34.1415	Andesite & Rhyolite	440	42	2315.7	2370.19	2143.69	0	2143.69	3713.99	3713.99
12	2.59379	8177.27	34.8508	Andesite & Rhyolite	440	42	2360.73	2416.28	2194.88	0	2194.88	3838.73	3838.73
13	2.59379	8916.38	35.5662	Andesite & Rhyolite	440	42	2416.27	2473.12	2258.01	0	2258.01	3985.73	3985.73
14	2.59379	9658.88	36.2881	Andesite & Rhyolite	440	42	2465.42	2523.43	2313.88	0	2313.88	4124.12	4124.12
15	2.59379	10384.3	37.0167	Andesite & Rhyolite	440	42	2505.24	2564.19	2359.15	0	2359.15	4248.12	4248.12

16	2.59379	11079.2	37.7523	Andesite & Rhyolite	440	42	2534.4	2594.03	2392.29	0	2392.29	4354.79	4354.79
17	2.59379	11649.9	38.4954	Andesite & Rhyolite	440	42	2539.18	2598.93	2397.73	0	2397.73	4417.16	4417.16
18	2.59379	12178.8	39.2462	Andesite & Rhyolite	440	42	2534.71	2594.35	2392.65	0	2392.65	4463.32	4463.32
19	2.59379	12688.4	40.0051	Andesite & Rhyolite	440	42	2525.23	2584.65	2381.88	0	2381.88	4501.18	4501.18
20	2.59379	13178.2	40.7726	Andesite & Rhyolite	440	42	2511.11	2570.2	2365.82	0	2365.82	4531.27	4531.27
21	2.59379	13647.5	41.5491	Andesite & Rhyolite	440	42	2492.66	2551.31	2344.85	0	2344.85	4553.98	4553.98
22	2.59379	14095.4	42.3349	Andesite & Rhyolite	440	42	2470.13	2528.25	2319.24	0	2319.24	4569.64	4569.64
23	2.59379	14523.8	43.1308	Andesite & Rhyolite	440	42	2444.03	2501.54	2289.57	0	2289.57	4579.12	4579.12
24	2.8708	16597.8	43.9808	Basalt	2000	49	5713.38	5847.82	3344.85	0	3344.85	8858.5	8858.5
25	2.8708	17112	44.8869	Basalt	2000	49	5567.34	5698.34	3214.91	0	3214.91	8760.31	8760.31
26	2.8708	17588.2	45.8075	Basalt	2000	49	5419.29	5546.81	3083.2	0	3083.2	8657.45	8657.45
27	2.8708	18012.8	46.7436	Basalt	2000	49	5268.17	5392.13	2948.72	0	2948.72	8547.7	8547.7
28	2.8708	18267.6	47.6963	Basalt	2000	49	5099.73	5219.73	2798.87	0	2798.87	8402.67	8402.67
29	2.59009	16691.1	48.6183	Andesite & Rhyolite	440	42	2181.89	2233.23	1991.58	0	1991.58	4468.05	4468.05
30	2.59009	16915.9	49.5093	Andesite & Rhyolite	440	42	2126.77	2176.81	1928.93	0	1928.93	4419.87	4419.87
31	2.59009	17108.1	50.4167	Andesite & Rhyolite	440	42	2067.28	2115.92	1861.3	0	1861.3	4361.7	4361.7
32	2.59009	17266	51.342	Andesite & Rhyolite	440	42	2003.16	2050.29	1788.41	0	1788.41	4292.51	4292.51
33	2.59009	17387.4	52.2863	Andesite & Rhyolite	440	42	1934.1	1979.61	1709.91	0	1709.91	4211.1	4211.1
34	2.59009	17469.9	53.2511	Andesite & Rhyolite	440	42	1859.79	1903.55	1625.44	0	1625.44	4116.1	4116.1
35	2.59009	17584.2	54.2383	Andesite & Rhyolite	440	42	1785.17	1827.18	1540.62	0	1540.62	4019.32	4019.32
36	2.59009	17722.5	55.2497	Andesite & Rhyolite	440	42	1708.57	1748.77	1453.53	0	1453.53	3916.39	3916.39
37	2.42425	16605.1	56.2534	Basalt	2000	49	3867.07	3958.06	1702.11	0	1702.11	7490.34	7490.34
38	2.42425	16506	57.2501	Basalt	2000	49	3735.02	3822.91	1584.63	0	1584.63	7391.4	7391.4
39	2.42425	16278.9	58.2745	Basalt	2000	49	3595.82	3680.43	1460.78	0	1460.78	7277.11	7277.11
40	2.42425	15949.1	59.3295	Basalt	2000	49	3453.3	3534.56	1333.97	0	1333.97	7156.81	7156.81
41	2.75373	17723.3	60.495	Andesite & Rhyolite	440	42	1191.76	1219.8	866.056	0	866.056	2972.05	2972.05
42	2.75373	16768.8	61.7812	Andesite & Rhyolite	440	42	1044.23	1068.8	698.352	0	698.352	2644.3	2644.3
43	2.75373	15434.3	63.1238	Andesite & Rhyolite	440	42	893.452	914.475	526.958	0	526.958	2289.87	2289.87
44	2.75373	13983.5	64.5318	Andesite & Rhyolite	440	42	754.077	771.82	368.523	0	368.523	1951.74	1951.74
45	2.75373	12397.3	66.0168	Andesite & Rhyolite	440	42	632.306	647.184	230.101	0	230.101	1651.4	1651.4
46	2.71541	10381.4	67.5825	Basalt	2000	49	2498.43	2557.22	484.383	0	484.383	6540.78	6540.78
47	2.71541	8215.86	69.2484	Basalt	2000	49	2411.11	2467.84	406.687	0	406.687	6770.16	6770.16
48	2.4746	5519.02	70.967	Andesite & Rhyolite	440	42	506.529	518.448	87.125	0	87.125	1555.44	1555.44
49	2.4746	3531.74	72.7631	Andesite & Rhyolite	440	42	594.045	608.023	186.609	0	186.609	2101.29	2101.29
50	2.4746	1236.78	74.7652	Andesite & Rhyolite	440	42	760.234	778.122	375.523	0	375.523	3166.95	3166.95

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.02353

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	120.011	200.015	0	0	0
2	122.605	201.356	1829.63	3476.29	62.2414
3	125.198	202.735	3716.03	7060.46	62.2415
4	127.792	204.153	5620.5	10678.9	62.2413
5	130.386	205.61	7508.73	14266.6	62.2415
6	132.98	207.108	9350.46	17765.9	62.2415
7	135.574	208.647	11119.1	21126.2	62.2414
8	138.167	210.227	12791.3	24303.4	62.2414
9	140.761	211.851	14346.7	27258.8	62.2415
10	143.355	213.519	15767.8	29958.9	62.2415
11	145.949	215.232	17039.4	32374.9	62.2415
12	148.543	216.991	18148.5	34482.2	62.2415
13	151.136	218.797	19083.4	36258.4	62.2414
14	153.73	220.651	19827.9	37673	62.2415
15	156.324	222.556	20369.6	38702.3	62.2415
16	158.918	224.512	20698.8	39327.6	62.2414
17	161.511	226.52	20808.3	39535.8	62.2415
18	164.105	228.583	20703.4	39336.5	62.2415
19	166.699	230.702	20383.9	38729.4	62.2415
20	169.293	232.879	19848.2	37711.6	62.2415
21	171.887	235.116	19095.6	36281.7	62.2415
22	174.48	237.414	18126.3	34440	62.2415
23	177.074	239.777	16941.1	32188.1	62.2415
24	179.668	242.207	15541.1	29528.1	62.2415
25	182.539	244.978	20193.3	38367.2	62.2414
26	185.41	247.837	24422.6	46403	62.2415
27	188.28	250.79	28244.1	53663.7	62.2414
28	191.151	253.841	31675.3	60183.1	62.2415
29	194.022	256.996	34752.2	66029.2	62.2415
30	196.612	259.935	32047.3	60889.9	62.2415
31	199.202	262.969	29169.1	55421.2	62.2414
32	201.792	266.102	26128.5	49644.1	62.2414
33	204.382	269.34	22938.5	43583.1	62.2414
34	206.972	272.689	19614.5	37267.6	62.2415
35	209.563	276.158	16174.8	30732.2	62.2415
36	212.153	279.754	12622.3	23982.3	62.2414
37	214.743	283.488	8964.19	17032	62.2415
38	217.167	287.116	9675.62	18383.7	62.2415
39	219.591	290.885	10285.6	19542.7	62.2415
40	222.015	294.806	10836.4	20589.1	62.2414
41	224.44	298.894	11366.2	21595.7	62.2414
42	227.193	303.76	7776.37	14775.1	62.2415
43	229.947	308.892	4554.03	8652.66	62.2415
44	232.701	314.326	1836.97	3490.25	62.2415
45	235.455	320.107	-313.838	-596.293	62.2415
46	238.208	326.297	-1855.82	-3526.06	62.2415
47	240.924	332.879	185.577	352.596	62.2414
48	243.639	340.046	2588.41	4917.98	62.2415
49	246.114	347.219	2389.54	4540.13	62.2415
50	248.588	355.195	1842.02	3499.84	62.2415
51	251.063	364.281	0	0	0

Query 1 (spencer) - Safety Factor: 1.02353

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	120.011	200.015	0	0	0
2	122.605	201.356	1829.63	3476.29	62.2414
3	125.198	202.735	3716.03	7060.46	62.2415

4	127.792	204.153	5620.5	10678.9	62.2413
5	130.386	205.61	7508.73	14266.6	62.2415
6	132.98	207.108	9350.46	17765.9	62.2415
7	135.574	208.647	11119.1	21126.2	62.2414
8	138.167	210.227	12791.3	24303.4	62.2414
9	140.761	211.851	14346.7	27258.8	62.2415
10	143.355	213.519	15767.8	29958.9	62.2415
11	145.949	215.232	17039.4	32374.9	62.2415
12	148.543	216.991	18148.5	34482.2	62.2415
13	151.136	218.797	19083.4	36258.4	62.2414
14	153.73	220.651	19827.9	37673	62.2415
15	156.324	222.556	20369.6	38702.3	62.2415
16	158.918	224.512	20698.8	39327.6	62.2414
17	161.511	226.52	20808.3	39535.8	62.2415
18	164.105	228.583	20703.4	39336.5	62.2415
19	166.699	230.702	20383.9	38729.4	62.2415
20	169.293	232.879	19848.2	37711.6	62.2415
21	171.887	235.116	19095.6	36281.7	62.2415
22	174.48	237.414	18126.3	34440	62.2415
23	177.074	239.777	16941.1	32188.1	62.2415
24	179.668	242.207	15541.1	29528.1	62.2415
25	182.539	244.978	20193.3	38367.2	62.2414
26	185.41	247.837	24422.6	46403	62.2415
27	188.28	250.79	28244.1	53663.7	62.2414
28	191.151	253.841	31675.3	60183.1	62.2415
29	194.022	256.996	34752.2	66029.2	62.2415
30	196.612	259.935	32047.3	60889.9	62.2415
31	199.202	262.969	29169.1	55421.2	62.2414
32	201.792	266.102	26128.5	49644.1	62.2414
33	204.382	269.34	22938.5	43583.1	62.2414
34	206.972	272.689	19614.5	37267.6	62.2415
35	209.563	276.158	16174.8	30732.2	62.2415
36	212.153	279.754	12622.3	23982.3	62.2414
37	214.743	283.488	8964.19	17032	62.2415
38	217.167	287.116	9675.62	18383.7	62.2415
39	219.591	290.885	10285.6	19542.7	62.2415
40	222.015	294.806	10836.4	20589.1	62.2414
41	224.44	298.894	11366.2	21595.7	62.2414
42	227.193	303.76	7776.37	14775.1	62.2415
43	229.947	308.892	4554.03	8652.66	62.2415
44	232.701	314.326	1836.97	3490.25	62.2415
45	235.455	320.107	-313.838	-596.293	62.2415
46	238.208	326.297	-1855.82	-3526.06	62.2415
47	240.924	332.879	185.577	352.596	62.2414
48	243.639	340.046	2588.41	4917.98	62.2415
49	246.114	347.219	2389.54	4540.13	62.2415
50	248.588	355.195	1842.02	3499.84	62.2415
51	251.063	364.281	0	0	0

Entity Information

External Boundary

X	Y
-119.082	0
900	0
900	242.207
900	256.996
900	283.488
900	298.894

900	326.297
900	340.046
900	364.52
900	378.882
900	401.213
900	416.559
900	548
700	548
628.434	569.928
580	550
343.655	416.559
316.475	401.213
276.924	378.882
251.485	364.52
226.69	350.52
219.266	340.046
209.52	326.297
190.097	298.894
179.177	283.488
160.399	256.996
149.917	242.207
120	200
-119.082	200

Material Boundary

X	Y
149.917	242.207
900	242.207

Material Boundary

X	Y
160.399	256.996
900	256.996

Material Boundary

X	Y
179.177	283.488
900	283.488

Material Boundary

X	Y
190.097	298.894
900	298.894

Material Boundary

X	Y
209.52	326.297
900	326.297

Material Boundary

X	Y
219.266	340.046
900	340.046

Material Boundary

X	Y
251.485	364.52
900	364.52

Material Boundary

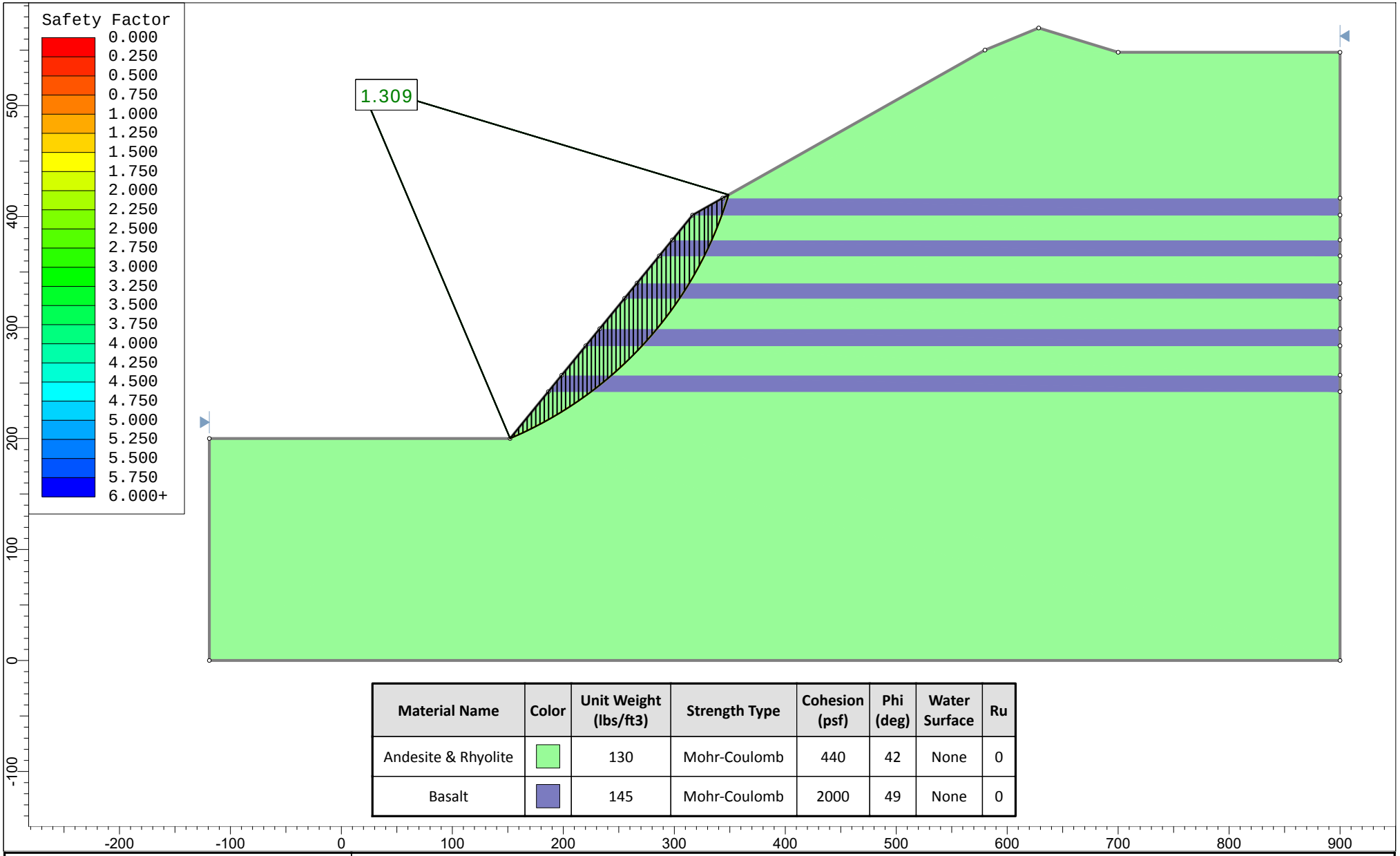
X	Y
276.924	378.882
900	378.882

Material Boundary

X	Y
316.475	401.213
900	401.213

Material Boundary

X	Y
343.655	416.559
900	416.559



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Andesite & Rhyolite		130	Mohr-Coulomb	440	42	None	0
Basalt		145	Mohr-Coulomb	2000	49	None	0

BAJADA Geosciences, Inc.

SLIDEINTERPRET 8.032

Project	Ward Lake Quarry Expansion		
Analysis Description	200' Slope, dry, static, 50 degree gross slope inclination		
Drawn By	J.Bianchin	Scale 1:1434	Company Bajada Geosciences, Inc.
Date	4/3/2020, 2:25:57 PM		File Name 200',dry,ststic,50deg.slim

Slide Analysis Information

Ward Lake Quarry Expansion

Project Summary

Slide Modeler Version: 8.032

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical

Analysis Methods Used	
	Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10

Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Property	Andesite & Rhyolite	Basalt
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	145
Cohesion [psf]	440	2000
Friction Angle [°]	42	49
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: spencer

FS	1.309350
Center:	16.553, 519.622
Radius:	347.122
Left Slip Surface Endpoint:	152.020, 200.025
Right Slip Surface Endpoint:	348.934, 419.540
Resisting Moment:	3.61389e+08 lb-ft
Driving Moment:	2.76007e+08 lb-ft
Resisting Horizontal Force:	708486 lb
Driving Horizontal Force:	541099 lb
Total Slice Area:	8280.15 ft2
Surface Horizontal Width:	196.914 ft
Surface Average Height:	42.0495 ft

Valid/Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	11154
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.30935

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]

1	3.85174	764.093	23.3167	Andesite & Rhyolite	440	42	545.969	714.865	305.268	0	305.268	540.588	540.588
2	3.85174	2278.35	24.0108	Andesite & Rhyolite	440	42	784.04	1026.58	651.466	0	651.466	1000.72	1000.72
3	3.85174	3764.53	24.7088	Andesite & Rhyolite	440	42	1008.29	1320.2	977.56	0	977.56	1441.51	1441.51
4	3.85174	5222.16	25.4106	Andesite & Rhyolite	440	42	1219.14	1596.28	1284.18	0	1284.18	1863.35	1863.35
5	3.85174	6650.74	26.1166	Andesite & Rhyolite	440	42	1417.02	1855.37	1571.93	0	1571.93	2266.62	2266.62
6	3.85174	8049.75	26.8268	Andesite & Rhyolite	440	42	1602.31	2097.98	1841.37	0	1841.37	2651.7	2651.7
7	3.85174	9418.64	27.5416	Andesite & Rhyolite	440	42	1775.39	2324.61	2093.07	0	2093.07	3018.92	3018.92
8	3.85174	10756.8	28.261	Andesite & Rhyolite	440	42	1936.63	2535.73	2327.55	0	2327.55	3368.62	3368.62
9	3.85174	12064	28.9853	Andesite & Rhyolite	440	42	2086.42	2731.86	2545.37	0	2545.37	3701.2	3701.2
10	3.85174	13487.7	29.7147	Andesite & Rhyolite	440	42	2245.54	2940.2	2776.76	0	2776.76	4058.36	4058.36
11	3.85174	15002.2	30.4495	Andesite & Rhyolite	440	42	2409.69	3155.13	3015.45	0	3015.45	4432.01	4432.01
12	3.85174	16483.2	31.1898	Andesite & Rhyolite	440	42	2561.82	3354.32	3236.69	0	3236.69	4787.56	4787.56
13	3.85174	17817.4	31.936	Andesite & Rhyolite	440	42	2687.64	3519.06	3419.64	0	3419.64	5094.89	5094.89
14	3.85174	18958.1	32.6883	Andesite & Rhyolite	440	42	2782.49	3643.25	3557.57	0	3557.57	5343.09	5343.09
15	3.85174	20061.8	33.447	Andesite & Rhyolite	440	42	2867.51	3754.57	3681.21	0	3681.21	5575.35	5575.35
16	3.85174	21128.6	34.2124	Andesite & Rhyolite	440	42	2943.1	3853.55	3791.13	0	3791.13	5792.18	5792.18
17	3.85174	22157.5	34.9848	Andesite & Rhyolite	440	42	3009.51	3940.5	3887.7	0	3887.7	5993.79	5993.79
18	3.85174	23158.8	35.7645	Andesite & Rhyolite	440	42	3068.27	4017.44	3973.16	0	3973.16	6183.17	6183.17
19	3.85174	24311.9	36.552	Andesite & Rhyolite	440	42	3140.27	4111.71	4077.83	0	4077.83	6405.92	6405.92
20	3.66655	24164.2	37.3283	Basalt	2000	49	5279.51	6912.72	4270.56	0	4270.56	8296.59	8296.59
21	3.66655	25041.6	38.0933	Basalt	2000	49	5307.31	6949.12	4302.21	0	4302.21	8462.67	8462.67
22	3.66655	25772.9	38.8664	Basalt	2000	49	5309	6951.34	4304.14	0	4304.14	8582.83	8582.83
23	3.66655	26318.5	39.6481	Basalt	2000	49	5280.51	6914.03	4271.7	0	4271.7	8647.59	8647.59
24	3.66655	26818.3	40.4387	Basalt	2000	49	5243.1	6865.05	4229.14	0	4229.14	8697.47	8697.47
25	3.92095	29279.5	41.2668	Andesite & Rhyolite	440	42	3239.87	4242.13	4222.7	0	4222.7	7065.67	7065.67
26	3.92095	29943.6	42.1337	Andesite & Rhyolite	440	42	3234.31	4234.85	4214.61	0	4214.61	7140.49	7140.49
27	3.92095	30552.4	43.0126	Andesite & Rhyolite	440	42	3221.16	4217.62	4195.46	0	4195.46	7200.56	7200.56
28	3.92095	31248.8	43.9043	Andesite & Rhyolite	440	42	3214.01	4208.27	4185.09	0	4185.09	7278.47	7278.47
29	3.92095	32021.5	44.8095	Andesite & Rhyolite	440	42	3211.29	4204.7	4181.11	0	4181.11	7371.12	7371.12
30	3.92095	32727.7	45.7292	Andesite & Rhyolite	440	42	3199.86	4189.74	4164.5	0	4164.5	7446.87	7446.87
31	3.92095	33190.6	46.6643	Andesite & Rhyolite	440	42	3164.93	4144	4113.71	0	4113.71	7468.06	7468.06
32	4.49179	38207.6	47.6865	Basalt	2000	49	4835.09	6330.83	3764.73	0	3764.73	9075.92	9075.92
33	4.49179	38138.6	48.8	Basalt	2000	49	4688.99	6139.53	3598.44	0	3598.44	8954.63	8954.63
34	4.49179	37937	49.9388	Basalt	2000	49	4532.62	5934.78	3420.45	0	3420.45	8810.51	8810.51
35	4.07983	34358.9	51.0504	Andesite & Rhyolite	440	42	2818.99	3691.05	3610.66	0	3610.66	7098.1	7098.1
36	4.07983	34544	52.1346	Andesite & Rhyolite	440	42	2755.63	3608.08	3518.5	0	3518.5	7062.67	7062.67
37	4.07983	34656.4	53.2459	Andesite & Rhyolite	440	42	2686.53	3517.61	3418.03	0	3418.03	7015.19	7015.19

38	4.07983	34589.9	54.3868	Andesite & Rhyolite	440	42	2604.9	3410.72	3299.32	0	3299.32	6936.03	6936.03
39	4.07983	34170.2	55.5604	Andesite & Rhyolite	440	42	2500.32	3273.8	3147.26	0	3147.26	6793.48	6793.48
40	4.3793	35804.4	56.8162	Basalt	2000	49	3681.46	4820.32	2451.66	0	2451.66	8081	8081
41	4.3793	34489.2	58.1617	Basalt	2000	49	3458.35	4528.19	2197.72	0	2197.72	7767.14	7767.14
42	4.49348	33923.1	59.5792	Andesite & Rhyolite	440	42	2055.9	2691.89	2500.98	0	2500.98	6002.27	6002.27
43	4.49348	31281.1	61.0785	Andesite & Rhyolite	440	42	1841.75	2411.5	2189.58	0	2189.58	5522.95	5522.95
44	4.49348	28021.1	62.6527	Andesite & Rhyolite	440	42	1607.07	2104.22	1848.31	0	1848.31	4955.65	4955.65
45	3.38384	18572	64.0993	Basalt	2000	49	2339.34	3063.01	924.057	0	924.057	5741.58	5741.58
46	3.38384	15985.8	65.4098	Basalt	2000	49	2075.48	2717.54	623.745	0	623.745	5159.04	5159.04
47	4.49572	17178.6	67.0318	Andesite & Rhyolite	440	42	955.454	1251.02	900.732	0	900.732	3155.12	3155.12
48	4.49572	12307.7	69.0189	Andesite & Rhyolite	440	42	702.696	920.075	533.177	0	533.177	2365.57	2365.57
49	5.1669	6422.28	71.3917	Basalt	2000	49	1079.2	1413.05	-510.228	0	-510.228	2695	2695
50	0.912136	146.191	72.9854	Andesite & Rhyolite	440	42	0	0	-551.133	0	-551.133	-551.133	-551.133

Query 1 (spencer) - Safety Factor: 1.30935

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	3.85174	764.093	23.3167	Andesite & Rhyolite	440	42	545.969	714.865	305.268	0	305.268	540.588	540.588
2	3.85174	2278.35	24.0108	Andesite & Rhyolite	440	42	784.04	1026.58	651.466	0	651.466	1000.72	1000.72
3	3.85174	3764.53	24.7088	Andesite & Rhyolite	440	42	1008.29	1320.2	977.56	0	977.56	1441.51	1441.51
4	3.85174	5222.16	25.4106	Andesite & Rhyolite	440	42	1219.14	1596.28	1284.18	0	1284.18	1863.35	1863.35
5	3.85174	6650.74	26.1166	Andesite & Rhyolite	440	42	1417.02	1855.37	1571.93	0	1571.93	2266.62	2266.62
6	3.85174	8049.75	26.8268	Andesite & Rhyolite	440	42	1602.31	2097.98	1841.37	0	1841.37	2651.7	2651.7
7	3.85174	9418.64	27.5416	Andesite & Rhyolite	440	42	1775.39	2324.61	2093.07	0	2093.07	3018.92	3018.92
8	3.85174	10756.8	28.261	Andesite & Rhyolite	440	42	1936.63	2535.73	2327.55	0	2327.55	3368.62	3368.62
9	3.85174	12064	28.9853	Andesite & Rhyolite	440	42	2086.42	2731.86	2545.37	0	2545.37	3701.2	3701.2
10	3.85174	13487.7	29.7147	Andesite & Rhyolite	440	42	2245.54	2940.2	2776.76	0	2776.76	4058.36	4058.36
11	3.85174	15002.2	30.4495	Andesite & Rhyolite	440	42	2409.69	3155.13	3015.45	0	3015.45	4432.01	4432.01
12	3.85174	16483.2	31.1898	Andesite & Rhyolite	440	42	2561.82	3354.32	3236.69	0	3236.69	4787.56	4787.56
13	3.85174	17817.4	31.936	Andesite & Rhyolite	440	42	2687.64	3519.06	3419.64	0	3419.64	5094.89	5094.89
14	3.85174	18958.1	32.6883	Andesite & Rhyolite	440	42	2782.49	3643.25	3557.57	0	3557.57	5343.09	5343.09
15	3.85174	20061.8	33.447	Andesite & Rhyolite	440	42	2867.51	3754.57	3681.21	0	3681.21	5575.35	5575.35
16	3.85174	21128.6	34.2124	Andesite & Rhyolite	440	42	2943.1	3853.55	3791.13	0	3791.13	5792.18	5792.18
17	3.85174	22157.5	34.9848	Andesite & Rhyolite	440	42	3009.51	3940.5	3887.7	0	3887.7	5993.79	5993.79
18	3.85174	23158.8	35.7645	Andesite & Rhyolite	440	42	3068.27	4017.44	3973.16	0	3973.16	6183.17	6183.17
19	3.85174	24311.9	36.552	Andesite & Rhyolite	440	42	3140.27	4111.71	4077.83	0	4077.83	6405.92	6405.92
20	3.66655	24164.2	37.3283	Basalt	2000	49	5279.51	6912.72	4270.56	0	4270.56	8296.59	8296.59

21	3.66655	25041.6	38.0933	Basalt	2000	49	5307.31	6949.12	4302.21	0	4302.21	8462.67	8462.67
22	3.66655	25772.9	38.8664	Basalt	2000	49	5309	6951.34	4304.14	0	4304.14	8582.83	8582.83
23	3.66655	26318.5	39.6481	Basalt	2000	49	5280.51	6914.03	4271.7	0	4271.7	8647.59	8647.59
24	3.66655	26818.3	40.4387	Basalt	2000	49	5243.1	6865.05	4229.14	0	4229.14	8697.47	8697.47
25	3.92095	29279.5	41.2668	Andesite & Rhyolite	440	42	3239.87	4242.13	4222.7	0	4222.7	7065.67	7065.67
26	3.92095	29943.6	42.1337	Andesite & Rhyolite	440	42	3234.31	4234.85	4214.61	0	4214.61	7140.49	7140.49
27	3.92095	30552.4	43.0126	Andesite & Rhyolite	440	42	3221.16	4217.62	4195.46	0	4195.46	7200.56	7200.56
28	3.92095	31248.8	43.9043	Andesite & Rhyolite	440	42	3214.01	4208.27	4185.09	0	4185.09	7278.47	7278.47
29	3.92095	32021.5	44.8095	Andesite & Rhyolite	440	42	3211.29	4204.7	4181.11	0	4181.11	7371.12	7371.12
30	3.92095	32727.7	45.7292	Andesite & Rhyolite	440	42	3199.86	4189.74	4164.5	0	4164.5	7446.87	7446.87
31	3.92095	33190.6	46.6643	Andesite & Rhyolite	440	42	3164.93	4144	4113.71	0	4113.71	7468.06	7468.06
32	4.49179	38207.6	47.6865	Basalt	2000	49	4835.09	6330.83	3764.73	0	3764.73	9075.92	9075.92
33	4.49179	38138.6	48.8	Basalt	2000	49	4688.99	6139.53	3598.44	0	3598.44	8954.63	8954.63
34	4.49179	37937	49.9388	Basalt	2000	49	4532.62	5934.78	3420.45	0	3420.45	8810.51	8810.51
35	4.07983	34358.9	51.0504	Andesite & Rhyolite	440	42	2818.99	3691.05	3610.66	0	3610.66	7098.1	7098.1
36	4.07983	34544	52.1346	Andesite & Rhyolite	440	42	2755.63	3608.08	3518.5	0	3518.5	7062.67	7062.67
37	4.07983	34656.4	53.2459	Andesite & Rhyolite	440	42	2686.53	3517.61	3418.03	0	3418.03	7015.19	7015.19
38	4.07983	34589.9	54.3868	Andesite & Rhyolite	440	42	2604.9	3410.72	3299.32	0	3299.32	6936.03	6936.03
39	4.07983	34170.2	55.5604	Andesite & Rhyolite	440	42	2500.32	3273.8	3147.26	0	3147.26	6793.48	6793.48
40	4.3793	35804.4	56.8162	Basalt	2000	49	3681.46	4820.32	2451.66	0	2451.66	8081	8081
41	4.3793	34489.2	58.1617	Basalt	2000	49	3458.35	4528.19	2197.72	0	2197.72	7767.14	7767.14
42	4.49348	33923.1	59.5792	Andesite & Rhyolite	440	42	2055.9	2691.89	2500.98	0	2500.98	6002.27	6002.27
43	4.49348	31281.1	61.0785	Andesite & Rhyolite	440	42	1841.75	2411.5	2189.58	0	2189.58	5522.95	5522.95
44	4.49348	28021.1	62.6527	Andesite & Rhyolite	440	42	1607.07	2104.22	1848.31	0	1848.31	4955.65	4955.65
45	3.38384	18572	64.0993	Basalt	2000	49	2339.34	3063.01	924.057	0	924.057	5741.58	5741.58
46	3.38384	15985.8	65.4098	Basalt	2000	49	2075.48	2717.54	623.745	0	623.745	5159.04	5159.04
47	4.49572	17178.6	67.0318	Andesite & Rhyolite	440	42	955.454	1251.02	900.732	0	900.732	3155.12	3155.12
48	4.49572	12307.7	69.0189	Andesite & Rhyolite	440	42	702.696	920.075	533.177	0	533.177	2365.57	2365.57
49	5.1669	6422.28	71.3917	Basalt	2000	49	1079.2	1413.05	-510.228	0	-510.228	2695	2695
50	0.912136	146.191	72.9854	Andesite & Rhyolite	440	42	0	0	-551.133	0	-551.133	-551.133	-551.133

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.30935

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	152.02	200.025	0	0	0
2	155.872	201.685	1589.57	1340.3	40.1371
3	159.724	203.4	3482.29	2936.21	40.137
4	163.575	205.173	5621.27	4739.76	40.137
5	167.427	207.003	7952.6	6705.5	40.137
6	171.279	208.891	10425.2	8790.37	40.1371
7	175.13	210.839	12990.8	10953.6	40.137
8	178.982	212.847	15603.5	13156.6	40.137

9	182.834	214.918	18220.3	15363	40.1369
10	186.686	217.052	20800.3	17538.5	40.1371
11	190.537	219.25	23318.4	19661.7	40.137
12	194.389	221.514	25743.1	21706.2	40.1371
13	198.241	223.846	28032.6	23636.6	40.137
14	202.093	226.247	30142.2	25415.5	40.1371
15	205.944	228.719	32033.1	27009.8	40.1371
16	209.796	231.263	33677.4	28396.3	40.1371
17	213.648	233.882	35049.6	29553.3	40.1371
18	217.5	236.577	36126	30460.9	40.1371
19	221.351	239.352	36884.4	31100.4	40.1371
20	225.203	242.207	37297.6	31448.8	40.1371
21	228.87	245.003	44654.2	37651.7	40.137
22	232.536	247.877	51687.3	43581.9	40.137
23	236.203	250.832	58373.5	49219.6	40.1371
24	239.869	253.871	64695.1	54549.8	40.137
25	243.536	256.996	70644.1	59566	40.1371
26	247.457	260.436	68779.2	57993.5	40.137
27	251.378	263.983	66471.8	56048	40.1371
28	255.299	267.641	63715.5	53723.9	40.1371
29	259.22	271.415	60484.6	50999.6	40.137
30	263.141	275.31	56751.2	47851.7	40.137
31	267.062	279.332	52508.7	44274.5	40.1371
32	270.983	283.488	47784.4	40291.1	40.1371
33	275.474	288.422	50859.3	42883.7	40.137
34	279.966	293.553	53392.1	45019.4	40.1371
35	284.458	298.894	55417.7	46727.3	40.137
36	288.538	303.941	48658.9	41028.4	40.137
37	292.618	309.189	41403.6	34910.8	40.137
38	296.697	314.651	33658.1	28380	40.1371
39	300.777	320.347	25460	21467.4	40.137
40	304.857	326.297	16904	14253.2	40.1371
41	309.236	332.993	16558.5	13961.9	40.1371
42	313.616	340.046	16156.8	13623.2	40.1371
43	318.109	347.699	6227.13	5250.62	40.1371
44	322.603	355.831	-3330.01	-2807.81	40.137
45	327.096	364.52	-12189.9	-10278.3	40.137
46	330.48	371.488	-10738	-9054.13	40.1371
47	333.864	378.882	-8348.99	-7039.74	40.1371
48	338.36	389.49	-13621.6	-11485.5	40.137
49	342.855	401.213	-16722.9	-14100.5	40.1371
50	348.022	416.559	-3334.41	-2811.52	40.137
51	348.934	419.54	0	0	0

Query 1 (spencer) - Safety Factor: 1.30935

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	152.02	200.025	0	0	0
2	155.872	201.685	1589.57	1340.3	40.1371
3	159.724	203.4	3482.29	2936.21	40.137
4	163.575	205.173	5621.27	4739.76	40.137
5	167.427	207.003	7952.6	6705.5	40.137
6	171.279	208.891	10425.2	8790.37	40.1371
7	175.13	210.839	12990.8	10953.6	40.137
8	178.982	212.847	15603.5	13156.6	40.137
9	182.834	214.918	18220.3	15363	40.1369
10	186.686	217.052	20800.3	17538.5	40.1371
11	190.537	219.25	23318.4	19661.7	40.137
12	194.389	221.514	25743.1	21706.2	40.1371
13	198.241	223.846	28032.6	23636.6	40.137
14	202.093	226.247	30142.2	25415.5	40.1371
15	205.944	228.719	32033.1	27009.8	40.1371

16	209.796	231.263	33677.4	28396.3	40.1371
17	213.648	233.882	35049.6	29553.3	40.1371
18	217.5	236.577	36126	30460.9	40.1371
19	221.351	239.352	36884.4	31100.4	40.1371
20	225.203	242.207	37297.6	31448.8	40.1371
21	228.87	245.003	44654.2	37651.7	40.137
22	232.536	247.877	51687.3	43581.9	40.137
23	236.203	250.832	58373.5	49219.6	40.1371
24	239.869	253.871	64695.1	54549.8	40.137
25	243.536	256.996	70644.1	59566	40.1371
26	247.457	260.436	68779.2	57993.5	40.137
27	251.378	263.983	66471.8	56048	40.1371
28	255.299	267.641	63715.5	53723.9	40.1371
29	259.22	271.415	60484.6	50999.6	40.137
30	263.141	275.31	56751.2	47851.7	40.137
31	267.062	279.332	52508.7	44274.5	40.1371
32	270.983	283.488	47784.4	40291.1	40.1371
33	275.474	288.422	50859.3	42883.7	40.137
34	279.966	293.553	53392.1	45019.4	40.1371
35	284.458	298.894	55417.7	46727.3	40.137
36	288.538	303.941	48658.9	41028.4	40.137
37	292.618	309.189	41403.6	34910.8	40.137
38	296.697	314.651	33658.1	28380	40.1371
39	300.777	320.347	25460	21467.4	40.137
40	304.857	326.297	16904	14253.2	40.1371
41	309.236	332.993	16558.5	13961.9	40.1371
42	313.616	340.046	16156.8	13623.2	40.1371
43	318.109	347.699	6227.13	5250.62	40.1371
44	322.603	355.831	-3330.01	-2807.81	40.137
45	327.096	364.52	-12189.9	-10278.3	40.137
46	330.48	371.488	-10738	-9054.13	40.1371
47	333.864	378.882	-8348.99	-7039.74	40.1371
48	338.36	389.49	-13621.6	-11485.5	40.137
49	342.855	401.213	-16722.9	-14100.5	40.1371
50	348.022	416.559	-3334.41	-2811.52	40.137
51	348.934	419.54	0	0	0

Entity Information

External Boundary

X	Y
-119.082	0
900	0
900	242.207
900	256.996
900	283.488
900	298.894
900	326.297
900	340.046
900	364.52
900	378.882
900	401.213
900	416.559
900	548
700	548
628.434	569.928
580	550
343.655	416.559
316.475	401.213
298.222	378.882

286.481	364.52
266.476	340.046
255.237	326.297
232.838	298.894
220.244	283.488
198.589	256.996
186.501	242.207
152	200
-119.082	200

Material Boundary

X	Y
186.501	242.207
900	242.207

Material Boundary

X	Y
198.589	256.996
900	256.996

Material Boundary

X	Y
220.244	283.488
900	283.488

Material Boundary

X	Y
232.838	298.894
900	298.894

Material Boundary

X	Y
255.237	326.297
900	326.297

Material Boundary

X	Y
266.476	340.046
900	340.046

Material Boundary

X	Y
286.481	364.52
900	364.52

Material Boundary

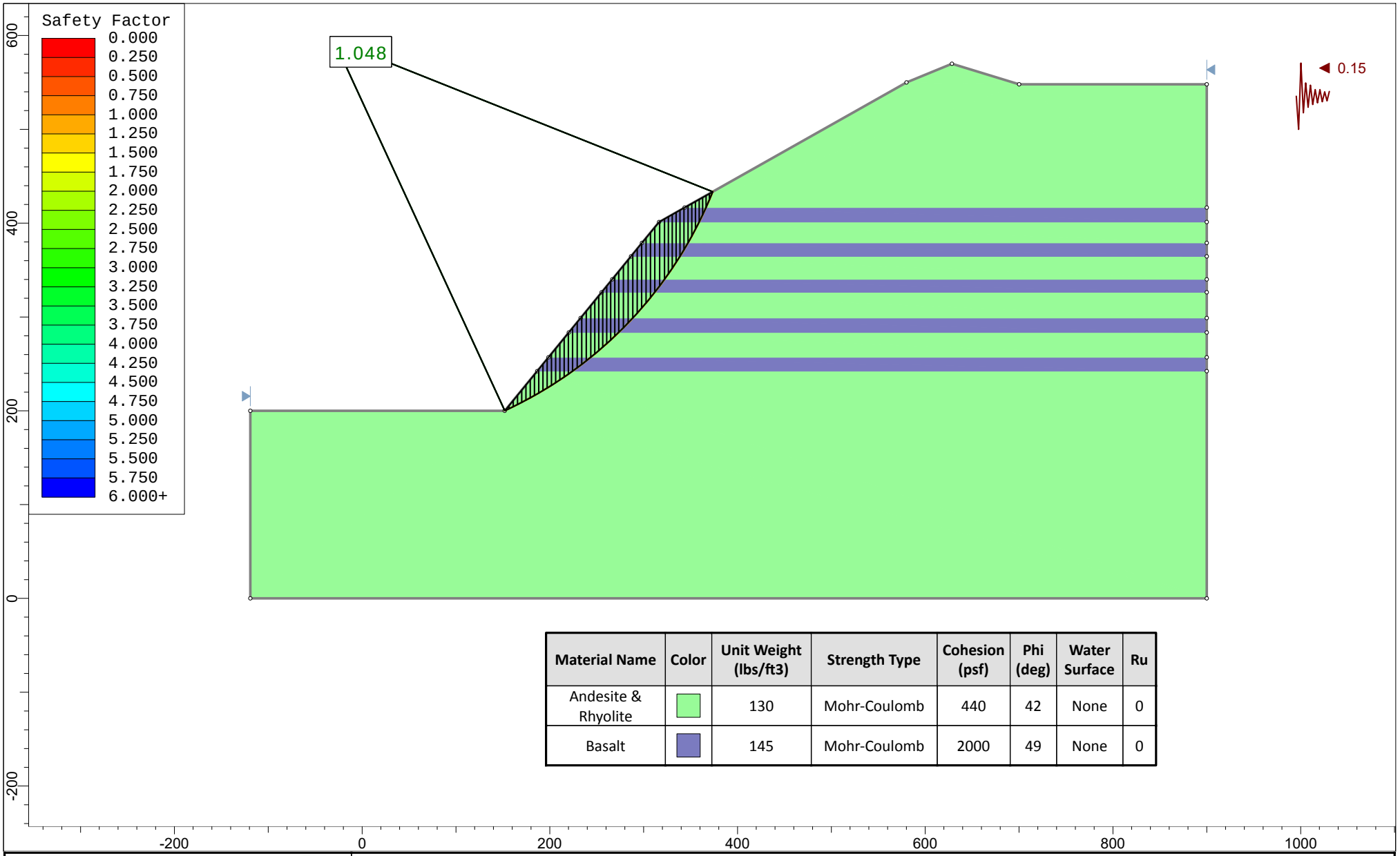
X	Y
298.222	378.882
900	378.882

Material Boundary

X	Y
316.475	401.213
900	401.213

Material Boundary

X	Y
343.655	416.559
900	416.559



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Andesite & Rhyolite		130	Mohr-Coulomb	440	42	None	0
Basalt		145	Mohr-Coulomb	2000	49	None	0

BAJADA Geosciences, Inc.

SLIDEINTERPRET 8.032

Project	Ward Lake Quarry Expansion		
Analysis Description	200' Slope, dry, pseudostatic, 50 degree gross slope inclination		
Drawn By	J.Bianchin	Scale 1:1695	Company Bajada Geosciences, Inc.
Date	4/3/2020, 2:25:57 PM		File Name 200',dry,PS,50deg.slim

Slide Analysis Information

Ward Lake Quarry Expansion

Project Summary

Slide Modeler Version:	8.032
Compute Time:	00h:00m:04.56s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical

Analysis Methods Used
Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search

Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis: No
Staged pseudostatic analysis: No

Seismic Load Coefficient (Horizontal): 0.15

Materials

Property	Andesite & Rhyolite	Basalt
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	145
Cohesion [psf]	440	2000
Friction Angle [°]	42	49
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: spencer

FS	1.047750
Center:	-29.731, 594.421
Radius:	434.259
Left Slip Surface Endpoint:	152.022, 200.027
Right Slip Surface Endpoint:	373.598, 433.465
Resisting Moment:	4.7909e+08 lb-ft
Driving Moment:	4.57258e+08 lb-ft
Resisting Horizontal Force:	781962 lb
Driving Horizontal Force:	746328 lb
Total Slice Area:	9774 ft2
Surface Horizontal Width:	221.576 ft
Surface Average Height:	44.1112 ft

Valid/Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	9810
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.04775

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	4.51672	1001.89	25.0711	Andesite & Rhyolite	440	42	1003.6	1051.52	679.163	0	679.163	1148.67	1148.67
2	4.51672	2986.96	25.7308	Andesite & Rhyolite	440	42	1328.11	1391.53	1056.78	0	1056.78	1696.84	1696.84
3	4.51672	4934.29	26.3942	Andesite & Rhyolite	440	42	1623.45	1700.97	1400.45	0	1400.45	2206.13	2206.13
4	4.51672	6843.24	27.0615	Andesite & Rhyolite	440	42	1891.21	1981.52	1712.03	0	1712.03	2678.21	2678.21
5	4.51672	8713.12	27.7327	Andesite & Rhyolite	440	42	2132.95	2234.8	1993.34	0	1993.34	3114.72	3114.72
6	4.51672	10543.2	28.4081	Andesite & Rhyolite	440	42	2350.13	2462.35	2246.04	0	2246.04	3517.18	3517.18
7	4.51672	12332.8	29.0878	Andesite & Rhyolite	440	42	2544.14	2665.62	2471.81	0	2471.81	3887.15	3887.15
8	4.51672	14106.1	29.7721	Andesite & Rhyolite	440	42	2719.87	2849.74	2676.29	0	2676.29	4232.21	4232.21
9	4.51672	16111.3	30.461	Andesite & Rhyolite	440	42	2912.03	3051.08	2899.9	0	2899.9	4612.55	4612.55
10	4.51672	18148.6	31.1549	Andesite & Rhyolite	440	42	3091.92	3239.56	3109.24	0	3109.24	4978.45	4978.45
11	4.51672	20052.8	31.8539	Andesite & Rhyolite	440	42	3239.04	3393.7	3280.41	0	3280.41	5292.92	5292.92
12	4.51672	21644.7	32.5582	Andesite & Rhyolite	440	42	3334.07	3493.27	3391	0	3391	5519.8	5519.8
13	4.51672	23172.5	33.2681	Andesite & Rhyolite	440	42	3411	3573.88	3480.53	0	3480.53	5718.43	5718.43
14	4.51672	24653.1	33.9838	Andesite & Rhyolite	440	42	3473.16	3639	3552.86	0	3552.86	5894.1	5894.1
15	4.51672	26085.3	34.7056	Andesite & Rhyolite	440	42	3521.5	3689.65	3609.09	0	3609.09	6048.01	6048.01
16	4.51672	27618	35.4338	Andesite & Rhyolite	440	42	3572.88	3743.49	3668.89	0	3668.89	6211.18	6211.18
17	4.83462	31319.5	36.1947	Basalt	2000	49	7617.23	7980.95	5199.15	0	5199.15	10773	10773
18	4.83462	32937.7	36.9892	Basalt	2000	49	7587.21	7949.5	5171.82	0	5171.82	10887	10887
19	4.83462	34191	37.7921	Basalt	2000	49	7498.59	7856.65	5091.11	0	5091.11	10906	10906
20	4.83462	35241.2	38.6038	Basalt	2000	49	7378.36	7730.68	4981.6	0	4981.6	10872.5	10872.5
21	4.25623	31944.5	39.3752	Andesite & Rhyolite	440	42	3569.89	3740.35	3665.42	0	3665.42	6595.17	6595.17
22	4.25623	32867.4	40.1055	Andesite & Rhyolite	440	42	3545.43	3714.72	3636.95	0	3636.95	6623.06	6623.06
23	4.25623	33751.1	40.8438	Andesite & Rhyolite	440	42	3515.67	3683.54	3602.31	0	3602.31	6641.65	6641.65
24	4.25623	34813.5	41.5904	Andesite & Rhyolite	440	42	3499.59	3666.7	3583.61	0	3583.61	6689.64	6689.64
25	4.25623	35908.7	42.3457	Andesite & Rhyolite	440	42	3484.06	3650.42	3565.54	0	3565.54	6740.87	6740.87
26	4.25623	36880.3	43.1102	Andesite & Rhyolite	440	42	3456.75	3621.81	3533.75	0	3533.75	6769.68	6769.68
27	4.25623	37549.1	43.8844	Andesite & Rhyolite	440	42	3405.17	3567.77	3473.74	0	3473.74	6748.83	6748.83
28	5.01251	44776.7	44.7395	Basalt	2000	49	6465.09	6773.8	4149.81	0	4149.81	10556.4	10556.4
29	5.01251	45102.3	45.6784	Basalt	2000	49	6251.17	6549.66	3954.96	0	3954.96	10355.9	10355.9
30	5.01251	45340.3	46.6332	Basalt	2000	49	6035.5	6323.7	3758.54	0	3758.54	10148.3	10148.3
31	4.68199	42937.2	47.5726	Andesite & Rhyolite	440	42	3074.99	3221.82	3089.53	0	3089.53	6453.84	6453.84
32	4.68199	43656.4	48.4965	Andesite & Rhyolite	440	42	3023.08	3167.43	3029.12	0	3029.12	6445.67	6445.67
33	4.68199	44101.6	49.4376	Andesite & Rhyolite	440	42	2957.87	3099.11	2953.24	0	2953.24	6408.84	6408.84
34	4.68199	44202.5	50.3971	Andesite &	440	42	2877.17	3014.55	2859.33	0	2859.33	6336.87	6336.87

				Rhyolite									
35	4.68199	44183.2	51.3765	Andesite & Rhyolite	440	42	2794.68	2928.13	2763.35	0	2763.35	6261.25	6261.25
36	5.17897	48420.8	52.4317	Basalt	2000	49	4924.52	5159.67	2746.66	0	2746.66	9148.61	9148.61
37	5.17897	46272.9	53.5674	Basalt	2000	49	4604.96	4824.85	2455.61	0	2455.61	8694.19	8694.19
38	4.11319	34674.5	54.6112	Andesite & Rhyolite	440	42	2338.81	2450.49	2232.87	0	2232.87	5525.27	5525.27
39	4.11319	32907.9	55.5596	Andesite & Rhyolite	440	42	2192.6	2297.3	2062.74	0	2062.74	5260.11	5260.11
40	4.11319	31025.9	56.5314	Andesite & Rhyolite	440	42	2046.96	2144.7	1893.26	0	1893.26	4989.56	4989.56
41	4.11319	29019.4	57.5289	Andesite & Rhyolite	440	42	1901.07	1991.85	1723.51	0	1723.51	4710.92	4710.92
42	4.29149	27765.3	58.5773	Basalt	2000	49	3285.44	3442.32	1253.79	0	1253.79	6631.42	6631.42
43	4.29149	24749.2	59.6812	Basalt	2000	49	3006.79	3150.36	999.995	0	999.995	6141.62	6141.62
44	3.97251	20168.9	60.7789	Andesite & Rhyolite	440	42	1385.32	1451.47	1123.35	0	1123.35	3599.94	3599.94
45	3.97251	17574.6	61.8716	Andesite & Rhyolite	440	42	1225.33	1283.84	937.18	0	937.18	3229.28	3229.28
46	3.97251	14800.6	63.0048	Andesite & Rhyolite	440	42	1058.39	1108.92	742.915	0	742.915	2820.54	2820.54
47	3.62662	10718.6	64.1305	Basalt	2000	49	2026.2	2122.95	106.88	0	106.88	4285.33	4285.33
48	3.62662	7649.13	65.2503	Basalt	2000	49	1777.23	1862.1	-119.878	0	-119.878	3735.29	3735.29
49	3.58231	4549.85	66.4124	Andesite & Rhyolite	440	42	490.183	513.589	81.7289	0	81.7289	1204.37	1204.37
50	3.58231	1555.2	67.6238	Andesite & Rhyolite	440	42	567.3	594.389	171.467	0	171.467	1549.46	1549.46

Query 1 (spencer) - Safety Factor: 1.04775

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	4.51672	1001.89	25.0711	Andesite & Rhyolite	440	42	1003.6	1051.52	679.163	0	679.163	1148.67	1148.67
2	4.51672	2986.96	25.7308	Andesite & Rhyolite	440	42	1328.11	1391.53	1056.78	0	1056.78	1696.84	1696.84
3	4.51672	4934.29	26.3942	Andesite & Rhyolite	440	42	1623.45	1700.97	1400.45	0	1400.45	2206.13	2206.13
4	4.51672	6843.24	27.0615	Andesite & Rhyolite	440	42	1891.21	1981.52	1712.03	0	1712.03	2678.21	2678.21
5	4.51672	8713.12	27.7327	Andesite & Rhyolite	440	42	2132.95	2234.8	1993.34	0	1993.34	3114.72	3114.72
6	4.51672	10543.2	28.4081	Andesite & Rhyolite	440	42	2350.13	2462.35	2246.04	0	2246.04	3517.18	3517.18
7	4.51672	12332.8	29.0878	Andesite & Rhyolite	440	42	2544.14	2665.62	2471.81	0	2471.81	3887.15	3887.15
8	4.51672	14106.1	29.7721	Andesite & Rhyolite	440	42	2719.87	2849.74	2676.29	0	2676.29	4232.21	4232.21
9	4.51672	16111.3	30.461	Andesite & Rhyolite	440	42	2912.03	3051.08	2899.9	0	2899.9	4612.55	4612.55
10	4.51672	18148.6	31.1549	Andesite & Rhyolite	440	42	3091.92	3239.56	3109.24	0	3109.24	4978.45	4978.45
11	4.51672	20052.8	31.8539	Andesite & Rhyolite	440	42	3239.04	3393.7	3280.41	0	3280.41	5292.92	5292.92
12	4.51672	21644.7	32.5582	Andesite & Rhyolite	440	42	3334.07	3493.27	3391	0	3391	5519.8	5519.8
13	4.51672	23172.5	33.2681	Andesite & Rhyolite	440	42	3411	3573.88	3480.53	0	3480.53	5718.43	5718.43
14	4.51672	24653.1	33.9838	Andesite & Rhyolite	440	42	3473.16	3639	3552.86	0	3552.86	5894.1	5894.1
15	4.51672	26085.3	34.7056	Andesite & Rhyolite	440	42	3521.5	3689.65	3609.09	0	3609.09	6048.01	6048.01
16	4.51672	27618	35.4338	Andesite & Rhyolite	440	42	3572.88	3743.49	3668.89	0	3668.89	6211.18	6211.18

17	4.83462	31319.5	36.1947	Basalt	2000	49	7617.23	7980.95	5199.15	0	5199.15	10773	10773
18	4.83462	32937.7	36.9892	Basalt	2000	49	7587.21	7949.5	5171.82	0	5171.82	10887	10887
19	4.83462	34191	37.7921	Basalt	2000	49	7498.59	7856.65	5091.11	0	5091.11	10906	10906
20	4.83462	35241.2	38.6038	Basalt	2000	49	7378.36	7730.68	4981.6	0	4981.6	10872.5	10872.5
21	4.25623	31944.5	39.3752	Andesite & Rhyolite	440	42	3569.89	3740.35	3665.42	0	3665.42	6595.17	6595.17
22	4.25623	32867.4	40.1055	Andesite & Rhyolite	440	42	3545.43	3714.72	3636.95	0	3636.95	6623.06	6623.06
23	4.25623	33751.1	40.8438	Andesite & Rhyolite	440	42	3515.67	3683.54	3602.31	0	3602.31	6641.65	6641.65
24	4.25623	34813.5	41.5904	Andesite & Rhyolite	440	42	3499.59	3666.7	3583.61	0	3583.61	6689.64	6689.64
25	4.25623	35908.7	42.3457	Andesite & Rhyolite	440	42	3484.06	3650.42	3565.54	0	3565.54	6740.87	6740.87
26	4.25623	36880.3	43.1102	Andesite & Rhyolite	440	42	3456.75	3621.81	3533.75	0	3533.75	6769.68	6769.68
27	4.25623	37549.1	43.8844	Andesite & Rhyolite	440	42	3405.17	3567.77	3473.74	0	3473.74	6748.83	6748.83
28	5.01251	44776.7	44.7395	Basalt	2000	49	6465.09	6773.8	4149.81	0	4149.81	10556.4	10556.4
29	5.01251	45102.3	45.6784	Basalt	2000	49	6251.17	6549.66	3954.96	0	3954.96	10355.9	10355.9
30	5.01251	45340.3	46.6332	Basalt	2000	49	6035.5	6323.7	3758.54	0	3758.54	10148.3	10148.3
31	4.68199	42937.2	47.5726	Andesite & Rhyolite	440	42	3074.99	3221.82	3089.53	0	3089.53	6453.84	6453.84
32	4.68199	43656.4	48.4965	Andesite & Rhyolite	440	42	3023.08	3167.43	3029.12	0	3029.12	6445.67	6445.67
33	4.68199	44101.6	49.4376	Andesite & Rhyolite	440	42	2957.87	3099.11	2953.24	0	2953.24	6408.84	6408.84
34	4.68199	44202.5	50.3971	Andesite & Rhyolite	440	42	2877.17	3014.55	2859.33	0	2859.33	6336.87	6336.87
35	4.68199	44183.2	51.3765	Andesite & Rhyolite	440	42	2794.68	2928.13	2763.35	0	2763.35	6261.25	6261.25
36	5.17897	48420.8	52.4317	Basalt	2000	49	4924.52	5159.67	2746.66	0	2746.66	9148.61	9148.61
37	5.17897	46272.9	53.5674	Basalt	2000	49	4604.96	4824.85	2455.61	0	2455.61	8694.19	8694.19
38	4.11319	34674.5	54.6112	Andesite & Rhyolite	440	42	2338.81	2450.49	2232.87	0	2232.87	5525.27	5525.27
39	4.11319	32907.9	55.5596	Andesite & Rhyolite	440	42	2192.6	2297.3	2062.74	0	2062.74	5260.11	5260.11
40	4.11319	31025.9	56.5314	Andesite & Rhyolite	440	42	2046.96	2144.7	1893.26	0	1893.26	4989.56	4989.56
41	4.11319	29019.4	57.5289	Andesite & Rhyolite	440	42	1901.07	1991.85	1723.51	0	1723.51	4710.92	4710.92
42	4.29149	27765.3	58.5773	Basalt	2000	49	3285.44	3442.32	1253.79	0	1253.79	6631.42	6631.42
43	4.29149	24749.2	59.6812	Basalt	2000	49	3006.79	3150.36	999.995	0	999.995	6141.62	6141.62
44	3.97251	20168.9	60.7789	Andesite & Rhyolite	440	42	1385.32	1451.47	1123.35	0	1123.35	3599.94	3599.94
45	3.97251	17574.6	61.8716	Andesite & Rhyolite	440	42	1225.33	1283.84	937.18	0	937.18	3229.28	3229.28
46	3.97251	14800.6	63.0048	Andesite & Rhyolite	440	42	1058.39	1108.92	742.915	0	742.915	2820.54	2820.54
47	3.62662	10718.6	64.1305	Basalt	2000	49	2026.2	2122.95	106.88	0	106.88	4285.33	4285.33
48	3.62662	7649.13	65.2503	Basalt	2000	49	1777.23	1862.1	-119.878	0	-119.878	3735.29	3735.29
49	3.58231	4549.85	66.4124	Andesite & Rhyolite	440	42	490.183	513.589	81.7289	0	81.7289	1204.37	1204.37
50	3.58231	1555.2	67.6238	Andesite & Rhyolite	440	42	567.3	594.389	171.467	0	171.467	1549.46	1549.46

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.04775

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	152.022	200.027	0	0	0

2	156.539	202.14	2934.44	4702.02	58.0325
3	161.055	204.317	6167.34	9882.28	58.0325
4	165.572	206.558	9599.38	15381.6	58.0325
5	170.089	208.866	13139.7	21054.4	58.0324
6	174.606	211.24	16705.2	26767.8	58.0326
7	179.122	213.683	20220.7	32400.8	58.0325
8	183.639	216.196	23617.6	37843.8	58.0325
9	188.156	218.78	26835.8	43000.5	58.0325
10	192.672	221.436	29830.4	47798.9	58.0325
11	197.189	224.167	32542.9	52145.3	58.0325
12	201.706	226.973	34916.2	55948.2	58.0325
13	206.223	229.857	36905.4	59135.6	58.0325
14	210.739	232.82	38477.3	61654.4	58.0325
15	215.256	235.865	39603.7	63459.2	58.0325
16	219.773	238.993	40260.3	64511.4	58.0325
17	224.289	242.207	40417.1	64762.6	58.0325
18	229.124	245.745	54045.4	86600	58.0325
19	233.959	249.387	66845.1	107110	58.0326
20	238.793	253.136	78777.1	126229	58.0325
21	243.628	256.996	89830.1	143940	58.0325
22	247.884	260.489	87385.1	140022	58.0325
23	252.14	264.073	84463.7	135341	58.0325
24	256.397	267.753	81066.1	129897	58.0325
25	260.653	271.531	77158.5	123635	58.0324
26	264.909	275.41	72727	116535	58.0326
27	269.165	279.394	67785.2	108616	58.0325
28	273.422	283.488	62383.7	99961	58.0325
29	278.434	288.455	67366.8	107946	58.0326
30	283.447	293.587	71545.1	114641	58.0326
31	288.459	298.894	74963.6	120118	58.0324
32	293.141	304.017	67052.1	107441	58.0324
33	297.823	309.308	58588.3	93879.4	58.0325
34	302.505	314.778	49627.8	79521.4	58.0325
35	307.187	320.437	40248.3	64492.1	58.0325
36	311.869	326.297	30473.9	48830.1	58.0325
37	317.048	333.03	30148.1	48308.1	58.0326
38	322.227	340.046	29757.8	47682.6	58.0325
39	326.34	345.836	21219.8	34001.7	58.0325
40	330.453	351.834	12903.6	20676.1	58.0324
41	334.567	358.056	4865.32	7795.97	58.0325
42	338.68	364.52	-2830.9	-4536.11	58.0325
43	342.971	371.544	-1744.28	-2794.96	58.0325
44	347.263	378.882	71.0074	113.779	58.0325
45	351.235	385.984	-5444.94	-8724.74	58.0325
46	355.208	393.415	-10191.8	-16330.9	58.0325
47	359.18	401.213	-14013	-22453.8	58.0325
48	362.807	408.692	-9093.21	-14570.6	58.0326
49	366.433	416.559	-2870.89	-4600.19	58.0325
50	370.016	424.763	-2473.02	-3962.66	58.0325
51	373.598	433.465	0	0	0

Query 1 (spencer) - Safety Factor: 1.04775

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	152.022	200.027	0	0	0
2	156.539	202.14	2934.44	4702.02	58.0325
3	161.055	204.317	6167.34	9882.28	58.0325
4	165.572	206.558	9599.38	15381.6	58.0325
5	170.089	208.866	13139.7	21054.4	58.0324
6	174.606	211.24	16705.2	26767.8	58.0326
7	179.122	213.683	20220.7	32400.8	58.0325

8	183.639	216.196	23617.6	37843.8	58.0325
9	188.156	218.78	26835.8	43000.5	58.0325
10	192.672	221.436	29830.4	47798.9	58.0325
11	197.189	224.167	32542.9	52145.3	58.0325
12	201.706	226.973	34916.2	55948.2	58.0325
13	206.223	229.857	36905.4	59135.6	58.0325
14	210.739	232.82	38477.3	61654.4	58.0325
15	215.256	235.865	39603.7	63459.2	58.0325
16	219.773	238.993	40260.3	64511.4	58.0325
17	224.289	242.207	40417.1	64762.6	58.0325
18	229.124	245.745	54045.4	86600	58.0325
19	233.959	249.387	66845.1	107110	58.0326
20	238.793	253.136	78777.1	126229	58.0325
21	243.628	256.996	89830.1	143940	58.0325
22	247.884	260.489	87385.1	140022	58.0325
23	252.14	264.073	84463.7	135341	58.0325
24	256.397	267.753	81066.1	129897	58.0325
25	260.653	271.531	77158.5	123635	58.0324
26	264.909	275.41	72727	116535	58.0326
27	269.165	279.394	67785.2	108616	58.0325
28	273.422	283.488	62383.7	99961	58.0325
29	278.434	288.455	67366.8	107946	58.0326
30	283.447	293.587	71545.1	114641	58.0326
31	288.459	298.894	74963.6	120118	58.0324
32	293.141	304.017	67052.1	107441	58.0324
33	297.823	309.308	58588.3	93879.4	58.0325
34	302.505	314.778	49627.8	79521.4	58.0325
35	307.187	320.437	40248.3	64492.1	58.0325
36	311.869	326.297	30473.9	48830.1	58.0325
37	317.048	333.03	30148.1	48308.1	58.0326
38	322.227	340.046	29757.8	47682.6	58.0325
39	326.34	345.836	21219.8	34001.7	58.0325
40	330.453	351.834	12903.6	20676.1	58.0324
41	334.567	358.056	4865.32	7795.97	58.0325
42	338.68	364.52	-2830.9	-4536.11	58.0325
43	342.971	371.544	-1744.28	-2794.96	58.0325
44	347.263	378.882	71.0074	113.779	58.0325
45	351.235	385.984	-5444.94	-8724.74	58.0325
46	355.208	393.415	-10191.8	-16330.9	58.0325
47	359.18	401.213	-14013	-22453.8	58.0325
48	362.807	408.692	-9093.21	-14570.6	58.0326
49	366.433	416.559	-2870.89	-4600.19	58.0325
50	370.016	424.763	-2473.02	-3962.66	58.0325
51	373.598	433.465	0	0	0

Entity Information

External Boundary

X	Y
-119.082	0
900	0
900	242.207
900	256.996
900	283.488
900	298.894
900	326.297
900	340.046
900	364.52
900	378.882

900	401.213
900	416.559
900	548
700	548
628.434	569.928
580	550
343.655	416.559
316.475	401.213
298.222	378.882
286.481	364.52
266.476	340.046
255.237	326.297
232.838	298.894
220.244	283.488
198.589	256.996
186.501	242.207
152	200
-119.082	200

Material Boundary

X	Y
186.501	242.207
900	242.207

Material Boundary

X	Y
198.589	256.996
900	256.996

Material Boundary

X	Y
220.244	283.488
900	283.488

Material Boundary

X	Y
232.838	298.894
900	298.894

Material Boundary

X	Y
255.237	326.297
900	326.297

Material Boundary

X	Y
266.476	340.046
900	340.046

Material Boundary

X	Y
286.481	364.52

900	364.52

Material Boundary

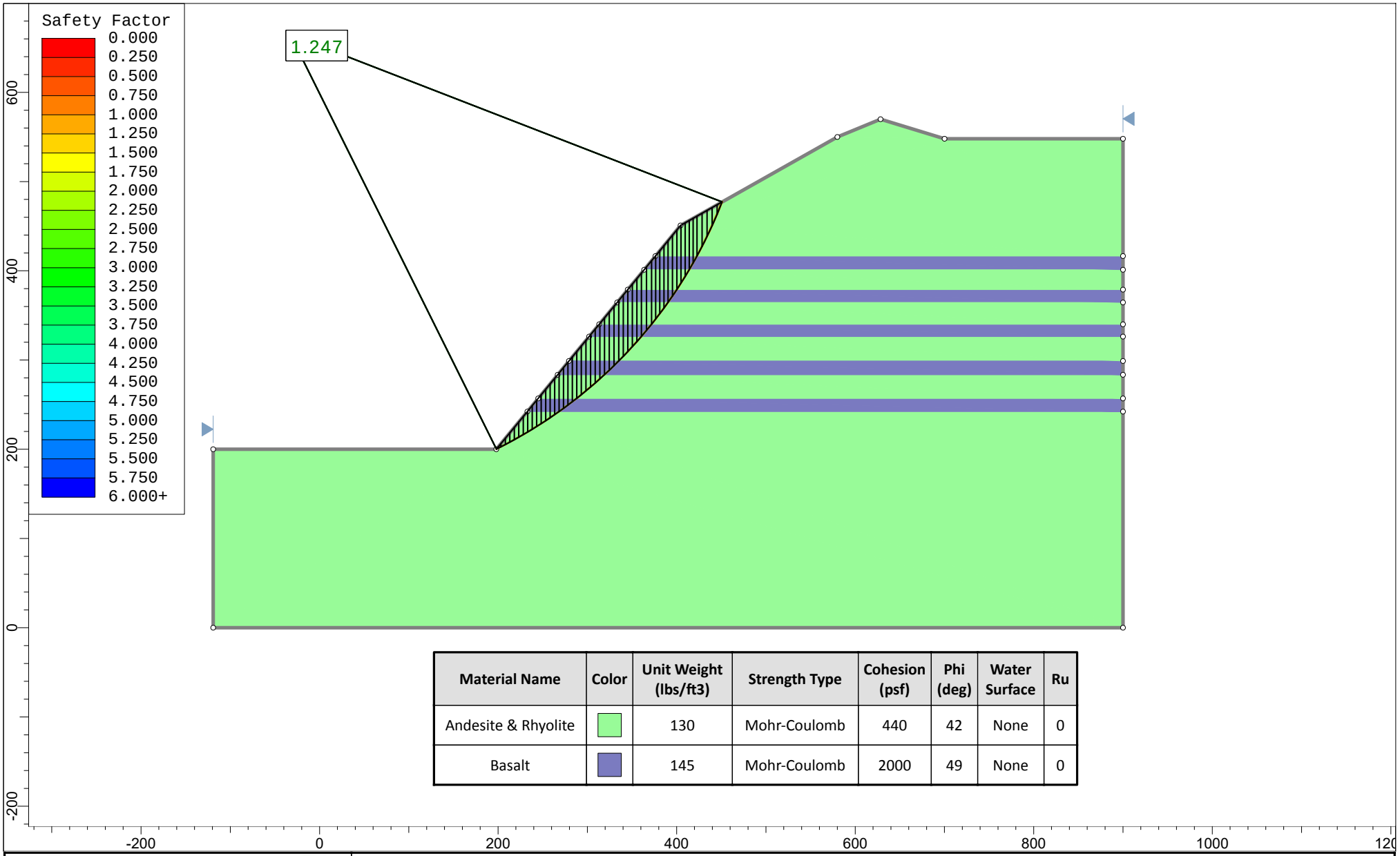
X	Y
298.222	378.882
900	378.882

Material Boundary

X	Y
316.475	401.213
900	401.213

Material Boundary

X	Y
343.655	416.559
900	416.559



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Andesite & Rhyolite		130	Mohr-Coulomb	440	42	None	0
Basalt		145	Mohr-Coulomb	2000	49	None	0

BAJADA Geosciences, Inc.

SLIDEINTERPRET 8.032

Project	Ward Lake Quarry Expansion			
Analysis Description	250' Slope, dry, static, 50 degree gross slope inclination			
Drawn By	J.Bianchin	Scale	1:1782	Company: Bajada Geosciences, Inc.
Date	4/3/2020, 2:25:57 PM			File Name: 250',dry,static,50deg.slim

Slide Analysis Information

Ward Lake Quarry Expansion

Project Summary

Slide Modeler Version:	8.032
Compute Time:	00h:00m:03.640s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical

Analysis Methods Used
Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search

Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Property	Andesite & Rhyolite	Basalt
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	145
Cohesion [psf]	440	2000
Friction Angle [°]	42	49
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: spencer

FS	1.247020
Center:	-32.840, 664.766
Radius:	518.888
Left Slip Surface Endpoint:	198.075, 200.091
Right Slip Surface Endpoint:	450.934, 477.129
Resisting Moment:	7.46699e+08 lb-ft
Driving Moment:	5.98788e+08 lb-ft
Resisting Horizontal Force:	990284 lb
Driving Horizontal Force:	794122 lb
Total Slice Area:	11952.6 ft2
Surface Horizontal Width:	252.859 ft
Surface Average Height:	47.2699 ft

Valid/Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	10048
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.24702

Slice	Width	Weight	Angle	Base	Base	Base	Shear	Shear	Base	Pore	Effective	Base	Effective

Number	[ft]	[lbs]	of Slice Base [degrees]	Material	Cohesion [psf]	Friction Angle [degrees]	Stress [psf]	Strength [psf]	Normal Stress [psf]	Pressure [psf]	Normal Stress [psf]	Vertical Stress [psf]	Vertical Stress [psf]
1	5.01649	1164.19	26.7346	Andesite & Rhyolite	440	42	590.871	736.828	329.66	0	329.66	627.284	627.284
2	5.01649	3470.18	27.3566	Andesite & Rhyolite	440	42	864.239	1077.72	708.264	0	708.264	1155.41	1155.41
3	5.01649	5731.02	27.982	Andesite & Rhyolite	440	42	1121.67	1398.75	1064.8	0	1064.8	1660.75	1660.75
4	5.01649	7945.93	28.6111	Andesite & Rhyolite	440	42	1363.71	1700.57	1400	0	1400	2143.86	2143.86
5	5.01649	10114.1	29.244	Andesite & Rhyolite	440	42	1590.83	1983.8	1714.56	0	1714.56	2605.25	2605.25
6	5.01649	12234.6	29.8809	Andesite & Rhyolite	440	42	1803.53	2249.04	2009.14	0	2009.14	3045.41	3045.41
7	5.01649	14308.6	30.5218	Andesite & Rhyolite	440	42	2002.47	2497.12	2284.67	0	2284.67	3465.25	3465.25
8	5.01649	16601	31.167	Andesite & Rhyolite	440	42	2216.93	2764.55	2581.68	0	2581.68	3922.55	3922.55
9	5.01649	19031.8	31.8166	Andesite & Rhyolite	440	42	2437.23	3039.28	2886.8	0	2886.8	4398.93	4398.93
10	5.01649	21309	32.4709	Andesite & Rhyolite	440	42	2632.28	3282.5	3156.92	0	3156.92	4831.99	4831.99
11	5.01649	23202.2	33.1299	Andesite & Rhyolite	440	42	2779.59	3466.21	3360.94	0	3360.94	5175	5175
12	5.01649	25016.1	33.7939	Andesite & Rhyolite	440	42	2912.25	3631.63	3544.66	0	3544.66	5493.79	5493.79
13	5.01649	26774.9	34.4631	Andesite & Rhyolite	440	42	3033.21	3782.47	3712.19	0	3712.19	5793.98	5793.98
14	5.01649	28501.1	35.1377	Andesite & Rhyolite	440	42	3145.09	3921.99	3867.14	0	3867.14	6080.64	6080.64
15	4.93515	29856.3	35.8124	Basalt	2000	49	5589.57	6970.3	4320.63	0	4320.63	8353.78	8353.78
16	4.93515	31568.5	36.4873	Basalt	2000	49	5695.75	7102.72	4435.73	0	4435.73	8648.41	8648.41
17	4.93515	33088.3	37.1681	Basalt	2000	49	5771.09	7196.66	4517.39	0	4517.39	8892.82	8892.82
18	4.93515	34238.4	37.8551	Basalt	2000	49	5796.35	7228.16	4544.78	0	4544.78	9049.82	9049.82
19	5.17792	37230.2	38.5658	Andesite & Rhyolite	440	42	3531.05	4403.29	4401.69	0	4401.69	7217.04	7217.04
20	5.17792	38650.5	39.3009	Andesite & Rhyolite	440	42	3579.63	4463.87	4468.96	0	4468.96	7398.94	7398.94
21	5.17792	40021.1	40.0437	Andesite & Rhyolite	440	42	3619.95	4514.15	4524.8	0	4524.8	7567.01	7567.01
22	5.17792	41665.4	40.7948	Andesite & Rhyolite	440	42	3678.01	4586.55	4605.21	0	4605.21	7779.39	7779.39
23	5.17792	43337	41.5544	Andesite & Rhyolite	440	42	3733.23	4655.41	4681.69	0	4681.69	7990.89	7990.89
24	5.17792	44623.3	42.3231	Andesite & Rhyolite	440	42	3754.04	4681.36	4710.51	0	4710.51	8129.19	8129.19
25	5.32993	46796.1	43.1128	Basalt	2000	49	5919	7381.11	4677.73	0	4677.73	10219.1	10219.1
26	5.32993	47372.8	43.9245	Basalt	2000	49	5838.4	7280.6	4590.36	0	4590.36	10213.6	10213.6
27	5.32993	47864	44.7474	Basalt	2000	49	5749.16	7169.32	4493.62	0	4493.62	10192.3	10192.3
28	5.07091	46427.1	45.5616	Andesite & Rhyolite	440	42	3628.64	4524.99	4536.84	0	4536.84	8237.32	8237.32
29	5.07091	47501.2	46.3672	Andesite & Rhyolite	440	42	3622.68	4517.56	4528.59	0	4528.59	8328.42	8328.42
30	5.07091	48235.1	47.1849	Andesite & Rhyolite	440	42	3590.34	4477.22	4483.79	0	4483.79	8358.95	8358.95
31	5.07091	48636.8	48.0153	Andesite & Rhyolite	440	42	3533.7	4406.6	4405.36	0	4405.36	8332.05	8332.05
32	5.07091	48929.2	48.8594	Andesite & Rhyolite	440	42	3468.64	4325.46	4315.25	0	4315.25	8285.74	8285.74
33	5.71298	55101.4	49.7734	Basalt	2000	49	5263.94	6564.24	3967.63	0	3967.63	10190.8	10190.8
34	5.71298	55071.6	50.7604	Basalt	2000	49	5118	6382.25	3809.44	0	3809.44	10075.9	10075.9
35	4.61856	44629.5	51.6702	Andesite & Rhyolite	440	42	3200.1	3990.59	3943.34	0	3943.34	7991.04	7991.04
36	4.61856	44607	52.5002	Andesite &	440	42	3120.05	3890.77	3832.46	0	3832.46	7898.63	7898.63

				Rhyolite									
37	4.61856	44307.2	53.3462	Andesite & Rhyolite	440	42	3022.4	3768.99	3697.22	0	3697.22	7758.92	7758.92
38	4.61856	43891.2	54.2094	Andesite & Rhyolite	440	42	2918.01	3638.82	3552.65	0	3552.65	7599.98	7599.98
39	4.91603	45860.7	55.12	Basalt	2000	49	4418.33	5509.74	3050.97	0	3050.97	9389.22	9389.22
40	4.91603	44560.1	56.0811	Basalt	2000	49	4213.23	5253.98	2828.64	0	2828.64	9094.11	9094.11
41	4.64749	41000.5	57.0391	Andesite & Rhyolite	440	42	2494.13	3110.23	2965.59	0	2965.59	6811.96	6811.96
42	4.64749	38919.7	57.9948	Andesite & Rhyolite	440	42	2307.83	2877.91	2707.57	0	2707.57	6400.13	6400.13
43	4.64749	35924.3	58.9768	Andesite & Rhyolite	440	42	2082.36	2596.74	2395.3	0	2395.3	5857.76	5857.76
44	4.35017	30505.5	59.9544	Basalt	2000	49	3194.74	3983.91	1724.59	0	1724.59	7247.9	7247.9
45	4.35017	27054.6	60.9284	Basalt	2000	49	2897.2	3612.87	1402.05	0	1402.05	6613.37	6613.37
46	5.62013	29945.6	62.0855	Andesite & Rhyolite	440	42	1372.76	1711.86	1412.54	0	1412.54	4003.65	4003.65
47	5.62013	24281.3	63.4423	Andesite & Rhyolite	440	42	1113.71	1388.81	1053.76	0	1053.76	3281.89	3281.89
48	5.62013	18115.9	64.8669	Andesite & Rhyolite	440	42	862.066	1075.01	705.254	0	705.254	2542.81	2542.81
49	5.62013	11364.9	66.3717	Andesite & Rhyolite	440	42	621.11	774.536	371.54	0	371.54	1791.29	1791.29
50	5.62013	3915.56	67.9733	Andesite & Rhyolite	440	42	365.279	455.51	17.2257	0	17.2257	920.11	920.11

Query 1 (spencer) - Safety Factor: 1.24702

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	5.01649	1164.19	26.7346	Andesite & Rhyolite	440	42	590.871	736.828	329.66	0	329.66	627.284	627.284
2	5.01649	3470.18	27.3566	Andesite & Rhyolite	440	42	864.239	1077.72	708.264	0	708.264	1155.41	1155.41
3	5.01649	5731.02	27.982	Andesite & Rhyolite	440	42	1121.67	1398.75	1064.8	0	1064.8	1660.75	1660.75
4	5.01649	7945.93	28.6111	Andesite & Rhyolite	440	42	1363.71	1700.57	1400	0	1400	2143.86	2143.86
5	5.01649	10114.1	29.244	Andesite & Rhyolite	440	42	1590.83	1983.8	1714.56	0	1714.56	2605.25	2605.25
6	5.01649	12234.6	29.8809	Andesite & Rhyolite	440	42	1803.53	2249.04	2009.14	0	2009.14	3045.41	3045.41
7	5.01649	14308.6	30.5218	Andesite & Rhyolite	440	42	2002.47	2497.12	2284.67	0	2284.67	3465.25	3465.25
8	5.01649	16601	31.167	Andesite & Rhyolite	440	42	2216.93	2764.55	2581.68	0	2581.68	3922.55	3922.55
9	5.01649	19031.8	31.8166	Andesite & Rhyolite	440	42	2437.23	3039.28	2886.8	0	2886.8	4398.93	4398.93
10	5.01649	21309	32.4709	Andesite & Rhyolite	440	42	2632.28	3282.5	3156.92	0	3156.92	4831.99	4831.99
11	5.01649	23202.2	33.1299	Andesite & Rhyolite	440	42	2779.59	3466.21	3360.94	0	3360.94	5175	5175
12	5.01649	25016.1	33.7939	Andesite & Rhyolite	440	42	2912.25	3631.63	3544.66	0	3544.66	5493.79	5493.79
13	5.01649	26774.9	34.4631	Andesite & Rhyolite	440	42	3033.21	3782.47	3712.19	0	3712.19	5793.98	5793.98
14	5.01649	28501.1	35.1377	Andesite & Rhyolite	440	42	3145.09	3921.99	3867.14	0	3867.14	6080.64	6080.64
15	4.93515	29856.3	35.8124	Basalt	2000	49	5589.57	6970.3	4320.63	0	4320.63	8353.78	8353.78
16	4.93515	31568.5	36.4873	Basalt	2000	49	5695.75	7102.72	4435.73	0	4435.73	8648.41	8648.41
17	4.93515	33088.3	37.1681	Basalt	2000	49	5771.09	7196.66	4517.39	0	4517.39	8892.82	8892.82
18	4.93515	34238.4	37.8551	Basalt	2000	49	5796.35	7228.16	4544.78	0	4544.78	9049.82	9049.82
19	5.17792	37230.2	38.5658	Andesite & Rhyolite	440	42	3531.05	4403.29	4401.69	0	4401.69	7217.04	7217.04

20	5.17792	38650.5	39.3009	Andesite & Rhyolite	440	42	3579.63	4463.87	4468.96	0	4468.96	7398.94	7398.94
21	5.17792	40021.1	40.0437	Andesite & Rhyolite	440	42	3619.95	4514.15	4524.8	0	4524.8	7567.01	7567.01
22	5.17792	41665.4	40.7948	Andesite & Rhyolite	440	42	3678.01	4586.55	4605.21	0	4605.21	7779.39	7779.39
23	5.17792	43337	41.5544	Andesite & Rhyolite	440	42	3733.23	4655.41	4681.69	0	4681.69	7990.89	7990.89
24	5.17792	44623.3	42.3231	Andesite & Rhyolite	440	42	3754.04	4681.36	4710.51	0	4710.51	8129.19	8129.19
25	5.32993	46796.1	43.1128	Basalt	2000	49	5919	7381.11	4677.73	0	4677.73	10219.1	10219.1
26	5.32993	47372.8	43.9245	Basalt	2000	49	5838.4	7280.6	4590.36	0	4590.36	10213.6	10213.6
27	5.32993	47864	44.7474	Basalt	2000	49	5749.16	7169.32	4493.62	0	4493.62	10192.3	10192.3
28	5.07091	46427.1	45.5616	Andesite & Rhyolite	440	42	3628.64	4524.99	4536.84	0	4536.84	8237.32	8237.32
29	5.07091	47501.2	46.3672	Andesite & Rhyolite	440	42	3622.68	4517.56	4528.59	0	4528.59	8328.42	8328.42
30	5.07091	48235.1	47.1849	Andesite & Rhyolite	440	42	3590.34	4477.22	4483.79	0	4483.79	8358.95	8358.95
31	5.07091	48636.8	48.0153	Andesite & Rhyolite	440	42	3533.7	4406.6	4405.36	0	4405.36	8332.05	8332.05
32	5.07091	48929.2	48.8594	Andesite & Rhyolite	440	42	3468.64	4325.46	4315.25	0	4315.25	8285.74	8285.74
33	5.71298	55101.4	49.7734	Basalt	2000	49	5263.94	6564.24	3967.63	0	3967.63	10190.8	10190.8
34	5.71298	55071.6	50.7604	Basalt	2000	49	5118	6382.25	3809.44	0	3809.44	10075.9	10075.9
35	4.61856	44629.5	51.6702	Andesite & Rhyolite	440	42	3200.1	3990.59	3943.34	0	3943.34	7991.04	7991.04
36	4.61856	44607	52.5002	Andesite & Rhyolite	440	42	3120.05	3890.77	3832.46	0	3832.46	7898.63	7898.63
37	4.61856	44307.2	53.3462	Andesite & Rhyolite	440	42	3022.4	3768.99	3697.22	0	3697.22	7758.92	7758.92
38	4.61856	43891.2	54.2094	Andesite & Rhyolite	440	42	2918.01	3638.82	3552.65	0	3552.65	7599.98	7599.98
39	4.91603	45860.7	55.12	Basalt	2000	49	4418.33	5509.74	3050.97	0	3050.97	9389.22	9389.22
40	4.91603	44560.1	56.0811	Basalt	2000	49	4213.23	5253.98	2828.64	0	2828.64	9094.11	9094.11
41	4.64749	41000.5	57.0391	Andesite & Rhyolite	440	42	2494.13	3110.23	2965.59	0	2965.59	6811.96	6811.96
42	4.64749	38919.7	57.9948	Andesite & Rhyolite	440	42	2307.83	2877.91	2707.57	0	2707.57	6400.13	6400.13
43	4.64749	35924.3	58.9768	Andesite & Rhyolite	440	42	2082.36	2596.74	2395.3	0	2395.3	5857.76	5857.76
44	4.35017	30505.5	59.9544	Basalt	2000	49	3194.74	3983.91	1724.59	0	1724.59	7247.9	7247.9
45	4.35017	27054.6	60.9284	Basalt	2000	49	2897.2	3612.87	1402.05	0	1402.05	6613.37	6613.37
46	5.62013	29945.6	62.0855	Andesite & Rhyolite	440	42	1372.76	1711.86	1412.54	0	1412.54	4003.65	4003.65
47	5.62013	24281.3	63.4423	Andesite & Rhyolite	440	42	1113.71	1388.81	1053.76	0	1053.76	3281.89	3281.89
48	5.62013	18115.9	64.8669	Andesite & Rhyolite	440	42	862.066	1075.01	705.254	0	705.254	2542.81	2542.81
49	5.62013	11364.9	66.3717	Andesite & Rhyolite	440	42	621.11	774.536	371.54	0	371.54	1791.29	1791.29
50	5.62013	3915.56	67.9733	Andesite & Rhyolite	440	42	365.279	455.51	17.2257	0	17.2257	920.11	920.11

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.24702

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	198.075	200.091	0	0	0
2	203.091	202.618	2139.62	1990.74	42.9357
3	208.108	205.213	4649.26	4325.74	42.9356

4	213.124	207.878	7454.29	6935.59	42.9356
5	218.141	210.615	10484.1	9754.55	42.9355
6	223.157	213.424	13671.8	12720.4	42.9355
7	228.174	216.306	16954.1	15774.3	42.9355
8	233.19	219.263	20271.4	18860.8	42.9356
9	238.207	222.298	23591.4	21949.8	42.9356
10	243.223	225.41	26868.1	24998.5	42.9356
11	248.24	228.602	30033.1	27943.3	42.9356
12	253.256	231.876	33013.5	30716.2	42.9355
13	258.273	235.234	35763.6	33275	42.9356
14	263.289	238.677	38242.4	35581.3	42.9356
15	268.306	242.207	40411.9	37599.8	42.9355
16	273.241	245.768	52691	49024.5	42.9356
17	278.176	249.418	64690.3	60188.8	42.9356
18	283.111	253.16	76350.9	71038	42.9356
19	288.046	256.996	87606.6	81510.5	42.9356
20	293.224	261.124	87770.6	81663.1	42.9356
21	298.402	265.362	87418.6	81335.5	42.9355
22	303.58	269.714	86526.5	80505.5	42.9356
23	308.758	274.182	85046.7	79128.7	42.9356
24	313.936	278.772	82944.5	77172.8	42.9356
25	319.114	283.488	80226.8	74644.2	42.9356
26	324.444	288.478	88523.9	82364	42.9356
27	329.774	293.611	96167.1	89475.3	42.9356
28	335.104	298.894	103157	95979.2	42.9357
29	340.175	304.065	98149.4	91319.7	42.9356
30	345.245	309.384	92485.5	86049.9	42.9356
31	350.316	314.858	86203.5	80205	42.9356
32	355.387	320.492	79350.6	73829	42.9356
33	360.458	326.297	71942.1	66936	42.9356
34	366.171	333.051	75303.9	70063.8	42.9355
35	371.884	340.046	77980.2	72554	42.9356
36	376.503	345.888	69766.2	64911.5	42.9356
37	381.121	351.907	61149.9	56894.8	42.9356
38	385.74	358.114	52201.5	48569.1	42.9356
39	390.358	364.52	42959	39969.7	42.9356
40	395.274	371.572	43226	40218.1	42.9356
41	400.19	378.882	43318.8	40304.4	42.9355
42	404.838	386.05	33688.5	31344.3	42.9356
43	409.485	393.486	24311.3	22619.6	42.9356
44	414.133	401.213	15506.8	14427.8	42.9357
45	418.483	408.734	16474	15327.7	42.9357
46	422.833	416.559	18142.8	16880.3	42.9355
47	428.453	427.167	10895.7	10137.5	42.9355
48	434.074	438.411	5324.5	4954	42.9356
49	439.694	450.391	1734.64	1613.93	42.9355
50	445.314	463.237	462.34	430.168	42.9356
51	450.934	477.129	0	0	0

Query 1 (spencer) - Safety Factor: 1.24702

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	198.075	200.091	0	0	0
2	203.091	202.618	2139.62	1990.74	42.9357
3	208.108	205.213	4649.26	4325.74	42.9356
4	213.124	207.878	7454.29	6935.59	42.9356
5	218.141	210.615	10484.1	9754.55	42.9355
6	223.157	213.424	13671.8	12720.4	42.9355
7	228.174	216.306	16954.1	15774.3	42.9355
8	233.19	219.263	20271.4	18860.8	42.9356
9	238.207	222.298	23591.4	21949.8	42.9356

10	243.223	225.41	26868.1	24998.5	42.9356
11	248.24	228.602	30033.1	27943.3	42.9356
12	253.256	231.876	33013.5	30716.2	42.9355
13	258.273	235.234	35763.6	33275	42.9356
14	263.289	238.677	38242.4	35581.3	42.9356
15	268.306	242.207	40411.9	37599.8	42.9355
16	273.241	245.768	52691	49024.5	42.9356
17	278.176	249.418	64690.3	60188.8	42.9356
18	283.111	253.16	76350.9	71038	42.9356
19	288.046	256.996	87606.6	81510.5	42.9356
20	293.224	261.124	87770.6	81663.1	42.9356
21	298.402	265.362	87418.6	81335.5	42.9355
22	303.58	269.714	86526.5	80505.5	42.9356
23	308.758	274.182	85046.7	79128.7	42.9356
24	313.936	278.772	82944.5	77172.8	42.9356
25	319.114	283.488	80226.8	74644.2	42.9356
26	324.444	288.478	88523.9	82364	42.9356
27	329.774	293.611	96167.1	89475.3	42.9356
28	335.104	298.894	103157	95979.2	42.9357
29	340.175	304.065	98149.4	91319.7	42.9356
30	345.245	309.384	92485.5	86049.9	42.9356
31	350.316	314.858	86203.5	80205	42.9356
32	355.387	320.492	79350.6	73829	42.9356
33	360.458	326.297	71942.1	66936	42.9356
34	366.171	333.051	75303.9	70063.8	42.9355
35	371.884	340.046	77980.2	72554	42.9356
36	376.503	345.888	69766.2	64911.5	42.9356
37	381.121	351.907	61149.9	56894.8	42.9356
38	385.74	358.114	52201.5	48569.1	42.9356
39	390.358	364.52	42959	39969.7	42.9356
40	395.274	371.572	43226	40218.1	42.9356
41	400.19	378.882	43318.8	40304.4	42.9355
42	404.838	386.05	33688.5	31344.3	42.9356
43	409.485	393.486	24311.3	22619.6	42.9356
44	414.133	401.213	15506.8	14427.8	42.9357
45	418.483	408.734	16474	15327.7	42.9357
46	422.833	416.559	18142.8	16880.3	42.9355
47	428.453	427.167	10895.7	10137.5	42.9355
48	434.074	438.411	5324.5	4954	42.9356
49	439.694	450.391	1734.64	1613.93	42.9355
50	445.314	463.237	462.34	430.168	42.9356
51	450.934	477.129	0	0	0

Entity Information

External Boundary

X	Y
-119.082	0
900	0
900	242.207
900	256.996
900	283.488
900	298.894
900	326.297
900	340.046
900	364.52
900	378.882
900	401.213
900	416.559

900	548
700	548
628.434	569.928
580	550
404.388	450.849
376.176	416.559
363.55	401.213
345.177	378.882
333.36	364.52
313.224	340.046
301.912	326.297
279.366	298.894
266.69	283.488
244.894	256.996
232.726	242.207
198	200
-119.082	200

Material Boundary

X	Y
232.726	242.207
900	242.207

Material Boundary

X	Y
244.894	256.996
900	256.996

Material Boundary

X	Y
266.69	283.488
900	283.488

Material Boundary

X	Y
279.366	298.894
900	298.894

Material Boundary

X	Y
301.912	326.297
900	326.297

Material Boundary

X	Y
313.224	340.046
900	340.046

Material Boundary

X	Y
333.36	364.52
900	364.52

Material Boundary

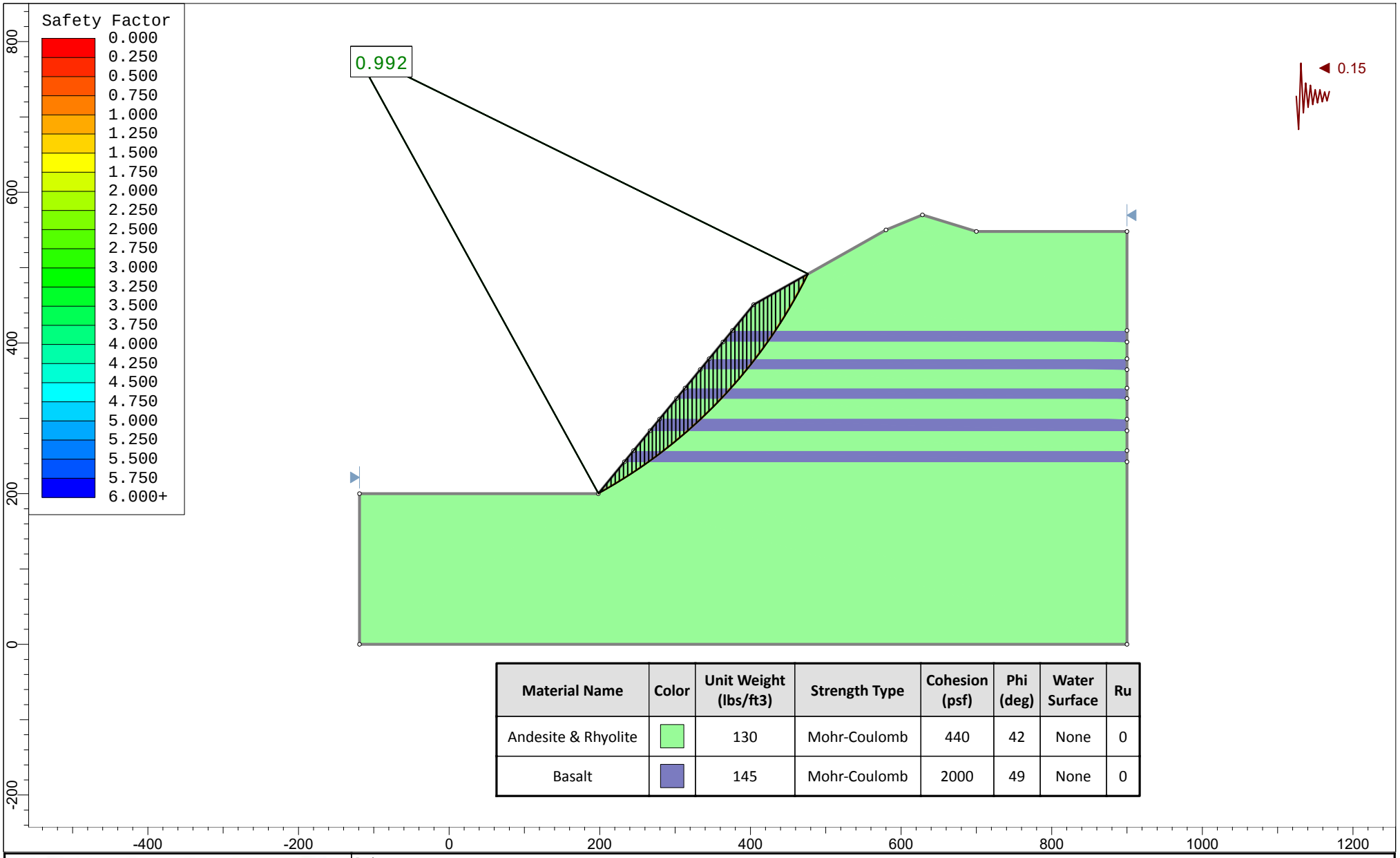
X	Y
345.177	378.882
900	378.882

Material Boundary

X	Y
363.55	401.213
900	401.213

Material Boundary

X	Y
376.176	416.559
900	416.559



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Andesite & Rhyolite		130	Mohr-Coulomb	440	42	None	0
Basalt		145	Mohr-Coulomb	2000	49	None	0

BAJADA Geosciences, Inc.

SLIDEINTERPRET 8.032

Project	Ward Lake Quarry Expansion			
Analysis Description	250' Slope, dry, pseudostatic, 50 degree gross slope inclination			
Drawn By	J.Bianchin	Scale	1:2113	Company: Bajada Geosciences, Inc.
Date	4/3/2020, 2:25:57 PM			File Name: 250',dry,PS,50deg.slim

Slide Analysis Information

Ward Lake Quarry Expansion

Project Summary

Slide Modeler Version:	8.032
Compute Time:	00h:00m:04.779s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical

Analysis Methods Used
Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search

Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis: No
Staged pseudostatic analysis: No

Seismic Load Coefficient (Horizontal): 0.15

Materials

Property	Andesite & Rhyolite	Basalt
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	145
Cohesion [psf]	440	2000
Friction Angle [°]	42	49
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: spencer

FS	0.992364
Center:	-125.329, 787.995
Radius:	670.922
Left Slip Surface Endpoint:	198.183, 200.223
Right Slip Surface Endpoint:	476.577, 491.607
Resisting Moment:	9.53963e+08 lb-ft
Driving Moment:	9.61304e+08 lb-ft
Resisting Horizontal Force:	1.00795e+06 lb
Driving Horizontal Force:	1.01571e+06 lb
Total Slice Area:	13200.6 ft2
Surface Horizontal Width:	278.394 ft
Surface Average Height:	47.417 ft

Valid/Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	10392
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 0.992364

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	5.55693	1322.38	29.1001	Andesite & Rhyolite	440	42	940.106	932.927	547.45	0	547.45	1070.71	1070.71
2	5.55693	3942.02	29.6446	Andesite & Rhyolite	440	42	1253.95	1244.38	893.353	0	893.353	1606.99	1606.99
3	5.55693	6511	30.1922	Andesite & Rhyolite	440	42	1544.44	1532.65	1213.51	0	1213.51	2112.12	2112.12
4	5.55693	9028.49	30.7428	Andesite & Rhyolite	440	42	1812.6	1798.76	1509.05	0	1509.05	2587.13	2587.13
5	5.55693	11493.6	31.2965	Andesite & Rhyolite	440	42	2059.39	2043.66	1781.04	0	1781.04	3033	3033
6	5.55693	13905.4	31.8536	Andesite & Rhyolite	440	42	2285.75	2268.3	2030.53	0	2030.53	3450.72	3450.72
7	5.55693	16435.9	32.414	Andesite & Rhyolite	440	42	2511.54	2492.36	2279.38	0	2279.38	3874.11	3874.11
8	5.55693	19288	32.9779	Andesite & Rhyolite	440	42	2757.79	2736.73	2550.78	0	2550.78	4340.19	4340.19
9	5.55693	21997.5	33.5454	Andesite & Rhyolite	440	42	2974.18	2951.47	2789.28	0	2789.28	4761.24	4761.24
10	5.55693	24232.4	34.1167	Andesite & Rhyolite	440	42	3129.01	3105.12	2959.91	0	2959.91	5079.74	5079.74
11	5.55693	26362.3	34.6919	Andesite & Rhyolite	440	42	3262.95	3238.03	3107.52	0	3107.52	5366.21	5366.21
12	5.55693	28432.3	35.2711	Andesite & Rhyolite	440	42	3381.54	3355.72	3238.24	0	3238.24	5629.95	5629.95
13	4.97447	27115.6	35.8237	Basalt	2000	49	7375.86	7319.54	4624.2	0	4624.2	9948.48	9948.48
14	4.97447	28831	36.3494	Basalt	2000	49	7474.93	7417.85	4709.67	0	4709.67	10210.5	10210.5
15	4.97447	30524.2	36.8787	Basalt	2000	49	7559.98	7502.25	4783.03	0	4783.03	10454.8	10454.8
16	4.97447	31904.7	37.4116	Basalt	2000	49	7591.06	7533.09	4809.84	0	4809.84	10616.1	10616.1
17	5.364	35844.9	37.9696	Andesite & Rhyolite	440	42	3752.28	3723.63	3646.84	0	3646.84	6575.24	6575.24
18	5.364	37441.1	38.553	Andesite & Rhyolite	440	42	3796.77	3767.78	3695.88	0	3695.88	6721.7	6721.7
19	5.364	38974.7	39.1412	Andesite & Rhyolite	440	42	3831.03	3801.78	3733.64	0	3733.64	6851.61	6851.61
20	5.364	40613.4	39.7343	Andesite & Rhyolite	440	42	3869.2	3839.65	3775.7	0	3775.7	6991.88	6991.88
21	5.364	42531.6	40.3326	Andesite & Rhyolite	440	42	3924.44	3894.47	3836.57	0	3836.57	7168.58	7168.58
22	5.364	44265.9	40.9363	Andesite & Rhyolite	440	42	3959.98	3929.74	3875.75	0	3875.75	7310.38	7310.38
23	5.66	47893	41.5624	Basalt	2000	49	7578.69	7520.82	4799.17	0	4799.17	11519	11519
24	5.66	48788.6	42.2117	Basalt	2000	49	7465.92	7408.91	4701.9	0	4701.9	11474.4	11474.4
25	5.66	49590.6	42.8678	Basalt	2000	49	7343.23	7287.16	4596.06	0	4596.06	11412.1	11412.1
26	5.50805	49479.1	43.5219	Andesite & Rhyolite	440	42	3834.44	3805.16	3737.39	0	3737.39	7378.93	7378.93
27	5.50805	51037.1	44.1742	Andesite & Rhyolite	440	42	3837.52	3808.22	3740.78	0	3740.78	7469.25	7469.25
28	5.50805	52253.6	44.8337	Andesite & Rhyolite	440	42	3816.38	3787.24	3717.48	0	3717.48	7511.78	7511.78
29	5.50805	53080.4	45.5009	Andesite & Rhyolite	440	42	3770.03	3741.24	3666.39	0	3666.39	7502.93	7502.93
30	5.50805	53812.6	46.1761	Andesite & Rhyolite	440	42	3718.06	3689.67	3609.13	0	3609.13	7483.06	7483.06
31	6.34038	62563.5	46.9121	Basalt	2000	49	6721.31	6669.99	4059.56	0	4059.56	11245.2	11245.2
32	6.34038	63288.7	47.7108	Basalt	2000	49	6558.56	6508.48	3919.16	0	3919.16	11129.6	11129.6
33	5.22788	52773.2	48.4497	Andesite & Rhyolite	440	42	3518.02	3491.16	3388.66	0	3388.66	7358.03	7358.03
34	5.22788	53071.8	49.1274	Andesite & Rhyolite	440	42	3451.64	3425.28	3315.49	0	3315.49	7304.01	7304.01
35	5.22788	53234.1	49.8144	Andesite &	440	42	3379.52	3353.71	3236.01	0	3236.01	7237.17	7237.17

				Rhyolite									
36	5.22788	53293.3	50.5114	Andesite & Rhyolite	440	42	3303.99	3278.76	3152.77	0	3152.77	7162.45	7162.45
37	5.68283	57568.7	51.2501	Basalt	2000	49	5766.79	5722.75	3236.14	0	3236.14	10421.4	10421.4
38	5.68283	56578.1	52.0322	Basalt	2000	49	5539.14	5496.84	3039.75	0	3039.75	10137.8	10137.8
39	5.48567	51931.6	52.8142	Andesite & Rhyolite	440	42	2881.67	2859.67	2687.32	0	2687.32	6485.74	6485.74
40	5.48567	48909.3	53.5964	Andesite & Rhyolite	440	42	2676.09	2655.66	2460.74	0	2460.74	6090.03	6090.03
41	5.48567	45733.8	54.3934	Andesite & Rhyolite	440	42	2472.58	2453.7	2236.44	0	2236.44	5689.27	5689.27
42	5.25568	40391.1	55.1889	Basalt	2000	49	4264.35	4231.79	1940.06	0	1940.06	8073.12	8073.12
43	5.25568	36571.2	55.9831	Basalt	2000	49	3941.73	3911.63	1661.75	0	1661.75	7501.9	7501.9
44	6.16894	38240.2	56.8662	Andesite & Rhyolite	440	42	1821.03	1807.12	1518.34	0	1518.34	4308.18	4308.18
45	6.16894	33309.1	57.843	Andesite & Rhyolite	440	42	1597.11	1584.91	1271.55	0	1271.55	3811.94	3811.94
46	6.16894	28075.7	58.8471	Andesite & Rhyolite	440	42	1372	1361.52	1023.45	0	1023.45	3293.1	3293.1
47	6.16894	22512.9	59.8812	Andesite & Rhyolite	440	42	1144.44	1135.7	772.651	0	772.651	2745.42	2745.42
48	6.16894	16589	60.9486	Andesite & Rhyolite	440	42	912.947	905.976	517.519	0	517.519	2161.04	2161.04
49	6.16894	10266.5	62.0532	Andesite & Rhyolite	440	42	675.775	670.615	256.124	0	256.124	1529.92	1529.92
50	6.16894	3500.22	63.1994	Andesite & Rhyolite	440	42	422.891	419.662	-22.5879	0	-22.5879	814.574	814.574

Query 1 (spencer) - Safety Factor: 0.992364

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	5.55693	1322.38	29.1001	Andesite & Rhyolite	440	42	940.106	932.927	547.45	0	547.45	1070.71	1070.71
2	5.55693	3942.02	29.6446	Andesite & Rhyolite	440	42	1253.95	1244.38	893.353	0	893.353	1606.99	1606.99
3	5.55693	6511	30.1922	Andesite & Rhyolite	440	42	1544.44	1532.65	1213.51	0	1213.51	2112.12	2112.12
4	5.55693	9028.49	30.7428	Andesite & Rhyolite	440	42	1812.6	1798.76	1509.05	0	1509.05	2587.13	2587.13
5	5.55693	11493.6	31.2965	Andesite & Rhyolite	440	42	2059.39	2043.66	1781.04	0	1781.04	3033	3033
6	5.55693	13905.4	31.8536	Andesite & Rhyolite	440	42	2285.75	2268.3	2030.53	0	2030.53	3450.72	3450.72
7	5.55693	16435.9	32.414	Andesite & Rhyolite	440	42	2511.54	2492.36	2279.38	0	2279.38	3874.11	3874.11
8	5.55693	19288	32.9779	Andesite & Rhyolite	440	42	2757.79	2736.73	2550.78	0	2550.78	4340.19	4340.19
9	5.55693	21997.5	33.5454	Andesite & Rhyolite	440	42	2974.18	2951.47	2789.28	0	2789.28	4761.24	4761.24
10	5.55693	24232.4	34.1167	Andesite & Rhyolite	440	42	3129.01	3105.12	2959.91	0	2959.91	5079.74	5079.74
11	5.55693	26362.3	34.6919	Andesite & Rhyolite	440	42	3262.95	3238.03	3107.52	0	3107.52	5366.21	5366.21
12	5.55693	28432.3	35.2711	Andesite & Rhyolite	440	42	3381.54	3355.72	3238.24	0	3238.24	5629.95	5629.95
13	4.97447	27115.6	35.8237	Basalt	2000	49	7375.86	7319.54	4624.2	0	4624.2	9948.48	9948.48
14	4.97447	28831	36.3494	Basalt	2000	49	7474.93	7417.85	4709.67	0	4709.67	10210.5	10210.5
15	4.97447	30524.2	36.8787	Basalt	2000	49	7559.98	7502.25	4783.03	0	4783.03	10454.8	10454.8
16	4.97447	31904.7	37.4116	Basalt	2000	49	7591.06	7533.09	4809.84	0	4809.84	10616.1	10616.1
17	5.364	35844.9	37.9696	Andesite & Rhyolite	440	42	3752.28	3723.63	3646.84	0	3646.84	6575.24	6575.24
18	5.364	37441.1	38.553	Andesite & Rhyolite	440	42	3796.77	3767.78	3695.88	0	3695.88	6721.7	6721.7

19	5.364	38974.7	39.1412	Andesite & Rhyolite	440	42	3831.03	3801.78	3733.64	0	3733.64	6851.61	6851.61
20	5.364	40613.4	39.7343	Andesite & Rhyolite	440	42	3869.2	3839.65	3775.7	0	3775.7	6991.88	6991.88
21	5.364	42531.6	40.3326	Andesite & Rhyolite	440	42	3924.44	3894.47	3836.57	0	3836.57	7168.58	7168.58
22	5.364	44265.9	40.9363	Andesite & Rhyolite	440	42	3959.98	3929.74	3875.75	0	3875.75	7310.38	7310.38
23	5.66	47893	41.5624	Basalt	2000	49	7578.69	7520.82	4799.17	0	4799.17	11519	11519
24	5.66	48788.6	42.2117	Basalt	2000	49	7465.92	7408.91	4701.9	0	4701.9	11474.4	11474.4
25	5.66	49590.6	42.8678	Basalt	2000	49	7343.23	7287.16	4596.06	0	4596.06	11412.1	11412.1
26	5.50805	49479.1	43.5219	Andesite & Rhyolite	440	42	3834.44	3805.16	3737.39	0	3737.39	7378.93	7378.93
27	5.50805	51037.1	44.1742	Andesite & Rhyolite	440	42	3837.52	3808.22	3740.78	0	3740.78	7469.25	7469.25
28	5.50805	52253.6	44.8337	Andesite & Rhyolite	440	42	3816.38	3787.24	3717.48	0	3717.48	7511.78	7511.78
29	5.50805	53080.4	45.5009	Andesite & Rhyolite	440	42	3770.03	3741.24	3666.39	0	3666.39	7502.93	7502.93
30	5.50805	53812.6	46.1761	Andesite & Rhyolite	440	42	3718.06	3689.67	3609.13	0	3609.13	7483.06	7483.06
31	6.34038	62563.5	46.9121	Basalt	2000	49	6721.31	6669.99	4059.56	0	4059.56	11245.2	11245.2
32	6.34038	63288.7	47.7108	Basalt	2000	49	6558.56	6508.48	3919.16	0	3919.16	11129.6	11129.6
33	5.22788	52773.2	48.4497	Andesite & Rhyolite	440	42	3518.02	3491.16	3388.66	0	3388.66	7358.03	7358.03
34	5.22788	53071.8	49.1274	Andesite & Rhyolite	440	42	3451.64	3425.28	3315.49	0	3315.49	7304.01	7304.01
35	5.22788	53234.1	49.8144	Andesite & Rhyolite	440	42	3379.52	3353.71	3236.01	0	3236.01	7237.17	7237.17
36	5.22788	53293.3	50.5114	Andesite & Rhyolite	440	42	3303.99	3278.76	3152.77	0	3152.77	7162.45	7162.45
37	5.68283	57568.7	51.2501	Basalt	2000	49	5766.79	5722.75	3236.14	0	3236.14	10421.4	10421.4
38	5.68283	56578.1	52.0322	Basalt	2000	49	5539.14	5496.84	3039.75	0	3039.75	10137.8	10137.8
39	5.48567	51931.6	52.8142	Andesite & Rhyolite	440	42	2881.67	2859.67	2687.32	0	2687.32	6485.74	6485.74
40	5.48567	48909.3	53.5964	Andesite & Rhyolite	440	42	2676.09	2655.66	2460.74	0	2460.74	6090.03	6090.03
41	5.48567	45733.8	54.3934	Andesite & Rhyolite	440	42	2472.58	2453.7	2236.44	0	2236.44	5689.27	5689.27
42	5.25568	40391.1	55.1889	Basalt	2000	49	4264.35	4231.79	1940.06	0	1940.06	8073.12	8073.12
43	5.25568	36571.2	55.9831	Basalt	2000	49	3941.73	3911.63	1661.75	0	1661.75	7501.9	7501.9
44	6.16894	38240.2	56.8662	Andesite & Rhyolite	440	42	1821.03	1807.12	1518.34	0	1518.34	4308.18	4308.18
45	6.16894	33309.1	57.843	Andesite & Rhyolite	440	42	1597.11	1584.91	1271.55	0	1271.55	3811.94	3811.94
46	6.16894	28075.7	58.8471	Andesite & Rhyolite	440	42	1372	1361.52	1023.45	0	1023.45	3293.1	3293.1
47	6.16894	22512.9	59.8812	Andesite & Rhyolite	440	42	1144.44	1135.7	772.651	0	772.651	2745.42	2745.42
48	6.16894	16589	60.9486	Andesite & Rhyolite	440	42	912.947	905.976	517.519	0	517.519	2161.04	2161.04
49	6.16894	10266.5	62.0532	Andesite & Rhyolite	440	42	675.775	670.615	256.124	0	256.124	1529.92	1529.92
50	6.16894	3500.22	63.1994	Andesite & Rhyolite	440	42	422.891	419.662	-22.5879	0	-22.5879	814.574	814.574

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 0.992364

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	198.183	200.223	0	0	0

2	203.74	203.315	3333.94	4993.49	56.2707
3	209.297	206.478	6887.45	10315.8	56.2705
4	214.854	209.711	10572	15834.5	56.2707
5	220.411	213.016	14305.4	21426.3	56.2707
6	225.968	216.394	18011.7	26977.4	56.2706
7	231.525	219.847	21620.4	32382.6	56.2708
8	237.082	223.376	25072.7	37553.3	56.2707
9	242.638	226.981	28311.3	42404	56.2707
10	248.195	230.666	31266.8	46830.6	56.2706
11	253.752	234.43	33881.2	50746.5	56.2707
12	259.309	238.277	36110.3	54085.1	56.2707
13	264.866	242.207	37914.3	56787.1	56.2707
14	269.841	245.798	53943.3	80794.9	56.2707
15	274.815	249.459	69571.9	104203	56.2707
16	279.79	253.191	84760	126951	56.2706
17	284.764	256.996	99445.3	148947	56.2707
18	290.128	261.182	98934.8	148182	56.2707
19	295.492	265.457	97890.9	146619	56.2707
20	300.856	269.822	96300.5	144236	56.2706
21	306.22	274.281	94133.8	140991	56.2706
22	311.584	278.835	91337.8	136803	56.2706
23	316.948	283.488	87913.6	131675	56.2707
24	322.608	288.506	99551.9	149106	56.2706
25	328.268	293.64	110361	165297	56.2708
26	333.928	298.894	120351	180259	56.2707
27	339.436	304.125	114505	171503	56.2707
28	344.944	309.477	107974	161720	56.2705
29	350.452	314.953	100805	150983	56.2706
30	355.96	320.558	93062.8	139387	56.2706
31	361.468	326.297	84763.2	126956	56.2706
32	367.809	333.075	90489	135532	56.2706
33	374.149	340.046	95271.9	142696	56.2707
34	379.377	345.945	85764.5	128456	56.2707
35	384.605	351.986	75824.3	113568	56.2707
36	389.833	358.175	65482.5	98078	56.2707
37	395.061	364.52	54763.4	82023.2	56.2706
38	400.743	371.6	55994.7	83867.4	56.2706
39	406.426	378.882	56858.7	85161.5	56.2707
40	411.912	386.113	45449.7	68073.4	56.2707
41	417.398	393.553	34490.5	51659.1	56.2707
42	422.883	401.213	24065.8	36045.1	56.2706
43	428.139	408.772	25760.8	38583.9	56.2707
44	433.395	416.559	28057.3	42023.6	56.2707
45	439.564	426.01	19208.5	28770	56.2707
46	445.732	435.822	11590.2	17359.6	56.2708
47	451.901	446.027	5400.58	8088.85	56.2707
48	458.07	456.661	869.215	1301.89	56.2707
49	464.239	467.767	-1733.01	-2595.66	56.2707
50	470.408	479.395	-2081.25	-3117.25	56.2707
51	476.577	491.607	0	0	0

Query 1 (spencer) - Safety Factor: 0.992364

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	198.183	200.223	0	0	0
2	203.74	203.315	3333.94	4993.49	56.2707
3	209.297	206.478	6887.45	10315.8	56.2705
4	214.854	209.711	10572	15834.5	56.2707
5	220.411	213.016	14305.4	21426.3	56.2707
6	225.968	216.394	18011.7	26977.4	56.2706
7	231.525	219.847	21620.4	32382.6	56.2708

8	237.082	223.376	25072.7	37553.3	56.2707
9	242.638	226.981	28311.3	42404	56.2707
10	248.195	230.666	31266.8	46830.6	56.2706
11	253.752	234.43	33881.2	50746.5	56.2707
12	259.309	238.277	36110.3	54085.1	56.2707
13	264.866	242.207	37914.3	56787.1	56.2707
14	269.841	245.798	53943.3	80794.9	56.2707
15	274.815	249.459	69571.9	104203	56.2707
16	279.79	253.191	84760	126951	56.2706
17	284.764	256.996	99445.3	148947	56.2707
18	290.128	261.182	98934.8	148182	56.2707
19	295.492	265.457	97890.9	146619	56.2707
20	300.856	269.822	96300.5	144236	56.2706
21	306.22	274.281	94133.8	140991	56.2706
22	311.584	278.835	91337.8	136803	56.2706
23	316.948	283.488	87913.6	131675	56.2707
24	322.608	288.506	99551.9	149106	56.2706
25	328.268	293.64	110361	165297	56.2708
26	333.928	298.894	120351	180259	56.2707
27	339.436	304.125	114505	171503	56.2707
28	344.944	309.477	107974	161720	56.2705
29	350.452	314.953	100805	150983	56.2706
30	355.96	320.558	93062.8	139387	56.2706
31	361.468	326.297	84763.2	126956	56.2706
32	367.809	333.075	90489	135532	56.2706
33	374.149	340.046	95271.9	142696	56.2707
34	379.377	345.945	85764.5	128456	56.2707
35	384.605	351.986	75824.3	113568	56.2707
36	389.833	358.175	65482.5	98078	56.2707
37	395.061	364.52	54763.4	82023.2	56.2706
38	400.743	371.6	55994.7	83867.4	56.2706
39	406.426	378.882	56858.7	85161.5	56.2707
40	411.912	386.113	45449.7	68073.4	56.2707
41	417.398	393.553	34490.5	51659.1	56.2707
42	422.883	401.213	24065.8	36045.1	56.2706
43	428.139	408.772	25760.8	38583.9	56.2707
44	433.395	416.559	28057.3	42023.6	56.2707
45	439.564	426.01	19208.5	28770	56.2707
46	445.732	435.822	11590.2	17359.6	56.2708
47	451.901	446.027	5400.58	8088.85	56.2707
48	458.07	456.661	869.215	1301.89	56.2707
49	464.239	467.767	-1733.01	-2595.66	56.2707
50	470.408	479.395	-2081.25	-3117.25	56.2707
51	476.577	491.607	0	0	0

Entity Information

External Boundary

X	Y
-119.082	0
900	0
900	242.207
900	256.996
900	283.488
900	298.894
900	326.297
900	340.046
900	364.52
900	378.882

900	401.213
900	416.559
900	548
700	548
628.434	569.928
580	550
404.388	450.849
376.176	416.559
363.55	401.213
345.177	378.882
333.36	364.52
313.224	340.046
301.912	326.297
279.366	298.894
266.69	283.488
244.894	256.996
232.726	242.207
198	200
-119.082	200

Material Boundary

X	Y
232.726	242.207
900	242.207

Material Boundary

X	Y
244.894	256.996
900	256.996

Material Boundary

X	Y
266.69	283.488
900	283.488

Material Boundary

X	Y
279.366	298.894
900	298.894

Material Boundary

X	Y
301.912	326.297
900	326.297

Material Boundary

X	Y
313.224	340.046
900	340.046

Material Boundary

X	Y

333.36	364.52
900	364.52

Material Boundary

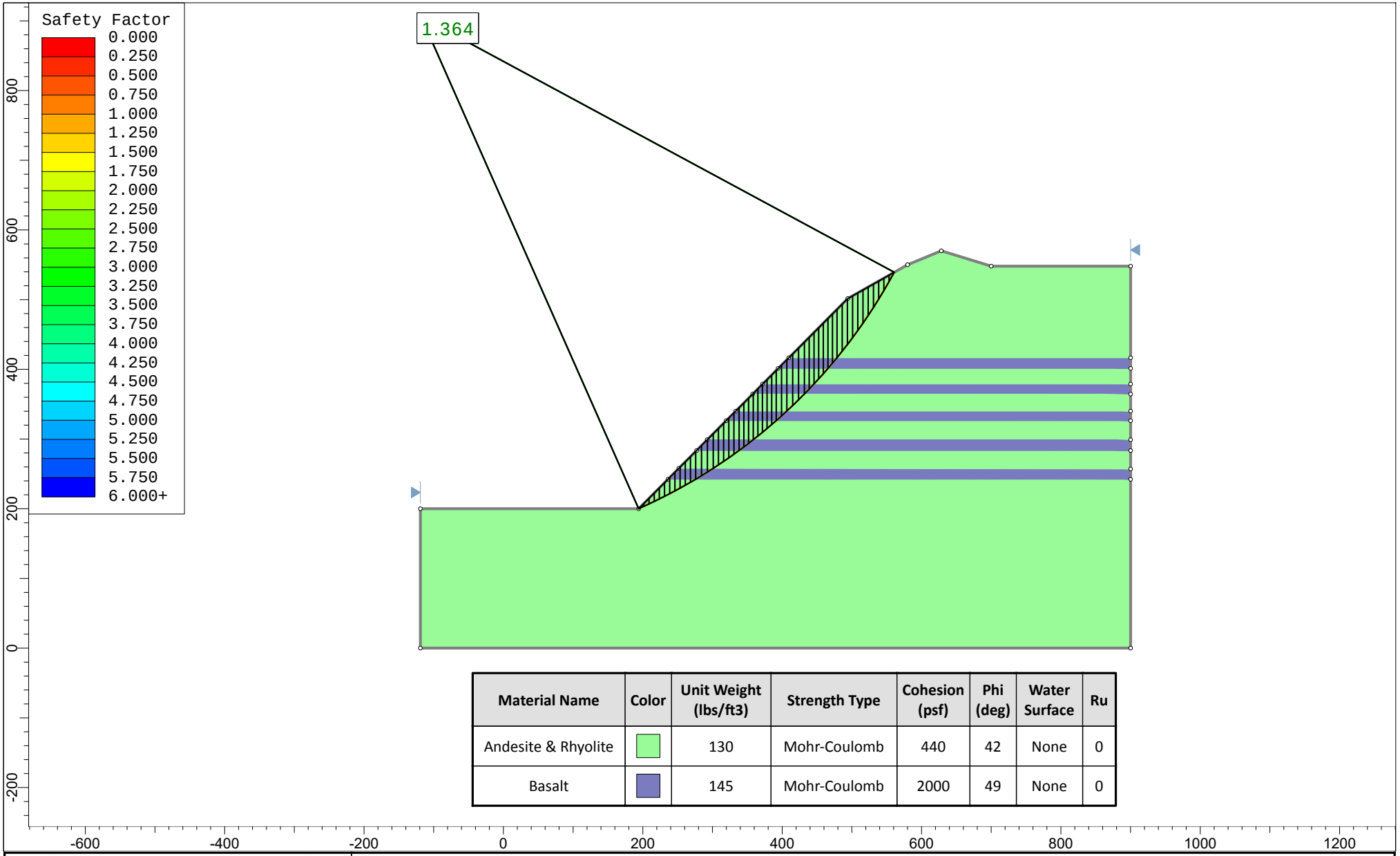
X	Y
345.177	378.882
900	378.882

Material Boundary

X	Y
363.55	401.213
900	401.213

Material Boundary

X	Y
376.176	416.559
900	416.559



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Andesite & Rhyolite		130	Mohr-Coulomb	440	42	None	0
Basalt		145	Mohr-Coulomb	2000	49	None	0

BAJADA Geosciences, Inc.

SLIDEINTERPRET 8.032

Project	Ward Lake Quarry Expansion				
Analysis Description	300' Slope, dry, static, 45 degree gross slope inclination				
Drawn By	J.Bianchin	*Scale*	1:2284	*Company*	Bajada Geosciences, Inc.
Date	4/3/2020, 2:25:57 PM			*File Name*	300',dry,static,45deg.slim

Slide Analysis Information

Ward Lake Quarry Expansion

Project Summary

Slide Modeler Version:	8.032
Compute Time:	00h:00m:04.322s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical

Analysis Methods Used
Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search

Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Property	Andesite & Rhyolite	Basalt
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	145
Cohesion [psf]	440	2000
Friction Angle [°]	42	49
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: spencer

FS	1.363560
Center:	-117.962, 905.410
Radius:	771.306
Left Slip Surface Endpoint:	194.014, 200.014
Right Slip Surface Endpoint:	560.859, 539.193
Resisting Moment:	1.71566e+09 lb-ft
Driving Moment:	1.25822e+09 lb-ft
Resisting Horizontal Force:	1.65724e+06 lb
Driving Horizontal Force:	1.21538e+06 lb
Total Slice Area:	18331.1 ft2
Surface Horizontal Width:	366.845 ft
Surface Average Height:	49.9696 ft

Valid/Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	9873
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.36356

Slice	Width	Weight	Angle	Base	Base	Base	Shear	Shear	Base	Pore	Effective	Base	Effective

Number	[ft]	[lbs]	of Slice Base [degrees]	Material	Cohesion [psf]	Friction Angle [degrees]	Stress [psf]	Strength [psf]	Normal Stress [psf]	Pressure [psf]	Normal Stress [psf]	Vertical Stress [psf]	Vertical Stress [psf]
1	7.43814	2000.16	24.1611	Andesite & Rhyolite	440	42	550.387	750.486	344.829	0	344.829	591.734	591.734
2	7.43814	5954.49	24.7682	Andesite & Rhyolite	440	42	851.709	1161.36	801.147	0	801.147	1194.12	1194.12
3	7.43814	9816.16	25.3782	Andesite & Rhyolite	440	42	1135.92	1548.9	1231.55	0	1231.55	1770.4	1770.4
4	7.43814	13583.8	25.9914	Andesite & Rhyolite	440	42	1403.53	1913.8	1636.82	0	1636.82	2321.1	2321.1
5	7.43814	17255.9	26.6077	Andesite & Rhyolite	440	42	1655.01	2256.71	2017.66	0	2017.66	2846.71	2846.71
6	7.43814	20883.3	27.2274	Andesite & Rhyolite	440	42	1894.63	2583.44	2380.54	0	2380.54	3355.39	3355.39
7	7.43814	25019.8	27.8506	Andesite & Rhyolite	440	42	2162.38	2948.53	2786.01	0	2786.01	3928.54	3928.54
8	7.43814	29204.2	28.4773	Andesite & Rhyolite	440	42	2424.18	3305.51	3182.48	0	3182.48	4497.46	4497.46
9	7.43814	32713.8	29.1078	Andesite & Rhyolite	440	42	2630.04	3586.22	3494.24	0	3494.24	4958.57	4958.57
10	7.43814	35882.4	29.7422	Andesite & Rhyolite	440	42	2805.22	3825.08	3759.52	0	3759.52	5362.32	5362.32
11	7.43814	38945	30.3806	Andesite & Rhyolite	440	42	2966.72	4045.3	4004.09	0	4004.09	5743.31	5743.31
12	8.42757	47753.6	31.0663	Basalt	2000	49	5313.63	7245.45	4559.8	0	4559.8	7760.93	7760.93
13	8.42757	51792.7	31.8001	Basalt	2000	49	5515.73	7521.03	4799.36	0	4799.36	8219.27	8219.27
14	8.42757	55092.3	32.5397	Basalt	2000	49	5652.53	7707.56	4961.51	0	4961.51	8568.07	8568.07
15	7.4259	50988.3	33.2408	Andesite & Rhyolite	440	42	3521.14	4801.29	4843.7	0	4843.7	7151.45	7151.45
16	7.4259	53433.4	33.9028	Andesite & Rhyolite	440	42	3614.26	4928.26	4984.71	0	4984.71	7413.65	7413.65
17	7.4259	55860.8	34.5701	Andesite & Rhyolite	440	42	3701.84	5047.68	5117.35	0	5117.35	7668.22	7668.22
18	7.4259	58787.9	35.2428	Andesite & Rhyolite	440	42	3814.57	5201.4	5288.08	0	5288.08	7983.23	7983.23
19	7.4259	61514.4	35.9211	Andesite & Rhyolite	440	42	3910.27	5331.89	5433	0	5433	8265.76	8265.76
20	6.76382	57517	36.5745	Basalt	2000	49	6177.15	8422.92	5583.36	0	5583.36	10166.6	10166.6
21	6.76382	58514.1	37.2027	Basalt	2000	49	6157.5	8396.12	5560.07	0	5560.07	10234.3	10234.3
22	6.76382	59400.8	37.8362	Basalt	2000	49	6127.5	8355.22	5524.5	0	5524.5	10283.7	10283.7
23	6.59051	59276.1	38.467	Andesite & Rhyolite	440	42	3961.43	5401.65	5510.47	0	5510.47	8657.81	8657.81
24	6.59051	61067.2	39.095	Andesite & Rhyolite	440	42	4008.93	5466.41	5582.4	0	5582.4	8839.78	8839.78
25	6.59051	62458	39.7287	Andesite & Rhyolite	440	42	4029.48	5494.44	5613.53	0	5613.53	8962.28	8962.28
26	6.59051	63385.9	40.3683	Andesite & Rhyolite	440	42	4020.61	5482.34	5600.09	0	5600.09	9018.05	9018.05
27	6.59051	64204	41.014	Andesite & Rhyolite	440	42	4003.9	5459.56	5574.78	0	5574.78	9057.04	9057.04
28	7.60811	74773.6	41.717	Basalt	2000	49	6045.12	8242.88	5426.85	0	5426.85	10816.1	10816.1
29	7.60811	75565.6	42.4787	Basalt	2000	49	5976.63	8149.5	5345.68	0	5345.68	10818.2	10818.2
30	8.39873	84416	43.2904	Andesite & Rhyolite	440	42	3893.49	5309.01	5407.58	0	5407.58	9075.39	9075.39
31	8.39873	84919.2	44.1538	Andesite & Rhyolite	440	42	3830.66	5223.33	5312.43	0	5312.43	9031.57	9031.57
32	8.39873	85091.8	45.0299	Andesite & Rhyolite	440	42	3753.51	5118.13	5195.59	0	5195.59	8953.02	8953.02
33	6.88424	69319	45.8384	Basalt	2000	49	5542.13	7557.03	4830.65	0	4830.65	10537.4	10537.4
34	6.88424	68341	46.5774	Basalt	2000	49	5379.95	7335.88	4638.41	0	4638.41	10323	10323
35	6.68715	65633.4	47.3157	Andesite & Rhyolite	440	42	3437.66	4687.46	4717.29	0	4717.29	8444.7	8444.7
36	6.68715	65088.7	48.0537	Andesite & Rhyolite	440	42	3346.42	4563.05	4579.11	0	4579.11	8302.7	8302.7

37	6.68715	64375.1	48.8023	Andesite & Rhyolite	440	42	3248.18	4429.09	4430.33	0	4430.33	8141	8141
38	6.45559	60937.9	49.549	Basalt	2000	49	4800.62	6545.93	3951.72	0	3951.72	9582.26	9582.26
39	6.45559	59199.3	50.2939	Basalt	2000	49	4610.58	6286.8	3726.46	0	3726.46	9278.72	9278.72
40	7.47418	66625.4	51.1114	Andesite & Rhyolite	440	42	2847.11	3882.2	3822.95	0	3822.95	7352.85	7352.85
41	7.47418	64772.1	52.0045	Andesite & Rhyolite	440	42	2708.37	3693.02	3612.84	0	3612.84	7079.96	7079.96
42	7.47418	61194.4	52.9159	Andesite & Rhyolite	440	42	2509.71	3422.14	3312.01	0	3312.01	6632.35	6632.35
43	7.47418	55526	53.8468	Andesite & Rhyolite	440	42	2243.49	3059.14	2908.85	0	2908.85	5979.46	5979.46
44	7.47418	49509.2	54.799	Andesite & Rhyolite	440	42	1976.17	2694.62	2504.01	0	2504.01	5305.3	5305.3
45	7.47418	43124.4	55.7742	Andesite & Rhyolite	440	42	1708.39	2329.49	2098.5	0	2098.5	4609.88	4609.88
46	7.47418	36343.3	56.7744	Andesite & Rhyolite	440	42	1440.75	1964.55	1693.18	0	1693.18	3892.73	3892.73
47	7.47418	29133.5	57.802	Andesite & Rhyolite	440	42	1173.93	1600.73	1289.12	0	1289.12	3153.45	3153.45
48	7.47418	21457.4	58.8598	Andesite & Rhyolite	440	42	908.824	1239.24	887.644	0	887.644	2391.83	2391.83
49	7.47418	13270.9	59.9511	Andesite & Rhyolite	440	42	646.486	881.522	490.36	0	490.36	1607.9	1607.9
50	7.47418	4522.07	61.0795	Andesite & Rhyolite	440	42	375.69	512.275	80.2701	0	80.2701	760.256	760.256

Query 1 (spencer) - Safety Factor: 1.36356

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	7.43814	2000.16	24.1611	Andesite & Rhyolite	440	42	550.387	750.486	344.829	0	344.829	591.734	591.734
2	7.43814	5954.49	24.7682	Andesite & Rhyolite	440	42	851.709	1161.36	801.147	0	801.147	1194.12	1194.12
3	7.43814	9816.16	25.3782	Andesite & Rhyolite	440	42	1135.92	1548.9	1231.55	0	1231.55	1770.4	1770.4
4	7.43814	13583.8	25.9914	Andesite & Rhyolite	440	42	1403.53	1913.8	1636.82	0	1636.82	2321.1	2321.1
5	7.43814	17255.9	26.6077	Andesite & Rhyolite	440	42	1655.01	2256.71	2017.66	0	2017.66	2846.71	2846.71
6	7.43814	20883.3	27.2274	Andesite & Rhyolite	440	42	1894.63	2583.44	2380.54	0	2380.54	3355.39	3355.39
7	7.43814	25019.8	27.8506	Andesite & Rhyolite	440	42	2162.38	2948.53	2786.01	0	2786.01	3928.54	3928.54
8	7.43814	29204.2	28.4773	Andesite & Rhyolite	440	42	2424.18	3305.51	3182.48	0	3182.48	4497.46	4497.46
9	7.43814	32713.8	29.1078	Andesite & Rhyolite	440	42	2630.04	3586.22	3494.24	0	3494.24	4958.57	4958.57
10	7.43814	35882.4	29.7422	Andesite & Rhyolite	440	42	2805.22	3825.08	3759.52	0	3759.52	5362.32	5362.32
11	7.43814	38945	30.3806	Andesite & Rhyolite	440	42	2966.72	4045.3	4004.09	0	4004.09	5743.31	5743.31
12	8.42757	47753.6	31.0663	Basalt	2000	49	5313.63	7245.45	4559.8	0	4559.8	7760.93	7760.93
13	8.42757	51792.7	31.8001	Basalt	2000	49	5515.73	7521.03	4799.36	0	4799.36	8219.27	8219.27
14	8.42757	55092.3	32.5397	Basalt	2000	49	5652.53	7707.56	4961.51	0	4961.51	8568.07	8568.07
15	7.4259	50988.3	33.2408	Andesite & Rhyolite	440	42	3521.14	4801.29	4843.7	0	4843.7	7151.45	7151.45
16	7.4259	53433.4	33.9028	Andesite & Rhyolite	440	42	3614.26	4928.26	4984.71	0	4984.71	7413.65	7413.65
17	7.4259	55860.8	34.5701	Andesite & Rhyolite	440	42	3701.84	5047.68	5117.35	0	5117.35	7668.22	7668.22
18	7.4259	58787.9	35.2428	Andesite & Rhyolite	440	42	3814.57	5201.4	5288.08	0	5288.08	7983.23	7983.23

19	7.4259	61514.4	35.9211	Andesite & Rhyolite	440	42	3910.27	5331.89	5433	0	5433	8265.76	8265.76
20	6.76382	57517	36.5745	Basalt	2000	49	6177.15	8422.92	5583.36	0	5583.36	10166.6	10166.6
21	6.76382	58514.1	37.2027	Basalt	2000	49	6157.5	8396.12	5560.07	0	5560.07	10234.3	10234.3
22	6.76382	59400.8	37.8362	Basalt	2000	49	6127.5	8355.22	5524.5	0	5524.5	10283.7	10283.7
23	6.59051	59276.1	38.467	Andesite & Rhyolite	440	42	3961.43	5401.65	5510.47	0	5510.47	8657.81	8657.81
24	6.59051	61067.2	39.095	Andesite & Rhyolite	440	42	4008.93	5466.41	5582.4	0	5582.4	8839.78	8839.78
25	6.59051	62458	39.7287	Andesite & Rhyolite	440	42	4029.48	5494.44	5613.53	0	5613.53	8962.28	8962.28
26	6.59051	63385.9	40.3683	Andesite & Rhyolite	440	42	4020.61	5482.34	5600.09	0	5600.09	9018.05	9018.05
27	6.59051	64204	41.014	Andesite & Rhyolite	440	42	4003.9	5459.56	5574.78	0	5574.78	9057.04	9057.04
28	7.60811	74773.6	41.717	Basalt	2000	49	6045.12	8242.88	5426.85	0	5426.85	10816.1	10816.1
29	7.60811	75565.6	42.4787	Basalt	2000	49	5976.63	8149.5	5345.68	0	5345.68	10818.2	10818.2
30	8.39873	84416	43.2904	Andesite & Rhyolite	440	42	3893.49	5309.01	5407.58	0	5407.58	9075.39	9075.39
31	8.39873	84919.2	44.1538	Andesite & Rhyolite	440	42	3830.66	5223.33	5312.43	0	5312.43	9031.57	9031.57
32	8.39873	85091.8	45.0299	Andesite & Rhyolite	440	42	3753.51	5118.13	5195.59	0	5195.59	8953.02	8953.02
33	6.88424	69319	45.8384	Basalt	2000	49	5542.13	7557.03	4830.65	0	4830.65	10537.4	10537.4
34	6.88424	68341	46.5774	Basalt	2000	49	5379.95	7335.88	4638.41	0	4638.41	10323	10323
35	6.68715	65633.4	47.3157	Andesite & Rhyolite	440	42	3437.66	4687.46	4717.29	0	4717.29	8444.7	8444.7
36	6.68715	65088.7	48.0537	Andesite & Rhyolite	440	42	3346.42	4563.05	4579.11	0	4579.11	8302.7	8302.7
37	6.68715	64375.1	48.8023	Andesite & Rhyolite	440	42	3248.18	4429.09	4430.33	0	4430.33	8141	8141
38	6.45559	60937.9	49.549	Basalt	2000	49	4800.62	6545.93	3951.72	0	3951.72	9582.26	9582.26
39	6.45559	59199.3	50.2939	Basalt	2000	49	4610.58	6286.8	3726.46	0	3726.46	9278.72	9278.72
40	7.47418	66625.4	51.1114	Andesite & Rhyolite	440	42	2847.11	3882.2	3822.95	0	3822.95	7352.85	7352.85
41	7.47418	64772.1	52.0045	Andesite & Rhyolite	440	42	2708.37	3693.02	3612.84	0	3612.84	7079.96	7079.96
42	7.47418	61194.4	52.9159	Andesite & Rhyolite	440	42	2509.71	3422.14	3312.01	0	3312.01	6632.35	6632.35
43	7.47418	55526	53.8468	Andesite & Rhyolite	440	42	2243.49	3059.14	2908.85	0	2908.85	5979.46	5979.46
44	7.47418	49509.2	54.799	Andesite & Rhyolite	440	42	1976.17	2694.62	2504.01	0	2504.01	5305.3	5305.3
45	7.47418	43124.4	55.7742	Andesite & Rhyolite	440	42	1708.39	2329.49	2098.5	0	2098.5	4609.88	4609.88
46	7.47418	36343.3	56.7744	Andesite & Rhyolite	440	42	1440.75	1964.55	1693.18	0	1693.18	3892.73	3892.73
47	7.47418	29133.5	57.802	Andesite & Rhyolite	440	42	1173.93	1600.73	1289.12	0	1289.12	3153.45	3153.45
48	7.47418	21457.4	58.8598	Andesite & Rhyolite	440	42	908.824	1239.24	887.644	0	887.644	2391.83	2391.83
49	7.47418	13270.9	59.9511	Andesite & Rhyolite	440	42	646.486	881.522	490.36	0	490.36	1607.9	1607.9
50	7.47418	4522.07	61.0795	Andesite & Rhyolite	440	42	375.69	512.275	80.2701	0	80.2701	760.256	760.256

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.36356

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	194.014	200.014	0	0	0

2	201.452	203.351	2949.33	2407.8	39.2278
3	208.89	206.783	6544.44	5342.81	39.2278
4	216.328	210.311	10660.7	8703.29	39.2279
5	223.766	213.937	15180.1	12392.9	39.2279
6	231.204	217.663	19990.8	16320.3	39.2279
7	238.643	221.491	24993.6	20404.5	39.2278
8	246.081	225.421	30152.4	24616.1	39.2278
9	253.519	229.455	35370.1	28875.7	39.2278
10	260.957	233.597	40491	33056.4	39.2278
11	268.395	237.847	45410	37072.3	39.2279
12	275.833	242.207	50049.7	40860	39.2278
13	284.261	247.284	71746.9	58573.4	39.2278
14	292.688	252.51	93222.1	76105.5	39.2278
15	301.116	257.887	114251	93273.5	39.2279
16	308.542	262.754	116864	95406.4	39.2278
17	315.968	267.744	118867	97041.4	39.2277
18	323.394	272.861	120211	98139.1	39.2279
19	330.82	278.108	120835	98648.4	39.2278
20	338.246	283.488	120688	98528.4	39.2278
21	345.009	288.506	134511	109813	39.2277
22	351.773	293.641	147673	120558	39.2277
23	358.537	298.894	160157	130751	39.2279
24	365.128	304.13	157451	128541	39.2278
25	371.718	309.485	154017	125738	39.2279
26	378.309	314.962	149867	122350	39.2279
27	384.899	320.565	145029	118400	39.2278
28	391.49	326.297	139502	113888	39.2278
29	399.098	333.08	148754	121441	39.2278
30	406.706	340.046	157053	128216	39.2277
31	415.105	347.958	147017	120023	39.2278
32	423.503	356.112	135919	110963	39.2279
33	431.902	364.52	123809	101076	39.2277
34	438.786	371.608	127776	104315	39.2278
35	445.67	378.882	131127	107051	39.2279
36	452.358	386.133	119946	97922.5	39.2278
37	459.045	393.574	108285	88402.5	39.2278
38	465.732	401.213	96193.6	78531.4	39.2278
39	472.188	408.785	97309.6	79442.5	39.2278
40	478.643	416.559	98148	80127	39.2278
41	486.117	425.826	84033.6	68604.1	39.2278
42	493.591	435.394	69738.6	56933.8	39.2278
43	501.066	445.282	55774.4	45533.6	39.2278
44	508.54	455.512	42810.9	34950.4	39.2279
45	516.014	466.107	31073.3	25367.9	39.2278
46	523.488	477.094	20804.4	16984.5	39.2278
47	530.962	488.505	12268.7	10016	39.2277
48	538.437	500.374	5754.38	4697.81	39.2278
49	545.911	512.745	1576.66	1287.17	39.2279
50	553.385	525.665	80.2719	65.5331	39.2278
51	560.859	539.193	0	0	0

Query 1 (spencer) - Safety Factor: 1.36356

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	194.014	200.014	0	0	0
2	201.452	203.351	2949.33	2407.8	39.2278
3	208.89	206.783	6544.44	5342.81	39.2278
4	216.328	210.311	10660.7	8703.29	39.2279
5	223.766	213.937	15180.1	12392.9	39.2279
6	231.204	217.663	19990.8	16320.3	39.2279
7	238.643	221.491	24993.6	20404.5	39.2278

8	246.081	225.421	30152.4	24616.1	39.2278
9	253.519	229.455	35370.1	28875.7	39.2278
10	260.957	233.597	40491	33056.4	39.2278
11	268.395	237.847	45410	37072.3	39.2279
12	275.833	242.207	50049.7	40860	39.2278
13	284.261	247.284	71746.9	58573.4	39.2278
14	292.688	252.51	93222.1	76105.5	39.2278
15	301.116	257.887	114251	93273.5	39.2279
16	308.542	262.754	116864	95406.4	39.2278
17	315.968	267.744	118867	97041.4	39.2277
18	323.394	272.861	120211	98139.1	39.2279
19	330.82	278.108	120835	98648.4	39.2278
20	338.246	283.488	120688	98528.4	39.2278
21	345.009	288.506	134511	109813	39.2277
22	351.773	293.641	147673	120558	39.2277
23	358.537	298.894	160157	130751	39.2279
24	365.128	304.13	157451	128541	39.2278
25	371.718	309.485	154017	125738	39.2279
26	378.309	314.962	149867	122350	39.2279
27	384.899	320.565	145029	118400	39.2278
28	391.49	326.297	139502	113888	39.2278
29	399.098	333.08	148754	121441	39.2278
30	406.706	340.046	157053	128216	39.2277
31	415.105	347.958	147017	120023	39.2278
32	423.503	356.112	135919	110963	39.2279
33	431.902	364.52	123809	101076	39.2277
34	438.786	371.608	127776	104315	39.2278
35	445.67	378.882	131127	107051	39.2279
36	452.358	386.133	119946	97922.5	39.2278
37	459.045	393.574	108285	88402.5	39.2278
38	465.732	401.213	96193.6	78531.4	39.2278
39	472.188	408.785	97309.6	79442.5	39.2278
40	478.643	416.559	98148	80127	39.2278
41	486.117	425.826	84033.6	68604.1	39.2278
42	493.591	435.394	69738.6	56933.8	39.2278
43	501.066	445.282	55774.4	45533.6	39.2278
44	508.54	455.512	42810.9	34950.4	39.2279
45	516.014	466.107	31073.3	25367.9	39.2278
46	523.488	477.094	20804.4	16984.5	39.2278
47	530.962	488.505	12268.7	10016	39.2277
48	538.437	500.374	5754.38	4697.81	39.2278
49	545.911	512.745	1576.66	1287.17	39.2279
50	553.385	525.665	80.2719	65.5331	39.2278
51	560.859	539.193	0	0	0

Entity Information

External Boundary

X	Y
-119.082	0
900	0
900	242.207
900	256.996
900	283.488
900	298.894
900	326.297
900	340.046
900	364.52
900	378.882

900	401.213
900	416.559
900	548
700	548
628.434	569.928
580	550
494.015	501.453
409.526	416.559
394.254	401.213
372.029	378.882
357.735	364.52
333.378	340.046
319.695	326.297
292.423	298.894
277.089	283.488
251.684	257.96
236.006	242.207
194	200
-119.082	200

Material Boundary

X	Y
236.006	242.207
900	242.207

Material Boundary

X	Y
251.684	257.96
900	256.996

Material Boundary

X	Y
277.089	283.488
900	283.488

Material Boundary

X	Y
292.423	298.894
900	298.894

Material Boundary

X	Y
319.695	326.297
900	326.297

Material Boundary

X	Y
333.378	340.046
900	340.046

Material Boundary

X	Y

357.735	364.52
900	364.52

Material Boundary

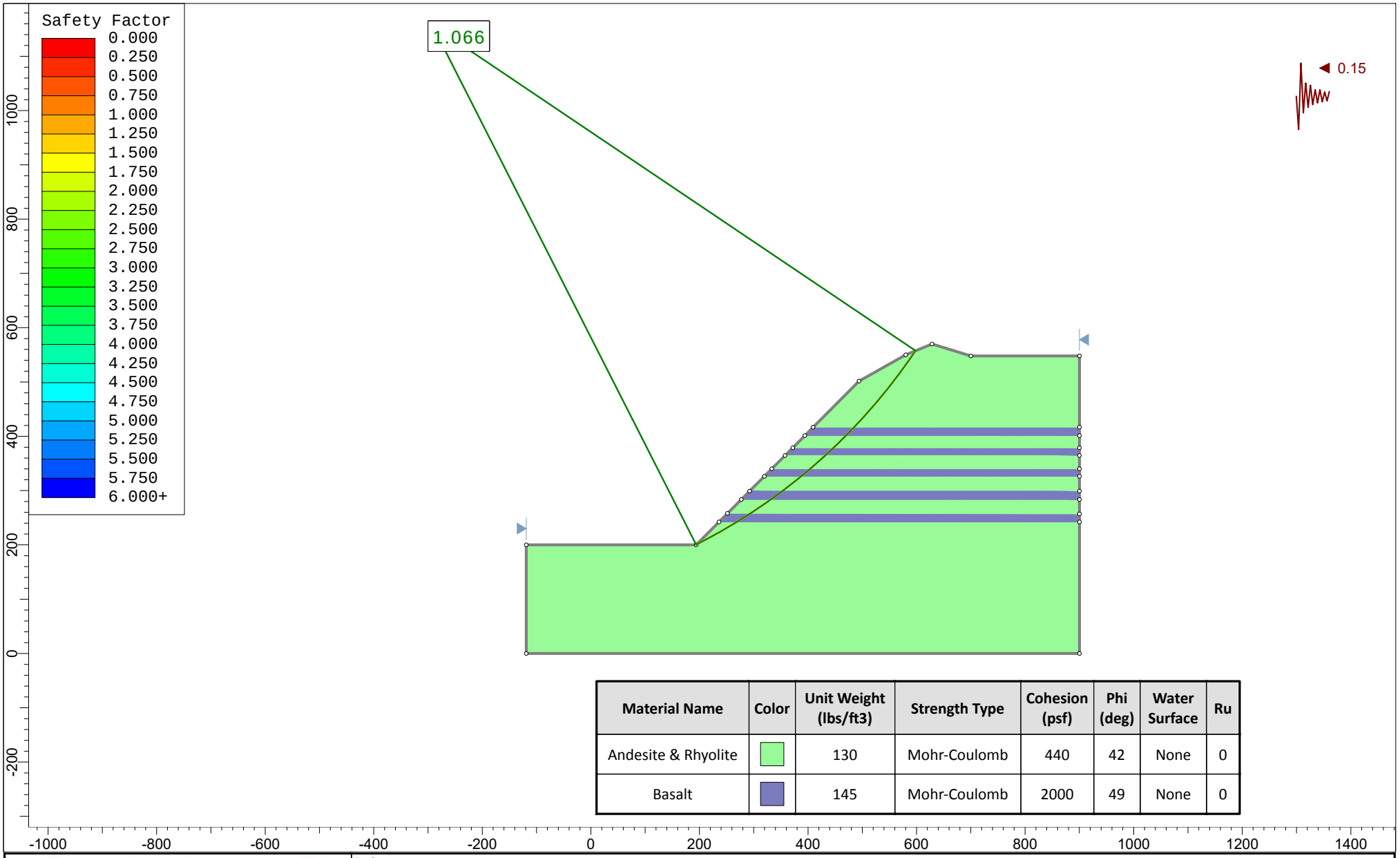
X	Y
372.029	378.882
900	378.882

Material Boundary

X	Y
394.254	401.213
900	401.213

Material Boundary

X	Y
409.526	416.559
900	416.559



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Andesite & Rhyolite		130	Mohr-Coulomb	440	42	None	0
Basalt		145	Mohr-Coulomb	2000	49	None	0

BAJADA Geosciences, Inc.

SLIDEINTERPRET 8.032

Project	Ward Lake Quarry Expansion				
Analysis Description	300' Slope, dry, pseudostatic, 45 degree gross slope inclination				
Drawn By	J.Bianchin	Scale	1:2932	Company	Bajada Geosciences, Inc.
Date	4/3/2020, 2:25:57 PM			File Name	300',dry,PS,45deg.slim

Slide Analysis Information

Ward Lake Quarry Expansion

Project Summary

Slide Modeler Version:	8.032
Compute Time:	00h:00m:03.410s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical

Analysis Methods Used
Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search

Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis: No
Staged pseudostatic analysis: No

Seismic Load Coefficient (Horizontal): 0.15

Materials

Property	Andesite & Rhyolite	Basalt
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	145
Cohesion [psf]	440	2000
Friction Angle [°]	42	49
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: spencer

FS	1.066260
Center:	-292.281, 1157.200
Radius:	1073.614
Left Slip Surface Endpoint:	194.057, 200.057
Right Slip Surface Endpoint:	598.229, 557.500
Resisting Moment:	2.32086e+09 lb-ft
Driving Moment:	2.17663e+09 lb-ft
Resisting Horizontal Force:	1.64096e+06 lb
Driving Horizontal Force:	1.53898e+06 lb
Total Slice Area:	19844.8 ft2
Surface Horizontal Width:	404.172 ft
Surface Average Height:	49.0998 ft

Valid/Invalid Surfaces

Method: spencer

Number of Valid Surfaces: 10694
Number of Invalid Surfaces: 0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.06626

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	8.36654	2234.73	27.1867	Andesite & Rhyolite	440	42	758.603	808.868	409.669	0	409.669	799.316	799.316
2	8.36654	6653.45	27.6898	Andesite & Rhyolite	440	42	1091.27	1163.58	803.615	0	803.615	1376.3	1376.3
3	8.36654	10970	28.1952	Andesite & Rhyolite	440	42	1403.53	1496.53	1173.4	0	1173.4	1925.81	1925.81
4	8.36654	15183	28.7031	Andesite & Rhyolite	440	42	1696.04	1808.42	1519.79	0	1519.79	2448.46	2448.46
5	8.36654	19290.9	29.2134	Andesite & Rhyolite	440	42	1969.44	2099.94	1843.54	0	1843.54	2944.83	2944.83
6	8.36654	23805	29.7263	Andesite & Rhyolite	440	42	2261.09	2410.91	2188.92	0	2188.92	3480	3480
7	8.36654	28746.2	30.2418	Andesite & Rhyolite	440	42	2571.09	2741.45	2556.01	0	2556.01	4054.93	4054.93
8	8.36654	32944	30.76	Andesite & Rhyolite	440	42	2817.31	3003.99	2847.6	0	2847.6	4524.39	4524.39
9	8.36654	36613.5	31.281	Andesite & Rhyolite	440	42	3017.57	3217.51	3084.74	0	3084.74	4918.07	4918.07
10	8.26496	39345.6	31.8017	Basalt	2000	49	6212.18	6623.8	4019.41	0	4019.41	7871.38	7871.38
11	8.26496	42641.3	32.3222	Basalt	2000	49	6406.5	6830.99	4199.51	0	4199.51	8253	8253
12	8.26496	46238.9	32.8457	Basalt	2000	49	6616.74	7055.17	4394.4	0	4394.4	8666.07	8666.07
13	7.4974	44649.8	33.3477	Andesite & Rhyolite	440	42	3648.28	3890.02	3831.63	0	3831.63	6232.46	6232.46
14	7.4974	47139.3	33.828	Andesite & Rhyolite	440	42	3761.67	4010.92	3965.9	0	3965.9	6486.79	6486.79
15	7.4974	49539.8	34.311	Andesite & Rhyolite	440	42	3863.96	4119.99	4087.04	0	4087.04	6723.95	6723.95
16	7.4974	51998.6	34.7968	Andesite & Rhyolite	440	42	3965.39	4228.14	4207.15	0	4207.15	6962.85	6962.85
17	7.4974	54993.4	35.2856	Andesite & Rhyolite	440	42	4097.06	4368.53	4363.07	0	4363.07	7262.4	7262.4
18	7.01003	53634.4	35.7612	Basalt	2000	49	7356.4	7843.83	5079.96	0	5079.96	10378	10378
19	7.01003	54900.5	36.2235	Basalt	2000	49	7358.35	7845.91	5081.77	0	5081.77	10471.9	10471.9
20	7.01003	56055.2	36.6887	Basalt	2000	49	7347.55	7834.4	5071.77	0	5071.77	10546.2	10546.2
21	8.73487	71857.4	37.2146	Andesite & Rhyolite	440	42	4251.56	4533.27	4546.03	0	4546.03	7774.85	7774.85
22	8.73487	75166.6	37.8023	Andesite & Rhyolite	440	42	4339.74	4627.29	4650.45	0	4650.45	8016.97	8016.97
23	8.73487	78152.8	38.3947	Andesite & Rhyolite	440	42	4406.04	4697.98	4728.97	0	4728.97	8220.48	8220.48
24	8.73487	80201.2	38.9919	Andesite & Rhyolite	440	42	4421.32	4714.28	4747.07	0	4747.07	8326.35	8326.35
25	8.23224	76882.5	39.5768	Basalt	2000	49	7426.15	7918.21	5144.62	0	5144.62	11283	11283
26	8.23224	78217.4	40.1492	Basalt	2000	49	7373.67	7862.25	5095.97	0	5095.97	11316	11316
27	9.24561	90064.7	40.7623	Andesite & Rhyolite	440	42	4400.02	4691.57	4721.85	0	4721.85	8514.8	8514.8
28	9.24561	91763.6	41.417	Andesite & Rhyolite	440	42	4380.54	4670.79	4698.77	0	4698.77	8563.04	8563.04
29	9.24561	93011.3	42.0784	Andesite & Rhyolite	440	42	4340.45	4628.05	4651.31	0	4651.31	8570.23	8570.23
30	7.7084	77925.8	42.6906	Basalt	2000	49	7076.74	7545.65	4820.76	0	4820.76	11348.8	11348.8
31	7.7084	77660.6	43.2528	Basalt	2000	49	6928.93	7388.04	4683.75	0	4683.75	11202.5	11202.5
32	7.60461	76615.3	43.8165	Andesite & Rhyolite	440	42	4111.81	4384.26	4380.54	0	4380.54	8325.9	8325.9
33	7.60461	76883.8	44.3816	Andesite & Rhyolite	440	42	4051.74	4320.21	4309.41	0	4309.41	8274.62	8274.62
34	7.60461	77006.3	44.9523	Andesite & Rhyolite	440	42	3985.42	4249.49	4230.87	0	4230.87	8209.65	8209.65
35	7.45891	75080.5	45.5231	Basalt	2000	49	6425.24	6850.98	4216.9	0	4216.9	10760.5	10760.5
36	7.45891	74049.2	46.0942	Basalt	2000	49	6246.17	6660.04	4050.91	0	4050.91	10540.3	10540.3

37	8.09086	79479.5	46.6959	Andesite & Rhyolite	440	42	3674.64	3918.12	3862.85	0	3862.85	7761.72	7761.72
38	8.09086	77447.9	47.3292	Andesite & Rhyolite	440	42	3522.27	3755.66	3682.42	0	3682.42	7503.38	7503.38
39	8.09086	72942.9	47.9702	Andesite & Rhyolite	440	42	3276.82	3493.94	3391.74	0	3391.74	7027.22	7027.22
40	8.09086	68197.3	48.6193	Andesite & Rhyolite	440	42	3030.26	3231.05	3099.78	0	3099.78	6539.27	6539.27
41	8.09086	63229.5	49.2768	Andesite & Rhyolite	440	42	2783.72	2968.17	2807.81	0	2807.81	6041.54	6041.54
42	8.09086	58030.7	49.9432	Andesite & Rhyolite	440	42	2537.18	2705.29	2515.86	0	2515.86	5533.47	5533.47
43	8.09086	52591.1	50.6189	Andesite & Rhyolite	440	42	2290.61	2442.39	2223.89	0	2223.89	5014.41	5014.41
44	8.09086	46900.3	51.3045	Andesite & Rhyolite	440	42	2044.02	2179.46	1931.87	0	1931.87	4483.64	4483.64
45	8.09086	40946.8	52.0005	Andesite & Rhyolite	440	42	1797.37	1916.46	1639.77	0	1639.77	3940.34	3940.34
46	8.09086	34718.2	52.7076	Andesite & Rhyolite	440	42	1550.58	1653.32	1347.53	0	1347.53	3383.51	3383.51
47	8.09086	28201.1	53.4262	Andesite & Rhyolite	440	42	1303.61	1389.98	1055.06	0	1055.06	2812.05	2812.05
48	8.09086	21338.8	54.1572	Andesite & Rhyolite	440	42	1055	1124.9	760.667	0	760.667	2221.16	2221.16
49	8.09086	13258.9	54.9014	Andesite & Rhyolite	440	42	777.492	829.009	432.038	0	432.038	1538.36	1538.36
50	8.09086	4477.48	55.6596	Andesite & Rhyolite	440	42	400.633	427.179	-14.2394	0	-14.2394	572.178	572.178

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.06626

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	194.057	200.057	0	0	0
2	202.423	204.354	4266.44	4648.67	47.455
3	210.79	208.745	8892.17	9688.81	47.455
4	219.156	213.23	13754.7	14987	47.4551
5	227.523	217.811	18739	20417.9	47.4551
6	235.889	222.49	23737.5	25864.1	47.455
7	244.256	227.267	28672.7	31241.5	47.455
8	252.622	232.145	33456.4	36453.7	47.455
9	260.989	237.124	37962.9	41364	47.455
10	269.355	242.207	42098.1	45869.6	47.455
11	277.62	247.332	67064.3	73072.6	47.455
12	285.885	252.561	91784.1	100007	47.455
13	294.15	257.897	116220	126632	47.455
14	301.648	262.831	118036	128611	47.4551
15	309.145	267.855	119310	129998	47.4548
16	316.643	272.972	120007	130758	47.4549
17	324.14	278.182	120088	130847	47.4551
18	331.637	283.488	119482	130186	47.4549
19	338.647	288.536	137482	149799	47.455
20	345.657	293.671	154859	168733	47.4551
21	352.667	298.894	171591	186964	47.455
22	361.402	305.528	167882	182923	47.4551
23	370.137	312.304	163094	177705	47.4549
24	378.872	319.226	157216	171301	47.455
25	387.607	326.297	150331	163799	47.455
26	395.839	333.102	165072	179861	47.4551
27	404.071	340.046	178799	194818	47.4551

28	413.317	348.016	168435	183525	47.455
29	422.563	356.172	156946	171006	47.4549
30	431.808	364.52	144393	157329	47.455
31	439.517	371.63	153107	166823	47.4549
32	447.225	378.882	161030	175457	47.4551
33	454.83	386.179	148918	162259	47.4549
34	462.434	393.621	136200	148402	47.455
35	470.039	401.213	122909	133920	47.4549
36	477.498	408.81	127654	139091	47.4551
37	484.957	416.559	131857	143670	47.455
38	493.047	425.144	116576	127020	47.455
39	501.138	433.921	101205	110272	47.455
40	509.229	442.897	86394.4	94134.4	47.455
41	517.32	452.081	72274.4	78749.4	47.455
42	525.411	461.479	58976.7	64260.4	47.455
43	533.502	471.102	46639.6	50818	47.455
44	541.593	480.959	35408.6	38580.8	47.455
45	549.683	491.06	25438	27717	47.455
46	557.774	501.416	16891.7	18405	47.455
47	565.865	512.039	9943.95	10834.8	47.4549
48	573.956	522.944	4781.23	5209.58	47.455
49	582.047	534.145	1616.89	1761.75	47.4551
50	590.138	545.657	959.837	1045.83	47.4551
51	598.229	557.5	0	0	0

Entity Information

External Boundary

X	Y
-119.082	0
900	0
900	242.207
900	256.996
900	283.488
900	298.894
900	326.297
900	340.046
900	364.52
900	378.882
900	401.213
900	416.559
900	548
700	548
628.434	569.928
580	550
494.015	501.453
409.526	416.559
394.254	401.213
372.029	378.882
357.735	364.52
333.378	340.046
319.695	326.297
292.423	298.894
277.089	283.488
251.684	257.96
236.006	242.207
194	200
-119.082	200

Material Boundary

X	Y
236.006	242.207
900	242.207

Material Boundary

X	Y
251.684	257.96
900	256.996

Material Boundary

X	Y
277.089	283.488
900	283.488

Material Boundary

X	Y
292.423	298.894
900	298.894

Material Boundary

X	Y
319.695	326.297
900	326.297

Material Boundary

X	Y
333.378	340.046
900	340.046

Material Boundary

X	Y
357.735	364.52
900	364.52

Material Boundary

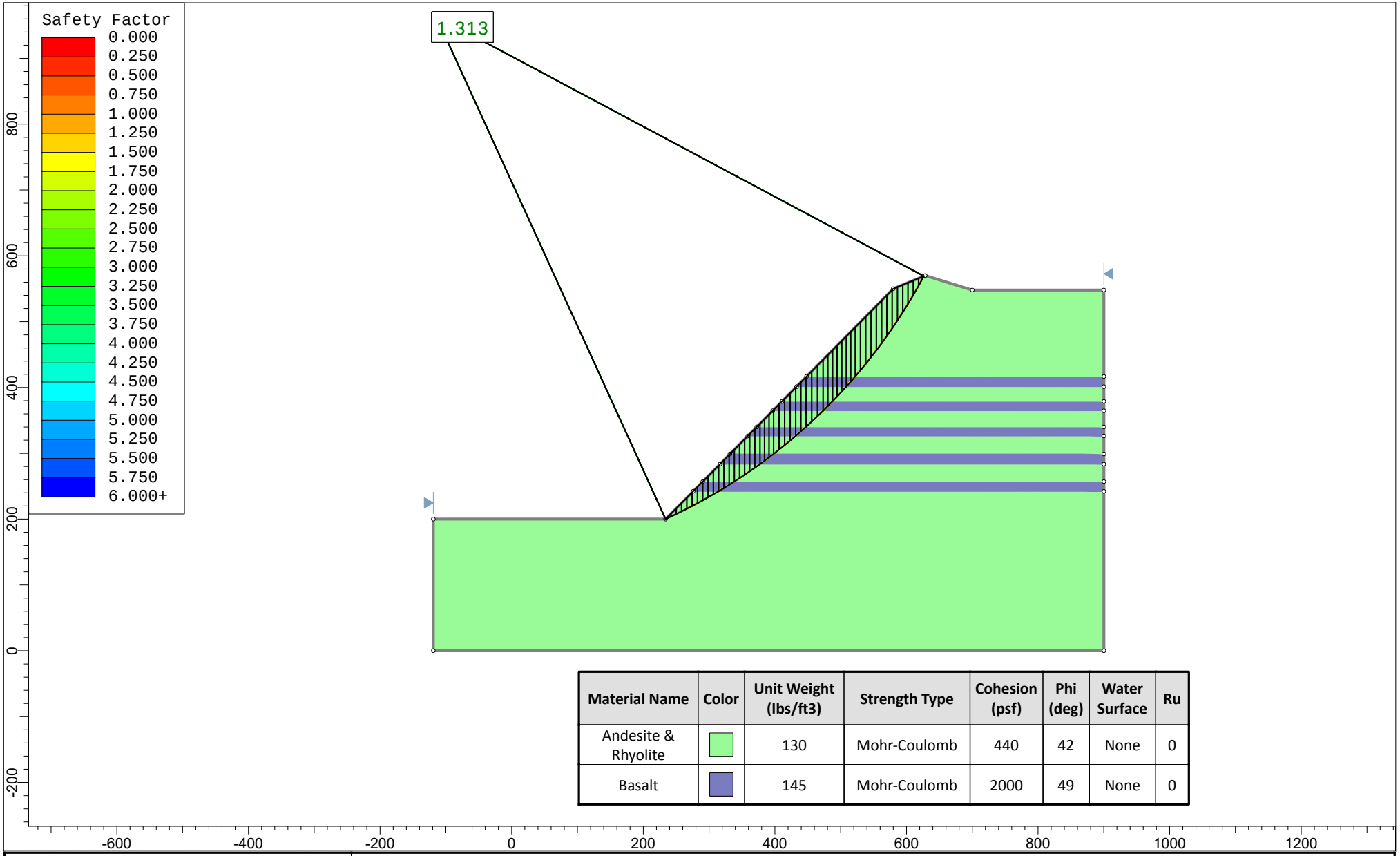
X	Y
372.029	378.882
900	378.882

Material Boundary

X	Y
394.254	401.213
900	401.213

Material Boundary

X	Y
409.526	416.559
900	416.559



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Andesite & Rhyolite		130	Mohr-Coulomb	440	42	None	0
Basalt		145	Mohr-Coulomb	2000	49	None	0

BAJADA Geosciences, Inc.

SLIDEINTERPRET 8.032

Project	Ward Lake Quarry Expansion		
Analysis Description	350' Slope, dry, static, 45 degree gross slope inclination		
Drawn By	J.Bianchin	*Scale* 1:2418	*Company* Bajada Geosciences, Inc.
Date	4/3/2020, 2:25:57 PM		*File Name* 350',dry,static,45deg.slim

Slide Analysis Information

Ward Lake Quarry Expansion

Project Summary

Slide Modeler Version:	8.032
Compute Time:	00h:00m:04.332s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical

Analysis Methods Used
Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search

Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Materials

Property	Andesite & Rhyolite	Basalt
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	145
Cohesion [psf]	440	2000
Friction Angle [°]	42	49
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: spencer

FS	1.313020
Center:	-114.959, 964.180
Radius:	840.074
Left Slip Surface Endpoint:	234.022, 200.023
Right Slip Surface Endpoint:	626.414, 569.097
Resisting Moment:	2.06244e+09 lb-ft
Driving Moment:	1.57076e+09 lb-ft
Resisting Horizontal Force:	1.81601e+06 lb
Driving Horizontal Force:	1.38308e+06 lb
Total Slice Area:	20824.1 ft2
Surface Horizontal Width:	392.392 ft
Surface Average Height:	53.0696 ft

Valid/Invalid Surfaces

Method: spencer

Number of Valid Surfaces:	9485
Number of Invalid Surfaces:	0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.31302

Slice	Width	Weight	Angle	Base	Base	Base	Shear	Shear	Base	Pore	Effective	Base	Effective

Number	[ft]	[lbs]	of Slice Base [degrees]	Material	Cohesion [psf]	Friction Angle [degrees]	Stress [psf]	Strength [psf]	Normal Stress [psf]	Pressure [psf]	Normal Stress [psf]	Vertical Stress [psf]	Vertical Stress [psf]
1	8.05296	2311.96	24.8482	Andesite & Rhyolite	440	42	582.428	764.739	360.659	0	360.659	630.374	630.374
2	8.05296	6881.4	25.455	Andesite & Rhyolite	440	42	913.31	1199.19	843.17	0	843.17	1277.92	1277.92
3	8.05296	11341	26.0649	Andesite & Rhyolite	440	42	1224.92	1608.35	1297.59	0	1297.59	1896.74	1896.74
4	8.05296	15689.2	26.6779	Andesite & Rhyolite	440	42	1517.86	1992.98	1724.76	0	1724.76	2487.43	2487.43
5	8.05296	19924	27.2943	Andesite & Rhyolite	440	42	1792.66	2353.8	2125.49	0	2125.49	3050.52	3050.52
6	8.05296	24375.7	27.9141	Andesite & Rhyolite	440	42	2072.76	2721.57	2533.94	0	2533.94	3632.06	3632.06
7	8.05296	29346.5	28.5375	Andesite & Rhyolite	440	42	2378.14	3122.55	2979.27	0	2979.27	4272.51	4272.51
8	8.05296	33715.9	29.1646	Andesite & Rhyolite	440	42	2632.5	3456.53	3350.2	0	3350.2	4819.32	4819.32
9	8.05296	37477.8	29.7955	Andesite & Rhyolite	440	42	2837.74	3726.01	3649.48	0	3649.48	5274.38	5274.38
10	8.05296	41116	30.4305	Andesite & Rhyolite	440	42	3027.25	3974.84	3925.83	0	3925.83	5704.07	5704.07
11	7.97887	44187.3	31.0666	Basalt	2000	49	5479.99	7195.34	4516.25	0	4516.25	7817.64	7817.64
12	7.97887	47863.6	31.7041	Basalt	2000	49	5691.9	7473.58	4758.11	0	4758.11	8274.06	8274.06
13	7.97887	51084.3	32.346	Basalt	2000	49	5856.54	7689.76	4946.03	0	4946.03	8654.97	8654.97
14	7.77516	52447	32.9841	Andesite & Rhyolite	440	42	3634.93	4772.73	4811.98	0	4811.98	7171.1	7171.1
15	7.77516	55233.9	33.6186	Andesite & Rhyolite	440	42	3748.28	4921.57	4977.29	0	4977.29	7469.4	7469.4
16	7.77516	57961.3	34.2578	Andesite & Rhyolite	440	42	3853	5059.06	5129.98	0	5129.98	7754.16	7754.16
17	7.77516	61234.8	34.9019	Andesite & Rhyolite	440	42	3985.19	5232.64	5322.76	0	5322.76	8103.07	8103.07
18	7.77516	64368.7	35.5511	Andesite & Rhyolite	440	42	4103.33	5387.76	5495.05	0	5495.05	8427.46	8427.46
19	6.87601	58614.3	36.1675	Basalt	2000	49	6520.68	8561.78	5704.07	0	5704.07	10470.8	10470.8
20	6.87601	59766.3	36.7506	Basalt	2000	49	6515.47	8554.94	5698.12	0	5698.12	10563.6	10563.6
21	6.87601	60823	37.3382	Basalt	2000	49	6500.43	8535.2	5680.96	0	5680.96	10639.8	10639.8
22	8.42543	76891.2	37.9977	Andesite & Rhyolite	440	42	4218.98	5539.61	5663.7	0	5663.7	8959.65	8959.65
23	8.42543	79876.3	38.7306	Andesite & Rhyolite	440	42	4289.55	5632.27	5766.6	0	5766.6	9206.95	9206.95
24	8.42543	81859.1	39.4711	Andesite & Rhyolite	440	42	4306.41	5654.4	5791.19	0	5791.19	9337.47	9337.47
25	8.42543	83492.4	40.2196	Andesite & Rhyolite	440	42	4303.45	5650.52	5786.87	0	5786.87	9426.09	9426.09
26	7.82334	78741.5	40.9491	Basalt	2000	49	6522.8	8564.57	5706.49	0	5706.49	11366.5	11366.5
27	7.82334	79909.2	41.6595	Basalt	2000	49	6475.02	8501.83	5651.95	0	5651.95	11412.8	11412.8
28	8.67662	89797.2	42.4174	Andesite & Rhyolite	440	42	4236.26	5562.3	5688.9	0	5688.9	9559.49	9559.49
29	8.67662	90631.2	43.2242	Andesite & Rhyolite	440	42	4185.3	5495.38	5614.57	0	5614.57	9548.15	9548.15
30	8.67662	91199.6	44.0419	Andesite & Rhyolite	440	42	4121.96	5412.21	5522.19	0	5522.19	9508.55	9508.55
31	7.14528	74964.5	44.7969	Basalt	2000	49	6086.19	7991.29	5208.14	0	5208.14	11251.3	11251.3
32	7.14528	74237.9	45.4879	Basalt	2000	49	5932.04	7788.89	5032.21	0	5032.21	11066.1	11066.1
33	6.97079	71930.7	46.1788	Andesite & Rhyolite	440	42	3833.7	5033.73	5101.86	0	5101.86	9096.64	9096.64
34	6.97079	71657.9	46.8698	Andesite & Rhyolite	440	42	3751.57	4925.88	4982.07	0	4982.07	8986.84	8986.84
35	6.97079	71220.9	47.5698	Andesite & Rhyolite	440	42	3662.06	4808.36	4851.55	0	4851.55	8857.78	8857.78
36	6.75987	68103.7	48.2685	Basalt	2000	49	5385.78	7071.64	4408.71	0	4408.71	10446.9	10446.9
37	6.75987	66592	48.966	Basalt	2000	49	5199.52	6827.08	4196.12	0	4196.12	10170.3	10170.3

38	8.02465	77390.9	49.7405	Andesite & Rhyolite	440	42	3277.15	4302.96	4290.25	0	4290.25	8160.08	8160.08
39	8.02465	75821.5	50.5951	Andesite & Rhyolite	440	42	3142.32	4125.93	4093.65	0	4093.65	7918.5	7918.5
40	8.02465	73939.2	51.4654	Andesite & Rhyolite	440	42	2998.42	3936.99	3883.8	0	3883.8	7648.67	7648.67
41	8.02465	71725.8	52.3527	Andesite & Rhyolite	440	42	2845.62	3736.35	3660.97	0	3660.97	7349.78	7349.78
42	8.02465	69161	53.2582	Andesite & Rhyolite	440	42	2684.11	3524.29	3425.45	0	3425.45	7020.99	7020.99
43	8.02465	66222.1	54.1833	Andesite & Rhyolite	440	42	2514.12	3301.09	3177.57	0	3177.57	6661.34	6661.34
44	8.02465	62883.6	55.1296	Andesite & Rhyolite	440	42	2335.91	3067.1	2917.7	0	2917.7	6269.84	6269.84
45	8.02465	57572.8	56.0989	Andesite & Rhyolite	440	42	2101.05	2758.72	2575.2	0	2575.2	5701.76	5701.76
46	8.02465	48437.3	57.0933	Andesite & Rhyolite	440	42	1759.25	2309.93	2076.77	0	2076.77	4795.45	4795.45
47	8.02465	38684.7	58.1151	Andesite & Rhyolite	440	42	1417.55	1861.27	1578.48	0	1578.48	3857.2	3857.2
48	8.02465	28388.2	59.1671	Andesite & Rhyolite	440	42	1080.68	1418.96	1087.24	0	1087.24	2897.74	2897.74
49	8.02465	17496	60.2525	Andesite & Rhyolite	440	42	749.937	984.682	604.931	0	604.931	1917.18	1917.18
50	8.02465	5947.02	61.3753	Andesite & Rhyolite	440	42	409.373	537.515	108.301	0	108.301	858.375	858.375

Query 1 (spencer) - Safety Factor: 1.31302

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	8.05296	2311.96	24.8482	Andesite & Rhyolite	440	42	582.428	764.739	360.659	0	360.659	630.374	630.374
2	8.05296	6881.4	25.455	Andesite & Rhyolite	440	42	913.31	1199.19	843.17	0	843.17	1277.92	1277.92
3	8.05296	11341	26.0649	Andesite & Rhyolite	440	42	1224.92	1608.35	1297.59	0	1297.59	1896.74	1896.74
4	8.05296	15689.2	26.6779	Andesite & Rhyolite	440	42	1517.86	1992.98	1724.76	0	1724.76	2487.43	2487.43
5	8.05296	19924	27.2943	Andesite & Rhyolite	440	42	1792.66	2353.8	2125.49	0	2125.49	3050.52	3050.52
6	8.05296	24375.7	27.9141	Andesite & Rhyolite	440	42	2072.76	2721.57	2533.94	0	2533.94	3632.06	3632.06
7	8.05296	29346.5	28.5375	Andesite & Rhyolite	440	42	2378.14	3122.55	2979.27	0	2979.27	4272.51	4272.51
8	8.05296	33715.9	29.1646	Andesite & Rhyolite	440	42	2632.5	3456.53	3350.2	0	3350.2	4819.32	4819.32
9	8.05296	37477.8	29.7955	Andesite & Rhyolite	440	42	2837.74	3726.01	3649.48	0	3649.48	5274.38	5274.38
10	8.05296	41116	30.4305	Andesite & Rhyolite	440	42	3027.25	3974.84	3925.83	0	3925.83	5704.07	5704.07
11	7.97887	44187.3	31.0666	Basalt	2000	49	5479.99	7195.34	4516.25	0	4516.25	7817.64	7817.64
12	7.97887	47863.6	31.7041	Basalt	2000	49	5691.9	7473.58	4758.11	0	4758.11	8274.06	8274.06
13	7.97887	51084.3	32.346	Basalt	2000	49	5856.54	7689.76	4946.03	0	4946.03	8654.97	8654.97
14	7.77516	52447	32.9841	Andesite & Rhyolite	440	42	3634.93	4772.73	4811.98	0	4811.98	7171.1	7171.1
15	7.77516	55233.9	33.6186	Andesite & Rhyolite	440	42	3748.28	4921.57	4977.29	0	4977.29	7469.4	7469.4
16	7.77516	57961.3	34.2578	Andesite & Rhyolite	440	42	3853	5059.06	5129.98	0	5129.98	7754.16	7754.16
17	7.77516	61234.8	34.9019	Andesite & Rhyolite	440	42	3985.19	5232.64	5322.76	0	5322.76	8103.07	8103.07
18	7.77516	64368.7	35.5511	Andesite & Rhyolite	440	42	4103.33	5387.76	5495.05	0	5495.05	8427.46	8427.46

19	6.87601	58614.3	36.1675	Basalt	2000	49	6520.68	8561.78	5704.07	0	5704.07	10470.8	10470.8
20	6.87601	59766.3	36.7506	Basalt	2000	49	6515.47	8554.94	5698.12	0	5698.12	10563.6	10563.6
21	6.87601	60823	37.3382	Basalt	2000	49	6500.43	8535.2	5680.96	0	5680.96	10639.8	10639.8
22	8.42543	76891.2	37.9977	Andesite & Rhyolite	440	42	4218.98	5539.61	5663.7	0	5663.7	8959.65	8959.65
23	8.42543	79876.3	38.7306	Andesite & Rhyolite	440	42	4289.55	5632.27	5766.6	0	5766.6	9206.95	9206.95
24	8.42543	81859.1	39.4711	Andesite & Rhyolite	440	42	4306.41	5654.4	5791.19	0	5791.19	9337.47	9337.47
25	8.42543	83492.4	40.2196	Andesite & Rhyolite	440	42	4303.45	5650.52	5786.87	0	5786.87	9426.09	9426.09
26	7.82334	78741.5	40.9491	Basalt	2000	49	6522.8	8564.57	5706.49	0	5706.49	11366.5	11366.5
27	7.82334	79909.2	41.6595	Basalt	2000	49	6475.02	8501.83	5651.95	0	5651.95	11412.8	11412.8
28	8.67662	89797.2	42.4174	Andesite & Rhyolite	440	42	4236.26	5562.3	5688.9	0	5688.9	9559.49	9559.49
29	8.67662	90631.2	43.2242	Andesite & Rhyolite	440	42	4185.3	5495.38	5614.57	0	5614.57	9548.15	9548.15
30	8.67662	91199.6	44.0419	Andesite & Rhyolite	440	42	4121.96	5412.21	5522.19	0	5522.19	9508.55	9508.55
31	7.14528	74964.5	44.7969	Basalt	2000	49	6086.19	7991.29	5208.14	0	5208.14	11251.3	11251.3
32	7.14528	74237.9	45.4879	Basalt	2000	49	5932.04	7788.89	5032.21	0	5032.21	11066.1	11066.1
33	6.97079	71930.7	46.1788	Andesite & Rhyolite	440	42	3833.7	5033.73	5101.86	0	5101.86	9096.64	9096.64
34	6.97079	71657.9	46.8698	Andesite & Rhyolite	440	42	3751.57	4925.88	4982.07	0	4982.07	8986.84	8986.84
35	6.97079	71220.9	47.5698	Andesite & Rhyolite	440	42	3662.06	4808.36	4851.55	0	4851.55	8857.78	8857.78
36	6.75987	68103.7	48.2685	Basalt	2000	49	5385.78	7071.64	4408.71	0	4408.71	10446.9	10446.9
37	6.75987	66592	48.966	Basalt	2000	49	5199.52	6827.08	4196.12	0	4196.12	10170.3	10170.3
38	8.02465	77390.9	49.7405	Andesite & Rhyolite	440	42	3277.15	4302.96	4290.25	0	4290.25	8160.08	8160.08
39	8.02465	75821.5	50.5951	Andesite & Rhyolite	440	42	3142.32	4125.93	4093.65	0	4093.65	7918.5	7918.5
40	8.02465	73939.2	51.4654	Andesite & Rhyolite	440	42	2998.42	3936.99	3883.8	0	3883.8	7648.67	7648.67
41	8.02465	71725.8	52.3527	Andesite & Rhyolite	440	42	2845.62	3736.35	3660.97	0	3660.97	7349.78	7349.78
42	8.02465	69161	53.2582	Andesite & Rhyolite	440	42	2684.11	3524.29	3425.45	0	3425.45	7020.99	7020.99
43	8.02465	66222.1	54.1833	Andesite & Rhyolite	440	42	2514.12	3301.09	3177.57	0	3177.57	6661.34	6661.34
44	8.02465	62883.6	55.1296	Andesite & Rhyolite	440	42	2335.91	3067.1	2917.7	0	2917.7	6269.84	6269.84
45	8.02465	57572.8	56.0989	Andesite & Rhyolite	440	42	2101.05	2758.72	2575.2	0	2575.2	5701.76	5701.76
46	8.02465	48437.3	57.0933	Andesite & Rhyolite	440	42	1759.25	2309.93	2076.77	0	2076.77	4795.45	4795.45
47	8.02465	38684.7	58.1151	Andesite & Rhyolite	440	42	1417.55	1861.27	1578.48	0	1578.48	3857.2	3857.2
48	8.02465	28388.2	59.1671	Andesite & Rhyolite	440	42	1080.68	1418.96	1087.24	0	1087.24	2897.74	2897.74
49	8.02465	17496	60.2525	Andesite & Rhyolite	440	42	749.937	984.682	604.931	0	604.931	1917.18	1917.18
50	8.02465	5947.02	61.3753	Andesite & Rhyolite	440	42	409.373	537.515	108.301	0	108.301	858.375	858.375

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.31302

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	234.022	200.023	0	0	0

2	242.075	203.752	3353.05	2773.14	39.5924
3	250.128	207.585	7487.93	6192.9	39.5925
4	258.181	211.524	12257.4	10137.5	39.5925
5	266.234	215.571	17521.9	14491.5	39.5925
6	274.287	219.726	23149.7	19146	39.5925
7	282.34	223.992	29058.4	24032.8	39.5925
8	290.393	228.372	35194.3	29107.5	39.5925
9	298.446	232.866	41372.6	34217.3	39.5925
10	306.499	237.477	47434.4	39230.7	39.5925
11	314.552	242.207	53282.3	44067.1	39.5924
12	322.531	247.014	75370	62334.8	39.5925
13	330.51	251.943	97409	80562.2	39.5925
14	338.489	256.996	119223	98603.2	39.5924
15	346.264	262.042	123249	101933	39.5924
16	354.039	267.211	126711	104797	39.5926
17	361.814	272.507	129553	107147	39.5925
18	369.589	277.931	131717	108936	39.5923
19	377.364	283.488	133141	110114	39.5924
20	384.24	288.514	149380	123544	39.5923
21	391.117	293.649	164996	136460	39.5925
22	397.993	298.894	179968	148843	39.5925
23	406.418	305.476	178295	147459	39.5925
24	414.843	312.234	175529	145171	39.5924
25	423.269	319.172	171691	141997	39.5924
26	431.694	326.297	166778	137934	39.5925
27	439.518	333.086	179154	148169	39.5924
28	447.341	340.046	190554	157598	39.5925
29	456.018	347.974	182272	150748	39.5924
30	464.694	356.128	172860	142964	39.5925
31	473.371	364.52	162346	134269	39.5926
32	480.516	371.614	168955	139734	39.5924
33	487.661	378.882	174837	144599	39.5925
34	494.632	386.146	164547	136089	39.5925
35	501.603	393.587	153669	127092	39.5925
36	508.574	401.213	142241	117640	39.5923
37	515.334	408.792	145296	120167	39.5924
38	522.093	416.559	147911	122330	39.5925
39	530.118	426.035	133598	110492	39.5924
40	538.143	435.803	118870	98311.9	39.5926
41	546.167	445.879	103839	85879.9	39.5924
42	554.192	456.281	88628.5	73300.3	39.5925
43	562.217	467.031	73381.2	60690	39.5925
44	570.241	478.15	58256.1	48180.8	39.5925
45	578.266	489.666	43432.6	35921	39.5925
46	586.291	501.607	29569.1	24455.1	39.5924
47	594.315	514.008	17955.8	14850.3	39.5924
48	602.34	526.908	8988.01	7433.54	39.5925
49	610.365	540.352	3057.67	2528.85	39.5925
50	618.389	554.394	591.369	489.092	39.5925
51	626.414	569.097	0	0	0

Query 1 (spencer) - Safety Factor: 1.31302

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	234.022	200.023	0	0	0
2	242.075	203.752	3353.05	2773.14	39.5924
3	250.128	207.585	7487.93	6192.9	39.5925
4	258.181	211.524	12257.4	10137.5	39.5925
5	266.234	215.571	17521.9	14491.5	39.5925
6	274.287	219.726	23149.7	19146	39.5925
7	282.34	223.992	29058.4	24032.8	39.5925

8	290.393	228.372	35194.3	29107.5	39.5925
9	298.446	232.866	41372.6	34217.3	39.5925
10	306.499	237.477	47434.4	39230.7	39.5925
11	314.552	242.207	53282.3	44067.1	39.5924
12	322.531	247.014	75370	62334.8	39.5925
13	330.51	251.943	97409	80562.2	39.5925
14	338.489	256.996	119223	98603.2	39.5924
15	346.264	262.042	123249	101933	39.5924
16	354.039	267.211	126711	104797	39.5926
17	361.814	272.507	129553	107147	39.5925
18	369.589	277.931	131717	108936	39.5923
19	377.364	283.488	133141	110114	39.5924
20	384.24	288.514	149380	123544	39.5923
21	391.117	293.649	164996	136460	39.5925
22	397.993	298.894	179968	148843	39.5925
23	406.418	305.476	178295	147459	39.5925
24	414.843	312.234	175529	145171	39.5924
25	423.269	319.172	171691	141997	39.5924
26	431.694	326.297	166778	137934	39.5925
27	439.518	333.086	179154	148169	39.5924
28	447.341	340.046	190554	157598	39.5925
29	456.018	347.974	182272	150748	39.5924
30	464.694	356.128	172860	142964	39.5925
31	473.371	364.52	162346	134269	39.5926
32	480.516	371.614	168955	139734	39.5924
33	487.661	378.882	174837	144599	39.5925
34	494.632	386.146	164547	136089	39.5925
35	501.603	393.587	153669	127092	39.5925
36	508.574	401.213	142241	117640	39.5923
37	515.334	408.792	145296	120167	39.5924
38	522.093	416.559	147911	122330	39.5925
39	530.118	426.035	133598	110492	39.5924
40	538.143	435.803	118870	98311.9	39.5926
41	546.167	445.879	103839	85879.9	39.5924
42	554.192	456.281	88628.5	73300.3	39.5925
43	562.217	467.031	73381.2	60690	39.5925
44	570.241	478.15	58256.1	48180.8	39.5925
45	578.266	489.666	43432.6	35921	39.5925
46	586.291	501.607	29569.1	24455.1	39.5924
47	594.315	514.008	17955.8	14850.3	39.5924
48	602.34	526.908	8988.01	7433.54	39.5925
49	610.365	540.352	3057.67	2528.85	39.5925
50	618.389	554.394	591.369	489.092	39.5925
51	626.414	569.097	0	0	0

Entity Information

External Boundary

X	Y
-119.082	0
900	0
900	242.207
900	256.996
900	283.488
900	298.894
900	326.297
900	340.046
900	364.52
900	378.882

900	401.213
900	416.559
900	548
700	548
628.434	569.928
580	550
448.084	416.559
432.914	401.213
410.838	378.882
396.639	364.52
372.445	340.046
358.854	326.297
331.764	298.894
316.534	283.488
290.344	256.996
275.725	242.207
234	200
-119.082	200

Material Boundary

X	Y
275.725	242.207
900	242.207

Material Boundary

X	Y
290.344	256.996
900	256.996

Material Boundary

X	Y
316.534	283.488
900	283.488

Material Boundary

X	Y
331.764	298.894
900	298.894

Material Boundary

X	Y
358.854	326.297
900	326.297

Material Boundary

X	Y
372.445	340.046
900	340.046

Material Boundary

X	Y
396.639	364.52

900	364.52

Material Boundary

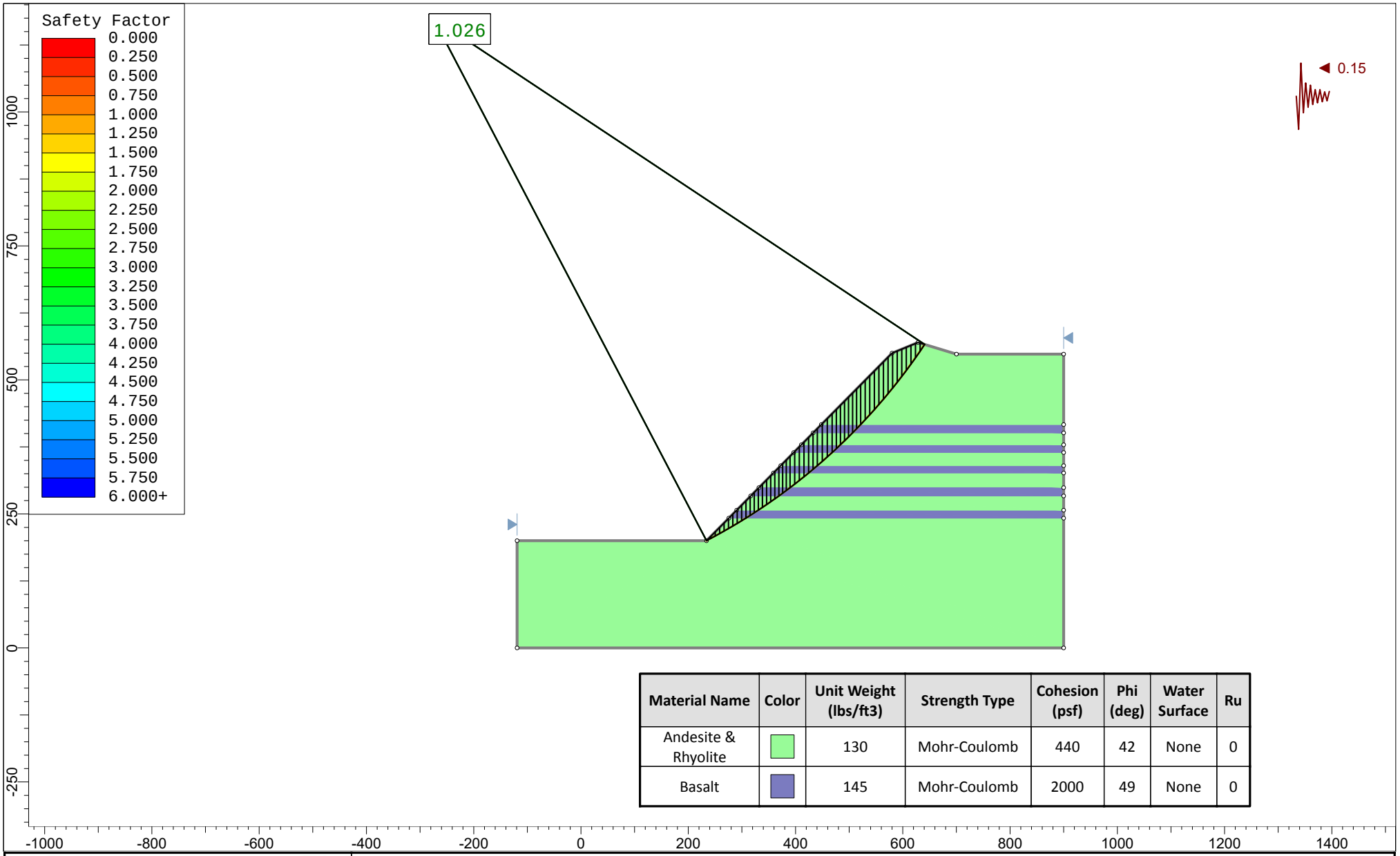
X	Y
410.838	378.882
900	378.882

Material Boundary

X	Y
432.914	401.213
900	401.213

Material Boundary

X	Y
448.084	416.559
900	416.559



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Andesite & Rhyolite		130	Mohr-Coulomb	440	42	None	0
Basalt		145	Mohr-Coulomb	2000	49	None	0

BAJADA Geosciences, Inc.

SLIDEINTERPRET 8.032

Project	Ward Lake Quarry Expansion		
Analysis Description	350' Slope, dry, pseudostatic, 45 degree gross slope inclination		
Drawn By	J.Bianchin	Scale 1:2967	Company Bajada Geosciences, Inc.
Date	4/3/2020, 2:25:57 PM		File Name 350',dry,PS,45deg.slim

Slide Analysis Information

Ward Lake Quarry Expansion

Project Summary

Slide Modeler Version:	8.032
Compute Time:	00h:00m:03.384s

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical

Analysis Methods Used
Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search

Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis: No
Staged pseudostatic analysis: No

Seismic Load Coefficient (Horizontal): 0.15

Materials

Property	Andesite & Rhyolite	Basalt
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	130	145
Cohesion [psf]	440	2000
Friction Angle [°]	42	49
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: spencer

FS	1.025820
Center:	-275.555, 1175.072
Radius:	1100.177
Left Slip Surface Endpoint:	234.022, 200.023
Right Slip Surface Endpoint:	640.747, 566.155
Resisting Moment:	2.4147e+09 lb-ft
Driving Moment:	2.35391e+09 lb-ft
Resisting Horizontal Force:	1.64514e+06 lb
Driving Horizontal Force:	1.60373e+06 lb
Total Slice Area:	20696 ft2
Surface Horizontal Width:	406.725 ft
Surface Average Height:	50.8846 ft

Valid/Invalid Surfaces

Method: spencer

Number of Valid Surfaces: 9884
Number of Invalid Surfaces: 0

Slice Data

Global Minimum Query (spencer) - Safety Factor: 1.02582

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	8.18328	2104.91	27.8333	Andesite & Rhyolite	440	42	783.573	803.805	404.046	0	404.046	817.76	817.76
2	8.18328	6267.6	28.3163	Andesite & Rhyolite	440	42	1114.22	1142.99	780.749	0	780.749	1381.11	1381.11
3	8.18328	10335.4	28.8016	Andesite & Rhyolite	440	42	1424.9	1461.69	1134.7	0	1134.7	1918.09	1918.09
4	8.18328	14306.9	29.289	Andesite & Rhyolite	440	42	1716.24	1760.55	1466.63	0	1466.63	2429.3	2429.3
5	8.18328	18180.8	29.7789	Andesite & Rhyolite	440	42	1988.86	2040.21	1777.21	0	1777.21	2915.27	2915.27
6	8.18328	22370.8	30.2711	Andesite & Rhyolite	440	42	2274.76	2333.49	2102.94	0	2102.94	3430.66	3430.66
7	8.18328	27049.6	30.7658	Andesite & Rhyolite	440	42	2585.73	2652.49	2457.22	0	2457.22	3996.53	3996.53
8	8.18328	31017.6	31.2631	Andesite & Rhyolite	440	42	2832.53	2905.67	2738.4	0	2738.4	4458.11	4458.11
9	8.18328	34486.1	31.763	Andesite & Rhyolite	440	42	3033.5	3111.82	2967.36	0	2967.36	4845.5	4845.5
10	7.67082	35105	32.2498	Basalt	2000	49	6311.33	6474.29	3889.44	0	3889.44	7871.56	7871.56
11	7.67082	37728.5	32.7234	Basalt	2000	49	6478.88	6646.16	4038.85	0	4038.85	8201.95	8201.95
12	7.67082	40815.7	33.1995	Basalt	2000	49	6683.63	6856.2	4221.43	0	4221.43	8594.99	8594.99
13	7.66569	43746.4	33.6781	Andesite & Rhyolite	440	42	3658.15	3752.6	3679.01	0	3679.01	6116.67	6116.67
14	7.66569	46345.6	34.1592	Andesite & Rhyolite	440	42	3780.22	3877.83	3818.09	0	3818.09	6383.2	6383.2
15	7.66569	48842.1	34.6431	Andesite & Rhyolite	440	42	3889.68	3990.11	3942.8	0	3942.8	6630.43	6630.43
16	7.66569	51290.2	35.1298	Andesite & Rhyolite	440	42	3990.68	4093.72	4057.86	0	4057.86	6865.66	6865.66
17	7.66569	54282.4	35.6194	Andesite & Rhyolite	440	42	4122.78	4229.23	4208.36	0	4208.36	7162.1	7162.1
18	6.93042	51389.5	36.0882	Basalt	2000	49	7488.7	7682.06	4939.34	0	4939.34	10397.8	10397.8
19	6.93042	52676.8	36.5362	Basalt	2000	49	7497.75	7691.34	4947.41	0	4947.41	10502.8	10502.8
20	6.93042	53790	36.9867	Basalt	2000	49	7487.4	7680.72	4938.18	0	4938.18	10577.6	10577.6
21	8.6551	69059.3	37.4967	Andesite & Rhyolite	440	42	4294.11	4404.98	4403.56	0	4403.56	7698.14	7698.14
22	8.6551	72143.2	38.067	Andesite & Rhyolite	440	42	4377.51	4490.54	4498.57	0	4498.57	7926.92	7926.92
23	8.6551	75240.1	38.6418	Andesite & Rhyolite	440	42	4456.11	4571.17	4588.13	0	4588.13	8150.72	8150.72
24	8.6551	77329.2	39.2213	Andesite & Rhyolite	440	42	4477.43	4593.04	4612.42	0	4612.42	8266.9	8266.9
25	8.17285	74277.5	39.7892	Basalt	2000	49	7579.17	7774.86	5020.01	0	5020.01	11332.3	11332.3
26	8.17285	75382.9	40.3454	Basalt	2000	49	7512.91	7706.89	4960.93	0	4960.93	11342.6	11342.6
27	9.19337	87083.9	40.9415	Andesite & Rhyolite	440	42	4452.3	4567.26	4583.79	0	4583.79	8446.14	8446.14
28	9.19337	88964.6	41.5784	Andesite & Rhyolite	440	42	4442.75	4557.46	4572.9	0	4572.9	8514.37	8514.37
29	9.19337	90220	42.2217	Andesite & Rhyolite	440	42	4403.7	4517.4	4528.41	0	4528.41	8524.48	8524.48
30	7.67626	75725.3	42.8175	Basalt	2000	49	7237.24	7424.11	4715.11	0	4715.11	11421	11421
31	7.67626	75480.8	43.3649	Basalt	2000	49	7087.67	7270.67	4581.73	0	4581.73	11276	11276
32	7.58265	74584	43.914	Andesite & Rhyolite	440	42	4173.79	4281.56	4266.49	0	4266.49	8284.98	8284.98
33	7.58265	74878.6	44.4647	Andesite & Rhyolite	440	42	4113.95	4220.17	4198.3	0	4198.3	8236.09	8236.09
34	7.58265	75031.5	45.0207	Andesite & Rhyolite	440	42	4047.71	4152.22	4122.84	0	4122.84	8173.48	8173.48
35	7.44672	73270.3	45.5771	Basalt	2000	49	6580.93	6750.85	4129.85	0	4129.85	10844.7	10844.7
36	7.44672	72277.7	46.1339	Basalt	2000	49	6399.14	6564.37	3967.74	0	3967.74	10625.3	10625.3

37	8.52881	81924.6	46.7378	Andesite & Rhyolite	440	42	3730.93	3827.26	3761.93	0	3761.93	7726.33	7726.33
38	8.52881	81326.2	47.3899	Andesite & Rhyolite	440	42	3630.86	3724.61	3647.93	0	3647.93	7595.06	7595.06
39	8.52881	80491.4	48.0502	Andesite & Rhyolite	440	42	3523.8	3614.78	3525.96	0	3525.96	7446.43	7446.43
40	8.52881	79411.1	48.719	Andesite & Rhyolite	440	42	3409.95	3497.99	3396.24	0	3396.24	7280.3	7280.3
41	8.52881	78075.3	49.3969	Andesite & Rhyolite	440	42	3289.5	3374.43	3259.01	0	3259.01	7096.51	7096.51
42	8.52881	76473.5	50.0842	Andesite & Rhyolite	440	42	3162.61	3244.27	3114.46	0	3114.46	6894.78	6894.78
43	8.52881	74551.3	50.7816	Andesite & Rhyolite	440	42	3027.97	3106.15	2961.06	0	2961.06	6671.28	6671.28
44	8.52881	68891	51.4895	Andesite & Rhyolite	440	42	2768.58	2840.06	2665.53	0	2665.53	6144.8	6144.8
45	8.52881	60742.6	52.2086	Andesite & Rhyolite	440	42	2435.15	2498.03	2285.68	0	2285.68	5426.03	5426.03
46	8.52881	52275.2	52.9395	Andesite & Rhyolite	440	42	2104.55	2158.89	1909.02	0	1909.02	4695.72	4695.72
47	8.52881	43472.7	53.683	Andesite & Rhyolite	440	42	1776.64	1822.51	1535.43	0	1535.43	3952.53	3952.53
48	8.52881	34317	54.4399	Andesite & Rhyolite	440	42	1451.29	1488.76	1164.76	0	1164.76	3194.88	3194.88
49	8.52881	24119.8	55.211	Andesite & Rhyolite	440	42	1107.88	1136.48	773.522	0	773.522	2368.2	2368.2
50	8.52881	8457.78	55.9974	Andesite & Rhyolite	440	42	475.811	488.096	53.4164	0	53.4164	758.766	758.766

Query 1 (spencer) - Safety Factor: 1.02582

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	8.18328	2104.91	27.8333	Andesite & Rhyolite	440	42	783.573	803.805	404.046	0	404.046	817.76	817.76
2	8.18328	6267.6	28.3163	Andesite & Rhyolite	440	42	1114.22	1142.99	780.749	0	780.749	1381.11	1381.11
3	8.18328	10335.4	28.8016	Andesite & Rhyolite	440	42	1424.9	1461.69	1134.7	0	1134.7	1918.09	1918.09
4	8.18328	14306.9	29.289	Andesite & Rhyolite	440	42	1716.24	1760.55	1466.63	0	1466.63	2429.3	2429.3
5	8.18328	18180.8	29.7789	Andesite & Rhyolite	440	42	1988.86	2040.21	1777.21	0	1777.21	2915.27	2915.27
6	8.18328	22370.8	30.2711	Andesite & Rhyolite	440	42	2274.76	2333.49	2102.94	0	2102.94	3430.66	3430.66
7	8.18328	27049.6	30.7658	Andesite & Rhyolite	440	42	2585.73	2652.49	2457.22	0	2457.22	3996.53	3996.53
8	8.18328	31017.6	31.2631	Andesite & Rhyolite	440	42	2832.53	2905.67	2738.4	0	2738.4	4458.11	4458.11
9	8.18328	34486.1	31.763	Andesite & Rhyolite	440	42	3033.5	3111.82	2967.36	0	2967.36	4845.5	4845.5
10	7.67082	35105	32.2498	Basalt	2000	49	6311.33	6474.29	3889.44	0	3889.44	7871.56	7871.56
11	7.67082	37728.5	32.7234	Basalt	2000	49	6478.88	6646.16	4038.85	0	4038.85	8201.95	8201.95
12	7.67082	40815.7	33.1995	Basalt	2000	49	6683.63	6856.2	4221.43	0	4221.43	8594.99	8594.99
13	7.66569	43746.4	33.6781	Andesite & Rhyolite	440	42	3658.15	3752.6	3679.01	0	3679.01	6116.67	6116.67
14	7.66569	46345.6	34.1592	Andesite & Rhyolite	440	42	3780.22	3877.83	3818.09	0	3818.09	6383.2	6383.2
15	7.66569	48842.1	34.6431	Andesite & Rhyolite	440	42	3889.68	3990.11	3942.8	0	3942.8	6630.43	6630.43
16	7.66569	51290.2	35.1298	Andesite & Rhyolite	440	42	3990.68	4093.72	4057.86	0	4057.86	6865.66	6865.66
17	7.66569	54282.4	35.6194	Andesite & Rhyolite	440	42	4122.78	4229.23	4208.36	0	4208.36	7162.1	7162.1

18	6.93042	51389.5	36.0882	Basalt	2000	49	7488.7	7682.06	4939.34	0	4939.34	10397.8	10397.8
19	6.93042	52676.8	36.5362	Basalt	2000	49	7497.75	7691.34	4947.41	0	4947.41	10502.8	10502.8
20	6.93042	53790	36.9867	Basalt	2000	49	7487.4	7680.72	4938.18	0	4938.18	10577.6	10577.6
21	8.6551	69059.3	37.4967	Andesite & Rhyolite	440	42	4294.11	4404.98	4403.56	0	4403.56	7698.14	7698.14
22	8.6551	72143.2	38.067	Andesite & Rhyolite	440	42	4377.51	4490.54	4498.57	0	4498.57	7926.92	7926.92
23	8.6551	75240.1	38.6418	Andesite & Rhyolite	440	42	4456.11	4571.17	4588.13	0	4588.13	8150.72	8150.72
24	8.6551	77329.2	39.2213	Andesite & Rhyolite	440	42	4477.43	4593.04	4612.42	0	4612.42	8266.9	8266.9
25	8.17285	74277.5	39.7892	Basalt	2000	49	7579.17	7774.86	5020.01	0	5020.01	11332.3	11332.3
26	8.17285	75382.9	40.3454	Basalt	2000	49	7512.91	7706.89	4960.93	0	4960.93	11342.6	11342.6
27	9.19337	87083.9	40.9415	Andesite & Rhyolite	440	42	4452.3	4567.26	4583.79	0	4583.79	8446.14	8446.14
28	9.19337	88964.6	41.5784	Andesite & Rhyolite	440	42	4442.75	4557.46	4572.9	0	4572.9	8514.37	8514.37
29	9.19337	90220	42.2217	Andesite & Rhyolite	440	42	4403.7	4517.4	4528.41	0	4528.41	8524.48	8524.48
30	7.67626	75725.3	42.8175	Basalt	2000	49	7237.24	7424.11	4715.11	0	4715.11	11421	11421
31	7.67626	75480.8	43.3649	Basalt	2000	49	7087.67	7270.67	4581.73	0	4581.73	11276	11276
32	7.58265	74584	43.914	Andesite & Rhyolite	440	42	4173.79	4281.56	4266.49	0	4266.49	8284.98	8284.98
33	7.58265	74878.6	44.4647	Andesite & Rhyolite	440	42	4113.95	4220.17	4198.3	0	4198.3	8236.09	8236.09
34	7.58265	75031.5	45.0207	Andesite & Rhyolite	440	42	4047.71	4152.22	4122.84	0	4122.84	8173.48	8173.48
35	7.44672	73270.3	45.5771	Basalt	2000	49	6580.93	6750.85	4129.85	0	4129.85	10844.7	10844.7
36	7.44672	72277.7	46.1339	Basalt	2000	49	6399.14	6564.37	3967.74	0	3967.74	10625.3	10625.3
37	8.52881	81924.6	46.7378	Andesite & Rhyolite	440	42	3730.93	3827.26	3761.93	0	3761.93	7726.33	7726.33
38	8.52881	81326.2	47.3899	Andesite & Rhyolite	440	42	3630.86	3724.61	3647.93	0	3647.93	7595.06	7595.06
39	8.52881	80491.4	48.0502	Andesite & Rhyolite	440	42	3523.8	3614.78	3525.96	0	3525.96	7446.43	7446.43
40	8.52881	79411.1	48.719	Andesite & Rhyolite	440	42	3409.95	3497.99	3396.24	0	3396.24	7280.3	7280.3
41	8.52881	78075.3	49.3969	Andesite & Rhyolite	440	42	3289.5	3374.43	3259.01	0	3259.01	7096.51	7096.51
42	8.52881	76473.5	50.0842	Andesite & Rhyolite	440	42	3162.61	3244.27	3114.46	0	3114.46	6894.78	6894.78
43	8.52881	74551.3	50.7816	Andesite & Rhyolite	440	42	3027.97	3106.15	2961.06	0	2961.06	6671.28	6671.28
44	8.52881	68891	51.4895	Andesite & Rhyolite	440	42	2768.58	2840.06	2665.53	0	2665.53	6144.8	6144.8
45	8.52881	60742.6	52.2086	Andesite & Rhyolite	440	42	2435.15	2498.03	2285.68	0	2285.68	5426.03	5426.03
46	8.52881	52275.2	52.9395	Andesite & Rhyolite	440	42	2104.55	2158.89	1909.02	0	1909.02	4695.72	4695.72
47	8.52881	43472.7	53.683	Andesite & Rhyolite	440	42	1776.64	1822.51	1535.43	0	1535.43	3952.53	3952.53
48	8.52881	34317	54.4399	Andesite & Rhyolite	440	42	1451.29	1488.76	1164.76	0	1164.76	3194.88	3194.88
49	8.52881	24119.8	55.211	Andesite & Rhyolite	440	42	1107.88	1136.48	773.522	0	773.522	2368.2	2368.2
50	8.52881	8457.78	55.9974	Andesite & Rhyolite	440	42	475.811	488.096	53.4164	0	53.4164	758.766	758.766

Interslice Data

Global Minimum Query (spencer) - Safety Factor: 1.02582

Slice Number	X coordinate	Y coordinate - Bottom	Interslice Normal Force	Interslice Shear Force	Interslice Force Angle

	[ft]	[ft]	[lbs]	[lbs]	[degrees]
1	234.022	200.023	0	0	0
2	242.206	204.343	4371.59	4809.32	47.7297
3	250.389	208.753	9136.59	10051.4	47.7296
4	258.572	213.252	14179.5	15599.3	47.7297
5	266.755	217.842	19391.5	21333.2	47.7297
6	274.939	222.524	24670.8	27141.1	47.7297
7	283.122	227.301	29946.3	32944.8	47.7297
8	291.305	232.172	35146.8	38666.1	47.7297
9	299.489	237.141	40143.8	44163.5	47.7297
10	307.672	242.207	44841.4	49331.4	47.7297
11	315.343	247.047	69321.8	76263.1	47.7297
12	323.014	251.976	93615.1	102989	47.7297
13	330.684	256.996	117739	129528	47.7296
14	338.35	262.104	120517	132585	47.7298
15	346.016	267.305	122777	135071	47.7298
16	353.681	272.602	124481	136946	47.7298
17	361.347	277.996	125593	138168	47.7296
18	369.013	283.488	126045	138666	47.7297
19	375.943	288.539	145454	160018	47.7296
20	382.874	293.674	164279	180728	47.7296
21	389.804	298.894	182493	200766	47.7297
22	398.459	305.535	180179	198221	47.7298
23	407.114	312.313	176876	194586	47.7296
24	415.769	319.233	172535	189811	47.7297
25	424.424	326.297	167231	183976	47.7297
26	432.597	333.104	184064	202495	47.7298
27	440.77	340.046	199919	219937	47.7297
28	449.964	348.021	191364	210526	47.7298
29	459.157	356.177	181700	199893	47.7296
30	468.35	364.52	171005	188128	47.7297
31	476.027	371.632	181846	200054	47.7296
32	483.703	378.882	191889	211103	47.7297
33	491.285	386.183	181305	199459	47.7297
34	498.868	393.625	170125	187159	47.7296
35	506.451	401.213	158377	174236	47.7298
36	513.897	408.812	165173	181712	47.7297
37	521.344	416.559	171399	188562	47.7298
38	529.873	425.622	156942	172657	47.7297
39	538.402	434.893	141988	156205	47.7296
40	546.931	444.382	126609	139286	47.7296
41	555.459	454.097	110881	121984	47.7298
42	563.988	464.046	94890.6	104392	47.7297
43	572.517	474.241	78729.9	86613.2	47.7297
44	581.046	484.692	62511.7	68771	47.7297
45	589.575	495.41	47297.9	52033.9	47.7297
46	598.103	506.408	33883.7	37276.5	47.7297
47	606.632	517.702	22491	24743	47.7297
48	615.161	529.305	13355.8	14693.2	47.7298
49	623.69	541.236	6730.15	7404.05	47.7297
50	632.219	553.512	3095.76	3405.74	47.7297
51	640.747	566.155	0	0	0

Query 1 (spencer) - Safety Factor: 1.02582

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	234.022	200.023	0	0	0
2	242.206	204.343	4371.59	4809.32	47.7297
3	250.389	208.753	9136.59	10051.4	47.7296
4	258.572	213.252	14179.5	15599.3	47.7297
5	266.755	217.842	19391.5	21333.2	47.7297

6	274.939	222.524	24670.8	27141.1	47.7297
7	283.122	227.301	29946.3	32944.8	47.7297
8	291.305	232.172	35146.8	38666.1	47.7297
9	299.489	237.141	40143.8	44163.5	47.7297
10	307.672	242.207	44841.4	49331.4	47.7297
11	315.343	247.047	69321.8	76263.1	47.7297
12	323.014	251.976	93615.1	102989	47.7297
13	330.684	256.996	117739	129528	47.7296
14	338.35	262.104	120517	132585	47.7298
15	346.016	267.305	122777	135071	47.7298
16	353.681	272.602	124481	136946	47.7298
17	361.347	277.996	125593	138168	47.7296
18	369.013	283.488	126045	138666	47.7297
19	375.943	288.539	145454	160018	47.7296
20	382.874	293.674	164279	180728	47.7296
21	389.804	298.894	182493	200766	47.7297
22	398.459	305.535	180179	198221	47.7298
23	407.114	312.313	176876	194586	47.7296
24	415.769	319.233	172535	189811	47.7297
25	424.424	326.297	167231	183976	47.7297
26	432.597	333.104	184064	202495	47.7298
27	440.77	340.046	199919	219937	47.7297
28	449.964	348.021	191364	210526	47.7298
29	459.157	356.177	181700	199893	47.7296
30	468.35	364.52	171005	188128	47.7297
31	476.027	371.632	181846	200054	47.7296
32	483.703	378.882	191889	211103	47.7297
33	491.285	386.183	181305	199459	47.7297
34	498.868	393.625	170125	187159	47.7296
35	506.451	401.213	158377	174236	47.7298
36	513.897	408.812	165173	181712	47.7297
37	521.344	416.559	171399	188562	47.7298
38	529.873	425.622	156942	172657	47.7297
39	538.402	434.893	141988	156205	47.7296
40	546.931	444.382	126609	139286	47.7296
41	555.459	454.097	110881	121984	47.7298
42	563.988	464.046	94890.6	104392	47.7297
43	572.517	474.241	78729.9	86613.2	47.7297
44	581.046	484.692	62511.7	68771	47.7297
45	589.575	495.41	47297.9	52033.9	47.7297
46	598.103	506.408	33883.7	37276.5	47.7297
47	606.632	517.702	22491	24743	47.7297
48	615.161	529.305	13355.8	14693.2	47.7298
49	623.69	541.236	6730.15	7404.05	47.7297
50	632.219	553.512	3095.76	3405.74	47.7297
51	640.747	566.155	0	0	0

Entity Information

External Boundary

X	Y
-119.082	0
900	0
900	242.207
900	256.996
900	283.488
900	298.894
900	326.297
900	340.046

900	364.52
900	378.882
900	401.213
900	416.559
900	548
700	548
628.434	569.928
580	550
448.084	416.559
432.914	401.213
410.838	378.882
396.639	364.52
372.445	340.046
358.854	326.297
331.764	298.894
316.534	283.488
290.344	256.996
275.725	242.207
234	200
-119.082	200

Material Boundary

X	Y
275.725	242.207
900	242.207

Material Boundary

X	Y
290.344	256.996
900	256.996

Material Boundary

X	Y
316.534	283.488
900	283.488

Material Boundary

X	Y
331.764	298.894
900	298.894

Material Boundary

X	Y
358.854	326.297
900	326.297

Material Boundary

X	Y
372.445	340.046
900	340.046

Material Boundary

X	Y
396.639	364.52
900	364.52

Material Boundary

X	Y
410.838	378.882
900	378.882

Material Boundary

X	Y
432.914	401.213
900	401.213

Material Boundary

X	Y
448.084	416.559
900	416.559

APPENDIX C

Air-Percussion Explorations



APPENDIX C
AIR-PERCUSSION EXPLORATIONS

Exploration at the project site was performed by Hat Creek Construction using air-percussion (Air-Track) methods. The drilling was performed between February 10 and February 24, 2020 by Precision Blasting out of Carson City, Nevada. A total of 90 air-percussion holes were advanced in the study area. A Bajada representative was not involved with development of the exploration plan nor was present on-site during drilling. Logs of the air-percussion drill holes were provided to Bajada after the exploration program was completed.

The logs of those air-percussion drill holes are attached to this appendix.

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Cell 775.315.1257
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Drill Log

Date 2/10/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2157

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
1	112	4		X	Fill 4' soft red tan 6ft/min 4'-80' tan soft clay rock/ boulder mix 4.8-5.8ft/min 80'-112'
					TEST DRILLING
					East side of primary crusher lower road north end

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/11/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2160.1

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
2	112	0		X	Soft red 6.4 ft/min 0'-14' brown rock 3.8 ft/min 14'-26' soft red/tan boulder mix 5.8ft/min
					26'-90' soft brown rock 4.2 ft/min 90'-112'
					TEST DRILL
					East side crusher primary lower road

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/11/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2160.8

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
3	112	0		X	Tan/red boulder mix 4ft/min 0'-18' tan/brown boulder mix 4ft-7ft/min 18'-112'
					Test Drill
					East side primary lower beach mid point

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/11/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2161.5

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
4	112	4		X	4ft clay/rock fill soft brown rock boulder mix 5ft/min 4'-90' tan rock 7ft/min 90'-112'
					Test drilling
					East side primary south side lower road

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/11/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2162.3

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
5	112	0		X	Soft brown rock 5ft/min 0'-38' 8ft/min 38'-100' soft tan rock 8ft/min 100'-112'
					Test drill
					East primary south side lower bench

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/11/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2163

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
6	112	8		X	8ft dirt super soft brownish red rock 9ft/min 8'-77' soft tan rock 7ft/min 77'-112'
					Test drill
					East primary 2nd bench north

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/11/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2163.8

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
7	112	0		X	Brown clay rock mix 3ft-7ft/ min 0'-38' soft brown rock 7ft/min 38'-112'
					Test drill
					East primary 2nd road midway

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/11/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 5.5 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2165

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
8	112	0		X	Soft brown rock 8ft/min 0'-36' tan boulder mix 4ft-7ft/ min 36'-112'
					East primary perpendicular to 2nd road

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/12/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2167

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
9	80	5		X	Clay rock mix 7ft/min 5'-40' soft tan boulder mix 8ft/min 40'-80'
					Test drill
					Location 3 south side pit mid bench north end

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/11/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2167.5

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
10	112	4		X	Clay rock mix 6ft/min 4'-38' soft tan boulder mix 9ft/min 38ft'-80' gray rock 3ft/min 80'-90'
					Rock clay mix 90'-112'
					Test drill
					Location 3 mid bench north side

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/12/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2169

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1.5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
11	96	3		X	0-8' soft dirt 7ft/min 8'-10' boulder 10'-48 Red/tan clay rock mix 6.5ft/min
					Tan clay mix 7ft/min 48'-96'

Number of Holes 1
Total Footage 96
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/12/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2170

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
12	112	4		X	Tan dirt 8ft/min 0-32' tan boulder mix 4.8-6ft/min 32'-90' soft white sand 12ft/min 09'-96'
					Test drill
					North boundary near blm before fence next to lone tree

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/12/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2172

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 2 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
13	112	3		X	Red tan clay boulder mix 6ft/min 0-14' light grey rock 2-4ft/min 14'-33' tan rock 4-5ft/min 33
					Grey tan mix rock 3.5-4.5ft-min 43'-60' grey rock 1.2-3ft/min 60'-90'
					Tan rock clay mix 4-5ft/min 90'-102' tan grey rock mix 1.8-3ft/min 102'-112'
					Test drill
					New property upper road at y north end

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/12/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-153 Hour Meter 2173

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
14	112	2		X	Fill 2' grey rock1.9-3ft/min 2'-12' tan rock 5ft/min 12'-17' grey rock 1.5-2.8ft/min 17'-24'
					Grey tan mix 3.4-4.8ft/min 24'-34' grey rock 1.8-2.9ft/min 34'-46'
					4-6 ft/min tan clay rock mix 46'-72 grey rock 1.4-4ft/min 72'-112'
					Test hole
					New pit Upper road across from east tree

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/12/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2174

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
15	80	8		X	Clay dirt 8' red tan soft clay 7ft/min 8'-80'

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/12/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2175

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
16	50	3		X	Dirt 3' red clay 3'-50'
					Test holes
					New pit upper road

Number of Holes 1
Total Footage 50
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/12/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2176

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
17	112	0		X	Fractured rock dirt mix 2.8-4.8ft/min 0-20' clay dirt rock mix 4-8ft/min 20'-84'
					Red rock clay boulder mix 9ft/min 84'-112'
					Test holes
					North end y where top and bottom road meet new pit

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/12/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2177

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
18	112	9		X	Rock dirt mix 2-4.5ft/min 9'-54' red rock dirt 7ft/min 54'-73' rock clay mix 73'-112'
					Test holes
					New pit bottom road north of y just before heading down hill toward river.

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/12/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2178

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
19	100	4		X	Dirt grey rock 4'-64' dirt clay mix 64'-80' tan rock mix 80'-100'

Number of Holes 1
Total Footage 100
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/13/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2179

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
20	112	0		X	Broken rock dirt mix 2-3.5ft/min 0-10' grey rock light dirt mix 2-4ft/min 10'-41'
					Dirt fractured grey/red rock mix 8-10ft/ min 41'-59' clay dirt boulder mix 5-9ft/min 59'-100'
					Soft dirt boulder mix 8-12ft/min 100'-112'
					Test hole
					New property lower road just before y intersection with upper road north end

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/13/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2181

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 2 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
21	112	2		X	Fractured rock dirt mix 2.5-5ft/min 2'-103' tan rock dirt mix 6-9ft/min 103'-112'
					Test hole
					New property lower road north end 2nd hole south of y

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/13/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2182

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
22	96	4			Red rock clay dirt mix 8ft/min 4'-16' dirt rock mix 4-6ft/min 16'-84' clay 84'-96'
					Test hole
					New pit lower road next to west tree

Number of Holes 1
Total Footage 96
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/13/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2183

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
23	92	5		X	Fill 5' grey rock dirt mix 1.3-3ft/min 5'-32' Dirt seam 11'-15' fractured rock dirt mix 4-6ft/min
					Clay boulder mix 59'-92
					Test hole
					New pit lower road close to wash on east side of mountain

Number of Holes 1
Total Footage 92
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/13/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2184

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
24	96	5		X	Dirt/clay 5' fractured rock dirt clay mix 4-6ft/min 5'-65' clay boulder mix 6-10ft/min 65'-96'
					Boulder 88'-92'
					Test hole
					New pit bottom road midway point

Number of Holes 1
Total Footage 96
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/13/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2185

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
25	112	3		X	3' fill soft tan rock clay mix 8ft/min 3'-16' grey rock dirt mix 2-4ft/min 16'-37'
					Clay 37'-42' tan rock mix 3-4.6ft/min 42'-87' clay boulder mix 4-7ft/min87'-112'
					Test hole
					Lower road south end near hole to east

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/13/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2186

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
26	105	6		X	Fill/dirt 6' clay dirt boulder mix 5-8ft/min 6'-92' dirt clay mix 92'-105'

Number of Holes 1
Total Footage 105
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/13/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2187

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
27	112	4			Dirt rock mix 4.5-7ft/min 4'- 80' clay 80'-96' dirt boulder mix 4-6ft/min 96'-112'
					Clay seam 107'-112'
					Test hole
					New pit lower bench south end almost to old pit

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/13/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2188

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
28	90	7		X	Light tan rock boulder clay mix 6-9ft/min 7'-90' Boulders every 5-8ft about 3-5ft in size
					Test hole
					New pit lower road near lone small tree to west

Number of Holes 1
Total Footage 90
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/14/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2189

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
29	112	3		X	Grey rock dirt mix 1.5-3ft/min 3'-34' clay red rock mix 5-7ft/min 34'-42'
					Dirt tan rock mix 3.5-7ft/min 42'-80' dirt soft 12ft/min 80'-112'
					Test hole
					New pit north end y heading east entrance

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/14/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2191

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1.5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
30	112	4		X	Dirt clay boulder mix 4-9ft/min 4'-87" boulder 87-92' tan rock clay dirt mix 6-9ft/min 92'-112
					Test hole
					New pit north road midway to corner

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/14/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2192

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
31	112	2		X	Grey rock dirt mix 2-4.5 2'-77' dirt tan rock 5-7ft/min 77'-80'
					Grey rock dirt mix 1.2-2..5ft/min 80'-102' soft tan grey rock dirt mix 5-9ft/min 102'-112'
					Test hole
					New pit farthest north top of hill next to intersection

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/14/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2193

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
32	112	3		X	Tan rock clay dirt mix 6.5-8ft/min 3'-112
					Test hole
					New pit middle road north end

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/14/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2193

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
33	112	3		X	Dirt tan rock boulder mix 6-8ft/min 3'-96' grey rock dirt mix 2-4ft/min 96'-112'
					Test hole
					New pit middle road north end knob

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/14/2020 Job Name Hat Creek Ward Lake 161-330 Driller Brandon Longe

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2195

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 2.5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
34	112	1		X	Dirt clay boulder mix 6-9ft/min 1'-23' broken rock clay mix 2.8-5ft/min 23'-67'
					Red tan rock boulder mix6-7ft/min 67'-100' red rock 4-6ft/min 100'-112'
					Test hole
					New property middle road on ridge north end

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/17/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2197.5

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
35	112	5		X	Brown rock 1.7-3.2ft/min 6'-34' soft tan 4ft/min 34'-50' brown rock 2.2-3.4ft/min 50'-63'
					Soft tan 4.5ft/min 63'-112'
					New land north of primary south lower road

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/17/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2198.4

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
36	112	3		X	Rock clay mix 4ft/min 3'-17' soft tan 5ft/min 17'-78' brown rock 2.2-3.1ft/min 78'-
					North primary south on lower road

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/17/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2199

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
37	112	4		X	Brown rock 2.3-3.7ft/min 4'-40' soft brown 4-6.5ft/min 40'-80ft/min brown rock 1.9-3.4ft/min
					80'-112'
					North primary last hole lower road

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/17/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2200.4

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 2 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
38	112	5		X	Rock clay mix 3-5ft/min 5'-22' soft brown 6ft/min 22'-112'
					New land upper road last hole to the south

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/17/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2201.4

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1.25 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
39	112	4		X	Clay rock mix 3.5ft/min 4'-20' brown rock gray boulder mix 2.8-4.8ft/min 20'-112'
					New land upper road south side

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/17/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2202.4

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
40	112	3		X	Clay 3ft/min 3'-15' soft brown rock 4-6ft/min 15'-47' brown rock w/ gray 1.5-3.7ft/min
					47'-101' soft brown 4-6ft/min 101'-112'

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/17/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill D65-151 Hour Meter 2203.6

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1.25 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
41	112	0		X	Brown rock 2.3-4.7ft/min 0'-37' soft clumpy brown 37'-46' brown rock 3.4-4ft/min 46'-80'
					Hard gray rock 1.2-2.4 ft/min 80'-112'
					New land upper road south side

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/18/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2206

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
42	112	4		X	Brown rock w/ gray boulders 1.7-3.5ft/min 4'-59' soft brown rock 5ft/min 59'-66' clumpy brov
					New land south side upper road

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/18/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2207

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
43	112	7		X	Rock clay mix 3.7ft/min 7'-19' brown rock w/ gray boulders2.6-3.5ft/min 19'-112'
					New land middle upper road

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/18/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2208

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
44	112	0		X	Brown rock w/ gray boulders 1.8-5.5ft/min 0-45' rock clay mix 45'-88' brown rock 2-3.5ft/mir
					88'-101' clay 101'-112'
					New land middle upper bench

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/18/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2209.2

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1.25 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
45	112	7		X	Gray rock 1.8-3.2ft/min 7'-61' brown rock 2.7-4.2ft/min 61'-112'
					New land middle upper road

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/18/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2210.4

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1.5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
46	112	0		X	Gray rock .7-2.1ft/min 0-89' brown rock 2.3-3.1ft/min 89'-
					New land upper bench north side

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/18/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2211.5

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
47	112	12		X	Clay rock mix 2.5ft/min 12-39' brown rock w/ gray boulders 1.2-3.9ft/min 39'-55'
					Clay rock mix 2.7-4.5ft/min 55'-75' wet clay 75'-80'
					New land north upper road

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/19/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2215.4

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
48	112	4		X	Light brown 6ft/min 4'-31' brown rock 3.2-4.5ft/min 31'-52' soft brown boulder mix6ft/min
					52'-112'
					New land upper road east

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/19/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2216

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
49	60	0		X	Soft brown boulder mix 6ft/min 0-21' rock clay mix 1ft/min 21'-60'
					New land east upper road

Number of Holes 1
Total Footage 60
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/19/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2216.4

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
50	60	0		X	Soft brown boulder mix 2.2-5.7ft/min 0-49' clay rock mix 1.3-2.4ft/min 49'-60'

Number of Holes 1
Total Footage 60
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/19/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2217.5

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
51	48	48		X	Dirt and boulders
					New land road northwest towards river

Number of Holes 1
Total Footage 48
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/19/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2218.2

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
52	112	21		X	Soft brown rock clay mix 5.2-7.1ft/min 21'-112'
					New land northwest road towards river

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/19/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2219

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
53	112	4		X	Brown rock w/ gray boulders 3.1-5ft/min 4'-20' gray rock .8-2.3ft/min 20'-80' brown rock
					2.1-3.2ft/min 80'-112'

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/19/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 6.75 Drill 65 Lite-152 Hour Meter 2220

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
54	112	3		X	Brown rock 3-4.5ft/min 3'-30' gray rock .7ft/min 30'-67' brown rock 2.7-4ft/min 67'-112'
					New land northwest road towards river

Number of Holes 1
Total Footage 112
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/20/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2225

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
55	96	13		X	Brown rock w/ gray boulders 2-4.7ft/min 13'-49' brown sandy rock 4.3-6.1ft/min 49'-96'
					New land lower road

Number of Holes 1
Total Footage 96
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/20/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2225.5

Type: Hammer ☒ Rotary ☐ Drilling Hrs. 1 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
56	80	7		X	Brown sandy rock 2-4ft/min 7'-31' gray rock 2.1-5.2ft/min 31'-96'

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/20/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2227

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
57	96	0		X	Brown rock with gray boulders 3.1-4.8ft/min 0-96ft

Number of Holes 1
Total Footage 96
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/20/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2227.4

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
58	96	7		X	Soft brown rock w/ gray boulders 5.8-8.2ft/min 7'-76' brown rock 2.9-5ft/min 76'-96'
					New land horseshoe road

Number of Holes 1
Total Footage 96
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/20/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2228

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
59	96	0		X	Brown rock w/ gray boulders 4.3-6.1ft/min 0'-66' brown clay 66'-71' brown rock
					4.1-6.3ft/min 71'-96'
					New land horseshoe road

Number of Holes 1
Total Footage 96
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/20/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2228.6

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
60	96	5		X	Gray rock 3.5ft/min 5'-55" brown rock 2.1-5.2ft/min 55'-64' gray rock 2.7-3.8ft/min 64'-78'
					Super soft brown 7-11ft/min 78'-96'
					New land horseshoe road

Number of Holes 1
Total Footage 96
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/20/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2229.1

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
61	96	0		X	Brown/gray rock 2.7-5ft/min 0-43' clay 43'-59' brown rock w/gray boulders 3.5-6.4ft/min
					59'-73' super soft brown 9ft/min 73'-96'
					New land horseshoe road

Number of Holes 1
Total Footage 96
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/20/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2229.6

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
62	96	0		X	Soft brown 6.5-11ft/min 0-96'
					New land horseshoe road

Number of Holes 1
Total Footage 96
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/20/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill D65-151 Hour Meter 2230.2

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
63	96	41		X	Soft brown 7ft/min 41'-96'
					New land northeast road

Number of Holes 1
Total Footage 96
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/20/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2230.9

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
64	96	0		X	Gray/brown rock 3.5-5ft/min 0-96'
					New land northeast road

Number of Holes 1
Total Footage 96
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/21/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2232.8

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
65	80	4		X	Fractured gray rock 3-5ft/min 4'-31' brown rock w/clay 4.4-6.7ft/min 31'-80'
					New land lowest road

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/21/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2233.4

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
66	80	7		X	Gray rock 3.2-4ft/min 7'-27' soft brown w/ boulders 3.4-8ft/min 27'-80'
					New land lowest road

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/21/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2234

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
67	80	5			Wet brown clay 5'-39' soft brown with gray boulders 7-12ft/min 39'-54' wet clay 54'-80'

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/21/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2234.6

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
68	80	12		X	Soft brown w/ brown boulders 5.7-7.6ft/min 12'-72' red 12ft/min 72'-80'
					New land lowest road

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/21/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2235.8

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
69	60	0		X	Soft brown w/ boulders7ft-9ft/min 0-60'
					New land floor

Number of Holes 1
Total Footage 60
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/21/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2236

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .25 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
70	60	60		X	Dirt

Number of Holes 1
Total Footage 60
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/21/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2236.3

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .25 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
71	60	60		X	Dirt w/ boulders 12ft/min 0-60'

Number of Holes 1
Total Footage 60
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/21/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 00 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2236.7

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
72	60	60		X	Dirt
					New land floor

Number of Holes 1
Total Footage 60
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/21/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2237.2

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
73	40	40		X	Dirt w/ dark brown clay couldn't drill deeper
					New land floor

Number of Holes 1
Total Footage 40
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2238.4

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
74	64	41		X	Soft brown 11ft/min 41'-64'
					West side new land

Number of Holes 1
Total Footage 64
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2238.8

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .25 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
75	64	21		X	Gray rock 3.1-4.4ft/min 21'-38' soft brown rock 6-9ft/min 38'-40' reddish brown 7-12ft/min
					40'-64'
					West side new land

Number of Holes 1
Total Footage 64
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 0 Drill 65 Lite-152 Hour Meter 2239

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .25 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
76	65	10		X	Soft brown w/ gray boulder 5-8ft/min 10'-64'
					New land west side

Number of Holes 1
Total Footage 65
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2239.6

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
77	64	8			Powdery gray rock 3.5-4.9ft/min 8'-21' brown rock 4-5.2ft/min 21'-37' soft reddish brown
					6.8-8.9ft/min 37'-64'
					New land west side

Number of Holes 1
Total Footage 64
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2240.3

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
78	64	0		X	Soft brown w/ boulder 7ft/min 0-54' reddish brown 9ft/min 54'-64'

Number of Holes 1
Total Footage 64
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2240.7

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
79	64	0		X	Soft brown w/ boulders 5.9-7.8ft/min 0-30' brown rock w/ clay 3.7-6ft/min 30'-80'
					West side lower road

Number of Holes 1
Total Footage 64
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2241.2

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
80	80	5		X	Fractured Brown rock w/ clay 4-6.3ft/min 5'-80'
					West side lower road

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2241.6

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
81	80	0		X	Brown rock 4.7-6.2ft/min 0-60' brown rock with clay 3.6-5.2ft/min 60'-80'
					Lower road west side

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2242

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
82	64	0		X	Soft brown7-9ft/min 0-64'
					Lower road west side

Number of Holes 1
Total Footage 64
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2243

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .75 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
83	80	0		X	Gray/brown rock 3.2-5.4 ft/min 0-55' soft brown 8ft/min 55'-80'
					New land north east road

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2243.4

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
84	60	0		X	Soft brown 8ft/min 0-35' sand 17ft/min 35'-60'
					New land northeast road

Number of Holes 1
Total Footage 60
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2244

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
85	64	0		X	Super soft brown 11-17ft/min 0-64'
					New land highest road

Number of Holes 1
Total Footage 64
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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872 LOCAL 872

CAL NEVADA PRECISION BLASTING

PO Box 3365
Carson City, NV 89702
Office 775.883.0303
Fax 775.883.8013
Cell 775.315.1257
Email don@nvblasting.com

Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2244.3

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .25 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
86	64	0		X	Soft brown with gray boulders 5.9-7.6ft/min 0-64'
					New land highest road

Number of Holes 1
Total Footage 64
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2244.6

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
87	80	0		X	Soft brown with boulders 5.9-9.8ft/min 0-
					New land highest road

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2245.3

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
89	80	5		X	Soft brown w/ boulders 4.7-10ft/min 5'-80'
					New land highest road

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2245.3

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
89	80	5		X	Soft brown w/ boulders 4.7-10ft/min 5'-80'
					New land highest road

Number of Holes 1
Total Footage 80
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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Drill Log

Date 2/24/2020 Job Name Hat Creek Ward Lake 161-330 Driller Carter Nuckolls

Shot # 0 Burden 0 Spacing 0 Sub-Drill 0 Bit Size 5.5 Drill 65 Lite-152 Hour Meter 2245.7

Type: Hammer ☒ Rotary ☐ Drilling Hrs. .5 (*Drilling Hrs. = Pre-op, Drilling, Watering, Fueling, Post-op*)

Standby Hrs. _____ Standby Approved by _____ Hammer #_____ Chuck Tender Name _____ Hrs. _____

Hole	Depth	Overburden	Water in Hole		Comments – seams, voids, material change, soft, hard, etc.
			Yes	No	
90	50	10		X	Soft brown w/ clay 2.9-11.7ft/min 10'-41' wet brown clay 41'-50'
					New land highest road

Number of Holes 1
Total Footage 50
Total Yardage 00.00
Total Yardage Minus Sub-Drill 00.00

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United States Department of Agriculture

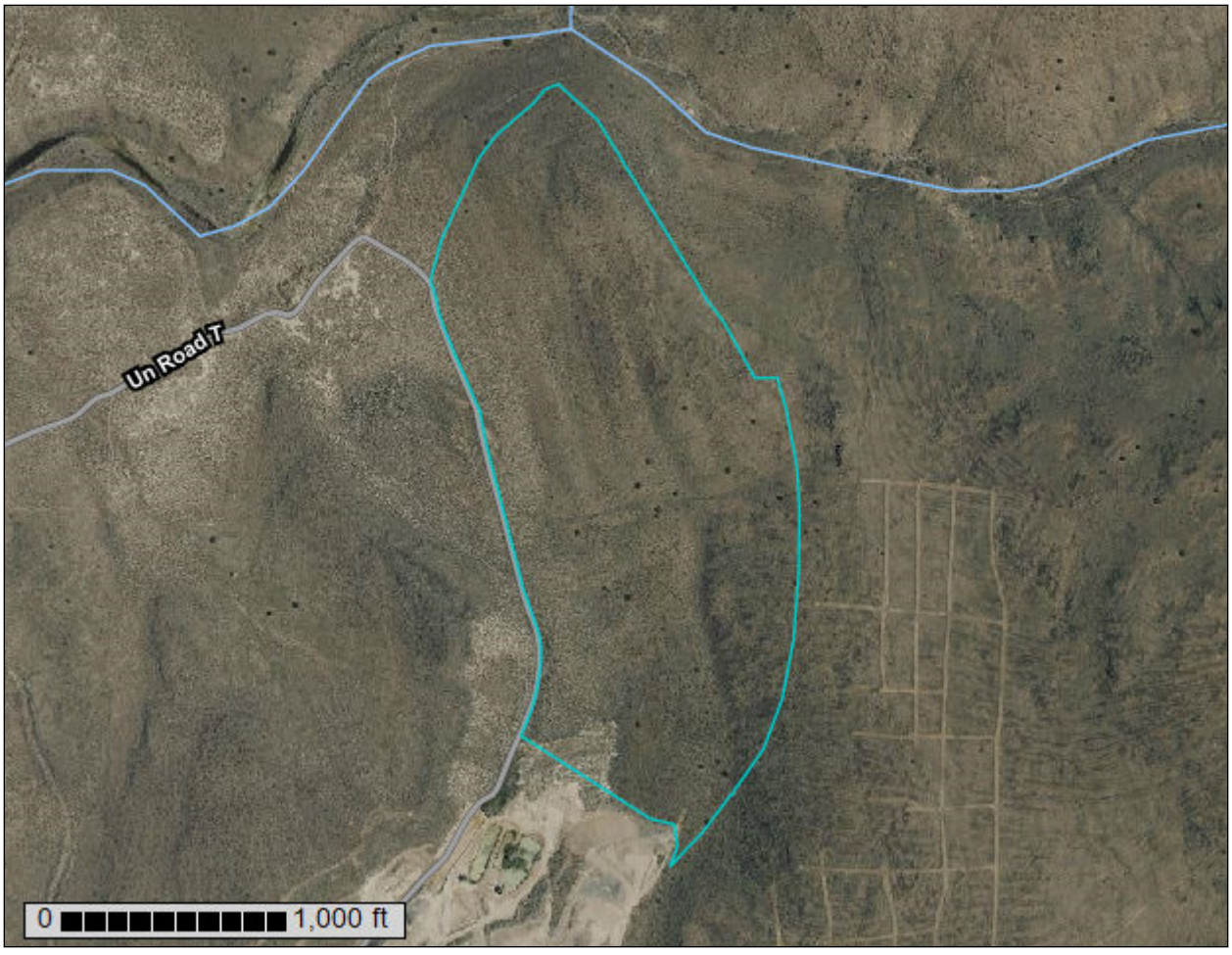
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Susanville Area, Parts of Lassen and Plumas Counties, California

Ward Lake Pit Expansion Area



October 19, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

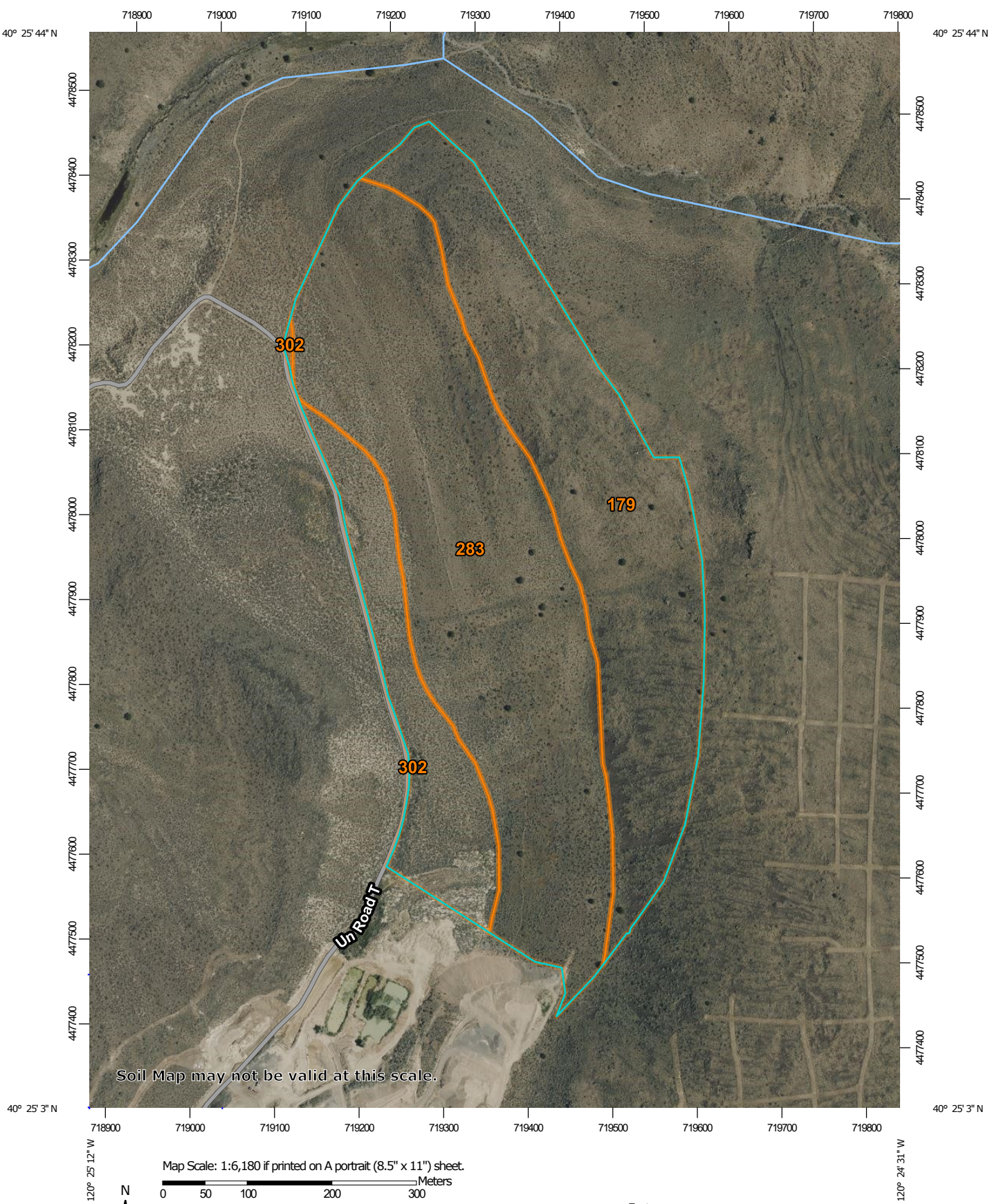
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Ward Lake Pit Expansion Area)



Map Scale: 1:6,180 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Susanville Area, Parts of Lassen and Plumas Counties, California
Survey Area Data: Version 11, Jun 1, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 8, 2019—Jun 21, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Ward Lake Pit Expansion Area)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
179	Devada-Rock outcrop association, 2 to 50 percent slopes	28.0	36.0%
283	McConnel-Mottsville complex, 2 to 9 percent slopes	39.8	51.1%
302	Orhood very stony sandy loam, 5 to 15 percent slopes	10.0	12.9%
Totals for Area of Interest		**77.9**	**100.0%**

Map Unit Descriptions (Ward Lake Pit Expansion Area)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Susanville Area, Parts of Lassen and Plumas Counties, California

179—Devada-Rock outcrop association, 2 to 50 percent slopes

Map Unit Setting

National map unit symbol: jc76
Elevation: 4,400 to 5,600 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 60 to 100 days
Farmland classification: Not prime farmland

Map Unit Composition

Devada and similar soils: 70 percent
Rock outcrop: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Devada

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Colluvium derived from andesite and basalt and residuum weathered from basalt or andesite

Typical profile

H1 - 0 to 7 inches: very cobbly loam
H2 - 7 to 15 inches: gravelly clay
H3 - 15 to 25 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 50 percent
Surface area covered with cobbles, stones or boulders: 5.0 percent
Depth to restrictive feature: 12 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 1.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R023XF081CA
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Mountains

Typical profile

H1 - 0 to 10 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 50 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Longcreek

Percent of map unit: 10 percent
Landform: Mountains
Landform position (two-dimensional): Backslope
Ecological site: R023XF082CA
Hydric soil rating: No

283—McConnel-Mottsville complex, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: jccv
Elevation: 4,000 to 5,610 feet
Mean annual precipitation: 6 to 12 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 60 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Mcconnel and similar soils: 60 percent
Mottsville and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mcconnel

Setting

Landform: Fan remnants
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Alluvium derived from mixed rocks and lacustrine deposits

Typical profile

H1 - 0 to 10 inches: gravelly fine sandy loam
H2 - 10 to 60 inches: stratified extremely gravelly coarse sand to very gravelly sandy loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Very slightly saline to strongly saline (2.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum: 12.0
Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R026XF052CA - GRANITIC UPLAND 9-12" P.Z.
Hydric soil rating: No

Description of Mottsville

Setting

Landform: Fan remnants
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 17 inches: gravelly loamy coarse sand
H2 - 17 to 60 inches: stratified gravelly coarse sand to loamy sand

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R026XF051CA - GRANITIC FAN 9-12"
Hydric soil rating: No

Minor Components

Devada
Percent of map unit: 5 percent
Landform: Plateaus
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R023XF081CA
Hydric soil rating: No

Mcconnel
Percent of map unit: 4 percent
Landform: Fan remnants
Ecological site: R026XF052CA - GRANITIC UPLAND 9-12" P.Z.
Hydric soil rating: No

Zorravista
Percent of map unit: 3 percent
Landform: Dunes
Ecological site: R023XG049CA - SAND DUNES 6-9"
Hydric soil rating: No

Longcreek
Percent of map unit: 3 percent
Landform: Plateaus
Ecological site: R023XF082CA
Hydric soil rating: No

302—Orhood very stony sandy loam, 5 to 15 percent slopes

Map Unit Setting
National map unit symbol: jcds
Elevation: 4,100 to 6,000 feet
Mean annual precipitation: 9 to 16 inches
Mean annual air temperature: 44 to 52 degrees F
Frost-free period: 60 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition
Orhood and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Orhood

Setting

Landform: Mountains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountainbase
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium derived from volcanic rock and residuum weathered from volcanic rock

Typical profile

H1 - 0 to 4 inches: very stony sandy loam
H2 - 4 to 9 inches: very cobbly loam
H3 - 9 to 19 inches: very cobbly clay loam
H4 - 19 to 29 inches: unweathered bedrock

Properties and qualities

Slope: 5 to 15 percent
Surface area covered with cobbles, stones or boulders: 15.0 percent
Depth to restrictive feature: 14 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R021XE174CA - STONY LOAM 12-16"
Hydric soil rating: No

Minor Components

Incy

Percent of map unit: 8 percent
Landform: Dunes
Ecological site: R026XF022CA - GRANITIC SAND 9-12"
Hydric soil rating: No

Searles

Percent of map unit: 6 percent
Landform: Mountains
Landform position (two-dimensional): Backslope
Ecological site: R021XE179CA - WARM STONY LOAM 12-16"
Hydric soil rating: No

Puls

Percent of map unit: 6 percent
Landform: Plateaus
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: R021XE173CA - SHALLOW STONY LOAM 12-16"
Hydric soil rating: No

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Hat Creek Materials Facility Expansion
Revised Environmental Noise Analysis

Lassen County, California

March 12, 2019

jcb Project # 2018-117 / 2019-109

Prepared for:

VESTRA

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President
Member, Institute of Noise Control Engineering (INCE)

INTRODUCTION

This report describes the existing noise environment in the area of the proposed Hat Creek Materials Facility Expansion Project (HCMFEP). In addition, this report provides an analysis for the potential of the proposed project to generate noise levels exceeding generally accepted exterior noise level standards at noise-sensitive receptors in the project area. Figure 1 shows the location of the project site. Figure 2 shows the project site layout.

The Hat Creek Materials Facility Expansion Project will consist of expanding the existing number of hours per day to 24-hour operations. A current typical day of operations includes 32 material hauling trucks (16 in and 16 out). Peak operations which occur infrequently include up to 700 material hauling trucks (350 in and 350 out) per day.

Existing Project Operations:

The project is an existing quarry which is located east of Ward Lake Road, and north of Center Road in Lassen County. The project includes a materials excavation and crushing operation, recycled asphalt and concrete crushing, and an asphalt batch plant. The current operating hours are from 6;00 a.m. to 6:00 p.m., although during data collection on May 3rd and 4th, 2018, two shifts were operating from 6:00 a.m. to midnight. As stated earlier, at times the current operations do include peak operations of 700 one-way truck trips during the daytime hours. The primary noise sources associated with the existing operations include the following:

- Cement Batch Plant;
- Excavation and Crushing Operations (this includes mobile equipment associated with the operations);
- Cement and Asphalt Batch Plants;
- Truck Traffic to and from the Site on area roadways.

Existing Adjacent Land Uses:

Adjacent uses generally include farm land with single family residential units adjacent to Ward Lake Road. Other land uses to the north, east and west of the site is generally open and undeveloped land, which is primarily BLM property.

ENVIRONMENTAL SETTING

BACKGROUND INFORMATION ON NOISE

Fundamentals of Acoustics

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

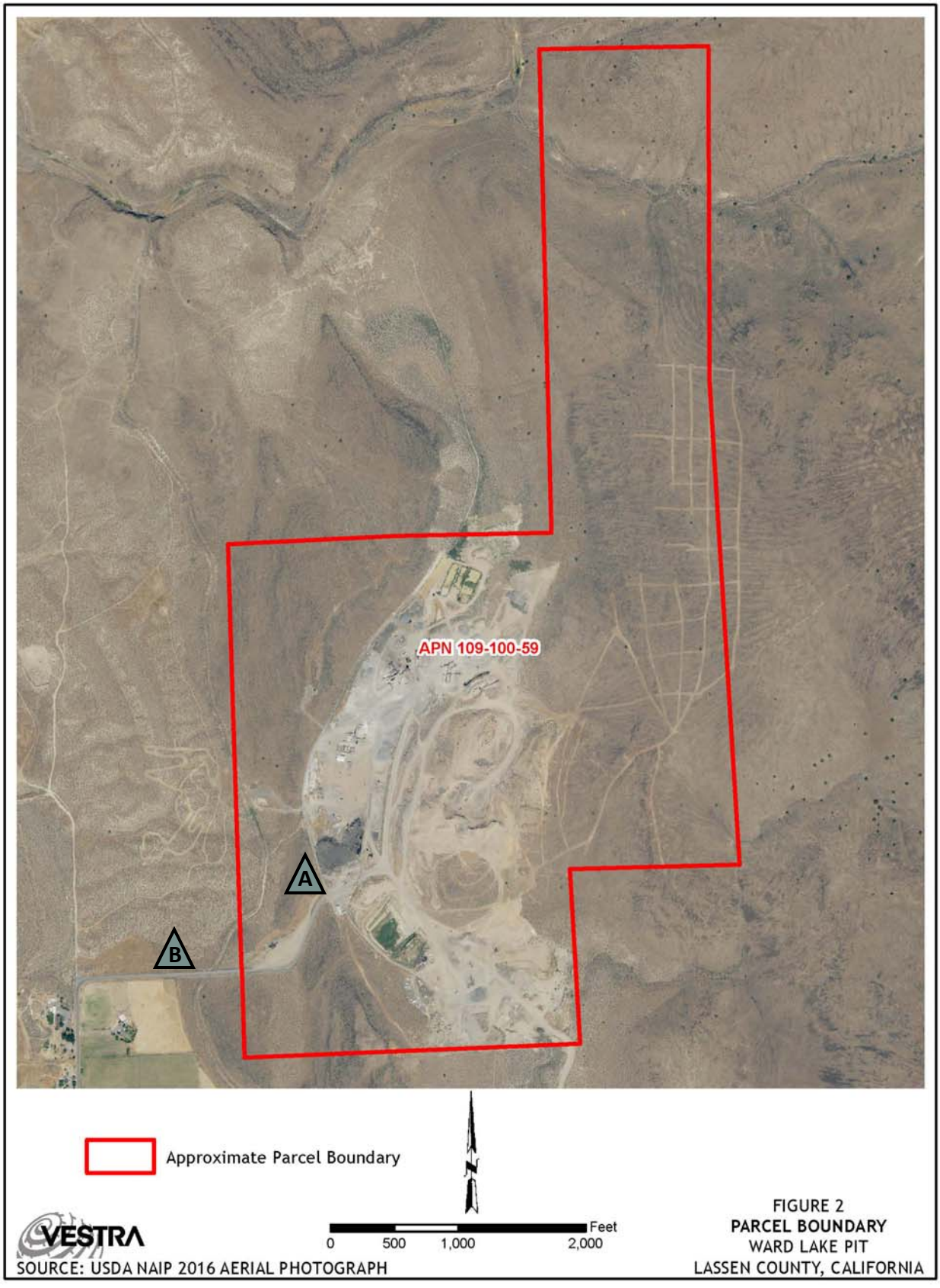
The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 1 lists several examples of the noise levels associated with common situations. Appendix A provides a summary of acoustical terms used in this report.



P:\GIS\71305\WardLakeExpansion\ProjectDescription\71305_ParcelBoundary.mxd

Legend

X : Continuous Noise Measurement Site

Figure 1
Project Boundary / Location
& Noise Measurement Sites

j.c. brennan & associates
consultants in acoustics

Date:
6/15/18



Figure 2
Project Site Layout

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Date:
6/15/18

TABLE 1
TYPICAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. November, 20013.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING CONDITIONS

EXISTING AMBIENT NOISE LEVELS

To quantify the existing ambient noise environment in the project vicinity due to existing operations, j.c. brennan & associates Inc. conducted continuous hourly noise level measurements for a 24-hour period at two locations. One location was on the project site, and adjacent to the entrance near the office building. The other site was adjacent to Ward Lake Road. The noise level measurements were conducted on Thursday May 3rd - Friday May 4th, 2018.

Noise measurement locations are shown on Figure 1. A summary of the noise level measurement survey results are provided in Table 2. Appendix B contains the complete results of the continuous (24-hr) noise monitoring.

The sound level meters were programmed to record the maximum, median, and average noise levels at each site during the survey. The maximum value, denoted Lmax, represents the highest noise level measured. The average value, denoted Leq, represents the energy average of all of the noise received by the sound level meter microphone during the monitoring period. The median value, denoted L50, represents the sound level exceeded 50 percent of the time during the monitoring period. In addition, the composite 24-hour average noise level (Ldn) was also calculated from the hourly Leq values. The calculated Ldn for each day applies a +10 dBA penalty to all noise which occurs during the nighttime period, which is defined as the hours between 10:00 p.m. and 7:00 a.m.

Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters were used for the ambient noise level measurement survey. The meters were calibrated before and after use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

Table 2
Summary of Existing Continuous Background Noise Measurement Data

MAY 3RD - 4TH, 2018

Site	Ldn	Average Measured Hourly Noise Levels					
		Daytime (7am-10pm)			Nighttime (10pm-7am)		
Site A -Entrance to the Site and Approximately 215-feet from the Scales, and 1,160-feet from the Concrete Plant, and 1,875-feet from the crushing plant	53.5 dBA	Leq	L50	Lmax	Leq	L50	Lmax
		49.4 dBA	39.0 dBA	65.8 dBA	46.5 dBA	33.1 dBA	56.3 dBA
		L2	L8	L25	L2	L8	L25
		47.8 dBA	45.1 dBA	41.9 dBA	40.7 dBA	38.7 dBA	35.9 dBA
Site B - 35-feet from the Ward Lake Road centerline	55.6 dBA	Leq	L50	Lmax	Leq	L50	Lmax
		54.6 dBA	32.7 dBA	78.7 dBA	46.9 dBA	26.8 dBA	68.0 dBA
		L2	L8	L25	L2	L8	L25
		54.6 dBA	42.1 dBA	35.9 dBA	41.5 dBA	34.3 dBA	29.4 dBA

Source: j.c. brennan & associates, Inc., 2018.

EXISTING HAT CREEK MATERIALS FACILITY PLANT OPERATIONS NOISE LEVELS

On May 3rd, 2018, j.c. brennan & associates, Inc. staff conducted noise measurements and observations of the Hat Creek Materials individual operations. The noise measurements were conducted with a Larson Davis Laboratories (LDL) Model 824 precision integrating sound level meter, which was equipped with 1/3 octave and 1/1 octave band filters. The equipment was calibrated prior to, and after the measurements with an LDL Model 200 acoustical calibrator to ensure accuracy of the measurement.. Octave band data was collected, including the hourly average and maximum noise levels. Statistical noise levels were not collected for each individual piece of equipment. It was determined that the overall noise levels collected at Site B, as shown in Table 2 would provide the overall statistical noise levels for the overall operations. Table 3 shows

the results of the individual operations noise measurements. Frequency data was not provided in this report since the noise level standards are based upon A-weighted overall noise levels.

Table 3
Hat Creek Individual Operations Noise Levels

Operation	Location	Sound Level		Source	Photo
		Leq	Lmax		
Sand Plant	**100-feet**	**66.6 dBA**	**74.8 dBA**	**Loader**	
Cement Plant	**100-feet**	**67.7 dBA**	**87.6 dBA**	**Trucks - Plant ops**	
Crushing Ops	**200-feet**	**85.6 dBA**	**88.7 dBA**	**Crushers - Loaders**	
Asphalt Plant	**Center of Site 50-feet from**	**85.6 dBA**	**87.5 dBA**	**Plant - Diesel Generator**	

Table 3
Hat Creek Individual Operations Noise Levels

	Burner **40-feet from Generator**				 

Source: j.c. brennan & associates, Inc., 2018

EXISTING TRAFFIC NOISE LEVELS

To describe existing noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly Leq values for free-flowing traffic conditions. Traffic volumes for existing conditions were obtained from the project traffic consultant. The traffic noise analysis contains the following assumptions:

- Baseline traffic includes an average of 32 one way truck trips per day, which are evenly distributed from 6:00 a.m. to 7:00 p.m.;
- The distribution of truck trips on a typical day (Existing) includes 40 percent traveling east on Center Road, and 60 percent traveling west on Center Road;
- During peak operations, there are up to 700 one way truck trips per day, which are evenly distributed from 6:00 a.m. to 7:00 p.m., with the same trip distribution shown above.

The analysis contained in Table 4 includes the overall 24-hour Ldn, the daytime peak hour, and the nighttime peak hour. Existing traffic noise levels are summarized in Table 4. Appendix C shows the inputs to the FHWA Model.

TABLE 4
PREDICTED EXISTING TRAFFIC NOISE LEVELS

Roadway	Location	Traffic Noise Level @ 75'*	Distance to Noise Contours	
			55 dBA	60 dBA
Traffic Noise Levels During an Average Day with 32 one-way truck trips (6:00 a.m. to 7:00 p.m.)				
Ward Lake Road	Entire Length	48.3 dBA Ldn	23-feet	10-feet
Center Road	West of Ward Lake	51.4 dBA Ldn	43-feet	20-feet
Center Road	East of Ward Lake	48.7 dBA Ldn	28-feet	13-feet
Center Road	East of Cutoff Road	48.3 dBA Ldn	27-feet	12-feet
Traffic Noise Levels During Peak Times with 700 one-way daily truck trips (6:00 a.m. to 7:00 p.m.)				
Ward Lake Road	Entire Length	60.1 dBA Ldn	134-feet	62-feet
Center Road	West of Ward Lake	57.9 dBA Ldn	108-feet	50-feet
Center Road	East of Ward Lake	55.1 dBA Ldn	71-feet	33-feet
Center Road	East of Cutoff Road	55.3 dBA Ldn	71-feet	33-feet
Traffic Noise Levels During an Average Day (Peak Hour Daytime Leq)				
Ward Lake Road	Entire Length	46.1 dBA Leq	19-feet	9-feet
Center Road	West of Ward Lake	52.2 dBA Leq	48-feet	22-feet
Center Road	East of Ward Lake	50.2 dBA Leq	35-feet	16-feet
Center Road	East of Cutoff Road	49.7 dBA Leq	33-feet	15-feet
Traffic Noise Levels During Peak Times (Peak Hour Daytime Leq)				
Ward Lake Road	Entire Length	61.8 dBA Leq	166-feet	77-feet
Center Road	West of Ward Lake	60.0 dBA Leq	145-feet	68-feet
Center Road	East of Ward Lake	57.1 dBA Leq	96-feet	44-feet
Center Road	East of Cutoff Road	57.3 dBA Leq	95-feet	44-feet
Traffic Noise Levels During an Average Day (Peak Hour Nighttime Leq)				
Ward Lake Road	Entire Length	45.7 dBA Leq	18-feet	8-feet
Center Road	West of Ward Lake	48.3 dBA Leq	27-feet	12-feet
Center Road	East of Ward Lake	48.3 dBA Leq	27-feet	12-feet
Center Road	East of Cutoff Road	46.9 dBA Leq	22-feet	10-feet
Traffic Noise Levels During Peak Times (Peak Hour Nighttime Leq)				
Ward Lake Road	Entire Length	45.7 dBA Leq	18-feet	8-feet
Center Road	West of Ward Lake	48.3 dBA Leq	27-feet	12-feet
Center Road	East of Ward Lake	48.3 dBA Leq	27-feet	12-feet
Center Road	East of Cutoff Road	46.9 dBA Leq	22-feet	10-feet

Sources: j.c. brennan & associates, Inc., and FHWA RD-77-108
***** - Roadway noise levels are calculated from the roadway centerline

Materials Facility On-Site Operations Noise Levels at the Nearest Residences

On-site operations associated with Materials Facility on-site activities are generally represented by the measured hourly L50 values. During the daytime, the measured hourly background L50 noise levels due to on-site activities ranged between 27 dBA and 44 dBA at Site B, which represents the nearest residence. The average measured hourly L50 value was 33 dBA at Site B.

During the nighttime hours, the Materials Facility on-site operations resulted in measured

background L50 noise levels ranging from 28 dBA to 45 dBA at Site B, while the plant was operating, which represents the nearest residence. (During the noise measurements, the plant operated during the nighttime hours until approximately 12:00 a.m. to 1:00 a.m.). The noisiest hours occurred during the start-up of operations between the hours of 6:00 a.m. and 8:00 a.m. Otherwise plant operations were represented by the average measured L50 value of 33 dBA.

The noisiest operations associated with the materials facility on-site facilities are the crushing operations, and the asphalt plant operations.

Overall Measured Background Noise Levels

The overall measured background hourly noise levels at Site B, which represents the nearest residence, ranged between 39 dBA and 61 dBA Leq. This included all background noise sources, including the roadway traffic, Materials Facility on-site operations, aircraft overflights, and neighborhood activities.

The measured 24-hour Ldn at Site B was 55.6 dBA.

Maximum noise levels experienced at the nearest residences are due to truck traffic along Ward Lake Road. Based upon signage at one residence along Ward Lake Road, there is concern about the use of engine brakes (jake brakes) from trucks descending the grade as they exit the site.

REGULATORY CONTEXT

LASSEN COUNTY GENERAL PLAN NOISE LEVEL CRITERIA

Lassen County's General Plan Noise element includes noise level policies for land use compatibility. The following summarizes the policies and criteria applicable to the proposed project:

Goal: The overall goals of the Lassen County Noise Element are to protect the citizens of Lassen County from the harmful and annoying effects of exposure to excessive noise, and to protect the economic base of Lassen County by preventing the encroachment of incompatible land uses within areas affected by existing noise-producing uses.

Objectives: The general objectives of the Lassen County Noise Element are to:

1. *Develop and adopt specific policies and an effective implementation program to abate and avoid excessive noise exposures in the county by requiring that effective noise mitigation measures be incorporated into the design of new noise-generating and new noise- sensitive land uses.*

2. *Provide sufficient noise exposure information so that existing and potential noise impacts may be effectively addressed in the land use planning and project review processes.*

3. *Protect areas within the county where the present noise environment is within acceptable limits.*

Implementation

Policy 1: Noise created by locally-regulated noise sources associated with new projects or

developments shall be controlled so as not to exceed the noise level standards as set forth below as measured at any affected residentially designated lands or land use situated in either the incorporated or unincorporated areas. New residential development shall not be allowed where the ambient noise level due to locally-regulated noise sources will exceed the noise level standards as set forth below [Table 5 of this report]. These standards do not apply to residential units established in conjunction with industrial or commercial uses.

Policy 2: The compatibility of proposed projects with existing and future noise levels due to traffic on public roadways, railroad line operations and aircraft in flight shall be evaluated by comparison to [Figure 3 of this report].

Policy 3: Areas within Lassen County shall be defined as noise-impacted if exposed to existing or projected exterior noise levels exceeding either 60 dB L_{dn}/CNEL or the performance standards of Table 5 of this report.

Policy 8: Noise produced by industrial uses shall not exceed 70 dB Ldn at the nearest property line.

Table 5
Lassen County General Plan Noise Level Performance Standards for New Projects and Developments

		Exterior Noise Level Standard, dBA		
Category	Cumulative Number of Minutes in Any One-Hour Time Period	Interpretation	Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)
1	30	L50	50	40
2	15	L25	55	45
3	5	L8	60	50
4	1	L1.5	65	55
5	0	Lmax	70	60
Each of the noise level standards specified above shall be reduced by 5 dBA for simple tone noise sources, noises consisting primarily of speech or music, or for recurring impulsive noises.				

DETERMINATION OF A SIGNIFICANT INCREASE IN NOISE LEVELS

California Environmental Quality Act (CEQA) guidelines define a significant impact of a project if it "increases substantially the ambient noise levels for adjoining areas." Table 6 is based upon recommendations made in August 1992 by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been asserted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the L_{dn}.

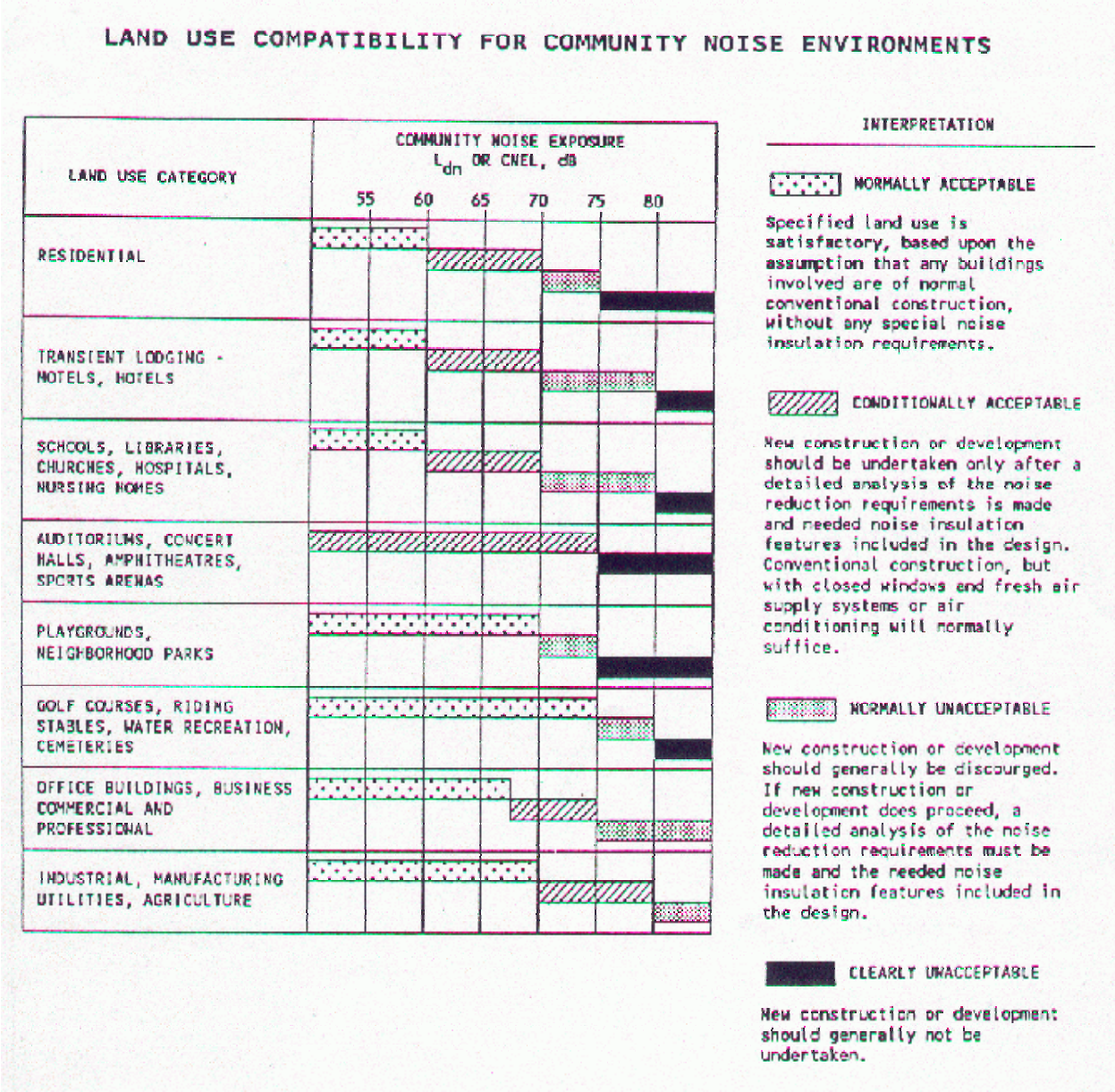
Based upon the Table 6 criteria, an increase in the traffic noise level of 1.5 dB or more would be significant where the ambient noise level exceeds 65 dB L_{dn}. The rationale for the Table 3 criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause significant annoyance.

Table 6
Determination of a Significant Increase in Noise Levels

Ambient Noise Level Without Project, L_{dn} /CNEL	Increase Required for Significant Impact
<60 dBA	+5.0 dB or more
60-65 dBA	+3.0 dB or more
>65 dBA	+1.5 dB or more

Source: FICON, August 1992.

Figure 3



Source: Lassen County General Plan

STANDARDS OF SIGNIFICANCE

CEQA Guidelines define a significant adverse impact on the environment as an impact that would:

a. Exposure of persons to or generation of noise levels in excess of standards established in the Lassen County General Plan. Specifically, exterior noise levels exceeding 60 dBA Ldn, or the performance standards contained in Table 5.

b. Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels. Specifically, a threshold of 0.1 in/sec p.p.v. is considered a safe criterion that would protect against architectural or structural damage and human annoyance.

b. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, as defined by the FICON criteria contained in Table 6.

c. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, as defined by the FICON criteria contained in Table 6.

d. For a project located within an airport land use plan or, where such a plan has not be adopted, within two miles of a public airport or public use airport, where the project would expose people residing or working in the area to excessive noise levels.

e. For a project within the vicinity of a private airstrip, where the project would expose people residing or working in the project area to excessive noise levels.

PROJECT IMPACTS

FUTURE MATERIALS FACILITY NOISE IMPACTS

The potential for the project operations to result in noise impacts are expected to be due to the extended hours of operations of the on-site plant activities, and the additional hours of materials haul trucks on the local roadway system.

Extended Hours of Operations

During the extended hours of operations, the asphalt batch plant, cement batch plant and crushing operations are expected to occur. The sand plant will not operate during the extended hours of operations. Based upon the measured background noise levels at Site B, it is expected that the on-site activities, which include the batch plants and crushing operations, will result in hourly noise levels equal to, or less than, 45 dBA L50. As stated earlier, the primary increase in L50 values occurred between 6:00 a.m. and 8:00 a.m. during the start-up operations. Once operations occur, they are generally in the mid 30 dBA L50 range.

Based upon the analysis, the nighttime noise levels could exceed the noise level criteria shown on Table 5 of 40 dBA L50, if start-up operations occur during the nighttime hours of 10:00 p.m. to 7:00 a.m.

Materials Haul Truck Operations

To describe project impact noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was once again used. The model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly Leq values for free-flowing traffic conditions. Traffic volumes for existing conditions were obtained from the project traffic consultant. The analysis contained in Table 7 includes the Existing plus Project overall 24-hour Ldn, the daytime peak hour, and the nighttime peak hour. Existing plus Project traffic noise levels are summarized in Table 7. Appendix C shows the inputs to the FHWA Model.

As stated earlier in this report, the traffic noise analysis contains the following assumptions:

- Baseline traffic includes an average of 32 one way truck trips per day, which are evenly distributed from 6:00 a.m. to 7:00 p.m. Also peak period of 700 trips during 6:00 a.m. to 7;00 p.m..;
- Truck trips during peak conditions (Plus Project) includes 700 one-way truck trips per day, which are evenly distributed over a 24-hour period;
- The distribution of truck trips on a typical day (Existing) includes 40 percent traveling east on Center Road, and 60 percent traveling west on Center Road;
- Under "Project" conditions, there is no changes to the existing average daily truck trips (32 one-way);
- Under "Project" conditions, during nighttime operations, all nighttime truck traffic will be required to turn west on Center Road.

TABLE 7
PREDICTED EXISTING + PROJECT (700 TRUCK TRIPS) TRAFFIC NOISE LEVELS

Roadway	Location	Traffic Noise Level @ 75'*	Distance to Noise Contours	
			55 dBA	60 dBA
Traffic Noise Levels with 700 Truck Trips Distributed Evenly Over 24-hours (24-hour Ldn)				
Ward Lake Road	Entire Length	66.6 dBA Ldn	445-feet	207-feet
Center Road	West of Ward Lake	67.9 dBA Ldn	545-feet	253-feet
Center Road	East of Ward Lake	56.8 dBA Ldn	99-feet	46-feet
Center Road	East of Cutoff Road	54.7 dBA Ldn	72-feet	33-feet
Traffic Noise Levels (Peak Hour Daytime Leq)				
Ward Lake Road	Entire Length	59.1 dBA Leq	141-feet	66-feet
Center Road	West of Ward Lake	57.7 dBA Leq	113-feet	53-feet
Center Road	East of Ward Lake	54.8 dBA Leq	73-feet	34-feet
Center Road	East of Cutoff Road	54. 7dBA Leq	71-feet	33-feet
Traffic Noise Levels (Peak Hour Nighttime Leq)				
Ward Lake Road	Entire Length	59.7 dBA Leq	106-feet	49-feet
Center Road	West of Ward Lake	60.2 dBA Leq	125-feet	58-feet
Center Road	East of Ward Lake	46.2 dBA Leq	19-feet	9-feet
Center Road	East of Cutoff Road	43.3 dBA Leq	12-feet	6-feet

Sources: j.c. brennan & associates, Inc., and FHWA RD-77-108
* - Roadway noise levels are calculated from the roadway centerline

Based upon Table 7, the project would exceed the 60 dBA Ldn noise level standard along Ward Lake Road, and a portion of Center Road, west of Ward Lake Road.

Also, based upon comparison of Table 7 to Table 4, the project would result in significant increases in traffic noise levels along the Material Haul Truck routes during typical operating operations. The project would result in significant increases in peak hour traffic noise levels during the daytime hours during typical operating operations. During the nighttime hours, the peak hour traffic associated with the project would result in significant increases the nighttime peak hour noise level along Ward Lake Road and Center Road, west of Ward Lake.

The increases in traffic noise levels would exceed the acceptable increases in traffic noise as for a significant impact under CEQA.

Applicant Reduced Project and Caltrans Project Requirements Scenario

The project applicant has stated that as a reduced project alternative, while meeting Caltrans roadway project requirements, there would be a total of 550 one-way truck trips over a 24-hour period, with 260 trucks occurring between the hours of 6:00 p.m. and 6:00 a.m. Therefore, there would be a total of 377 truck trips during the daytime hours of 7:00 a.m. to 10:00 p.m., and 173 truck trips during the nighttime hours. All nighttime trucks would turn west on Center Road during the nighttime hours.

Table 8 shows the results of this analysis.

TABLE 8
REDUCED PROJECT/CALTRANS PROJECT TRAFFIC NOISE LEVELS

Roadway	Location	Traffic Noise Level @ 75'*	Distance to Noise Contours	
			55 dBA	60 dBA
Traffic Noise Levels (24-hour Ldn)				
Ward Lake Road	Entire Length	64.6 dBA Ldn	328-feet	152-feet
Center Road	West of Ward Lake	65.0 dBA Ldn	350-feet	162-feet
Center Road	East of Ward Lake	55.1 dBA Ldn	77-feet	36-feet
Center Road	East of Cutoff Road	53.9 dBA Ldn	64-feet	30-feet
Sources: j.c. brennan & associates, Inc., and FHWA RD-77-108 * - Roadway noise levels are calculated from the roadway centerline				

Based upon Table 8, the project would result in noise levels which exceed the County noise level standard of 60 dB Ldn along Ward Lake Road and Center Road, west of Ward Lake. However, the overall noise levels would decrease from the proposed project. The County Noise Element does provide for exceptions up to 70 dB Ldn, as contained in Figure 3 of this report. Based upon the calculations, the noise levels would not exceed 65 dB Ldn with the reduced project.

MITIGATION MEASURES

Materials Facility Operations

Mitigation measures for the Materials Facility operations to reduce on-site operations to a less than significant level include the following:

1. Restrict the start-up operations to between the hours of 7:00 a.m. to 10:00 p.m;
2. Shield the asphalt plant generator noise levels by either placing the generator behind a berm, or barrier, and orient the generator opening to the north. The berm or barrier shall extend to a height even with the top of the generator enclosure.

Material Haul Truck Traffic

Due to the number of Material Haul Trucks utilizing the facility, the project can reduce the noise impacts to comply with the 60 dB Ldn noise level standard with the following mitigation measures.

1. Restrict the use of engine brakes leaving the project site;

2. Request that the County provide an allowance for up to 65 dB Ldn, based upon the Reduced Project Alternative.

Appendix A
Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
L_{eq}	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
$L_{(n)}$	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L_{50} is the sound level exceeded 50% of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
NRC	Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the AMaximum@ level, which is the highest RMS level.
RT_{60}	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.
SEL	Sound Exposure Level. SEL is s rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.
STC	Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

Appendix B
Ward Lake Quarry Expansion
24hr Continuous Noise Monitoring - Site A
May 3-4, 2018

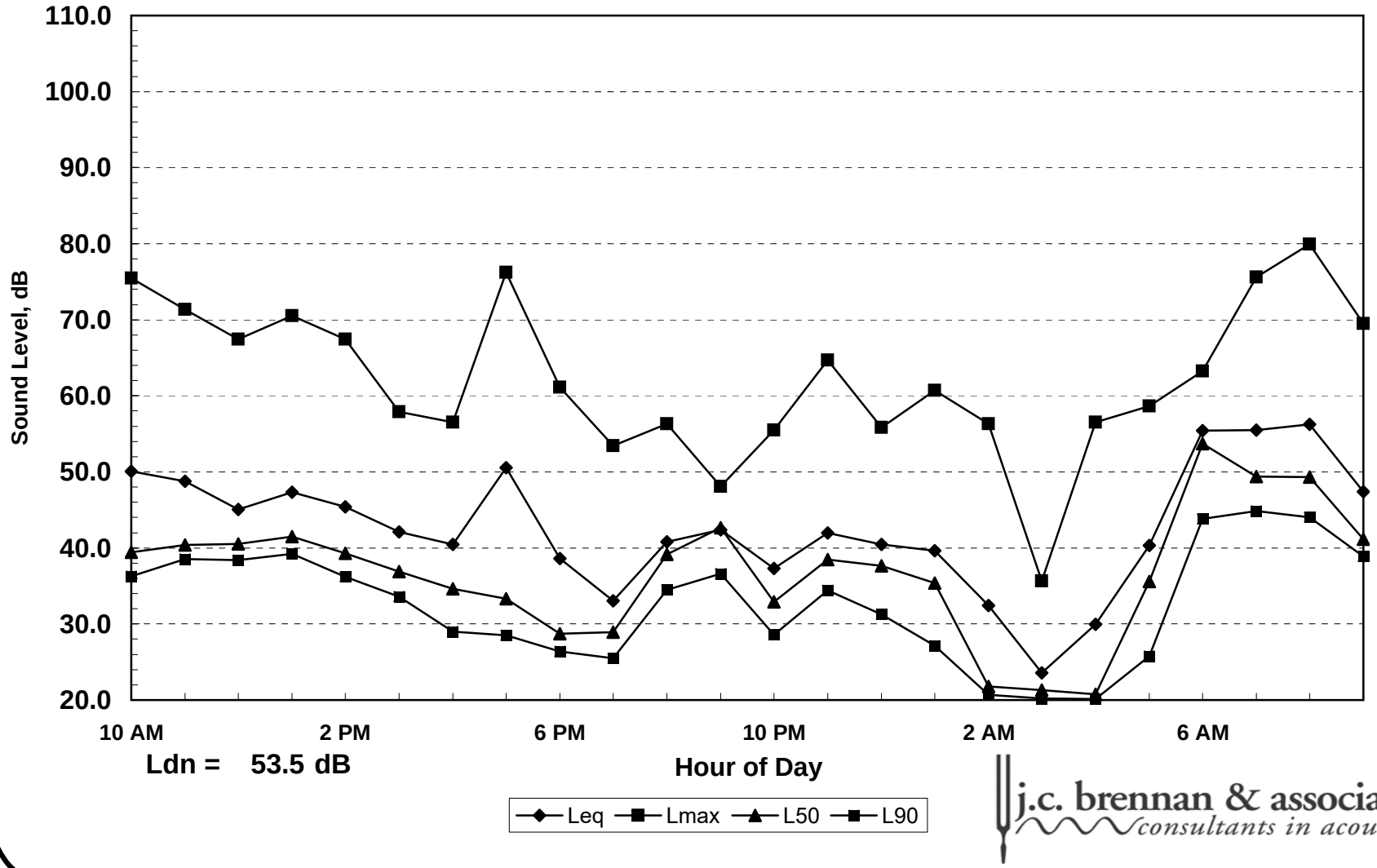
Hour	Leq	Lmax	L50	L90
10:00	50.1	75.4	39.4	36.3
11:00	48.8	71.4	40.4	38.5
12:00	45.1	67.4	40.6	38.4
13:00	47.3	70.5	41.5	39.2
14:00	45.4	67.5	39.3	36.2
15:00	42.1	57.9	36.9	33.6
16:00	40.4	56.5	34.6	29.0
17:00	50.5	76.3	33.3	28.5
18:00	38.6	61.1	28.8	26.4
19:00	33.0	53.4	28.9	25.5
20:00	40.8	56.3	39.1	34.5
21:00	42.4	48.1	42.6	36.6
22:00	37.3	55.5	32.9	28.6
23:00	42.0	64.7	38.5	34.4
0:00	40.4	55.9	37.6	31.3
1:00	39.7	60.7	35.4	27.1
2:00	32.5	56.3	21.8	20.7
3:00	23.6	35.6	21.3	20.2
4:00	30.0	56.5	20.8	20.1
5:00	40.3	58.6	35.6	25.8
6:00	55.4	63.2	53.7	43.8
7:00	55.5	75.6	49.4	44.9
8:00	56.2	79.9	49.3	44.0
9:00	47.4	69.5	41.2	38.9

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	56.2	33.0	49.4	55.4	23.6	46.5
Lmax (Maximum)	79.9	48.1	65.8	64.7	35.6	56.3
L50 (Median)	49.4	28.8	39.0	53.7	20.8	33.1
L90 (Background)	44.9	25.5	35.4	43.8	20.1	28.0

Computed Ldn, dB	53.5
% Daytime Energy	76%
% Nighttime Energy	24%

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Appendix B
Ward Lake Quarry Expansion
24hr Continuous Noise Monitoring - Site A
May 3-4, 2018



Ldn = 53.5 dB

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Appendix B
Ward Lake Quarry Expansion
24hr Continuous Noise Monitoring - Site B
May 3-4, 2018

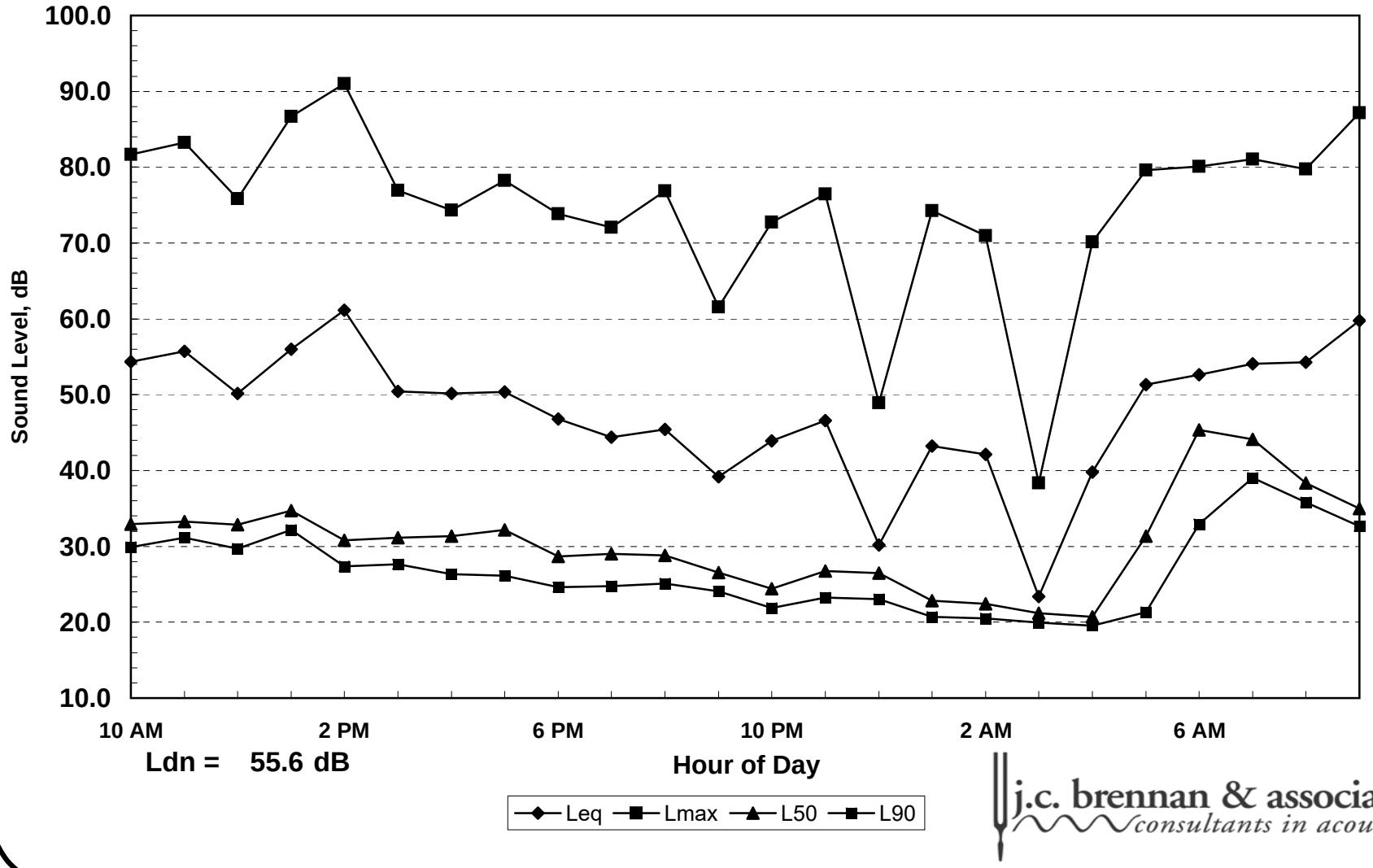
Hour	Leq	Lmax	L50	L90
10:00	54.4	81.7	32.9	29.9
11:00	55.7	83.2	33.3	31.1
12:00	50.2	75.8	32.9	29.7
13:00	56.0	86.7	34.7	32.1
14:00	61.1	91.0	30.8	27.4
15:00	50.5	77.0	31.2	27.7
16:00	50.2	74.3	31.4	26.3
17:00	50.4	78.3	32.2	26.1
18:00	46.8	73.9	28.7	24.6
19:00	44.4	72.1	29.1	24.8
20:00	45.5	76.9	28.8	25.1
21:00	39.2	61.6	26.5	24.1
22:00	43.9	72.8	24.4	21.9
23:00	46.6	76.4	26.8	23.2
0:00	30.2	48.9	26.5	23.1
1:00	43.2	74.2	22.8	20.7
2:00	42.2	70.9	22.5	20.5
3:00	23.4	38.4	21.2	19.9
4:00	39.8	70.2	20.7	19.6
5:00	51.3	79.6	31.3	21.3
6:00	52.6	80.1	45.4	32.9
7:00	54.0	81.1	44.1	39.0
8:00	54.3	79.8	38.3	35.8
9:00	59.8	87.2	35.0	32.6

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	61.1	39.2	54.6	52.6	23.4	46.9
Lmax (Maximum)	91.0	61.6	78.7	80.1	38.4	68.0
L50 (Median)	44.1	26.5	32.7	45.4	20.7	26.8
L90 (Background)	39.0	24.1	29.1	32.9	19.6	22.6

Computed Ldn, dB	55.6
% Daytime Energy	91%
% Nighttime Energy	9%

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consultants in acoustics

Appendix B
Ward Lake Quarry Expansion
24hr Continuous Noise Monitoring - Site B
May 3-4, 2018



Ldn = 55.6 dB

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Appendix C
FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2018-117
Description: Existing ADT
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Ward Lake Road	Entire Length	156	90		10	2.0	14.0	25	75	
2	Center Road	West of Ward Lake	520	90		10	1.0	2.3	45	75	
3	Center Road	East of Ward Lake	556	90		10	1.0	1.5	35	75	
4	Center Road	East of Cutoff Road	500	90		10	1.0	1.6	35	75	
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7										75	
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C

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2018-117
Description: Existing ADT
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Ward Lake Road	Entire Length	36.4	31.8	47.9	48.3
2	Center Road	West of Ward Lake	49.6	38.0	46.1	51.4
3	Center Road	East of Ward Lake	46.8	36.6	43.5	48.7
4	Center Road	East of Cutoff Road	46.3	36.1	43.3	48.3

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Appendix C

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2018-117
Description: Existing ADT
Ldn/CNEL: Ldn
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Ward Lake Road	Entire Length	1	3	6	12	27
2	Center Road	West of Ward Lake	2	4	9	20	43
3	Center Road	East of Ward Lake	1	3	6	13	29
4	Center Road	East of Cutoff Road	1	3	6	13	27

Appendix C
FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Data Input Sheet - Peak Hour Leq
Peak Hour Leq daytime

Project #: 2018-117
Description: Existing Conditions
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Peak Hour Volume	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Ward Lake Road	Entire Length	16	1.0	7.0	25	75	
2	Center Road	West of Ward Lake	52	1.0	2.0	45	75	
3	Center Road	East of Ward Lake	56	1.0	2.0	35	75	
4	Center Road	East of Cutoff Road	50	1.0	2.0	35	75	
5							75	
6							75	
7							75	
8							75	
9							75	
10							75	
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Appendix C

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)

Predicted Levels

Peak Hour Leq daytime

Project #: 2018-117

Description: Existing Conditions

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Ward Lake Road	Entire Length	37.9	29.9	46.0	46.7
2	Center Road	West of Ward Lake	50.6	39.0	46.5	52.2
3	Center Road	East of Ward Lake	47.8	37.6	45.8	50.2
4	Center Road	East of Cutoff Road	47.3	37.1	45.3	49.7
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			#NUM!	#NUM!	#NUM!	#NUM!
			#NUM!	#NUM!	#NUM!	#NUM!

Appendix C

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)

Noise Contour Output

Peak Hour Leq daytime

Project #: 2018-117

Description: Existing Conditions

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Ward Lake Road	Entire Length	1	2	5	10	21
2	Center Road	West of Ward Lake	2	5	11	23	49
3	Center Road	East of Ward Lake	2	4	8	17	36
4	Center Road	East of Cutoff Road	2	3	7	15	33

Appendix C
FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Data Input Sheet - Peak Hour Leq
Peak Hour Leq Nighttime

Project #: 2018-117
Description: Existing Conditions
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Peak Hour Volume	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Ward Lake Road	Entire Length	5	1.0	0.1	25	75	
2	Center Road	West of Ward Lake	12	1.0	0.1	45	75	
3	Center Road	East of Ward Lake	27	1.0	0.1	35	75	
4	Center Road	East of Cutoff Road	14	1.0	0.1	35	75	
5							75	
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7							75	
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10							75	
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Appendix C

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)

Predicted Levels

Peak Hour Leq Nighttime

Project #: 2018-117

Description: Existing Conditions

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Ward Lake Road	Entire Length	33.2	24.8	22.5	34.1
2	Center Road	West of Ward Lake	44.3	32.6	27.1	44.7
3	Center Road	East of Ward Lake	44.7	34.4	29.6	45.2
4	Center Road	East of Cutoff Road	41.8	31.6	26.8	42.4
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			#NUM!	#NUM!	#NUM!	#NUM!
			#NUM!	#NUM!	#NUM!	#NUM!

Appendix C

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)

Noise Contour Output

Peak Hour Leq Nighttime

Project #: 2018-117

Description: Existing Conditions

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Ward Lake Road	Entire Length	0	0	1	1	3
2	Center Road	West of Ward Lake	1	2	3	7	15
3	Center Road	East of Ward Lake	1	2	4	8	17
4	Center Road	East of Cutoff Road	1	1	2	5	11

Appendix C
FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2018-117
Description: Existing + Project ADT 700 trucks
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Ward Lake Road	Entire Length	910	72		28	1.0	97.0	25	75	
2	Center Road	West of Ward Lake	1,210	72		28	1.0	80.0	45	75	
3	Center Road	East of Ward Lake	993	90		10	1.0	15.0	35	75	
4	Center Road	East of Cutoff Road	583	90		10	1.0	16.0	35	75	
5										75	
6										75	
7										75	
8										75	
9										75	
10										75	
11										75	
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FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2018-117

Description: Existing + Project ADT 700 trucks

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Ward Lake Road	Entire Length	30.5	39.1	66.6	66.6
2	Center Road	West of Ward Lake	48.9	44.3	67.8	67.9
3	Center Road	East of Ward Lake	48.6	39.1	56.0	56.8
4	Center Road	East of Cutoff Road	46.3	36.8	54.0	54.7

j.c. brennan & associates
consultants in acoustics

Appendix C

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2018-117

Description: Existing + Project ADT 700 trucks

Ldn/CNEL: Ldn

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Ward Lake Road	Entire Length	21	45	96	207	445
2	Center Road	West of Ward Lake	25	55	117	253	545
3	Center Road	East of Ward Lake	5	10	21	46	99
4	Center Road	East of Cutoff Road	3	7	16	33	72

Appendix C
FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Data Input Sheet - Peak Hour Leq
Peak Hour Leq daytime

Project #: 2018-117
Description: Existing + Project Conditions daytime Leq
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Peak Hour Volume	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Ward Lake Road	Entire Length	44	1.0	52.0	25	75	
2	Center Road	West of Ward Lake	69	1.0	15.0	45	75	
3	Center Road	East of Ward Lake	67	1.0	10.0	35	75	
4	Center Road	East of Cutoff Road	61	1.0	11.0	35	75	
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Appendix C

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)

Predicted Levels

Peak Hour Leq daytime

Project #: 2018-117

Description: Existing + Project Conditions daytime Leq

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Ward Lake Road	Entire Length	39.4	34.3	59.1	59.1
2	Center Road	West of Ward Lake	51.2	40.2	56.5	57.7
3	Center Road	East of Ward Lake	48.2	38.4	53.6	54.8
4	Center Road	East of Cutoff Road	47.7	38.0	53.6	54.7
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Appendix C

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)

Noise Contour Output

Peak Hour Leq daytime

Project #: 2018-117

Description: Existing + Project Conditions daytime Leq

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Ward Lake Road	Entire Length	7	14	30	66	141
2	Center Road	West of Ward Lake	5	11	24	53	113
3	Center Road	East of Ward Lake	3	7	16	34	73
4	Center Road	East of Cutoff Road	3	7	15	33	71

Appendix C
FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2018-117
Description: Existing Peak ADT with Peak Conditions 700 Daily Trucks
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Ward Lake Road	Entire Length	649	95		5	1.0	74.0	25	75	
2	Center Road	West of Ward Lake	875	97		3	1.0	27.0	45	75	
3	Center Road	East of Ward Lake	752	97		3	1.0	21.0	35	75	
4	Center Road	East of Cutoff Road	727	97		3	1.0	23.0	35	75	
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FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2018-117

Description: Existing Peak ADT with Peak Conditions 700 Daily Trucks

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Ward Lake Road	Entire Length	36.1	33.8	60.1	60.1
2	Center Road	West of Ward Lake	48.8	38.5	57.3	57.9
3	Center Road	East of Ward Lake	45.4	36.1	54.5	55.1
4	Center Road	East of Cutoff Road	45.1	36.0	54.8	55.3

Appendix C

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2018-117

Description: Existing Peak ADT with Peak Conditions 700 Daily Trucks

Ldn/CNEL: Ldn

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Ward Lake Road	Entire Length	8	16	36	77	165
2	Center Road	West of Ward Lake	5	12	25	54	117
3	Center Road	East of Ward Lake	4	8	16	35	76
4	Center Road	East of Cutoff Road	4	8	17	36	78

Appendix C
FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Data Input Sheet - Peak Hour Leq
Peak Hour Leq daytime

Project #: 2018-117
Description: Existing Conditions Peak Conditions with 700 daily trucks
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Peak Hour Volume	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Ward Lake Road	Entire Length	62	1.0	68.0	25	75	
2	Center Road	West of Ward Lake	80	1.0	25.0	45	75	
3	Center Road	East of Ward Lake	75	1.0	17.0	35	75	
4	Center Road	East of Cutoff Road	72	1.0	19.0	35	75	
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Appendix C

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)

Predicted Levels

Peak Hour Leq daytime

Project #: 2018-117

Description: Existing Conditions Peak Conditions with 700 daily trucks

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Ward Lake Road	Entire Length	39.1	35.8	61.7	61.8
2	Center Road	West of Ward Lake	51.3	40.9	59.3	60.0
3	Center Road	East of Ward Lake	48.3	38.9	56.4	57.1
4	Center Road	East of Cutoff Road	48.0	38.7	56.7	57.3
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Appendix C

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)

Noise Contour Output

Peak Hour Leq daytime

Project #: 2018-117

Description: Existing Conditions Peak Conditions with 700 daily trucks

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Ward Lake Road	Entire Length	10	21	46	98	212
2	Center Road	West of Ward Lake	8	16	35	75	162
3	Center Road	East of Ward Lake	5	10	22	48	103
4	Center Road	East of Cutoff Road	5	11	23	50	107

Appendix C
FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2018-117
Description: Existing + Caltrans Project 550 Trucks
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Ward Lake Road	Entire Length	760	72		28	1.0	73.0	25	75	
2	Center Road	West of Ward Lake	950	75		25	1.0	55.0	45	75	
3	Center Road	East of Ward Lake	673	90		10	1.0	15.0	35	75	
4	Center Road	East of Cutoff Road	483	90		10	1.0	16.0	35	75	
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FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Predicted Levels

Project #: 2018-117

Description: Existing + Caltrans Project 550 Trucks

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Ward Lake Road	Entire Length	40.8	38.3	64.6	64.6
2	Center Road	West of Ward Lake	51.1	42.9	64.8	65.0
3	Center Road	East of Ward Lake	46.9	37.4	54.3	55.1
4	Center Road	East of Cutoff Road	45.5	35.9	53.2	53.9

Appendix C

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Contour Output

Project #: 2018-117

Description: Existing + Caltrans Project 550 Trucks

Ldn/CNEL: Ldn

Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment Description	75	70	65	60	55
1	Ward Lake Road	Entire Length	15	33	71	152	328
2	Center Road	West of Ward Lake	16	35	75	162	350
3	Center Road	East of Ward Lake	4	8	17	36	77
4	Center Road	East of Cutoff Road	3	6	14	30	64

Appendix I

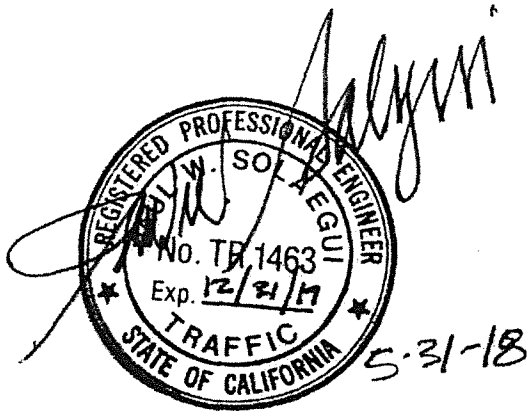
Traffic Study

SOLAEGUI
ENGINEERS, LTD

HAT CREEK
MATERIALS FACILITY

UPDATED TRAFFIC STUDY

MAY 2018



Prepared by:
Solaegui Engineers, Ltd.
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HAT CREEK MATERIALS FACILITY

UPDATED TRAFFIC STUDY

EXECUTIVE SUMMARY

The Hat Creek Materials Facility is located in Lassen County, California. The project site is located east of Ward Lake Road and north of Center Road. The project site currently contains the existing Hat Creek Materials Facility. The purpose of this updated study is to address the project's impact upon the adjacent street network. The Center Road/Ward Lake Road and Center Road/Cutoff Road intersections have been identified for peak hour analysis for the existing and existing plus project scenarios. The typical AM and PM peak hours and a late night peak hour were identified for analysis. Center Road, Ward Lake Road, and Cutoff Road have been identified for daily traffic loading review for the existing and existing plus project scenarios.

The Hat Creek Materials Facility consists of a construction and materials facility. Access to the site is provided from Ward Lake Road via Center Road. The project is proposing to expand the daily hours of operation which will result in increased truck traffic to and from their facility. The expanded hours of operation are anticipated to generate 320 daily trips with 22 trips occurring during the AM peak hour, 22 trips occurring during the PM peak hour, and 22 trips occurring during the Night peak hour.

The increased traffic generated by the Hat Creek Materials Facility will have little impact on the adjacent street network.

No improvements are recommended at either the Center Road/Ward Lake Road intersection or the Center Road/Cutoff Road intersection.

INTRODUCTION

STUDY AREA

The Hat Creek Materials Facility is located in Lassen County, California. The project site is located east of Ward Lake Road and north of Center Road. Figure 1 shows the approximate location of the project site. The purpose of this updated study is to address the project's traffic impact on the adjacent street network. The Center Road/Ward Lake Road and Center Road/Cutoff Road intersections have been identified for peak hour analysis for the existing and existing plus project scenarios. The typical AM and PM peak hours and a late night peak hour were identified for analysis. Center Road, Ward Lake Road, and Cutoff Road have been identified for daily traffic loading review for the existing and existing plus project scenarios.

EXISTING AND PROPOSED LAND USES

The project site contains the existing Hat Creek Materials Facility. Adjacent properties generally include farm land with single family dwelling units to the southwest and undeveloped land to the north and west. The Hat Creek Materials Facility consists of a construction and materials facility. Access to the site is provided from Ward Lake Road via Center Road. The project is proposing to expand the daily hours of operation which will result in increased truck traffic to and from their facility.

EXISTING AND PROPOSED ROADWAYS AND INTERSECTIONS

Center Road is a rural, two-lane roadway with one through lane in each direction in the vicinity of the site. The speed limit is posted for 35 miles per hour generally east of Ward Lake Road, 45 miles per hour west of Ward Lake Road, and 55 miles per hour further west. Roadway improvements generally include ±1 wide paved shoulders with solid white edgelines and a striped centerline.

Ward Lake Road is a rural, two-lane roadway with one through lane in each direction north of Center Road. The speed limit is not posted. Roadway improvements generally include paved travel lanes with a striped centerline.

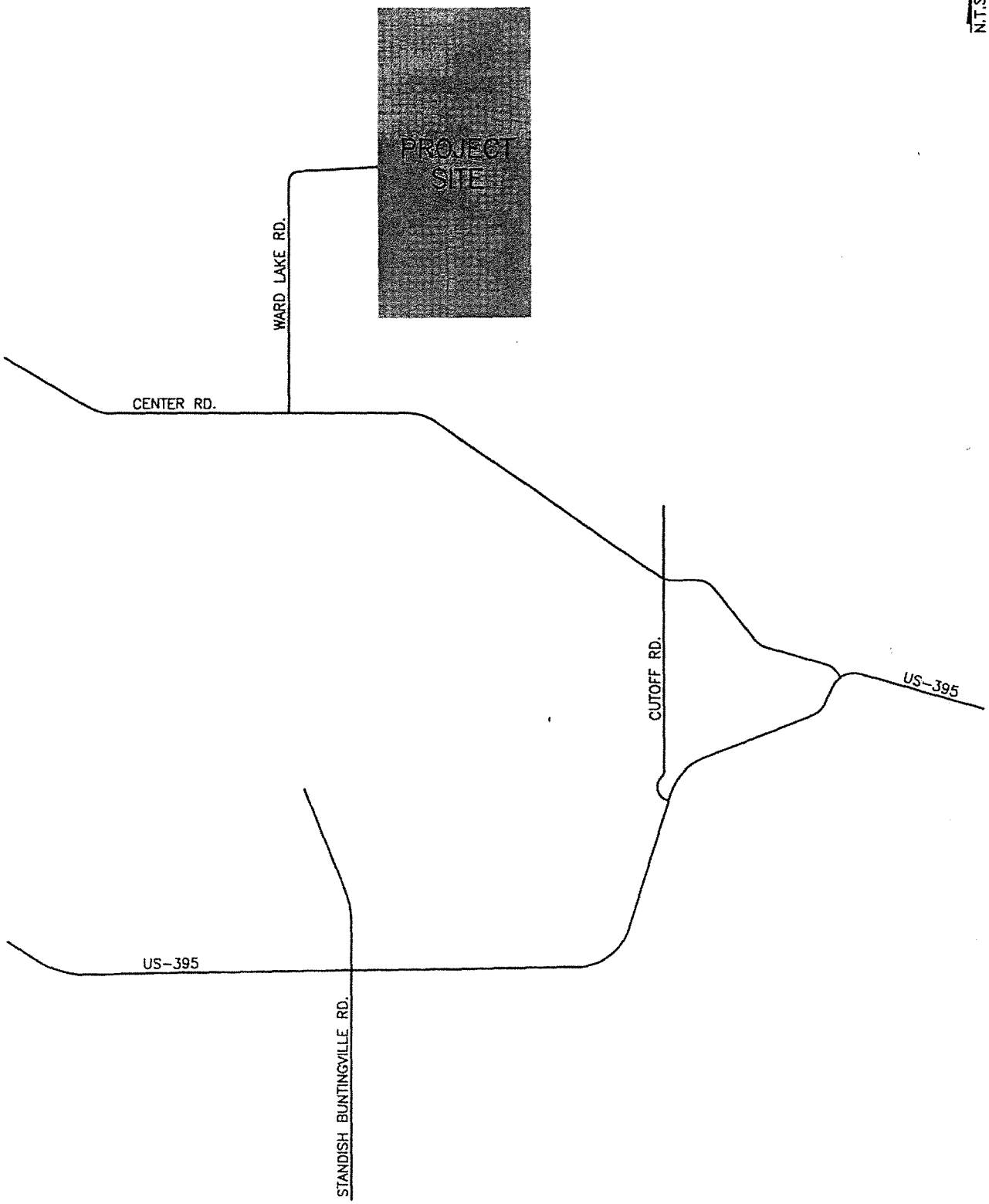
Cutoff Road is a rural, two-lane roadway with one through lane in each direction from US-395 to north of Center Road. The speed limit is not posted except for a 25 mile per hour zone on a curve. Roadway improvements generally include paved travel lanes with a striped centerline.

The Center Road/Ward Lake Road intersection is an unsignalized three-leg intersection with stop control at the north approach. The north approach contains one shared left turn-right turn lane. The west approach contains one shared left turn-through lane. The east approach contains one shared through-right turn lane.

The Center Road/Cutoff Road intersection is an unsignalized four-leg intersection with stop control at the north and south approaches. All approaches contain a shared left turn-through-right turn lane.

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HAT CREEK MATERIALS FACILITY

VICINITY MAP
FIGURE 1

TRIP GENERATION

In order to assess the magnitude of traffic impacts of the project's expanded operation on the adjacent street network, daily and peak hour trip generation volumes had to be determined. The peak hours occurring from 7:00 to 8:00 AM, 4:00 to 5:00 PM, and 9:00 to 10:00 PM were identified for analysis after consultation with Lassen County Department of Public Works staff (Bob McGarva).

The current project permit allows 10 material hauling trucks per day which includes 10 trucks arriving empty and 10 trucks departing full. The proposed operation is to include 145 material hauling trucks per day which amounts to 145 arriving trucks and 145 departing trucks per day. Deducting the existing 10 material hauling trucks per day results in an increase of 135 material hauling trucks per day. The existing 10 material hauling trucks were deducted because they are already included in the existing daily traffic volumes discussed in the Existing and Projected Traffic Volume section of this report. The daily trip generation for the proposed increase is therefore 270 material hauling trucks per day assuming 135 arriving trucks and 135 departing trucks. These material hauling trucks are assumed to be equally dispersed throughout a twelve-hour day resulting in 11 trips entering and 11 trips departing during both the 7:00 to 8:00 AM and 4:00 to 5:00 PM peak hours. During night operations, an increased total of 135 material hailing truck trips are again anticipated (135 empty trucks arriving and 135 full trucks departing). Again, these material hauling trucks are assumed to be equally dispersed throughout a twelve-hour night resulting in 11 entering and departing trips during the 9:00 to 10:00 PM peak hour.

Additional traffic entering and departing the site includes employees and suppliers. The proposed operation will include up to 20 seasonal employees and 5 supplier truck loads resulting in daily trip generation volumes of 40 employee trips per day (20 entering and 20 exiting) and 10 supplier truck trips per day (5 entering and 5 exiting). The increased employee trips will begin work around 6:00 AM and depart around 6:00 PM so they fall outside the 7:00 to 8:00 AM, 4:00 to 5:00 PM, and 9:00 to 10:00 PM peak hours. The increased supplier truck trips are also anticipated to occur outside the peak hours. Table 1 shows a summary of the daily traffic volumes and peak hour volumes generated by the expanded operation.

TABLE 1
TRIP GENERATION

LAND USE	DAILY	AM PEAK HOUR		PM PEAK HOUR		NIGHT PEAK HOUR	
		IN	OUT	IN	OUT	IN	OUT
Material Hauling Trucks	270	11	11	11	11	11	11
Seasonal Employees	40	0	0	0	0	0	0
Supplier Trucks	10	0	0	0	0	0	0
Total	320	11	11	11	11	11	11

Material hauling trucks include asphalt, base, concrete, etc. and supplier trucks include oil, cement, parts, etc.

TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of the project traffic to the key roadways and intersections was based on existing peak hour traffic patterns and the locations of attractions and productions in the area. Figure 2 shows the anticipated trip distribution. The daily traffic and peak hour trips shown in Table 1 were subsequently assigned to the key roadways and intersections based on the trip distribution percentages. Figure 3 shows the daily trip assignment volumes on the key roadways and the peak hour traffic volumes at the key intersections.

EXISTING AND PROJECTED TRAFFIC VOLUMES

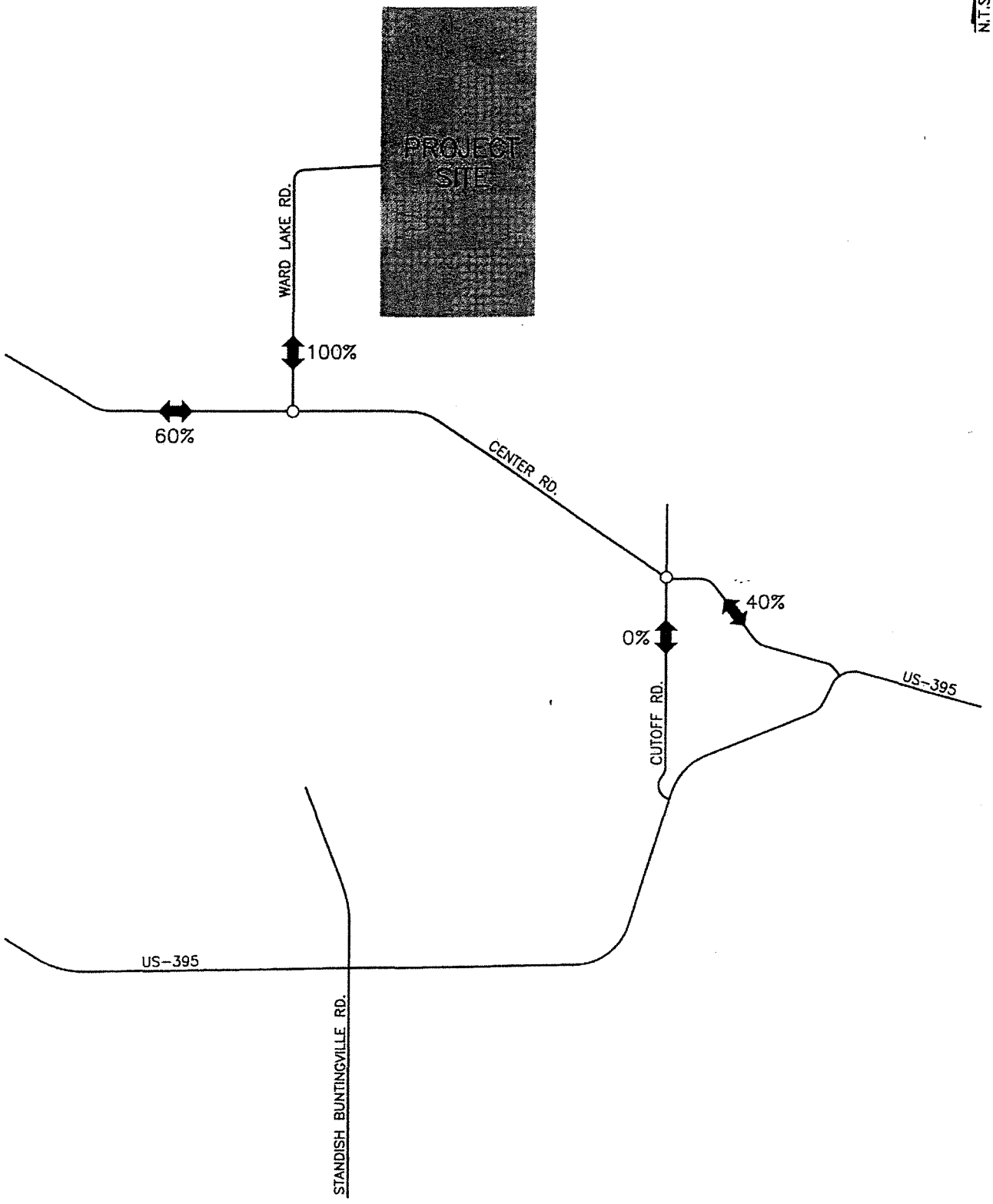
Figure 4 shows the existing traffic volumes at the key intersections during the AM and PM peak hours. The existing AM and PM peak hour traffic volumes at the intersections were obtained from manual traffic counts conducted by Solaegui Engineers in April of 2018.

Figure 4 also shows the existing daily traffic volumes on the adjacent roadway segments. The existing daily traffic volumes were not counted but were instead estimated by applying a 10% peak hour factor to the PM peak hour roadway volumes. The peak hour factor is the ratio of hourly traffic volume to the daily traffic volume. The daily traffic volumes on the various roadway segments were therefore calculated by dividing the peak hour link volumes by 10%. For example, the existing daily traffic volume on Center Road just west of Ward Creek Road (510 vehicles per day) was calculated by adding the eastbound left turn volume (2 vehicles per hour), eastbound through volume (19 vehicles per hour), westbound through volume (27 vehicles per hour), and southbound right turn volume (3 vehicles per hour) and then dividing the sum (51 vehicles per hour) by the 10% PM peak hour factor. This method of estimating daily traffic volumes was discussed with and subsequently approved by Lassen County Department of Public Works staff (Bob McGarva) during the scoping of the traffic study. The California Department of Transportation (Caltrans) publishes actual daily traffic volumes on some of their roadways. However, our research of Caltrans traffic volumes indicates that no count information is available on Center Road or Ward Lake Road.

Figure 5 shows the existing plus project traffic volumes at the key intersections during the AM and PM peak hours and the existing plus project daily traffic volumes on the key roadways. The existing plus project traffic volumes were obtained by adding the trip assignment volumes shown on Figure 3 to the existing traffic volumes shown on Figure 4.

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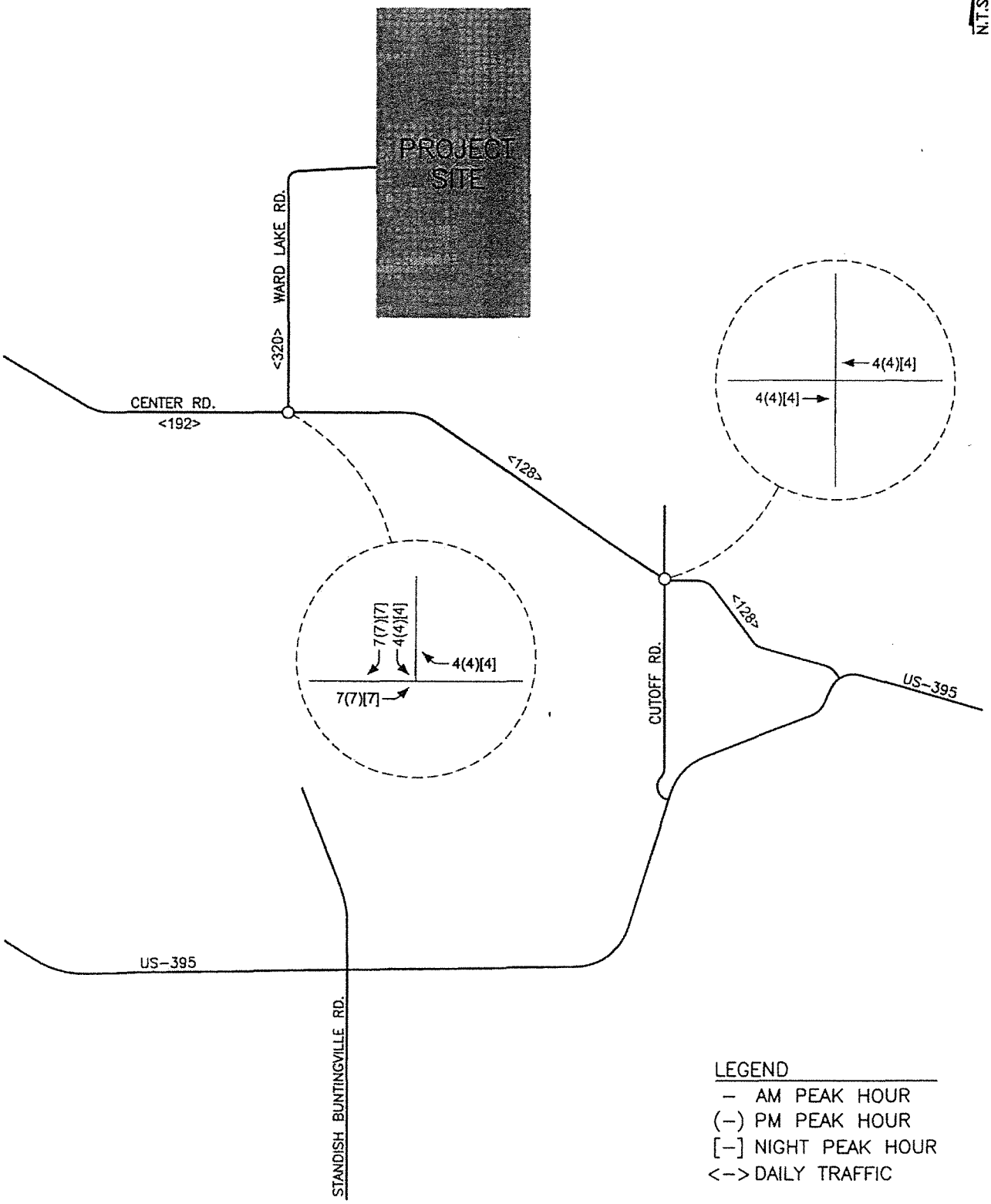


HAT CREEK MATERIALS FACILITY

TRIP DISTRIBUTION
FIGURE 2

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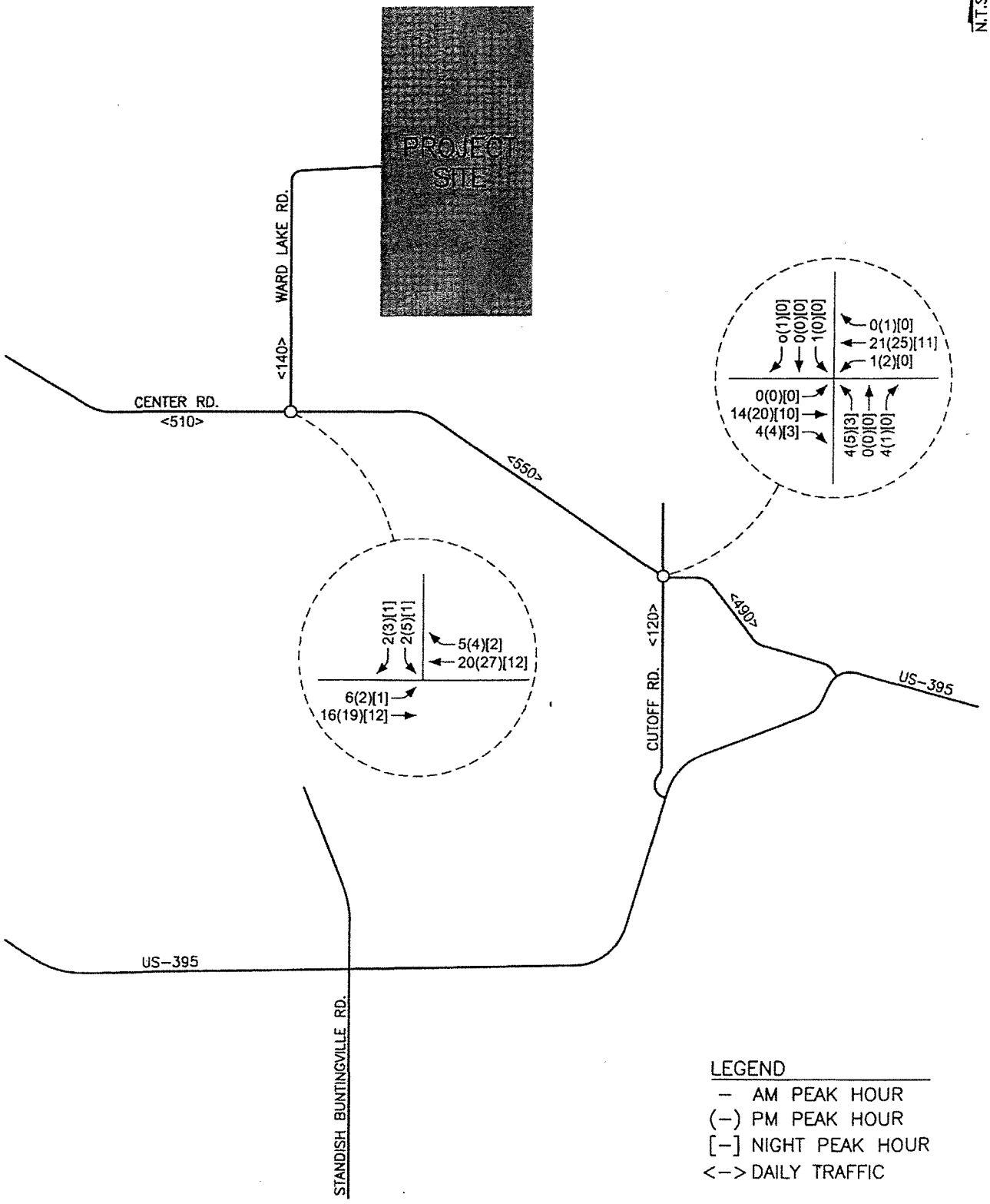


HAT CREEK MATERIALS FACILITY

TRIP ASSIGNMENT
FIGURE 3

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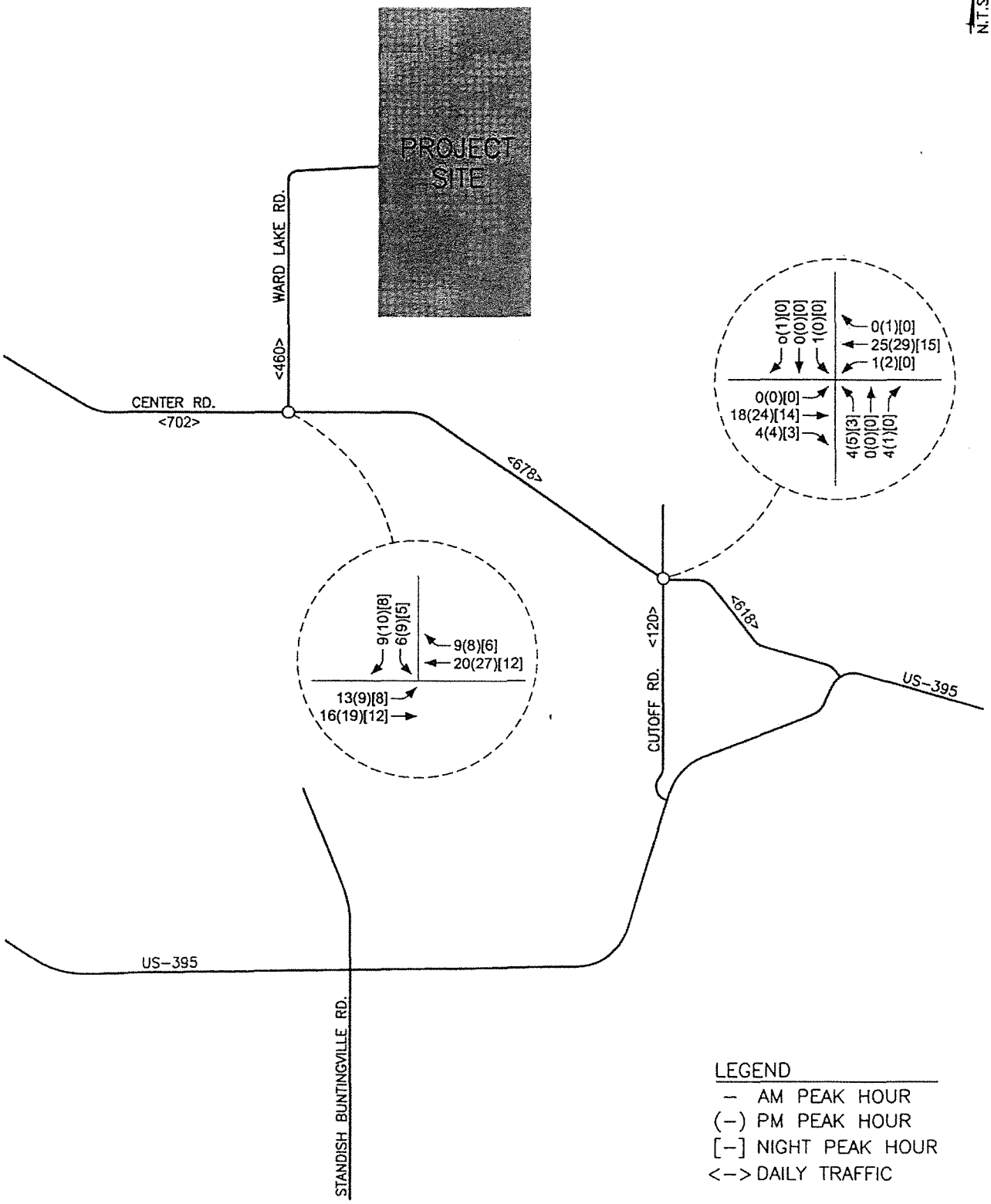
HAT CREEK MATERIALS FACILITY

EXISTING TRAFFIC VOLUMES

FIGURE 4

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HAT CREEK MATERIALS FACILITY

EXISTING PLUS PROJECT TRAFFIC VOLUMES

FIGURE 5

INTERSECTION CAPACITY ANALYSIS

The Center Road/Ward Lake Road and Center Road/Cutoff Road intersections were analyzed for capacity based on procedures presented in the *Highway Capacity Manual (6th Edition)*, prepared by the Transportation Research Board, for unsignalized intersections using the latest version of the Highway Capacity software.

The result of capacity analysis is a level of service (LOS) rating for each unsignalized intersection minor movement. Level of service is a qualitative measure of traffic operating conditions where a letter grade "A" through "F", corresponding to progressively worsening traffic operation, is assigned to the intersection minor movement.

The *Highway Capacity Manual* defines level of service for stop controlled intersections in terms of computed or measured control delay for each minor movement. Level of service is not defined for the intersection as a whole. The level of service criteria for unsignalized intersections is shown in Table 2.

TABLE 2
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DELAY RANGE (SEC/VEH)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

Table 3 shows the AM, PM, and Night peak hour level of service and delay results at the key intersections for the existing and existing plus project scenarios. The capacity worksheets are included in the Appendix.

TABLE 3
INTERSECTION LEVEL OF SERVICE AND DELAY RESULTS

INTERSECTION/MOVEMENT	EXISTING			EXISTING + PROJECT		
	AM	PM	NIGHT	AM	PM	NIGHT
Center Road & Ward Lake Road						
Eastbound Left	A7.3	A7.3	A7.3	A7.8	A7.8	A7.7
Southbound Left-Right	A8.6	A8.7	A8.5	A9.2	A9.3	A9.1
Center Road & Cutoff Road						
Eastbound Left	A7.3	A7.3	A7.3	A7.3	A7.3	A7.3
Westbound Left	A7.3	A7.3	A7.3	A7.3	A7.3	A7.3
Northbound Left-Thru-Right	A8.6	A8.8	A8.7	A8.7	A8.9	A8.7
Southbound Left-Thru-Right	A8.8	A8.5	A0.0	A8.8	A8.5	A0.0

Center Road/Ward Lake Road Intersection

The Center Road/Ward Lake Road intersection was analyzed as an unsignalized three-leg intersection with stop sign control at the north approach for the existing and existing plus project traffic volumes. The intersection minor movements currently operate at LOS A during the AM, PM, and Night peak hours. For the existing plus project traffic volumes the intersection minor movements continue to operate at LOS A during the AM, PM, and Night peak hours. The intersection was analyzed with the existing approach lanes for all scenarios.

The need for an exclusive eastbound left turn lane on Center Road at the Ward Lake Road intersection was reviewed based on Table 9-23 of the AASHTO publication *A Policy on Geometric Design of Highways and Streets*. A copy of this table is included in the Appendix. Table 9-23 shows traffic volumes and operating speeds which may trigger the need for a left turn lane on a two-lane highway. The traffic volumes to be considered include the advancing traffic volume (eastbound left turn plus eastbound through volumes), opposing traffic volume (westbound through plus westbound right turn volumes), and the percent of advancing traffic which is turning left (eastbound left turn volume divided by the sum of the eastbound left turn and through volumes). As shown in Table 9.23, for an estimated operating speed of 50 miles per hour on Center Road with 30% left turns, the volume threshold to warrant an exclusive left turn lane would be 135 advancing vehicles and 800 opposing vehicles or 295 advancing vehicles and 100 opposing vehicles. As shown on Figure 5, for the higher PM peak hour, the advancing volume amounts to 28 vehicles per hour, the opposing volume amounts to 35 vehicles per hour, and the percent of advancing traffic which is turning left is approximately 32%. These existing plus project traffic volumes are well below the AASHTO volume thresholds and therefore an exclusive left turn lane on Center Road is not recommended.

The need for an exclusive westbound right turn lane on Center Road at the Ward Lake Road intersection was reviewed based on the *Caltrans Highway Design Manual*. The manual states that right turn lanes can be justified on the basis of capacity, analysis, and frequent rear-end and sideswipe crash experience. Other factors such as a high volume of right turn traffic causing backup in the through lanes and pedestrians conflicts with right turn traffic may also contribute to the need for right turn lanes. A copy of Section 405.3 "Right Turn Channelization" from the *Caltrans Highway Design Manual* is include in the Appendix. The *Caltrans Highway Design Manual* does not specifically identify thresholds for intersection capacity, pedestrian and bicycle counts, and right turn volume. However, an exclusive right turn lane is not recommended at this location based on 1) the intersection is anticipated to operate well below capacity, LOS A as shown in Table 3, 2) right turn conflicts with pedestrians and bicycles are not anticipated due to the fact that no pedestrians or bicycles were observed at the intersection when the existing counts were performed, and 3) the projected right turn traffic is projected to be extremely low, only 9 vehicles during the highest peak hour. Traffic crash data was not made available to us at this location.

Center Road/Cutoff Road Intersection

The Center Road/Cutoff Road intersection was analyzed as an unsignalized four-leg intersection with stop sign control at the north and south approaches for the existing and existing plus project traffic volumes. The intersection minor movements currently operate at LOS A during the AM, PM, and Night peak hours. For the existing plus project traffic volumes the intersection minor movements continue to operate at LOS A during the AM, PM, and Night peak hours. The intersection was analyzed with the existing approach lanes for all scenarios. The need for an exclusive eastbound right turn lane on Center Road at the Cutoff Road intersection was not reviewed since the project developer has committed to send no trucks onto Cutoff Road.

RECOMMENDATIONS

The increased traffic generated by the Hat Creek Materials Facility will have little impact on the adjacent street network.

No improvements are recommended at either the Center Road/Ward Lake Road intersection or the Center Road/Cutoff Road intersection.

APPENDIX

HCS7 Two-Way Stop-Control Report

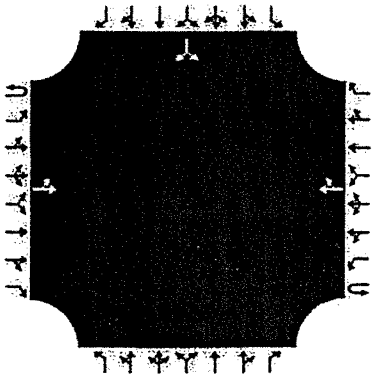
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/18/2018
Analysis Year	2018
Time Analyzed	AM Existing
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Center & Ward Lake
Jurisdiction	Lassen County
East/West Street	Center Road
North/South Street	Ward Lake Road
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume, V (veh/h)		6	16				20	5						2		2
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7													4	
Capacity, c (veh/h)		1577													993	
v/c Ratio		0.00													0.00	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.3													8.6	
Level of Service, LOS		A													A	
Approach Delay (s/veh)		2.0												8.6		
Approach LOS														A		

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HCS7 Two-Way Stop-Control Report

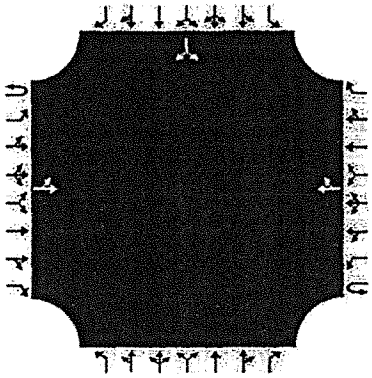
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/18/2018
Analysis Year	2018
Time Analyzed	PM Existing
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Center & Ward Lake
Jurisdiction	Lassen County
East/West Street	Center Road
North/South Street	Ward Lake Road
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume, V (veh/h)		2	19				27	4						5		3
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2													9	
Capacity, c (veh/h)		1569													978	
v/c Ratio		0.00													0.01	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.3													8.7	
Level of Service, LOS		A													A	
Approach Delay (s/veh)		0.7												8.7		
Approach LOS														A		

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HCS7 Two-Way Stop-Control Report

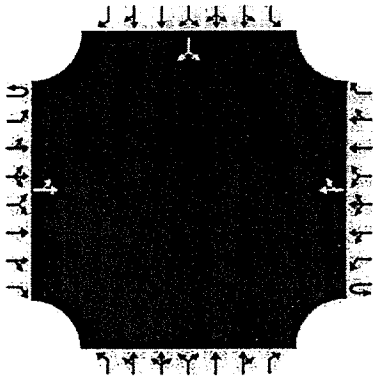
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/18/2018
Analysis Year	2018
Time Analyzed	Night Existing
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Center & Ward Lake
Jurisdiction	Lassen County
East/West Street	Center Road
North/South Street	Ward Lake Road
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume, V (veh/h)		1	12				12	2						1		1
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1													2	
Capacity, c (veh/h)		1593													1020	
v/c Ratio		0.00													0.00	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.3													8.5	
Level of Service, LOS		A													A	
Approach Delay (s/veh)		0.6												8.5		
Approach LOS														A		

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HCS7 Two-Way Stop-Control Report

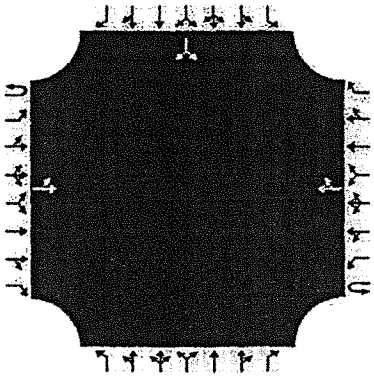
eneral Information

Analyst	MSH
gency/Co.	Solaegui Engineers
ate Performed	4/18/2018
Analysis Year	2018
me Analyzed	AM Existing + Project
ntersection Orientation	East-West
Project Description	

Site Information

Intersection	Center & Ward Lake
Jurisdiction	Lassen County
East/West Street	Center Road
North/South Street	Ward Lake Road
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

nes



Major Street: East-West

ehicle Volumes and Adjustments

proach	Eastbound				Westbound				Northbound				Southbound			
ovement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
mber of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
olume, V (veh/h)		13	16				20	9						6		9
cent Heavy Vehicles (%)		50												50		50
Proportion Time Blocked																
cent Grade (%)														0		
ht Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

tical and Follow-up Headways

Base Critical Headway (sec)																
ical Headway (sec)																
e Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

ay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		14													17	
pacity, c (veh/h)		1320													878	
v Ratio		0.01													0.02	
95% Queue Length, Q_{95} (veh)		0.0													0.1	
trol Delay (s/veh)		7.8													9.2	
el of Service, LOS		A													A	
Approach Delay (s/veh)		3.5												9.2		
roach LOS														A		

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HCS7 Two-Way Stop-Control Report

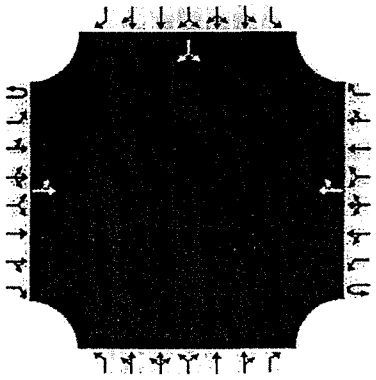
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/18/2018
Analysis Year	2018
Time Analyzed	PM Existing + Project
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Center & Ward Lake
Jurisdiction	Lassen County
East/West Street	Center Road
North/South Street	Ward Lake Road
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume, V (veh/h)		9	19				27	8						9		10
Percent Heavy Vehicles (%)		50												50		50
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10													21	
Capacity, c (veh/h)		1311													866	
v/c Ratio		0.01													0.02	
95% Queue Length, Q_{95} (veh)		0.0													0.1	
Control Delay (s/veh)		7.8													9.3	
Level of Service, LOS		A													A	
Approach Delay (s/veh)		2.5												9.3		
Approach LOS														A		

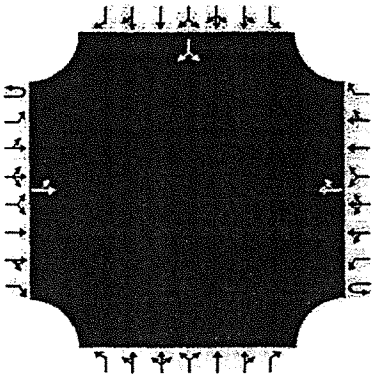
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HCS7 Two-Way Stop-Control Report

eneral Information / Site Information

Analyst	MSH	Intersection	Center & Ward Lake
gency/Co.	Solaegui Engineers	Jurisdiction	Lassen County
ate Performed	4/18/2018	East/West Street	Center Road
Analysis Year	2018	North/South Street	Ward Lake Road
me Analyzed	Night Existing + Project	Peak Hour Factor	0.90
ntersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description			

nes



Vehicle Volumes and Adjustments

proach	Eastbound				Westbound				Northbound				Southbound			
ovement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
mber of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
olume, V (veh/h)		8	12				12	6						5		8
cent Heavy Vehicles (%)		50												50		50
Proportion Time Blocked																
cent Grade (%)														0		
ht Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

tical and Follow-up Headways

Base Critical Headway (sec)																
tical Headway (sec)																
e Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

ay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		9													14	
pacity, c (veh/h)		1334													901	
Ratio		0.01													0.02	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
trol Delay (s/veh)		7.7													9.1	
el of Service, LOS		A													A	
Approach Delay (s/veh)		3.1												9.1		
roach LOS														A		

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HCS7 Two-Way Stop-Control Report

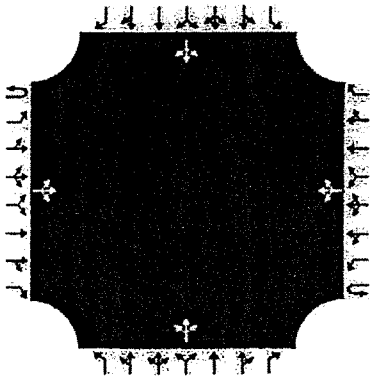
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/18/2018
Analysis Year	2018
Time Analyzed	AM Existing
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Center & Cutoff
Jurisdiction	Lassen County
East/West Street	Center Road
North/South Street	Cutoff Road
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume, V (veh/h)		0	14	4		1	21	0		4	0	4		1	0	0
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				1					9				1	
Capacity, c (veh/h)		1584				1588					1004				948	
v/c Ratio		0.00				0.00					0.01				0.00	
95% Queue Length, Q_{95} (veh)		0.0				0.0					0.0				0.0	
Control Delay (s/veh)		7.3				7.3					8.6				8.8	
Level of Service, LOS		A				A					A				A	
Approach Delay (s/veh)		0.0				0.3				8.6				8.8		
Approach LOS										A				A		

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HCS7 Two-Way Stop-Control Report

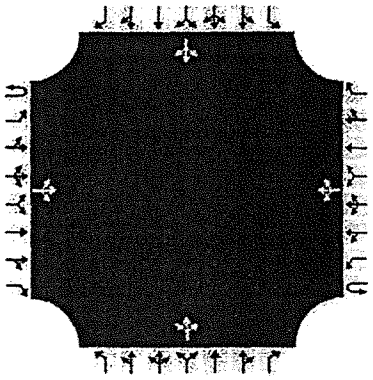
eneral Information

Analyst	MSH
gency/Co.	Solaegui Engineers
ate Performed	4/18/2018
Analysis Year	2018
ime Analyzed	PM Existing
ntersection Orientation	East-West
Project Description	

Site Information

Intersection	Center & Cutoff
Jurisdiction	Lassen County
East/West Street	Center Road
North/South Street	Cutoff Road
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

nes



Major Street: East-West

Vehicle Volumes and Adjustments

pproach	Eastbound				Westbound				Northbound				Southbound			
ovement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
umber of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume, V (veh/h)		0	20	4		2	25	1		5	0	1		0	0	1
rcent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
rcent Grade (%)										0				0		
ght Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

tical and Follow-up Headways

Base Critical Headway (sec)																
tical Headway (sec)																
se Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

lay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				2					7				1	
pacity, c (veh/h)		1576				1578					951				1043	
Ratio		0.00				0.00					0.01				0.00	
95% Queue Length, Q_{95} (veh)		0.0				0.0					0.0				0.0	
trol Delay (s/veh)		7.3				7.3					8.8				8.5	
el of Service, LOS		A				A					A				A	
Approach Delay (s/veh)		0.0				0.5					8.8				8.5	
Approach LOS											A				A	

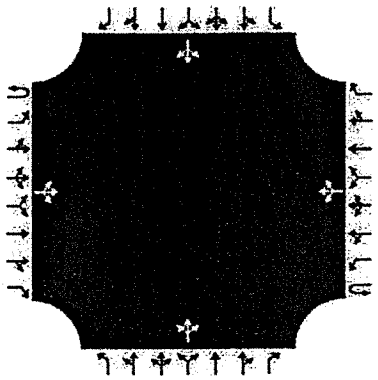
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HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH	Intersection	Center & Cutoff
Agency/Co.	Solaegui Engineers	Jurisdiction	Lassen County
Date Performed	4/18/2018	East/West Street	Center Road
Analysis Year	2018	North/South Street	Cutoff Road
Time Analyzed	Night Existing	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description			

Lanes



Major Street East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume, V (veh/h)		0	10	3		0	11	0		3	0	0		0	0	0
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

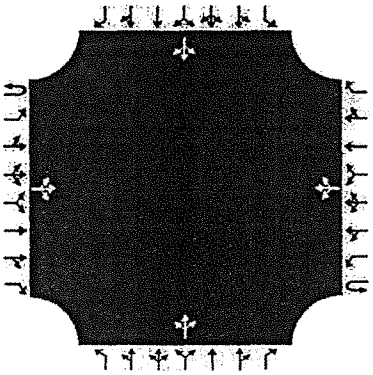
Flow Rate, v (veh/h)		0				0					3				0	
Capacity, c (veh/h)		1598				1596					983				0	
v/c Ratio		0.00				0.00					0.00					
95% Queue Length, Q_{95} (veh)		0.0				0.0					0.0					
Control Delay (s/veh)		7.3				7.3					8.7				5.0	
Level of Service, LOS		A				A					A				A	
Approach Delay (s/veh)		0.0				0.0					8.7				5.0	
Approach LOS											A				A	

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Center & Cutoff
Agency/Co.	Solaegui Engineers	Jurisdiction	Lassen County
Date Performed	4/18/2018	East/West Street	Center Road
Analysis Year	2018	North/South Street	Cutoff Road
Time Analyzed	AM Existing + Project	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description			

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume, V (veh/h)		0	18	4		1	25	0		4	0	4		1	0	0
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				1					9				1	
Capacity, c (veh/h)		1577				1582					994				936	
v/c Ratio		0.00				0.00					0.01				0.00	
95% Queue Length, Q_{95} (veh)		0.0				0.0					0.0				0.0	
Control Delay (s/veh)		7.3				7.3					8.7				8.8	
Level of Service, LOS		A				A					A				A	
Approach Delay (s/veh)		0.0				0.3					8.7				8.8	
Approach LOS											A				A	

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HCS7 Two-Way Stop-Control Report

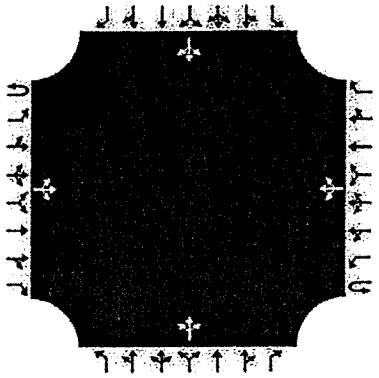
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/18/2018
Analysis Year	2018
Time Analyzed	PM Existing + Project
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Center & Cutoff
Jurisdiction	Lassen County
East/West Street	Center Road
North/South Street	Cutoff Road
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume, V (veh/h)		0	24	4		2	29	1		5	0	1		0	0	1
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

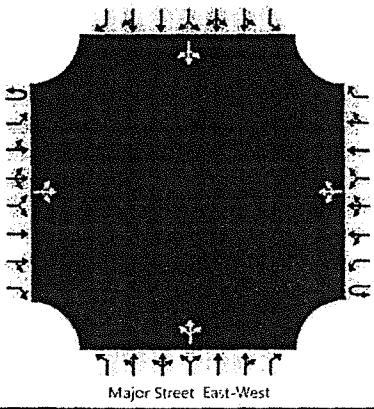
Flow Rate, v (veh/h)		0				2					7				1	
Capacity, c (veh/h)		1570				1573					939				1037	
v/c Ratio		0.00				0.00					0.01				0.00	
95% Queue Length, Q_{95} (veh)		0.0				0.0					0.0				0.0	
Control Delay (s/veh)		7.3				7.3					8.9				8.5	
Level of Service, LOS		A				A					A				A	
Approach Delay (s/veh)		0.0				0.5				8.9				8.5		
Approach LOS										A				A		

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Center & Cutoff
Agency/Co.	Solaegui Engineers	Jurisdiction	Lassen County
Date Performed	4/18/2018	East/West Street	Center Road
Analysis Year	2018	North/South Street	Cutoff Road
Time Analyzed	Night Existing + Project	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description			

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume, V (veh/h)		0	14	3		0	15	0		3	0	0		0	0	0
Percent Heavy Vehicles (%)		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

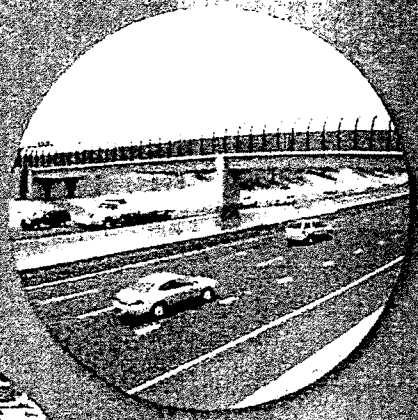
Flow Rate, v (veh/h)		0				0					3				0	
Capacity, c (veh/h)		1592				1589					970				0	
v/c Ratio		0.00				0.00					0.00					
95% Queue Length, Q_{95} (veh)		0.0				0.0					0.0					
Control Delay (s/veh)		7.3				7.3					8.7				5.0	
Level of Service, LOS		A				A					A				A	
Approach Delay (s/veh)		0.0				0.0					8.7				5.0	
Approach LOS											A				A	

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A Policy on Geometric Design of Highways and Streets

2011

6th Edition







AMERICAN ASSOCIATION OF
STATE HIGHWAY AND
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AASHTO
THE VOICE OF TRANSPORTATION

Table 9-23. Guide for Left-Turn Lanes on Two-Lane Highways (*10*)

Metric					U.S. Customary				
	Advancing Volume (veh/h)					Advancing Volume (veh/h)			
Opposing Volume (veh/h)	5% Left Turns	10% Left Turns	20% Left Turns	30% Left Turns	Opposing Volume (veh/h)	5% Left Turns	10% Left Turns	20% Left Turns	30% Left Turns
60-km/h Operating Speed					40-mph Operating Speed				
800	330	240	180	160	800	330	240	180	160
600	410	305	225	200	600	410	305	225	200
400	510	380	275	245	400	510	380	275	245
200	640	470	350	305	200	640	470	350	305
100	720	515	390	340	100	720	515	390	340
80-km/h Operating Speed					50-mph Operating Speed				
800	280	210	165	135	800	280	210	165	135
600	350	260	195	170	600	350	260	195	170
400	430	320	240	210	400	430	320	240	210
200	550	400	300	270	200	550	400	300	270
100	615	445	335	295	100	615	445	335	295
100-km/h Operating Speed					60-mph Operating Speed				
800	230	170	125	115	800	230	170	125	115
600	290	210	160	140	600	290	210	160	140
400	365	270	200	175	400	365	270	200	175
200	450	330	250	215	200	450	330	250	215
100	505	370	275	240	100	505	370	275	240

Additional information on left-turn lanes, including their suggested lengths, can be found in *Highway Research Record 211*, NCHRP Report 225, and NCHRP Report 279 (*10, 19, 17*). In the case of double left-turn lanes, a capacity analysis of the intersection should be performed to determine what traffic controls are needed in order for it to function properly.

Local conditions and the cost of right-of-way often influence the type of intersection selected as well as many of the design details. Limited sight distance, for example, may make it desirable to control traffic by yield signs, stop signs, or traffic signals when the traffic densities are less than those ordinarily considered appropriate for such control. The alignment and grade of the intersecting roads and the angle of intersection may make it advisable to channelize or use auxiliary pavement areas, regardless of the traffic densities. In general, traffic service, highway design designation, physical conditions, and cost of right-of-way are considered jointly in choosing the type of intersection.

For the general benefit of through-traffic movements, the number of crossroads, intersecting roads, or intersecting streets should be minimized. Where intersections are closely spaced on a two-way facility, it is seldom practical to provide signals for completely coordinated traffic movements at reasonable speeds in opposing directions on that facility. At the same time, the resultant road or street patterns should permit travel on roadways other than the predominant highway without too much inconvenience. Traffic analysis



California Department of Transportation

Highway Design Manual

U.S. Customary Units

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(3) *Double Left-turn Lanes.* At signalized intersections on multilane conventional highways and on multilane ramp terminals, double left-turn lanes should be considered if the left-turn demand is 300 vehicles per hour or more. The lane widths and other design elements of left-turn lanes given under Index 405.2(2) applies to double as well as single left-turn lanes.

The design of double left-turn lanes can be accomplished by adding one or two lanes in the median. See "Guidelines for Reconstruction of Intersections", published by Headquarters, Division of Traffic Operations, for the various treatments of double left-turn lanes.

(4) *Two-way Left-turn Lane (TWLTL).* The TWLTL consists of a striped lane in the median of an arterial and is devised to address the special capacity and safety problems associated with high-density strip development. It can be used on 2-lane highways as well as multilane highways. Normally, the District Traffic Operations Branch should determine the need for a TWLTL.

The minimum width for a TWLTL shall be 12 feet (see Index 301.1). The preferred width is 14 feet. Wider TWLTL's are occasionally provided to conform with local agency standards. However, TWLTL's wider than 14 feet are not recommended, and in no case should the width of a TWLTL exceed 16 feet. Additional width may encourage drivers in opposite directions to use the TWLTL simultaneously.

405.3 Right-turn Channelization

(1) *General.* For right-turning traffic, delays are less critical and conflicts less severe than for left-turning traffic. Nevertheless, right-turn lanes can be justified on the basis of capacity, analysis, and crash experience.

In rural areas a history of high speed rear-end collisions may warrant the addition of a right-turn lane.

In urban areas other factors may contribute to the need such as:

- High volumes of right-turning traffic causing backup and delay on the through lanes.
- Conflicts between crossing pedestrians and right-turning vehicles and bicycles.
- Frequent rear-end and sideswipe collisions involving right-turning vehicles.

Where right-turn channelization is proposed, lower speed right-turn lanes should be provided to reduce the likelihood of conflicts between vehicles, pedestrians, and bicyclists.

(2) *Design Elements.*

(a) Lane and Shoulder Width--**Index 301.1 shall be used for right-turn lane width requirements. Shoulder width shall be a minimum of 4 feet.** Although not desirable, lane and shoulder widths less than those given above can be considered for right-turn lanes under the following conditions pursuant to Index 82.2:

- In urban, city or town centers (rural main streets) with posted speeds less than 40 miles per hour in severely constrained situations, if truck or bus use is low, consideration may be given to reducing the right-turn lane width to 10 feet.
- Shoulder widths may also be considered for reduction under constricted situations. Whenever possible, at least a 2-foot shoulder should be provided where the right-turn lane is adjacent to a curb. Entire omission of the shoulder should only be considered in constrained situations and where an 11-foot lane can be constructed.

  Gutter pans can be included within a shoulder, but cannot be included as part of the travel lane width. Additional right of way for a future right-turn lane should be considered when an intersection is being designed.