TECHNICAL APPENDICES

TO THE

INITIAL STUDY and MITIGATED NEGATIVE DECLARATION

FOR

Coachella Valley Water District
Highway 86 Water Transmission Main,
Phase 3 and 4 Project

Appendix A

Air Quality and Green House Gas Analysis

ALBERT A. WEBB ASSOCIATES

Technical Memorandum

To: Mario Zamora, Coachella Valley Water District

From: Eliza Laws, Senior Environmental Analyst
Noemi Avila, Assistant Environmental Analyst

Date: January 26, 2024

Re: Air Quality/Greenhouse Gas Analysis for the Highway 86 Water Transmission Main Project for Coachella Valley Water District (CVWD)

The following air quality assessment was prepared to evaluate whether the expected criteria air pollutant emissions generated as a result of construction and operation of the proposed Project would cause exceedances of applicable thresholds for air quality and greenhouse gas (GHG) emissions. The Project facilities are located in the Salton Sea Air Basin and extend through the South Coast Air Quality Management District (SCAQMD) and Imperial County Air Pollution Control District (ICAPCD) jurisdictions. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000 et seq.). The methodology follows the SCAQMD's and ICAPCD's *CEQA Air Quality Handbook*, respectively, for quantification of emissions and evaluation of potential impacts to air resources. As recommended by SCAQMD and ICAPCD staff, the **Cal**ifornia **E**missions **E**stimator **Mod**el® version 2020.4.0 (CalEEMod) was used to quantify Project-related emissions.

The analysis herein evaluates the proposed Highway 86 Water Transmission Main Project ("Project"). The Project facilities are located within unincorporated Riverside County and unincorporated Imperial County areas and includes the construction and operation of approximately 77,500 linear feet (LF) of 30-inch diameter ductile iron water transmission pipeline to replace existing 16- and 18-inch diameter pipeline. The northernmost portion of the Project alignment within Riverside County is within SCAQMD's jurisdiction while the remaining portion of the Project alignment in Imperial County is within ICAPCD's jurisdiction.

Pipeline installation will begin within Riverside County from 84TH Avenue in the community of Salton near Highway 86 and extend south to 86TH Avenue at the County boundary.

The Project alignment south of 86th Avenue along Highway 86 is within Imperial County. The pipeline will be constructed using typical trenching methods except at the Highway 86 crossing between Harbor Drive and Golden Avenue. Construction at this crossing is proposed to be via the trenchless jack-and-bore method.

▪ Regional Significance Thresholds

The thresholds contained in the *SCAQMD CEQA Air Quality Handbook*[1] (SCAQMD 1993) and posted in a supplemental table as mass daily thresholds on SCAQMD's website[2] are considered regional thresholds. Likewise, the ICAPCD's *CEQA Air Quality Handbook*[3] (ICAPCD 2017) established screening thresholds of significance for criteria pollutants. Applicable thresholds are shown in **Table 1 – CEQA Daily Significance Thresholds**, below.

Table 1 – CEQA Daily Significance Thresholds

Threshold	Units	VOC	NO_X	CO	SO_X	PM-10	PM-2.5
Construction Emissions							
SCAQMD	lbs/day	75	100	550	150	150	55
ICAPCD	lbs/day	75	100	550	--	150	--
Operation Emissions							
SCAQMD	lbs/day	55	55	550	150	150	55
ICAPCD	lbs/day	137	137	550	150	150	550

Air quality impacts can be described in a short- and long-term perspective. Short-term impacts occur during site grading and Project construction and consist of fugitive dust and other particulate matter, as well as exhaust emissions generated by construction-related vehicles. Long-term air quality impacts occur once the Project is in operation. The Project consists of the construction of water pipelines. Operational emissions related to the pipelines would be primarily from the infrequent visits by vehicles driven by maintenance personnel and are considered negligible; therefore, only short-term impacts were evaluated herein.

The Project will be required to comply with existing rules for the reduction of fugitive dust emissions. The portion of the Project alignment within SCAQMD's jurisdiction will adhere to the procedures established by Rule 403 establishes these procedures. Compliance with Rule 403 is achieved through application of standard best management practices in construction and operation activities, such as the application of water or chemical stabilizers to disturbed soils, reducing haul road dust by application of water, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 mph, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing a permanent, stabilizing ground cover on finished sites. In addition, SCAQMD Rule 403.1 requires specific measures for reducing fugitive dust in the Coachella Valley. Compliance with this regulation includes having an approved Fugitive Dust Control Plan for activities disturbing more than 5,000 square feet, maintenance of a daily dust control log on-site, installation of construction project signage with contact information for complaints, and the presence of an environmental observer for construction sites larger than 50 acres. Based on the size of this Project's disturbance area (approximately 45.49 acres total), an environmental observer will not be required.

The portion of the Project alignment within ICAPCD jurisdiction will adhere to the procedures established by ICAPCD Regulation VIII for fugitive dust control, which includes Rules 800 through 805. Regulation VIII mandates Reasonably Available Control Measures during construction and operation to reduce particulate matter. Examples include water or chemical soil stabilizers, speed reduction for construction vehicles, covering haul vehicles, and Track-Out Prevention devices. Rule 800 addresses PM-10

[1] South Coast Air Quality Management District, *CEQA Air Quality Handbook*, November 1993. (Available at SCAQMD.)

[2] https://www.aqmd.gov/docs/default-source/ceqa/handbook/south-coast-aqmd-air-quality-significance-thresholds.pdf?sfvrsn=25

[3] https://apcd.imperialcounty.org/wp-content/uploads/2022/06/P36-CEQA-Air-Quality-Handbook-REV-06-07-22.pdf

emissions from anthropogenic fugitive dust sources. Rules 801, 802, 803, 804, and 805 set opacity limits, require dust management plans, and limit dust emissions from various sources.

Short-Term Analysis

Short-term emissions from Project construction were evaluated using the CalEEMod program. The estimated construction period for the proposed Project is approximately 17 months as identified below. The default parameters within CalEEMod were used, except as identified below, and these default values generally reflect a worst-case scenario, which means that Project emissions are expected to be equal to or less than the estimated emissions. In addition to the default values used (shown in the CalEEMod output Attachment to this memo), assumptions for the Project relevant to model inputs for short-term construction emission estimates used are:

- Construction of the Project is anticipated to begin no sooner than September 2023. The modeled construction schedule for each Project activity is shown below:

Construction Activity	Start Date	End Date	Total Working Days
Pipeline Trenching	September 1, 2023	January 16, 2025	360 days
Paving	January 17, 2025	February 17, 2025	22 days
Jack and Bore	October 4, 2024	November 14, 2024	30 days

Note: The exact schedule for each construction activity is unknown but has been assumed for analysis purposes and to be conservative. Should construction occur any time after the respective dates, resulting emissions are anticipated to be lower since emission factors for construction decrease as time passes due to emission regulations becoming more stringent.

- The off-road equipment to be used by each crew during the construction of the Project is shown below based on engineering estimates and assumes all equipment operates 8-hours per day. The off-road equipment list for Pipeline Trenching/Installation activities assumes two crews operating at one time.

Construction Activity	Off-Road Equipment	Unit Amount
Pipeline Trenching/Installation	Concrete/Industrial Saws	2
	Excavators	2
	Tractors/Loaders/Backhoes	2
Pipeline Paving	Pavers	1
	Paving Equipment	1
	Rollers	1
Jack and Bore	Bore/Drill Rig	1
	Concrete/Industrial Saw	1
	Excavators	1
	Pavers	1
	Paving Equipment	1
	Rollers	1
	Tractors /Loaders/Backhoes	1

- Installation includes approximately 14.67 miles of 30-inch diameter water transmission pipeline within existing rights-of-way. The construction footprint is estimated to be 25-feet wide with a trench width five feet wide. The last 1,500 LF of pipeline at the southern end of the Project alignment is assumed to be repaved, at a width of 12 feet.

- Pipeline Trenching/Installation assumes two crews working concurrently using the open trench construction method operating the equipment listed above. Each crew will have a staging area that is assumed to be 0.5 acres in size, which results in a cumulative disturbance area of one acre for staging purposes.

- The two jack-and-bore pit locations (receiving pit and jacking pit) where trenchless construction methods (i.e., jack-and-bore operations) are proposed are estimated to disturb a total of 624 square feet.

- To evaluate Project compliance with SCAQMD Rule 403 and ICACPD Regulation VIII for fugitive dust control, the Project utilized the mitigation option of watering the Project site three times daily, which achieves a control efficiency of 61 percent for PM-10 and PM-2.5 emissions, and limiting vehicle speeds to 15 miles per hour (mph) on unpaved roads.

- The Project assumes worker, vendor and hauling trips will travel on 95% paved roads.

- Four (4) one-way vendor trips per day were added to the pipeline installation and paving activities for each crew to account for water truck trips.

- Four (4) one way vendor trips per day were added to the pipeline installation and paving activities for each crew to account for the crew trucks.

- Eight (8) one way hauling trips per day were added to the pipeline installation and paving activities to account for two truckloads of soil hauling per day and two truckloads of material handling (pipes and construction materials), for each crew.

The results of this analysis are summarized below. The results are shown in **Table 2**.

Table 2 –Unmitigated Estimated Daily Construction Emissions

Activity	Peak Daily Emissions (lb/day)					
	VOC	NO_X	CO	SO_2	PM-10	PM-2.5
Pipeline Trenching/Installation 2023	1.49	13.64	19.73	0.04	29.85	3.57
Pipeline Trenching/Installation 2024	**1.41**	**12.84**	**19.69**	**0.04**	**29.79**	**3.50**
Pipeline Trenching/Installation 2025	1.32	11.94	19.60	0.04	29.71	3.43
Jack and Bore 2024	**1.46**	**13.11**	**19.66**	**0.04**	**22.21**	**2.74**
Pipeline Paving 2025	1.02	5.43	7.98	0.02	15.19	1.74
Maximum	**2.87**	**25.95**	**39.33**	**0.08**	**51.99**	**6.24**
SCAQMD Threshold	**75**	**100**	**550**	**150**	**150**	**55**
ICAPCD Threshold	**75**	**100**	**550**	**--**	**150**	--
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Maximum emissions are the greater of either Pipeline Trenching/Installation 2023, the sum of Pipeline Trenching/Installation 2024 and Jack and Bore 2024, Pipeline Trenching/Installation 2025, or Paving 2025 since some activities overlap. Maximum Emissions are shown in bold.

As shown in **Table 2**, above, the emissions from construction of the Project are below the SCAQMD and ICAPCD daily construction thresholds for all criteria pollutants.

Long-Term Analysis

Long-term air quality impacts occur once the Project is in operation. Operations emissions refer to a full range of activities that can or may generate pollutant emissions when the development is functioning in its intended use, and typically include vehicle emissions, area source emissions that include stationary combustion of natural gas used for space and water heating, landscape maintenance, use of consumer products, and energy use.

Operational emissions related to the water transmission pipelines would be primarily from infrequent visits by vehicles driven by maintenance personnel and are considered negligible.

▪ Localized Significance Threshold Analysis

The SCAQMD has established Localized Significance Thresholds (LST) to assist in evaluating localized effects; however, the ICAPCD has not established any localized thresholds. Accordingly, the analysis presented below identifies the localized impacts from the Project's proposed activities that are located exclusively within the jurisdiction of SCAQMD. Specifically, only the Project's pipeline trenching activities in the northernmost portion of the Project alignment occur within the SCAQMD boundary.

Background

As part of the SCAQMD's environmental justice program, attention has been focused on localized effects of air quality. Staff at SCAQMD developed LST methodology[4] that can be used by public agencies to determine whether or not a project may generate significant adverse localized air quality impacts (both short- and long-term). LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area (SRA). The portion of the Project within SCAQMD's jurisdiction is located within SRA 30.

Short-Term Analysis

According to the LST methodology, only on-site emissions need to be analyzed. Emissions associated with vendor and worker trips are mobile source emissions that occur off site. The emissions analyzed under the LST methodology are NO_2, CO, PM-10, and PM-2.5. SCAQMD has provided LST lookup tables[5] to allow users to readily determine if the daily emissions for proposed construction or operational activities could result in significant localized air quality impacts for projects five acres or smaller. The LST tables can be used as a screening tool to determine if dispersion modeling would be necessary. If project-related emissions are below the LST table emissions, no further analysis is necessary. Although the Project alignment disturbs an area greater than five acres per day, the Project alignment is linear, and its construction will progress in a linear fashion disturbing a smaller area per day. To be conservative, the one-acre LST lookup tables were utilized. In addition, the equipment list for the Pipeline Trenching/ Installation is for two crews. However, only one crew will be operating in a given location and only one crew will be located within SCAQMD's boundary. As such, a conservative analysis is presented below.

The LST thresholds are estimated using the maximum daily disturbed area (in acres) and the distance of the Project to the nearest sensitive receptors (in meters). The receptor distances provided in the LST lookup tables are 25, 50, 100, 200, and 500 meters. There are no sensitive receptors within 500 meters of the portion of the Project alignment within SCAQMD jurisdiction. The closest sensitive receptor is a residence that is approximately 1,634 meters (1.02 miles) north of the alignment, near the intersection of Johnson Street and 82nd Avenue. To provide a conservative analysis, a receptor distance of 500 meters (1,640 feet) was utilized. The results are summarized in **Table 3**.

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[4] South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, Revised July 2008. (Available at http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds, accessed January 2024.)

[5] http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds

Table 3 –Unmitigated LST Results for Daily Construction Emissions

Pollutant	Peak Daily Emissions (lb/day)			
	NO_X	CO	PM-10	PM-2.5
LST for 1-acre at 500 meters	**733**	**24,417**	**214**	**105**
Pipeline Trenching/ Installation 2023	**11.34**	18.29	**0.56**	**0.54**
Pipeline Trenching/ Installation 2024	10.53	**18.30**	0.49	0.47
Maximum	**11.34**	**18.30**	**0.56**	**0.54**
Exceeds Threshold?	**No**	**No**	**No**	**No**

Note: Maximum emissions are shown in bold. Emissions reported represent the emissions for two pipeline trenching crews operating at one time; however, only one crew would be working within SCAQMD jurisdiction.

As shown in **Table 3,** emissions from construction of the Project alignment within SCAQMD's jurisdiction are below the LST established by SCAQMD.

Long-Term Analysis

The Project involves construction of a water transmission pipeline. The long-term emissions from the pipeline, as discussed previously, are primarily in the form of mobile source emissions, with no stationary sources of emissions present. According to the LST methodology, LSTs only apply to the operational phase if a project includes stationary sources or on-site mobile equipment generating on-site emissions. The proposed Project does not include such uses. Therefore, no long-term LST analysis is needed.

▪ Greenhouse Gas Analysis

Greenhouse gases (GHG) are not presented in lbs/day like criteria pollutants; they are typically evaluated on an annual basis using the metric system. Several agencies, at various levels, have proposed draft GHG significance thresholds for use in CEQA documents. SCAQMD has been working on GHG thresholds for development projects. In December 2008, the SCAQMD adopted a threshold of 10,000 metric tonnes per year of carbon dioxide equivalents ($MTCO_2E$/yr) for stationary source projects where SCAQMD is the lead agency. The most recent draft proposal was in September 2010[6] and included screening significance thresholds for residential, commercial, and mixed-use projects at 3,500, 1,400, and 3,000 $MTCO_2E$/yr, respectively. Alternatively, a lead agency has the option to use 3,000 $MTCO_2E$/yr as a threshold for all non-industrial projects. Although both options are recommended by SCAQMD, a lead agency is advised to use only one option and to use it consistently. The ICAPCD has not adopted a GHG significance threshold; therefore, the SCAQMD significance threshold of 3,000 $MTCO_2E$/yr s was utilized for evaluation of the entire Project alignment. SCAQMD significance thresholds also evaluate construction emissions by amortizing them over an expected project life of 30 years. If emissions are above the screening level threshold, additional analysis may be required.

Short-Term Analysis

Construction-Related Emissions

The CalEEMod model calculates GHG emissions from fuel usage by construction equipment and construction-related activities, like construction worker trips, for the Project. The CalEEMod estimate does not analyze emissions from construction-related electricity or natural gas. Construction-related electricity and natural gas emissions vary based on the amount of electric power used during construction and other unknown factors which make them too speculative to quantify. The CalEEMod

[6] http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-main-presentation.pdf?sfvrsn=2

output results for construction-related GHG emissions provide for CO_2, methane (CH_4), nitrous oxide (N_2O), and CO_2E[7] as shown on **Table 4**.

Table 4 – Project Construction Equipment GHG Emissions

Year	Metric Tons per year (MT/yr)			
	Total CO_2	Total CH_4	Total N_2O	Total CO_2E
2023	161.25	0.02	0.01	164.02
2024	545.36	0.08	0.02	554.37
2025	39.71	0.01	0.00	40.44
Total	746.32	0.11	0.03	758.83
			Amortized[1]	**25.29**

Note: [1]Construction emissions were amortized over a 30-year period, as recommended by SCAQMD.

Results indicate that an estimated 758.83 $MTCO_2E$ will occur from Project construction equipment over the course of the estimated approximately 17-month construction period. The draft SCAQMD GHG threshold guidance document released in October 2008[8] recommends that construction emissions be amortized for a project lifetime of 30 years to ensure that GHG reduction measures address construction GHG emissions as part of the operational reduction strategies.

The proposed Project does not fit into the categories provided (industrial, commercial, and residential) in the draft thresholds from SCAQMD. The Project's emissions were compared to whichever threshold is more conservative. Since the draft SCAQMD GHG threshold Guidance document released in October 2008 (SCAQMD 2008b, p. 3-8) recommends that construction emissions be amortized for a project lifetime of 30 years, the total GHG emissions from Project construction were amortized and are below the SCAQMD recommended screening level of 3,000 $MTCO_2E$/yr. Due to the lack of adopted emissions thresholds, the estimated amount of emissions from Project construction and negligible operational emissions from infrequent maintenance vehicles related to the pipeline, the proposed Project will not generate GHG emissions that exceed the screening threshold.

▪ Conclusion

The conclusion of this analysis indicates that construction of the proposed Project will not exceed criteria pollutant thresholds established by SCAQMD or ICAPCD on a regional level. The Project's localized construction emissions within SCAQMD's jurisdiction will also not exceed the SCAQMD established LST. The Project will not generate GHG emissions that exceed the SCAQMD screening threshold. No mitigation is required.

Should you have any questions, please contact me at (951) 686-1070.

[7] CO_2E is the sum of CO_2 emissions estimated plus the sum of CH_4 and N_2O emissions estimated multiplied by their respective global warming potential (GWP).

[8] http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-6/ghg-meeting-6-guidance-document-discussion.pdf?sfvrsn=2

CalEEMod Output Files

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Highway 86 Water Transmission Main

Salton Sea Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	180.00	1000sqft	4.13	180,000.00	0
Other Non-Asphalt Surfaces	1,801.68	1000sqft	41.36	1,801,684.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	20
Climate Zone	15			**Operational Year**	2025
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Per alignment, includes paved and unpaved portions of pipeline construction.

Construction Phase - Per engineering estimates

Off-road Equipment - Per Engineers

Off-road Equipment - Per Engineers

Off-road Equipment - Per Engineers, modeling equiptment for 2 trenching crews.

On-road Fugitive Dust - 95% Paved Roads assumed

Construction Off-road Equipment Mitigation - Water 3x daily, 15mph speed limit assumed

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDays	75.00	30.00
tblConstructionPhase	NumDays	55.00	22.00
tblLandUse	LandUseSquareFeet	1,801,680.00	1,801,684.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOnRoadDust	HaulingPercentPave	50.00	95.00
tblOnRoadDust	HaulingPercentPave	50.00	95.00
tblOnRoadDust	HaulingPercentPave	50.00	95.00
tblOnRoadDust	VendorPercentPave	50.00	95.00
tblOnRoadDust	VendorPercentPave	50.00	95.00
tblOnRoadDust	VendorPercentPave	50.00	95.00
tblOnRoadDust	WorkerPercentPave	50.00	95.00
tblOnRoadDust	WorkerPercentPave	50.00	95.00
tblOnRoadDust	WorkerPercentPave	50.00	95.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	5,760.00
tblTripsAndVMT	HaulingTripNumber	0.00	240.00
tblTripsAndVMT	HaulingTripNumber	0.00	176.00
tblTripsAndVMT	VendorTripNumber	0.00	16.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00

2.0 Emissions Summary

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Highway 86 Water Transmission Main - Salton Sea Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	1.4872	13.4541	19.7273	0.0420	47.4796	0.5840	48.0636	4.8287	0.5587	5.3874	0.0000	4,146.2525	4,146.2525	0.5893	0.1883	4,217.0956
2024	2.8659	25.6794	39.3286	0.0845	82.6112	1.0715	83.6828	8.3983	1.0136	9.4119	0.0000	8,311.4451	8,311.4451	1.5371	0.2799	8,433.2925
2025	1.3174	11.7531	19.6024	0.0415	47.4795	0.4373	47.9168	4.8287	0.4180	5.2467	0.0000	4,092.8869	4,092.8869	0.5831	0.1805	4,161.2401
Maximum	**2.8659**	**25.6794**	**39.3286**	**0.0845**	**82.6112**	**1.0715**	**83.6828**	**8.3983**	**1.0136**	**9.4119**	**0.0000**	**8,311.4451**	**8,311.4451**	**1.5371**	**0.2799**	**8,433.2925**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	1.4872	13.4541	19.7273	0.0420	29.2703	0.5840	29.8543	3.0078	0.5587	3.5665	0.0000	4,146.2525	4,146.2525	0.5893	0.1883	4,217.0956
2024	2.8659	25.6794	39.3286	0.0845	50.9233	1.0715	51.9948	5.2295	1.0136	6.2432	0.0000	8,311.4451	8,311.4451	1.5371	0.2799	8,433.2925
2025	1.3174	11.7531	19.6024	0.0415	29.2702	0.4373	29.7075	3.0078	0.4180	3.4257	0.0000	4,092.8869	4,092.8869	0.5831	0.1805	4,161.2401
Maximum	**2.8659**	**25.6794**	**39.3286**	**0.0845**	**50.9233**	**1.0715**	**51.9948**	**5.2295**	**1.0136**	**6.2432**	**0.0000**	**8,311.4451**	**8,311.4451**	**1.5371**	**0.2799**	**8,433.2925**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	38.35	0.00	37.91	37.72	0.00	33.97	0.00	0.00	0.00	0.00	0.00	0.00

Highway 86 Water Transmission Main - Salton Sea Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9470	1.8300e-003	0.2018	2.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004		0.4337	0.4337	1.1300e-003		0.4619
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.9470**	**1.8300e-003**	**0.2018**	**2.0000e-005**	**0.0000**	**7.2000e-004**	**7.2000e-004**	**0.0000**	**7.2000e-004**	**7.2000e-004**		**0.4337**	**0.4337**	**1.1300e-003**	**0.0000**	**0.4619**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9470	1.8300e-003	0.2018	2.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004		0.4337	0.4337	1.1300e-003		0.4619
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.9470**	**1.8300e-003**	**0.2018**	**2.0000e-005**	**0.0000**	**7.2000e-004**	**7.2000e-004**	**0.0000**	**7.2000e-004**	**7.2000e-004**		**0.4337**	**0.4337**	**1.1300e-003**	**0.0000**	**0.4619**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Trenching	Trenching	9/1/2023	1/16/2025	5	360	
2	Jack and Bore	Grading	10/4/2024	11/14/2024	5	30	
3	Paving	Paving	1/17/2025	2/17/2025	5	22	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 45.49

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Trenching	Concrete/Industrial Saws	2	8.00	81	0.73
Trenching	Excavators	2	8.00	158	0.38
Trenching	Rubber Tired Dozers	0	8.00	247	0.40
Trenching	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Jack and Bore	Bore/Drill Rigs	1	8.00	221	0.50
Jack and Bore	Concrete/Industrial Saws	1	8.00	81	0.73
Jack and Bore	Excavators	1	8.00	158	0.38
Jack and Bore	Graders	0	8.00	187	0.41

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Jack and Bore	Pavers	1	8.00	130	0.42
Jack and Bore	Paving Equipment	1	8.00	132	0.36
Jack and Bore	Rollers	1	8.00	80	0.38
Jack and Bore	Rubber Tired Dozers	0	8.00	247	0.40
Jack and Bore	Scrapers	0	8.00	367	0.48
Jack and Bore	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Trenching	6	15.00	16.00	5,760.00	14.60	6.20	20.00	LD_Mix	HDT_Mix	HHDT
Jack and Bore	7	18.00	8.00	240.00	14.60	6.20	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	8.00	176.00	14.60	6.20	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3475	11.3371	18.2929	0.0291		0.5598	0.5598		0.5355	0.5355		2,788.6956	2,788.6956	0.5770		2,803.1197
Total	**1.3475**	**11.3371**	**18.2929**	**0.0291**		**0.5598**	**0.5598**		**0.5355**	**0.5355**		**2,788.6956**	**2,788.6956**	**0.5770**		**2,803.1197**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0393	1.5769	0.4778	8.7000e-003	23.8169	0.0194	23.8363	2.4241	0.0185	2.4426		923.4890	923.4890	6.3700e-003	0.1453	966.9421
Vendor	0.0248	0.4979	0.2735	2.6500e-003	7.3885	4.0900e-003	7.3926	0.7542	3.9200e-003	0.7581		279.2073	279.2073	2.0600e-003	0.0390	290.8878
Worker	0.0757	0.0422	0.6831	1.5300e-003	16.2742	8.0000e-004	16.2750	1.6505	7.3000e-004	1.6512		154.8605	154.8605	3.9100e-003	3.9900e-003	156.1460
Total	**0.1397**	**2.1170**	**1.4344**	**0.0129**	**47.4796**	**0.0243**	**47.5038**	**4.8287**	**0.0232**	**4.8519**		**1,357.5569**	**1,357.5569**	**0.0123**	**0.1883**	**1,413.9759**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3475	11.3371	18.2929	0.0291		0.5598	0.5598		0.5355	0.5355	0.0000	2,788.6956	2,788.6956	0.5770		2,803.1197
Total	**1.3475**	**11.3371**	**18.2929**	**0.0291**		**0.5598**	**0.5598**		**0.5355**	**0.5355**	**0.0000**	**2,788.6956**	**2,788.6956**	**0.5770**		**2,803.1197**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0393	1.5769	0.4778	8.7000e-003	14.6866	0.0194	14.7060	1.5110	0.0185	1.5296		923.4890	923.4890	6.3700e-003	0.1453	966.9421
Vendor	0.0248	0.4979	0.2735	2.6500e-003	4.5581	4.0900e-003	4.5622	0.4711	3.9200e-003	0.4750		279.2073	279.2073	2.0600e-003	0.0390	290.8878
Worker	0.0757	0.0422	0.6831	1.5300e-003	10.0256	8.0000e-004	10.0264	1.0256	7.3000e-004	1.0263		154.8605	154.8605	3.9100e-003	3.9900e-003	156.1460
Total	**0.1397**	**2.1170**	**1.4344**	**0.0129**	**29.2703**	**0.0243**	**29.2945**	**3.0078**	**0.0232**	**3.0309**		**1,357.5569**	**1,357.5569**	**0.0123**	**0.1883**	**1,413.9759**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2741	10.5307	18.3014	0.0291		0.4922	0.4922		0.4705	0.4705		2,789.3935	2,789.3935	0.5751		2,803.7711
Total	**1.2741**	**10.5307**	**18.3014**	**0.0291**		**0.4922**	**0.4922**		**0.4705**	**0.4705**		**2,789.3935**	**2,789.3935**	**0.5751**		**2,803.7711**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0393	1.5919	0.4823	8.5500e-003	23.8169	0.0191	23.8360	2.4241	0.0182	2.4423		908.0954	908.0954	6.5600e-003	0.1429	950.8331
Vendor	0.0242	0.4997	0.2681	2.6100e-003	7.3885	4.0300e-003	7.3925	0.7542	3.8500e-003	0.7580		275.4274	275.4274	2.0500e-003	0.0383	286.9049
Worker	0.0704	0.0376	0.6362	1.4900e-003	16.2742	7.7000e-004	16.2749	1.6505	7.1000e-004	1.6512		150.4244	150.4244	3.5500e-003	3.6900e-003	151.6136
Total	**0.1339**	**2.1291**	**1.3866**	**0.0127**	**47.4796**	**0.0239**	**47.5034**	**4.8287**	**0.0228**	**4.8515**		**1,333.9472**	**1,333.9472**	**0.0122**	**0.1849**	**1,389.3517**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2741	10.5307	18.3014	0.0291		0.4922	0.4922		0.4705	0.4705	0.0000	2,789.3935	2,789.3935	0.5751		2,803.7711
Total	**1.2741**	**10.5307**	**18.3014**	**0.0291**		**0.4922**	**0.4922**		**0.4705**	**0.4705**	**0.0000**	**2,789.3935**	**2,789.3935**	**0.5751**		**2,803.7711**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0393	1.5919	0.4823	8.5500e-003	14.6866	0.0191	14.7056	1.5110	0.0182	1.5293		908.0954	908.0954	6.5600e-003	0.1429	950.8331
Vendor	0.0242	0.4997	0.2681	2.6100e-003	4.5581	4.0300e-003	4.5621	0.4711	3.8500e-003	0.4750		275.4274	275.4274	2.0500e-003	0.0383	286.9049
Worker	0.0704	0.0376	0.6362	1.4900e-003	10.0256	7.7000e-004	10.0264	1.0256	7.1000e-004	1.0263		150.4244	150.4244	3.5500e-003	3.6900e-003	151.6136
Total	**0.1339**	**2.1291**	**1.3866**	**0.0127**	**29.2703**	**0.0239**	**29.2941**	**3.0078**	**0.0228**	**3.0305**		**1,333.9472**	**1,333.9472**	**0.0122**	**0.1849**	**1,389.3517**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1888	9.6521	18.2678	0.0291		0.4136	0.4136		0.3954	0.3954		2,790.1188	2,790.1188	0.5712		2,804.3980
Total	**1.1888**	**9.6521**	**18.2678**	**0.0291**		**0.4136**	**0.4136**		**0.3954**	**0.3954**		**2,790.1188**	**2,790.1188**	**0.5712**		**2,804.3980**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0392	1.5731	0.4840	8.3500e-003	23.8169	0.0189	23.8358	2.4241	0.0181	2.4422		887.0912	887.0912	6.7500e-003	0.1396	928.8512
Vendor	0.0238	0.4943	0.2629	2.5700e-003	7.3885	4.0100e-003	7.3925	0.7542	3.8300e-003	0.7580		270.4467	270.4467	2.0400e-003	0.0375	281.6590
Worker	0.0656	0.0336	0.5877	1.4400e-003	16.2742	7.3000e-004	16.2749	1.6505	6.7000e-004	1.6511		145.2302	145.2302	3.1800e-003	3.4300e-003	146.3319
Total	**0.1286**	**2.1010**	**1.3346**	**0.0124**	**47.4795**	**0.0237**	**47.5032**	**4.8287**	**0.0226**	**4.8513**		**1,302.7680**	**1,302.7680**	**0.0120**	**0.1805**	**1,356.8421**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1888	9.6521	18.2678	0.0291		0.4136	0.4136		0.3954	0.3954	0.0000	2,790.1188	2,790.1188	0.5712		2,804.3980
Total	**1.1888**	**9.6521**	**18.2678**	**0.0291**		**0.4136**	**0.4136**		**0.3954**	**0.3954**	**0.0000**	**2,790.1188**	**2,790.1188**	**0.5712**		**2,804.3980**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0392	1.5731	0.4840	8.3500e-003	14.6866	0.0189	14.7055	1.5110	0.0181	1.5292		887.0912	887.0912	6.7500e-003	0.1396	928.8512
Vendor	0.0238	0.4943	0.2629	2.5700e-003	4.5581	4.0100e-003	4.5621	0.4711	3.8300e-003	0.4750		270.4467	270.4467	2.0400e-003	0.0375	281.6590
Worker	0.0656	0.0336	0.5877	1.4400e-003	10.0256	7.3000e-004	10.0263	1.0256	6.7000e-004	1.0263		145.2302	145.2302	3.1800e-003	3.4300e-003	146.3319
Total	**0.1286**	**2.1010**	**1.3346**	**0.0124**	**29.2702**	**0.0237**	**29.2939**	**3.0078**	**0.0226**	**3.0304**		**1,302.7680**	**1,302.7680**	**0.0120**	**0.1805**	**1,356.8421**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Jack and Bore - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.3416	11.9286	18.5020	0.0354		0.5430	0.5430		0.5084	0.5084		3,415.8337	3,415.8337	0.9412		3,439.3644
Total	**1.3416**	**11.9286**	**18.5020**	**0.0354**	**0.0000**	**0.5430**	**0.5430**	**0.0000**	**0.5084**	**0.5084**		**3,415.8337**	**3,415.8337**	**0.9412**		**3,439.3644**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0196	0.7959	0.2412	4.2700e-003	11.9085	9.5300e-003	11.9180	1.2120	9.1200e-003	1.2212		454.0477	454.0477	3.2800e-003	0.0714	475.4166
Vendor	0.0121	0.2498	0.1341	1.3100e-003	3.6942	2.0100e-003	3.6963	0.3771	1.9300e-003	0.3790		137.7137	137.7137	1.0200e-003	0.0192	143.4525
Worker	0.0845	0.0451	0.7634	1.7900e-003	19.5290	9.2000e-004	19.5299	1.9805	8.5000e-004	1.9814		180.5093	180.5093	4.2600e-003	4.4300e-003	181.9364
Total	**0.1163**	**1.0909**	**1.1386**	**7.3700e-003**	**35.1317**	**0.0125**	**35.1442**	**3.5697**	**0.0119**	**3.5815**		**772.2707**	**772.2707**	**8.5600e-003**	**0.0950**	**800.8054**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Jack and Bore - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.3416	11.9286	18.5020	0.0354		0.5430	0.5430		0.5084	0.5084	0.0000	3,415.8337	3,415.8337	0.9412		3,439.3644
Total	**1.3416**	**11.9286**	**18.5020**	**0.0354**	**0.0000**	**0.5430**	**0.5430**	**0.0000**	**0.5084**	**0.5084**	**0.0000**	**3,415.8337**	**3,415.8337**	**0.9412**		**3,439.3644**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0196	0.7959	0.2412	4.2700e-003	7.3433	9.5300e-003	7.3528	0.7555	9.1200e-003	0.7646		454.0477	454.0477	3.2800e-003	0.0714	475.4166
Vendor	0.0121	0.2498	0.1341	1.3100e-003	2.2790	2.0100e-003	2.2811	0.2356	1.9300e-003	0.2375		137.7137	137.7137	1.0200e-003	0.0192	143.4525
Worker	0.0845	0.0451	0.7634	1.7900e-003	12.0307	9.2000e-004	12.0316	1.2307	8.5000e-004	1.2316		180.5093	180.5093	4.2600e-003	4.4300e-003	181.9364
Total	**0.1163**	**1.0909**	**1.1386**	**7.3700e-003**	**21.6530**	**0.0125**	**21.6655**	**2.2218**	**0.0119**	**2.2337**		**772.2707**	**772.2707**	**8.5600e-003**	**0.0950**	**800.8054**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4576	4.2908	7.2890	0.0114		0.2093	0.2093		0.1925	0.1925		1,103.3726	1,103.3726	0.3569		1,112.2939
Paving	0.4919					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9494**	**4.2908**	**7.2890**	**0.0114**		**0.2093**	**0.2093**		**0.1925**	**0.1925**		**1,103.3726**	**1,103.3726**	**0.3569**		**1,112.2939**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0196	0.7866	0.2420	4.1700e-003	11.9085	9.4700e-003	11.9179	1.2120	9.0600e-003	1.2211		443.5456	443.5456	3.3700e-003	0.0698	464.4256
Vendor	0.0119	0.2472	0.1315	1.2800e-003	3.6942	2.0000e-003	3.6962	0.3771	1.9200e-003	0.3790		135.2233	135.2233	1.0200e-003	0.0187	140.8295
Worker	0.0350	0.0179	0.3134	7.7000e-004	8.6796	3.9000e-004	8.6799	0.8802	3.6000e-004	0.8806		77.4561	77.4561	1.7000e-003	1.8300e-003	78.0437
Total	**0.0665**	**1.0516**	**0.6869**	**6.2200e-003**	**24.2822**	**0.0119**	**24.2941**	**2.4694**	**0.0113**	**2.4807**		**656.2250**	**656.2250**	**6.0900e-003**	**0.0903**	**683.2988**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4576	4.2908	7.2890	0.0114		0.2093	0.2093		0.1925	0.1925	0.0000	1,103.3726	1,103.3726	0.3569		1,112.2939
Paving	0.4919					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9494**	**4.2908**	**7.2890**	**0.0114**		**0.2093**	**0.2093**		**0.1925**	**0.1925**	**0.0000**	**1,103.3726**	**1,103.3726**	**0.3569**		**1,112.2939**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0196	0.7866	0.2420	4.1700e-003	7.3433	9.4700e-003	7.3528	0.7555	9.0600e-003	0.7646		443.5456	443.5456	3.3700e-003	0.0698	464.4256
Vendor	0.0119	0.2472	0.1315	1.2800e-003	2.2790	2.0000e-003	2.2810	0.2356	1.9200e-003	0.2375		135.2233	135.2233	1.0200e-003	0.0187	140.8295
Worker	0.0350	0.0179	0.3134	7.7000e-004	5.3470	3.9000e-004	5.3474	0.5470	3.6000e-004	0.5473		77.4561	77.4561	1.7000e-003	1.8300e-003	78.0437
Total	**0.0665**	**1.0516**	**0.6869**	**6.2200e-003**	**14.9693**	**0.0119**	**14.9812**	**1.5381**	**0.0113**	**1.5494**		**656.2250**	**656.2250**	**6.0900e-003**	**0.0903**	**683.2988**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	13.80	6.20	6.20	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	13.80	6.20	6.20	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.519370	0.060618	0.186312	0.143152	0.024585	0.006910	0.010773	0.020267	0.000881	0.000230	0.022128	0.000902	0.003872
Other Non-Asphalt Surfaces	0.519370	0.060618	0.186312	0.143152	0.024585	0.006910	0.010773	0.020267	0.000881	0.000230	0.022128	0.000902	0.003872

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

Highway 86 Water Transmission Main - Salton Sea Air Basin, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.9470	1.8300e-003	0.2018	2.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004		0.4337	0.4337	1.1300e-003		0.4619
Unmitigated	0.9470	1.8300e-003	0.2018	2.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004		0.4337	0.4337	1.1300e-003		0.4619

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2265					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.7019					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0186	1.8300e-003	0.2018	2.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004		0.4337	0.4337	1.1300e-003		0.4619
Total	**0.9470**	**1.8300e-003**	**0.2018**	**2.0000e-005**		**7.2000e-004**	**7.2000e-004**		**7.2000e-004**	**7.2000e-004**		**0.4337**	**0.4337**	**1.1300e-003**		**0.4619**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2265					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.7019					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0186	1.8300e-003	0.2018	2.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004		0.4337	0.4337	1.1300e-003		0.4619
Total	**0.9470**	**1.8300e-003**	**0.2018**	**2.0000e-005**		**7.2000e-004**	**7.2000e-004**		**7.2000e-004**	**7.2000e-004**		**0.4337**	**0.4337**	**1.1300e-003**		**0.4619**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Highway 86 Water Transmission Main

Salton Sea Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	180.00	1000sqft	4.13	180,000.00	0
Other Non-Asphalt Surfaces	1,801.68	1000sqft	41.36	1,801,684.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	20
Climate Zone	15			**Operational Year**	2025
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Per alignment, includes paved and unpaved portions of pipeline construction.

Construction Phase - Per engineering estimates

Off-road Equipment - Per Engineers

Off-road Equipment - Per Engineers

Off-road Equipment - Per Engineers, modeling equiptment for 2 trenching crews.

On-road Fugitive Dust - 95% Paved Roads assumed

Construction Off-road Equipment Mitigation - Water 3x daily, 15mph speed limit assumed

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDays	75.00	30.00
tblConstructionPhase	NumDays	55.00	22.00
tblLandUse	LandUseSquareFeet	1,801,680.00	1,801,684.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOnRoadDust	HaulingPercentPave	50.00	95.00
tblOnRoadDust	HaulingPercentPave	50.00	95.00
tblOnRoadDust	HaulingPercentPave	50.00	95.00
tblOnRoadDust	VendorPercentPave	50.00	95.00
tblOnRoadDust	VendorPercentPave	50.00	95.00
tblOnRoadDust	VendorPercentPave	50.00	95.00
tblOnRoadDust	WorkerPercentPave	50.00	95.00
tblOnRoadDust	WorkerPercentPave	50.00	95.00
tblOnRoadDust	WorkerPercentPave	50.00	95.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	5,760.00
tblTripsAndVMT	HaulingTripNumber	0.00	240.00
tblTripsAndVMT	HaulingTripNumber	0.00	176.00
tblTripsAndVMT	VendorTripNumber	0.00	16.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00

2.0 Emissions Summary

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	1.4662	13.6371	19.5432	0.0418	47.4796	0.5841	48.0636	4.8287	0.5588	5.3874	0.0000	4,126.0060	4,126.0060	0.5890	0.1889	4,197.0088
2024	2.8265	25.9563	38.9406	0.0841	82.6112	1.0716	83.6829	8.3983	1.0137	9.4120	0.0000	8,266.5275	8,266.5275	1.5365	0.2808	8,388.6149
2025	1.2989	11.9350	19.4482	0.0413	47.4795	0.4373	47.9169	4.8287	0.4180	5.2467	0.0000	4,074.1150	4,074.1150	0.5828	0.1810	4,142.6191
Maximum	**2.8265**	**25.9563**	**38.9406**	**0.0841**	**82.6112**	**1.0716**	**83.6829**	**8.3983**	**1.0137**	**9.4120**	**0.0000**	**8,266.5275**	**8,266.5275**	**1.5365**	**0.2808**	**8,388.6149**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	1.4662	13.6371	19.5432	0.0418	29.2703	0.5841	29.8543	3.0078	0.5588	3.5665	0.0000	4,126.0060	4,126.0060	0.5890	0.1889	4,197.0088
2024	2.8265	25.9563	38.9406	0.0841	50.9233	1.0716	51.9949	5.2295	1.0137	6.2432	0.0000	8,266.5275	8,266.5275	1.5365	0.2808	8,388.6149
2025	1.2989	11.9350	19.4482	0.0413	29.2702	0.4373	29.7076	3.0078	0.4180	3.4258	0.0000	4,074.1150	4,074.1150	0.5828	0.1810	4,142.6190
Maximum	**2.8265**	**25.9563**	**38.9406**	**0.0841**	**50.9233**	**1.0716**	**51.9949**	**5.2295**	**1.0137**	**6.2432**	**0.0000**	**8,266.5275**	**8,266.5275**	**1.5365**	**0.2808**	**8,388.6149**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	38.35	0.00	37.91	37.72	0.00	33.97	0.00	0.00	0.00	0.00	0.00	0.00

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9470	1.8300e-003	0.2018	2.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004		0.4337	0.4337	1.1300e-003		0.4619
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.9470**	**1.8300e-003**	**0.2018**	**2.0000e-005**	**0.0000**	**7.2000e-004**	**7.2000e-004**	**0.0000**	**7.2000e-004**	**7.2000e-004**		**0.4337**	**0.4337**	**1.1300e-003**	**0.0000**	**0.4619**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9470	1.8300e-003	0.2018	2.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004		0.4337	0.4337	1.1300e-003		0.4619
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.9470**	**1.8300e-003**	**0.2018**	**2.0000e-005**	**0.0000**	**7.2000e-004**	**7.2000e-004**	**0.0000**	**7.2000e-004**	**7.2000e-004**		**0.4337**	**0.4337**	**1.1300e-003**	**0.0000**	**0.4619**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Trenching	Trenching	9/1/2023	1/16/2025	5	360	
2	Jack and Bore	Grading	10/4/2024	11/14/2024	5	30	
3	Paving	Paving	1/17/2025	2/17/2025	5	22	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 45.49

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Trenching	Concrete/Industrial Saws	2	8.00	81	0.73
Trenching	Excavators	2	8.00	158	0.38
Trenching	Rubber Tired Dozers	0	8.00	247	0.40
Trenching	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Jack and Bore	Bore/Drill Rigs	1	8.00	221	0.50
Jack and Bore	Concrete/Industrial Saws	1	8.00	81	0.73
Jack and Bore	Excavators	1	8.00	158	0.38
Jack and Bore	Graders	0	8.00	187	0.41

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Jack and Bore	Pavers	1	8.00	130	0.42
Jack and Bore	Paving Equipment	1	8.00	132	0.36
Jack and Bore	Rollers	1	8.00	80	0.38
Jack and Bore	Rubber Tired Dozers	0	8.00	247	0.40
Jack and Bore	Scrapers	0	8.00	367	0.48
Jack and Bore	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Trenching	6	15.00	16.00	5,760.00	14.60	6.20	20.00	LD_Mix	HDT_Mix	HHDT
Jack and Bore	7	18.00	8.00	240.00	14.60	6.20	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	8.00	176.00	14.60	6.20	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3475	11.3371	18.2929	0.0291		0.5598	0.5598		0.5355	0.5355		2,788.6956	2,788.6956	0.5770		2,803.1197
Total	**1.3475**	**11.3371**	**18.2929**	**0.0291**		**0.5598**	**0.5598**		**0.5355**	**0.5355**		**2,788.6956**	**2,788.6956**	**0.5770**		**2,803.1197**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0358	1.7155	0.4891	8.7100e-003	23.8169	0.0194	23.8363	2.4241	0.0186	2.4426		925.3036	925.3036	6.2100e-003	0.1456	968.8385
Vendor	0.0228	0.5411	0.2837	2.6600e-003	7.3885	4.1100e-003	7.3926	0.7542	3.9300e-003	0.7581		280.1089	280.1089	2.0000e-003	0.0393	291.8548
Worker	0.0601	0.0434	0.4776	1.3000e-003	16.2742	8.0000e-004	16.2750	1.6505	7.3000e-004	1.6512		131.8979	131.8979	3.7800e-003	4.0400e-003	133.1958
Total	**0.1187**	**2.3001**	**1.2503**	**0.0127**	**47.4796**	**0.0243**	**47.5039**	**4.8287**	**0.0232**	**4.8519**		**1,337.3104**	**1,337.3104**	**0.0120**	**0.1889**	**1,393.8892**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3475	11.3371	18.2929	0.0291		0.5598	0.5598		0.5355	0.5355	0.0000	2,788.6956	2,788.6956	0.5770		2,803.1197
Total	**1.3475**	**11.3371**	**18.2929**	**0.0291**		**0.5598**	**0.5598**		**0.5355**	**0.5355**	**0.0000**	**2,788.6956**	**2,788.6956**	**0.5770**		**2,803.1197**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0358	1.7155	0.4891	8.7100e-003	14.6866	0.0194	14.7060	1.5110	0.0186	1.5296		925.3036	925.3036	6.2100e-003	0.1456	968.8385
Vendor	0.0228	0.5411	0.2837	2.6600e-003	4.5581	4.1100e-003	4.5622	0.4711	3.9300e-003	0.4751		280.1089	280.1089	2.0000e-003	0.0393	291.8548
Worker	0.0601	0.0434	0.4776	1.3000e-003	10.0256	8.0000e-004	10.0264	1.0256	7.3000e-004	1.0263		131.8979	131.8979	3.7800e-003	4.0400e-003	133.1958
Total	**0.1187**	**2.3001**	**1.2503**	**0.0127**	**29.2703**	**0.0243**	**29.2946**	**3.0078**	**0.0232**	**3.0310**		**1,337.3104**	**1,337.3104**	**0.0120**	**0.1889**	**1,393.8892**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2741	10.5307	18.3014	0.0291		0.4922	0.4922		0.4705	0.4705		2,789.3935	2,789.3935	0.5751		2,803.7711
Total	**1.2741**	**10.5307**	**18.3014**	**0.0291**		**0.4922**	**0.4922**		**0.4705**	**0.4705**		**2,789.3935**	**2,789.3935**	**0.5751**		**2,803.7711**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0357	1.7318	0.4936	8.5700e-003	23.8169	0.0191	23.8360	2.4241	0.0183	2.4423		909.8913	909.8913	6.3900e-003	0.1432	952.7100
Vendor	0.0223	0.5429	0.2783	2.6200e-003	7.3885	4.0500e-003	7.3925	0.7542	3.8700e-003	0.7580		276.3240	276.3240	1.9800e-003	0.0386	287.8646
Worker	0.0562	0.0386	0.4451	1.2700e-003	16.2742	7.7000e-004	16.2749	1.6505	7.1000e-004	1.6512		128.1716	128.1716	3.4400e-003	3.7400e-003	129.3716
Total	**0.1143**	**2.3133**	**1.2171**	**0.0125**	**47.4796**	**0.0239**	**47.5034**	**4.8287**	**0.0228**	**4.8515**		**1,314.3868**	**1,314.3868**	**0.0118**	**0.1855**	**1,369.9462**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2741	10.5307	18.3014	0.0291		0.4922	0.4922		0.4705	0.4705	0.0000	2,789.3935	2,789.3935	0.5751		2,803.7711
Total	**1.2741**	**10.5307**	**18.3014**	**0.0291**		**0.4922**	**0.4922**		**0.4705**	**0.4705**	**0.0000**	**2,789.3935**	**2,789.3935**	**0.5751**		**2,803.7711**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0357	1.7318	0.4936	8.5700e-003	14.6866	0.0191	14.7057	1.5110	0.0183	1.5293		909.8913	909.8913	6.3900e-003	0.1432	952.7100
Vendor	0.0223	0.5429	0.2783	2.6200e-003	4.5581	4.0500e-003	4.5621	0.4711	3.8700e-003	0.4750		276.3240	276.3240	1.9800e-003	0.0386	287.8646
Worker	0.0562	0.0386	0.4451	1.2700e-003	10.0256	7.7000e-004	10.0264	1.0256	7.1000e-004	1.0263		128.1716	128.1716	3.4400e-003	3.7400e-003	129.3716
Total	**0.1143**	**2.3133**	**1.2171**	**0.0125**	**29.2703**	**0.0239**	**29.2942**	**3.0078**	**0.0228**	**3.0306**		**1,314.3868**	**1,314.3868**	**0.0118**	**0.1855**	**1,369.9462**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1888	9.6521	18.2678	0.0291		0.4136	0.4136		0.3954	0.3954		2,790.1188	2,790.1188	0.5712		2,804.3980
Total	**1.1888**	**9.6521**	**18.2678**	**0.0291**		**0.4136**	**0.4136**		**0.3954**	**0.3954**		**2,790.1188**	**2,790.1188**	**0.5712**		**2,804.3980**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0357	1.7115	0.4953	8.3700e-003	23.8169	0.0190	23.8359	2.4241	0.0181	2.4422		888.8636	888.8636	6.5800e-003	0.1399	930.7034
Vendor	0.0219	0.5370	0.2732	2.5700e-003	7.3885	4.0300e-003	7.3925	0.7542	3.8500e-003	0.7580		271.3353	271.3353	1.9800e-003	0.0377	282.6087
Worker	0.0526	0.0344	0.4118	1.2200e-003	16.2742	7.3000e-004	16.2749	1.6505	6.7000e-004	1.6511		123.7974	123.7974	3.1000e-003	3.4700e-003	124.9090
Total	**0.1102**	**2.2829**	**1.1804**	**0.0122**	**47.4795**	**0.0237**	**47.5033**	**4.8287**	**0.0227**	**4.8513**		**1,283.9962**	**1,283.9962**	**0.0117**	**0.1810**	**1,338.2211**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1888	9.6521	18.2678	0.0291		0.4136	0.4136		0.3954	0.3954	0.0000	2,790.1188	2,790.1188	0.5712		2,804.3980
Total	**1.1888**	**9.6521**	**18.2678**	**0.0291**		**0.4136**	**0.4136**		**0.3954**	**0.3954**	**0.0000**	**2,790.1188**	**2,790.1188**	**0.5712**		**2,804.3980**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0357	1.7115	0.4953	8.3700e-003	14.6866	0.0190	14.7055	1.5110	0.0181	1.5292		888.8636	888.8636	6.5800e-003	0.1399	930.7034
Vendor	0.0219	0.5370	0.2732	2.5700e-003	4.5581	4.0300e-003	4.5621	0.4711	3.8500e-003	0.4750		271.3353	271.3353	1.9800e-003	0.0377	282.6087
Worker	0.0526	0.0344	0.4118	1.2200e-003	10.0256	7.3000e-004	10.0263	1.0256	6.7000e-004	1.0263		123.7974	123.7974	3.1000e-003	3.4700e-003	124.9090
Total	**0.1102**	**2.2829**	**1.1804**	**0.0122**	**29.2702**	**0.0237**	**29.2940**	**3.0078**	**0.0227**	**3.0304**		**1,283.9962**	**1,283.9962**	**0.0117**	**0.1810**	**1,338.2211**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Jack and Bore - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.3416	11.9286	18.5020	0.0354		0.5430	0.5430		0.5084	0.5084		3,415.8337	3,415.8337	0.9412		3,439.3644
Total	**1.3416**	**11.9286**	**18.5020**	**0.0354**	**0.0000**	**0.5430**	**0.5430**	**0.0000**	**0.5084**	**0.5084**		**3,415.8337**	**3,415.8337**	**0.9412**		**3,439.3644**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0179	0.8659	0.2468	4.2800e-003	11.9085	9.5500e-003	11.9180	1.2120	9.1300e-003	1.2212		454.9456	454.9456	3.2000e-003	0.0716	476.3550
Vendor	0.0112	0.2715	0.1392	1.3100e-003	3.6942	2.0200e-003	3.6963	0.3771	1.9300e-003	0.3790		138.1620	138.1620	9.9000e-004	0.0193	143.9323
Worker	0.0675	0.0463	0.5342	1.5200e-003	19.5290	9.2000e-004	19.5299	1.9805	8.5000e-004	1.9814		153.8059	153.8059	4.1200e-003	4.4900e-003	155.2460
Total	**0.0965**	**1.1837**	**0.9201**	**7.1100e-003**	**35.1317**	**0.0125**	**35.1442**	**3.5697**	**0.0119**	**3.5816**		**746.9135**	**746.9135**	**8.3100e-003**	**0.0954**	**775.5333**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Jack and Bore - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.3416	11.9286	18.5020	0.0354		0.5430	0.5430		0.5084	0.5084	0.0000	3,415.8337	3,415.8337	0.9412		3,439.3644
Total	**1.3416**	**11.9286**	**18.5020**	**0.0354**	**0.0000**	**0.5430**	**0.5430**	**0.0000**	**0.5084**	**0.5084**	**0.0000**	**3,415.8337**	**3,415.8337**	**0.9412**		**3,439.3644**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0179	0.8659	0.2468	4.2800e-003	7.3433	9.5500e-003	7.3528	0.7555	9.1300e-003	0.7647		454.9456	454.9456	3.2000e-003	0.0716	476.3550
Vendor	0.0112	0.2715	0.1392	1.3100e-003	2.2790	2.0200e-003	2.2811	0.2356	1.9300e-003	0.2375		138.1620	138.1620	9.9000e-004	0.0193	143.9323
Worker	0.0675	0.0463	0.5342	1.5200e-003	12.0307	9.2000e-004	12.0316	1.2307	8.5000e-004	1.2316		153.8059	153.8059	4.1200e-003	4.4900e-003	155.2460
Total	**0.0965**	**1.1837**	**0.9201**	**7.1100e-003**	**21.6530**	**0.0125**	**21.6655**	**2.2218**	**0.0119**	**2.2337**		**746.9135**	**746.9135**	**8.3100e-003**	**0.0954**	**775.5333**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4576	4.2908	7.2890	0.0114		0.2093	0.2093		0.1925	0.1925		1,103.3726	1,103.3726	0.3569		1,112.2939
Paving	0.4919					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9494**	**4.2908**	**7.2890**	**0.0114**		**0.2093**	**0.2093**		**0.1925**	**0.1925**		**1,103.3726**	**1,103.3726**	**0.3569**		**1,112.2939**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0178	0.8557	0.2477	4.1800e-003	11.9085	9.4800e-003	11.9179	1.2120	9.0700e-003	1.2211		444.4318	444.4318	3.2900e-003	0.0699	465.3517
Vendor	0.0109	0.2685	0.1366	1.2900e-003	3.6942	2.0100e-003	3.6963	0.3771	1.9300e-003	0.3790		135.6676	135.6676	9.9000e-004	0.0188	141.3044
Worker	0.0281	0.0184	0.2197	6.5000e-004	8.6796	3.9000e-004	8.6799	0.8802	3.6000e-004	0.8806		66.0253	66.0253	1.6500e-003	1.8500e-003	66.6181
Total	**0.0568**	**1.1426**	**0.6039**	**6.1200e-003**	**24.2822**	**0.0119**	**24.2941**	**2.4694**	**0.0114**	**2.4807**		**646.1247**	**646.1247**	**5.9300e-003**	**0.0906**	**673.2742**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4576	4.2908	7.2890	0.0114		0.2093	0.2093		0.1925	0.1925	0.0000	1,103.3726	1,103.3726	0.3569		1,112.2939
Paving	0.4919					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9494**	**4.2908**	**7.2890**	**0.0114**		**0.2093**	**0.2093**		**0.1925**	**0.1925**	**0.0000**	**1,103.3726**	**1,103.3726**	**0.3569**		**1,112.2939**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0178	0.8557	0.2477	4.1800e-003	7.3433	9.4800e-003	7.3528	0.7555	9.0700e-003	0.7646		444.4318	444.4318	3.2900e-003	0.0699	465.3517
Vendor	0.0109	0.2685	0.1366	1.2900e-003	2.2790	2.0100e-003	2.2811	0.2356	1.9300e-003	0.2375		135.6676	135.6676	9.9000e-004	0.0188	141.3044
Worker	0.0281	0.0184	0.2197	6.5000e-004	5.3470	3.9000e-004	5.3474	0.5470	3.6000e-004	0.5473		66.0253	66.0253	1.6500e-003	1.8500e-003	66.6181
Total	**0.0568**	**1.1426**	**0.6039**	**6.1200e-003**	**14.9693**	**0.0119**	**14.9812**	**1.5381**	**0.0114**	**1.5494**		**646.1247**	**646.1247**	**5.9300e-003**	**0.0906**	**673.2742**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	13.80	6.20	6.20	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	13.80	6.20	6.20	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.519370	0.060618	0.186312	0.143152	0.024585	0.006910	0.010773	0.020267	0.000881	0.000230	0.022128	0.000902	0.003872
Other Non-Asphalt Surfaces	0.519370	0.060618	0.186312	0.143152	0.024585	0.006910	0.010773	0.020267	0.000881	0.000230	0.022128	0.000902	0.003872

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

Highway 86 Water Transmission Main - Salton Sea Air Basin, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.9470	1.8300e-003	0.2018	2.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004		0.4337	0.4337	1.1300e-003		0.4619
Unmitigated	0.9470	1.8300e-003	0.2018	2.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004		0.4337	0.4337	1.1300e-003		0.4619

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2265					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.7019					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0186	1.8300e-003	0.2018	2.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004		0.4337	0.4337	1.1300e-003		0.4619
Total	**0.9470**	**1.8300e-003**	**0.2018**	**2.0000e-005**		**7.2000e-004**	**7.2000e-004**		**7.2000e-004**	**7.2000e-004**		**0.4337**	**0.4337**	**1.1300e-003**		**0.4619**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2265					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.7019					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0186	1.8300e-003	0.2018	2.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004		0.4337	0.4337	1.1300e-003		0.4619
Total	**0.9470**	**1.8300e-003**	**0.2018**	**2.0000e-005**		**7.2000e-004**	**7.2000e-004**		**7.2000e-004**	**7.2000e-004**		**0.4337**	**0.4337**	**1.1300e-003**		**0.4619**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Highway 86 Water Transmission Main

Salton Sea Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	180.00	1000sqft	4.13	180,000.00	0
Other Non-Asphalt Surfaces	1,801.68	1000sqft	41.36	1,801,684.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	20
Climate Zone	15			**Operational Year**	2025
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Per alignment, includes paved and unpaved portions of pipeline construction.

Construction Phase - Per engineering estimates

Off-road Equipment - Per Engineers

Off-road Equipment - Per Engineers

Off-road Equipment - Per Engineers, modeling equiptment for 2 trenching crews.

On-road Fugitive Dust - 95% Paved Roads assumed

Construction Off-road Equipment Mitigation - Water 3x daily, 15mph speed limit assumed

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDays	75.00	30.00
tblConstructionPhase	NumDays	55.00	22.00
tblLandUse	LandUseSquareFeet	1,801,680.00	1,801,684.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOnRoadDust	HaulingPercentPave	50.00	95.00
tblOnRoadDust	HaulingPercentPave	50.00	95.00
tblOnRoadDust	HaulingPercentPave	50.00	95.00
tblOnRoadDust	VendorPercentPave	50.00	95.00
tblOnRoadDust	VendorPercentPave	50.00	95.00
tblOnRoadDust	VendorPercentPave	50.00	95.00
tblOnRoadDust	WorkerPercentPave	50.00	95.00
tblOnRoadDust	WorkerPercentPave	50.00	95.00
tblOnRoadDust	WorkerPercentPave	50.00	95.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	5,760.00
tblTripsAndVMT	HaulingTripNumber	0.00	240.00
tblTripsAndVMT	HaulingTripNumber	0.00	176.00
tblTripsAndVMT	VendorTripNumber	0.00	16.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00

2.0 Emissions Summary

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Highway 86 Water Transmission Main - Salton Sea Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0633	0.5842	0.8426	1.8000e-003	1.9307	0.0251	1.9559	0.1965	0.0240	0.2206	0.0000	161.2501	161.2501	0.0230	7.3500e-003	164.0160
2024	0.2042	1.8720	2.8554	6.0900e-003	6.3804	0.0759	6.4563	0.6494	0.0724	0.7219	0.0000	545.3580	545.3580	0.0827	0.0233	554.3668
2025	0.0189	0.1308	0.2040	4.4000e-004	0.5220	5.0600e-003	0.5271	0.0531	4.7500e-003	0.0579	0.0000	39.7109	39.7109	6.7900e-003	1.8900e-003	40.4427
Maximum	**0.2042**	**1.8720**	**2.8554**	**6.0900e-003**	**6.3804**	**0.0759**	**6.4563**	**0.6494**	**0.0724**	**0.7219**	**0.0000**	**545.3580**	**545.3580**	**0.0827**	**0.0233**	**554.3668**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0633	0.5842	0.8426	1.8000e-003	1.1906	0.0251	1.2158	0.1225	0.0240	0.1466	0.0000	161.2500	161.2500	0.0230	7.3500e-003	164.0159
2024	0.2042	1.8720	2.8554	6.0900e-003	3.9345	0.0759	4.0105	0.4048	0.0724	0.4773	0.0000	545.3575	545.3575	0.0827	0.0233	554.3664
2025	0.0189	0.1308	0.2040	4.4000e-004	0.3219	5.0600e-003	0.3270	0.0331	4.7500e-003	0.0379	0.0000	39.7109	39.7109	6.7900e-003	1.8900e-003	40.4427
Maximum	**0.2042**	**1.8720**	**2.8554**	**6.0900e-003**	**3.9345**	**0.0759**	**4.0105**	**0.4048**	**0.0724**	**0.4773**	**0.0000**	**545.3575**	**545.3575**	**0.0827**	**0.0233**	**554.3664**

Highway 86 Water Transmission Main - Salton Sea Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**38.33**	**0.00**	**37.88**	**37.66**	**0.00**	**33.85**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-1-2023**	**11-30-2023**	0.4891	0.4891
2	**12-1-2023**	**2-29-2024**	0.4722	0.4722
3	**3-1-2024**	**5-31-2024**	0.4640	0.4640
4	**6-1-2024**	**8-31-2024**	0.4622	0.4622
5	**9-1-2024**	**11-30-2024**	0.6790	0.6790
6	**12-1-2024**	**2-28-2025**	0.3068	0.3068
		Highest	0.6790	0.6790

Highway 86 Water Transmission Main - Salton Sea Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1711	1.6000e-004	0.0182	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0354	0.0354	9.0000e-005	0.0000	0.0377
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1711**	**1.6000e-004**	**0.0182**	**0.0000**	**0.0000**	**6.0000e-005**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.0354**	**0.0354**	**9.0000e-005**	**0.0000**	**0.0377**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1711	1.6000e-004	0.0182	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0354	0.0354	9.0000e-005	0.0000	0.0377
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1711**	**1.6000e-004**	**0.0182**	**0.0000**	**0.0000**	**6.0000e-005**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.0354**	**0.0354**	**9.0000e-005**	**0.0000**	**0.0377**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Trenching	Trenching	9/1/2023	1/16/2025	5	360	
2	Jack and Bore	Grading	10/4/2024	11/14/2024	5	30	
3	Paving	Paving	1/17/2025	2/17/2025	5	22	

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 45.49

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Trenching	Concrete/Industrial Saws	2	8.00	81	0.73
Trenching	Excavators	2	8.00	158	0.38
Trenching	Rubber Tired Dozers	0	8.00	247	0.40
Trenching	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Jack and Bore	Bore/Drill Rigs	1	8.00	221	0.50
Jack and Bore	Concrete/Industrial Saws	1	8.00	81	0.73
Jack and Bore	Excavators	1	8.00	158	0.38
Jack and Bore	Graders	0	8.00	187	0.41
Jack and Bore	Pavers	1	8.00	130	0.42
Jack and Bore	Paving Equipment	1	8.00	132	0.36
Jack and Bore	Rollers	1	8.00	80	0.38
Jack and Bore	Rubber Tired Dozers	0	8.00	247	0.40
Jack and Bore	Scrapers	0	8.00	367	0.48
Jack and Bore	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	8.00	80	0.38

Trips and VMT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Trenching	6	15.00	16.00	5,760.00	14.60	6.20	20.00	LD_Mix	HDT_Mix	HHDT
Jack and Bore	7	18.00	8.00	240.00	14.60	6.20	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	8.00	176.00	14.60	6.20	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Trenching - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0579	0.4875	0.7866	1.2500e-003		0.0241	0.0241		0.0230	0.0230	0.0000	108.7841	108.7841	0.0225	0.0000	109.3467
Total	**0.0579**	**0.4875**	**0.7866**	**1.2500e-003**		**0.0241**	**0.0241**		**0.0230**	**0.0230**	**0.0000**	**108.7841**	**108.7841**	**0.0225**	**0.0000**	**109.3467**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.6200e-003	0.0722	0.0208	3.7000e-004	0.9685	8.3000e-004	0.9694	0.0987	8.0000e-004	0.0995	0.0000	36.0541	36.0541	2.5000e-004	5.6700e-003	37.7505
Vendor	1.0200e-003	0.0226	0.0119	1.1000e-004	0.3005	1.8000e-004	0.3006	0.0307	1.7000e-004	0.0309	0.0000	10.9063	10.9063	8.0000e-005	1.5300e-003	11.3633
Worker	2.6900e-003	1.8200e-003	0.0233	6.0000e-005	0.6617	3.0000e-005	0.6618	0.0672	3.0000e-005	0.0672	0.0000	5.5057	5.5057	1.5000e-004	1.6000e-004	5.5556
Total	**5.3300e-003**	**0.0967**	**0.0560**	**5.4000e-004**	**1.9307**	**1.0400e-003**	**1.9318**	**0.1965**	**1.0000e-003**	**0.1975**	**0.0000**	**52.4661**	**52.4661**	**4.8000e-004**	**7.3600e-003**	**54.6693**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0579	0.4875	0.7866	1.2500e-003		0.0241	0.0241		0.0230	0.0230	0.0000	108.7839	108.7839	0.0225	0.0000	109.3466
Total	**0.0579**	**0.4875**	**0.7866**	**1.2500e-003**		**0.0241**	**0.0241**		**0.0230**	**0.0230**	**0.0000**	**108.7839**	**108.7839**	**0.0225**	**0.0000**	**109.3466**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.6200e-003	0.0722	0.0208	3.7000e-004	0.5974	8.3000e-004	0.5983	0.0616	8.0000e-004	0.0624	0.0000	36.0541	36.0541	2.5000e-004	5.6700e-003	37.7505
Vendor	1.0200e-003	0.0226	0.0119	1.1000e-004	0.1854	1.8000e-004	0.1856	0.0192	1.7000e-004	0.0194	0.0000	10.9063	10.9063	8.0000e-005	1.5300e-003	11.3633
Worker	2.6900e-003	1.8200e-003	0.0233	6.0000e-005	0.4078	3.0000e-005	0.4078	0.0418	3.0000e-005	0.0418	0.0000	5.5057	5.5057	1.5000e-004	1.6000e-004	5.5556
Total	**5.3300e-003**	**0.0967**	**0.0560**	**5.4000e-004**	**1.1906**	**1.0400e-003**	**1.1917**	**0.1225**	**1.0000e-003**	**0.1235**	**0.0000**	**52.4661**	**52.4661**	**4.8000e-004**	**7.3600e-003**	**54.6693**

3.2 Trenching - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1669	1.3795	2.3975	3.8100e-003		0.0645	0.0645		0.0616	0.0616	0.0000	331.4949	331.4949	0.0684	0.0000	333.2035
Total	**0.1669**	**1.3795**	**2.3975**	**3.8100e-003**		**0.0645**	**0.0645**		**0.0616**	**0.0616**	**0.0000**	**331.4949**	**331.4949**	**0.0684**	**0.0000**	**333.2035**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.9500e-003	0.2220	0.0638	1.1200e-003	2.9506	2.5000e-003	2.9531	0.3006	2.3900e-003	0.3030	0.0000	108.0088	108.0088	7.7000e-004	0.0170	113.0919
Vendor	3.0200e-003	0.0692	0.0357	3.4000e-004	0.9154	5.3000e-004	0.9159	0.0935	5.1000e-004	0.0940	0.0000	32.7768	32.7768	2.4000e-004	4.5700e-003	34.1446
Worker	7.6600e-003	4.9400e-003	0.0661	1.8000e-004	2.0160	1.0000e-004	2.0161	0.2046	9.0000e-005	0.2047	0.0000	16.2962	16.2962	4.0000e-004	4.4000e-004	16.4367
Total	**0.0156**	**0.2962**	**0.1656**	**1.6400e-003**	**5.8820**	**3.1300e-003**	**5.8851**	**0.5988**	**2.9900e-003**	**0.6017**	**0.0000**	**157.0818**	**157.0818**	**1.4100e-003**	**0.0220**	**163.6732**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1669	1.3795	2.3975	3.8100e-003		0.0645	0.0645		0.0616	0.0616	0.0000	331.4945	331.4945	0.0684	0.0000	333.2031
Total	**0.1669**	**1.3795**	**2.3975**	**3.8100e-003**		**0.0645**	**0.0645**		**0.0616**	**0.0616**	**0.0000**	**331.4945**	**331.4945**	**0.0684**	**0.0000**	**333.2031**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.9500e-003	0.2220	0.0638	1.1200e-003	1.8201	2.5000e-003	1.8226	0.1876	2.3900e-003	0.1899	0.0000	108.0088	108.0088	7.7000e-004	0.0170	113.0919
Vendor	3.0200e-003	0.0692	0.0357	3.4000e-004	0.5649	5.3000e-004	0.5654	0.0585	5.1000e-004	0.0590	0.0000	32.7768	32.7768	2.4000e-004	4.5700e-003	34.1446
Worker	7.6600e-003	4.9400e-003	0.0661	1.8000e-004	1.2423	1.0000e-004	1.2424	0.1272	9.0000e-005	0.1273	0.0000	16.2962	16.2962	4.0000e-004	4.4000e-004	16.4367
Total	**0.0156**	**0.2962**	**0.1656**	**1.6400e-003**	**3.6273**	**3.1300e-003**	**3.6304**	**0.3733**	**2.9900e-003**	**0.3763**	**0.0000**	**157.0818**	**157.0818**	**1.4100e-003**	**0.0220**	**163.6732**

3.2 Trenching - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.1300e-003	0.0579	0.1096	1.7000e-004		2.4800e-003	2.4800e-003		2.3700e-003	2.3700e-003	0.0000	15.1869	15.1869	3.1100e-003	0.0000	15.2646
Total	**7.1300e-003**	**0.0579**	**0.1096**	**1.7000e-004**		**2.4800e-003**	**2.4800e-003**		**2.3700e-003**	**2.3700e-003**	**0.0000**	**15.1869**	**15.1869**	**3.1100e-003**	**0.0000**	**15.2646**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.3000e-004	0.0101	2.9300e-003	5.0000e-005	0.1351	1.1000e-004	0.1353	0.0138	1.1000e-004	0.0139	0.0000	4.8326	4.8326	4.0000e-005	7.6000e-004	5.0601
Vendor	1.4000e-004	3.1400e-003	1.6000e-003	2.0000e-005	0.0419	2.0000e-005	0.0420	4.2800e-003	2.0000e-005	4.3100e-003	0.0000	1.4741	1.4741	1.0000e-005	2.0000e-004	1.5353
Worker	3.3000e-004	2.0000e-004	2.8000e-003	1.0000e-005	0.0923	0.0000	0.0923	9.3700e-003	0.0000	9.3800e-003	0.0000	0.7208	0.7208	2.0000e-005	2.0000e-005	0.7268
Total	**7.0000e-004**	**0.0134**	**7.3300e-003**	**8.0000e-005**	**0.2694**	**1.3000e-004**	**0.2696**	**0.0274**	**1.3000e-004**	**0.0276**	**0.0000**	**7.0275**	**7.0275**	**7.0000e-005**	**9.8000e-004**	**7.3221**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.1300e-003	0.0579	0.1096	1.7000e-004		2.4800e-003	2.4800e-003		2.3700e-003	2.3700e-003	0.0000	15.1869	15.1869	3.1100e-003	0.0000	15.2646
Total	**7.1300e-003**	**0.0579**	**0.1096**	**1.7000e-004**		**2.4800e-003**	**2.4800e-003**		**2.3700e-003**	**2.3700e-003**	**0.0000**	**15.1869**	**15.1869**	**3.1100e-003**	**0.0000**	**15.2646**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Trenching - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.3000e-004	0.0101	2.9300e-003	5.0000e-005	0.0834	1.1000e-004	0.0835	8.5900e-003	1.1000e-004	8.7000e-003	0.0000	4.8326	4.8326	4.0000e-005	7.6000e-004	5.0601
Vendor	1.4000e-004	3.1400e-003	1.6000e-003	2.0000e-005	0.0259	2.0000e-005	0.0259	2.6800e-003	2.0000e-005	2.7000e-003	0.0000	1.4741	1.4741	1.0000e-005	2.0000e-004	1.5353
Worker	3.3000e-004	2.0000e-004	2.8000e-003	1.0000e-005	0.0569	0.0000	0.0569	5.8300e-003	0.0000	5.8300e-003	0.0000	0.7208	0.7208	2.0000e-005	2.0000e-005	0.7268
Total	**7.0000e-004**	**0.0134**	**7.3300e-003**	**8.0000e-005**	**0.1661**	**1.3000e-004**	**0.1663**	**0.0171**	**1.3000e-004**	**0.0172**	**0.0000**	**7.0275**	**7.0275**	**7.0000e-005**	**9.8000e-004**	**7.3221**

3.3 Jack and Bore - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0201	0.1789	0.2775	5.3000e-004		8.1500e-003	8.1500e-003		7.6300e-003	7.6300e-003	0.0000	46.4819	46.4819	0.0128	0.0000	46.8021
Total	**0.0201**	**0.1789**	**0.2775**	**5.3000e-004**	**0.0000**	**8.1500e-003**	**8.1500e-003**	**0.0000**	**7.6300e-003**	**7.6300e-003**	**0.0000**	**46.4819**	**46.4819**	**0.0128**	**0.0000**	**46.8021**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Jack and Bore - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.8000e-004	0.0127	3.6500e-003	6.0000e-005	0.1689	1.4000e-004	0.1691	0.0172	1.4000e-004	0.0174	0.0000	6.1837	6.1837	4.0000e-005	9.7000e-004	6.4747
Vendor	1.7000e-004	3.9600e-003	2.0400e-003	2.0000e-005	0.0524	3.0000e-005	0.0524	5.3600e-003	3.0000e-005	5.3800e-003	0.0000	1.8765	1.8765	1.0000e-005	2.6000e-004	1.9548
Worker	1.0500e-003	6.8000e-004	9.0900e-003	2.0000e-005	0.2770	1.0000e-005	0.2770	0.0281	1.0000e-005	0.0281	0.0000	2.2392	2.2392	6.0000e-005	6.0000e-005	2.2585
Total	**1.5000e-003**	**0.0174**	**0.0148**	**1.0000e-004**	**0.4984**	**1.8000e-004**	**0.4985**	**0.0507**	**1.8000e-004**	**0.0509**	**0.0000**	**10.2994**	**10.2994**	**1.1000e-004**	**1.2900e-003**	**10.6881**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0201	0.1789	0.2775	5.3000e-004		8.1500e-003	8.1500e-003		7.6300e-003	7.6300e-003	0.0000	46.4818	46.4818	0.0128	0.0000	46.8020
Total	**0.0201**	**0.1789**	**0.2775**	**5.3000e-004**	**0.0000**	**8.1500e-003**	**8.1500e-003**	**0.0000**	**7.6300e-003**	**7.6300e-003**	**0.0000**	**46.4818**	**46.4818**	**0.0128**	**0.0000**	**46.8020**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Jack and Bore - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.8000e-004	0.0127	3.6500e-003	6.0000e-005	0.1042	1.4000e-004	0.1044	0.0107	1.4000e-004	0.0109	0.0000	6.1837	6.1837	4.0000e-005	9.7000e-004	6.4747
Vendor	1.7000e-004	3.9600e-003	2.0400e-003	2.0000e-005	0.0323	3.0000e-005	0.0324	3.3500e-003	3.0000e-005	3.3800e-003	0.0000	1.8765	1.8765	1.0000e-005	2.6000e-004	1.9548
Worker	1.0500e-003	6.8000e-004	9.0900e-003	2.0000e-005	0.1707	1.0000e-005	0.1707	0.0175	1.0000e-005	0.0175	0.0000	2.2392	2.2392	6.0000e-005	6.0000e-005	2.2585
Total	**1.5000e-003**	**0.0174**	**0.0148**	**1.0000e-004**	**0.3072**	**1.8000e-004**	**0.3074**	**0.0316**	**1.8000e-004**	**0.0318**	**0.0000**	**10.2994**	**10.2994**	**1.1000e-004**	**1.2900e-003**	**10.6881**

3.4 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.0300e-003	0.0472	0.0802	1.3000e-004		2.3000e-003	2.3000e-003		2.1200e-003	2.1200e-003	0.0000	11.0106	11.0106	3.5600e-003	0.0000	11.0996
Paving	5.4100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0104**	**0.0472**	**0.0802**	**1.3000e-004**		**2.3000e-003**	**2.3000e-003**		**2.1200e-003**	**2.1200e-003**	**0.0000**	**11.0106**	**11.0106**	**3.5600e-003**	**0.0000**	**11.0996**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Paving - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.1000e-004	9.2100e-003	2.6900e-003	5.0000e-005	0.1239	1.0000e-004	0.1240	0.0126	1.0000e-004	0.0127	0.0000	4.4299	4.4299	3.0000e-005	7.0000e-004	4.6384
Vendor	1.2000e-004	2.8700e-003	1.4700e-003	1.0000e-005	0.0384	2.0000e-005	0.0385	3.9300e-003	2.0000e-005	3.9500e-003	0.0000	1.3513	1.3513	1.0000e-005	1.9000e-004	1.4074
Worker	3.2000e-004	2.0000e-004	2.7400e-003	1.0000e-005	0.0903	0.0000	0.0903	9.1600e-003	0.0000	9.1700e-003	0.0000	0.7048	0.7048	2.0000e-005	2.0000e-005	0.7106
Total	**6.5000e-004**	**0.0123**	**6.9000e-003**	**7.0000e-005**	**0.2526**	**1.2000e-004**	**0.2527**	**0.0257**	**1.2000e-004**	**0.0258**	**0.0000**	**6.4859**	**6.4859**	**6.0000e-005**	**9.1000e-004**	**6.7564**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.0300e-003	0.0472	0.0802	1.3000e-004		2.3000e-003	2.3000e-003		2.1200e-003	2.1200e-003	0.0000	11.0106	11.0106	3.5600e-003	0.0000	11.0996
Paving	5.4100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0104**	**0.0472**	**0.0802**	**1.3000e-004**		**2.3000e-003**	**2.3000e-003**		**2.1200e-003**	**2.1200e-003**	**0.0000**	**11.0106**	**11.0106**	**3.5600e-003**	**0.0000**	**11.0996**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Paving - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.1000e-004	9.2100e-003	2.6900e-003	5.0000e-005	0.0764	1.0000e-004	0.0765	7.8700e-003	1.0000e-004	7.9700e-003	0.0000	4.4299	4.4299	3.0000e-005	7.0000e-004	4.6384
Vendor	1.2000e-004	2.8700e-003	1.4700e-003	1.0000e-005	0.0237	2.0000e-005	0.0237	2.4600e-003	2.0000e-005	2.4800e-003	0.0000	1.3513	1.3513	1.0000e-005	1.9000e-004	1.4074
Worker	3.2000e-004	2.0000e-004	2.7400e-003	1.0000e-005	0.0556	0.0000	0.0556	5.7000e-003	0.0000	5.7000e-003	0.0000	0.7048	0.7048	2.0000e-005	2.0000e-005	0.7106
Total	**6.5000e-004**	**0.0123**	**6.9000e-003**	**7.0000e-005**	**0.1558**	**1.2000e-004**	**0.1559**	**0.0160**	**1.2000e-004**	**0.0162**	**0.0000**	**6.4859**	**6.4859**	**6.0000e-005**	**9.1000e-004**	**6.7564**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Highway 86 Water Transmission Main - Salton Sea Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	13.80	6.20	6.20	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	13.80	6.20	6.20	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.519370	0.060618	0.186312	0.143152	0.024585	0.006910	0.010773	0.020267	0.000881	0.000230	0.022128	0.000902	0.003872
Other Non-Asphalt Surfaces	0.519370	0.060618	0.186312	0.143152	0.024585	0.006910	0.010773	0.020267	0.000881	0.000230	0.022128	0.000902	0.003872

5.0 Energy Detail

Highway 86 Water Transmission Main - Salton Sea Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Highway 86 Water Transmission Main - Salton Sea Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

Highway 86 Water Transmission Main - Salton Sea Air Basin, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1711	1.6000e-004	0.0182	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0354	0.0354	9.0000e-005	0.0000	0.0377
Unmitigated	0.1711	1.6000e-004	0.0182	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0354	0.0354	9.0000e-005	0.0000	0.0377

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0413					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1281					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.6700e-003	1.6000e-004	0.0182	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0354	0.0354	9.0000e-005	0.0000	0.0377
Total	**0.1711**	**1.6000e-004**	**0.0182**	**0.0000**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.0354**	**0.0354**	**9.0000e-005**	**0.0000**	**0.0377**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0413					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1281					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.6700e-003	1.6000e-004	0.0182	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0354	0.0354	9.0000e-005	0.0000	0.0377
Total	**0.1711**	**1.6000e-004**	**0.0182**	**0.0000**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.0354**	**0.0354**	**9.0000e-005**	**0.0000**	**0.0377**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

Biological Resources Technical Report

Biological Resources Technical Report

Highway 86 Water Transmission Main Phases 3 and 4 Project

Imperial and Riverside Counties, California

Prepared for:

Coachella Valley Water District
75-515 Hovley Lane East
Palm Desert, CA 92211

Prepared by:

Dokken Engineering
110 Blue Ravine Road, Suite 200
Folsom, California 95630

November 2024

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List of Abbreviations

°F	Fahrenheit
BIA	Bureau of Indian Affairs
BMPs	Best Management Practices
BRTR	Biological Resources Technical Report
BSA	Biological Study Area
Cal-IPC	California Invasive Plant Council
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFG	California Fish and Game
CFR	Code of Federal Regulations
CGP	Construction General Permit
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CVCC	Coachella Valley Conservation Commission
CVWD	Coachella Valley Water District
CWA	Clean Water Act
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Environmentally Sensitive Area
FESA	Federal Endangered Species Act
IPaC	Information for Planning and Consultation
ITP	Incidental Take Permit
MBTA	Migratory Bird Treaty Act
MSHCP	Coachella Valley Multiple Species Habitat Conservation Plan
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NPDES	National Pollution Discharge Elimination System
NWS	National Weather Service
OHWM	Ordinary High-Water Mark
Project	Highway 86 Water Transmission Main Phases 3 and 4 Project
ROW	Right of Way
RWQCB	Regional Water Quality Control Board
SSC	Species of Special Concern
SWRCB	State Water Resources Control Board
TMDL	Total Maximum Daily Load
U.S.	United States
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WDR	Wastewater Discharge Requirement
WOTUS	Waters of the United States

Executive Summary

The Coachella Valley Water District (CVWD) proposes to complete the Highway 86 Water Transmission Main Phases 3 and 4 (Project) by installing approximately 15.4 miles of 24-inch diameter ductile iron pipe water transmission main from Oasis, California, to Salton City, California.

This Biological Resources Technical Report (BRTR) is a review and evaluation of the potential impacts to threatened, endangered, proposed listed, or sensitive species and protected habitat resources that may result from the proposed Project. General biological surveys were conducted within a Biological Study Area (BSA) which encompasses the project centerline plus an approximate 25-foot buffer along either side of the proposed pipeline. The BSA totals approximately 185.98 acres.

Literature and database research, habitat assessments, and field surveys were conducted to determine the potential for special status species to occur within the Project area. Special status species include any plant or animal species listed by a state or federal agency or by one or more special interest groups, such as the California Native Plant Society (CNPS). Based on literature review, biological surveys, and habitat assessments, six special status wildlife species have the potential to occur within the Project area, including burrowing owl (*Athene cunicularia*), LeConte's thrasher (*Toxostoma lecontei*), Palm Springs pocket mouse (*Perognathus longimembris bangsi*), western yellow bat (*Lasiurus xanthinus*), Colorado Desert fringe-toed lizard (*Uma nonata*), and flat-tailed horned lizard (*Phrynosoma mcallii*). These species are further discussed in Chapter 4. No state or federally listed species are anticipated to occur within the Project area; as such, consultation with the United States (U.S.) Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) regarding listed species is not required.

An analysis was conducted to assess any biological resources within the Project area that may be impacted by the Project. The proposed pipeline alignment crosses a total of 38 desert washes that provide ephemeral aquatic habitat within the Project area and are considered Waters of the State. No permanent impacts to sensitive habitat communities will result from this Project; however, the Project is anticipated to temporarily impact approximately 3.32 acres of desert wash habitat. The following permits, related to waters, will be obtained for the Project: a Waste Discharge Requirement (WDR) from the Regional Water Quality Control Board (RWQCB), a National Pollutant Discharge Elimination System (NPDES) Construction General Permit from RWQCB, and a §1602 Streambed Alteration Agreement from the CDFW. Specific impacts to each channel throughout the alignment are detailed in Chapter 4.

The proposed Project is subject to compliance with the California Environmental Quality Act (CEQA); CVWD represents the Project proponent and is the CEQA lead agency. In addition, the project alignment crosses allotted Native American land and the Bureau of Indian Affairs (BIA) will need to grant discretionary approval for the project to move forward on these parcels. BIA will be a National Environmental Policy Act (NEPA) lead agency for this project.

Chapter 1. Introduction

The CVWD proposes to install a 24-inch water transmission main from Oasis, California to Salton City, California as part of the Highway 86 Water Transmission Main Phases 3 and 4 Project in Riverside County and Imperial County, California. The Project spans approximately 15 miles and occurs roughly adjacent to Highway 86 (Figure 1. Project Vicinity; Figure 2. Project Location). The Project area occurs within the Oasis (3311641), Seventeen Palms (3311631), and Truckhaven (3311538) quadrangles of the U.S. Geological Survey (USGS) 7.5-minute topographic maps as it moves southward adjacent to Highway 86.

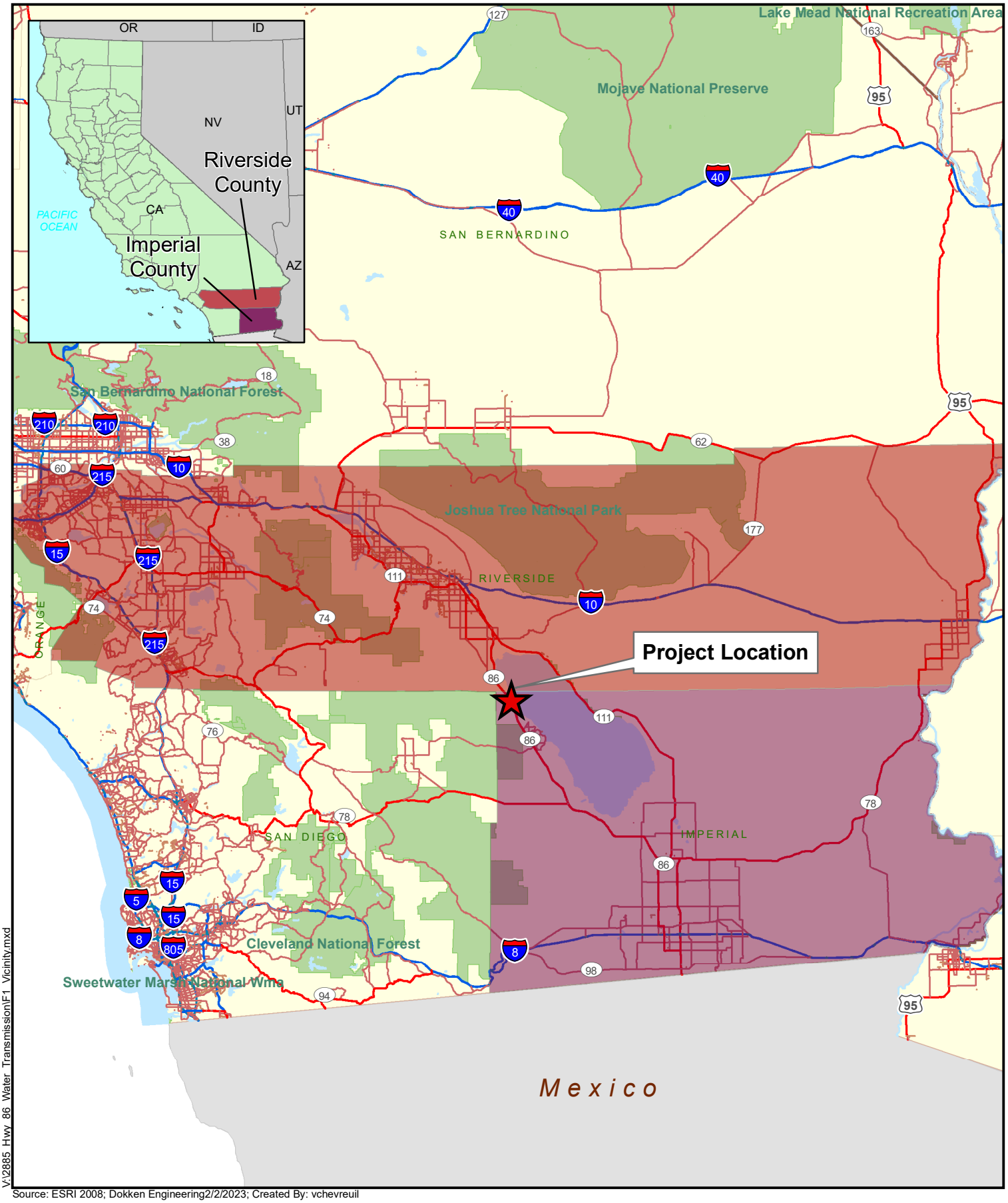
1.1 Project Description

The proposed water transmission main will replace the existing 16-inch and 18-inch domestic water distribution line along Highway 86 for the communities of Salton Sea Beach, Desert Shores, Salton City, and unincorporated areas in Riverside and Imperial Counties on the west side of the Salton Sea. The existing 16-inch and 18-inch diameter line no longer meets the needs of the community and segments of the pipeline are beginning to deteriorate and are in need of replacement.

The proposed 24-inch ductile iron pipeline will be approximately 15.4 miles long and will connect to the existing water distribution network west of Highway 86 at the intersection of Lincoln Street and 84th Avenue (Figure 2. Project Location). The pipeline will follow 84th Avenue east for approximately one mile before turning southward, where it will run roughly parallel to southbound Highway 86. Near Postmile 61, approximately one mile south of the Red Earth Casino, the proposed pipeline will turn east for approximately 0.75 miles, then continue south along Lesser Drive. The pipeline will then intersect and run parallel to southbound Highway 86 for approximately 3 more miles. Upon reaching Golden Avenue, the pipeline will cut west and terminate at Reservoir 1092, a CVWD facility.

Pipeline construction may consist of both open trench and subsurface boring. The pipeline will be installed with a minimum of four feet of earthen cover. Vertical deflections and restrained joints will be installed where the proposed pipeline crosses other utilities including irrigation mains, agricultural drain lines, storm drain culverts, and buried telephone lines. In-line valves will be installed at half-mile intervals and crosses to accommodate future connections that may be implemented along the alignment. The pipeline will be placed in polyethylene wrap to protect the pipeline from the mildly corrosive soils.

The proposed Project is subject to compliance with CEQA; CVWD is both the Project proponent and CEQA lead agency. In addition, the Project alignment crosses allotted Native American land and the BIA will need to grant discretionary approval for the project to move forward on these parcels. BIA will be a NEPA lead agency for this project.



Source: ESRI 2008; Dokken Engineering2/2/2023; Created By: vchevreuil

V:\2885_Hwy_86_Water_Transmission\F1_Vicinity.mxd

0 10 20 30 Miles

FIGURE 1
Project Vicinity
Coachella Valley Water District
Highway 86 Water Transmission Main Phase 3 and 4
Riverside and Imperial Counties, California

Source: ESRI World Street Maps Online; Dokken Engineering 3/6/2024; Created By: vchevreuil

0 1 2 3 4 Miles

FIGURE 2
Project Location
Coachella Valley Water District
Highway 86 Water Transmission Main Phase 3 and 4
Riverside and Imperial Counties, California

Chapter 2. Study Methods

2.1 Regulatory Requirements

This section describes the general federal, state, and local plans, policies, and laws that are relevant to biological resources within the Project area. Applicable approvals that could be required before construction of the Project is provided in Chapter 5.

2.1.1 Federal Regulations

National Environmental Policy Act

NEPA provides an interdisciplinary framework for environmental review by federal agencies and contains specific requirements to ensure that federal agency decisions take environmental factors into account. NEPA is applicable when a federal agency proposes an action, grants a permit, grants discretionary approval, or agrees to fund or otherwise authorize any other entity to undertake an action that could possibly affect environmental resources. The project alignment crosses allotted Native American land and the BIA will need to grant discretionary approval for the project to move forward on these parcels. BIA will be a NEPA lead agency for this project.

Clean Water Act

The CWA was enacted as an amendment to the Federal Water Pollutant Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants to Waters of the U.S. The CWA serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. The CWA empowers the U.S. Environmental Protection Agency (EPA) to set national water quality standards and effluent limitations and includes programs addressing both point-source and non-point-source pollution for all Waters of the United States.

Section 401

On May 25, 2023 the U.S. Supreme Court issued its ruling on the Sackett v. EPA case redefining Waters of the United States (WOTUS). The ruling limits the scope of WOTUS to only those "wetlands with a continuous surface connection to bodies that are WOTUS in their own right." In addition, the Court's decision also holds that "only those relatively permanent, standing or continuously flowing bodies of water forming geographic features that are described in ordinary parlance as streams, oceans, river, and lakes" are considered WOTUS. The RWQCB has jurisdiction under Section 401 of the CWA and regulates any activity which may result in a discharge to WOTUS.

The Project Area contains numerous ephemeral channels that drain directly into the Salton Sea. Prior to the Sackett ruling, these channels would have been considered WOTUS; however, under the new rules, ephemeral channels are not considered relatively permanent, standing, or continuously flowing and these channels are no longer considered WOTUS. As such, CWA protections and regulations no longer apply to any waters within the Project Area.

Section 402

Construction General Permit (CGP) (Order No. 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-0006-DWQ), became effective on February 14, 2011 and July 17, 2012, respectively. The permit regulates stormwater discharges from construction sites which result in a land disturbance of equal to or greater than one acre, and/or are smaller sites that are part of a

larger common plan of development. For all projects subject to the CGP, applicants are required to develop and implement an effective Stormwater Pollution Prevention Plan (SWPPP) as a condition of their NPDES permit.

By law, all stormwater discharges associated with construction activity, including, but not limited to, clearing, grading, grubbing or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre must comply with the provisions of the CGP. Construction activity that results in soil disturbances of less than one acre is subject to this CGP if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop a SWPPP; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the CGP.

Executive Order 13112: Prevention and Control of Invasive Species

Executive Order (EO) 13112 (signed February 3, 1999) directs all federal agencies to prevent and control introductions of invasive species in a cost-effective and environmentally sound manner. The EO requires consideration of invasive species in the NEPA analyses, including their identification and distribution, their potential impacts, and measures to prevent or eradicate them.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S. Code 703-712), as amended, was enacted to preserve the populations of all protected migratory bird species based on the four cooperative international treaties the U.S. entered with Canada in 1916, Mexico in 1936, Japan in 1972, and Russia in 1976.

Within the MBTA, take is defined as “the action of or attempt to pursue, hunt, shoot, capture, collect, or kill” (50 Code of Federal Regulations [CFR] 10.12) and includes intentional take (i.e., take that is the purpose of the activity in question) and unintentional take (i.e., take that results from, but is not the purpose of, the activity in question). The MBTA prohibits any take of protected migratory bird species without prior authorization by the USFWS.

2.1.2 State Regulations

California Environmental Quality Act

The CEQA is a state law created to inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities and to work to reduce these negative environmental impacts. CVWD is the CEQA lead agency for this Project.

Section 1600: Streambed Alteration Agreement

Under CFG Code 1602, public agencies are required to notify CDFW before undertaking any project that will divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occurs during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resources. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project.

Section 3513: Migratory Birds

CFG Code §3513 prohibits the take or possession of any migratory non-game bird as designated in the MBTA or any part of such migratory non-game bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA.

Section 3503 and 3503.5: Bird and Raptors

CFG Code §3503 prohibits the destruction of bird nests and §3503.5 prohibits the killing of raptor species and destruction of raptor nests.

Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. The act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the CWA and regulates discharges to waters of the state. Discharges under the Porter-Cologne Act are permitted via WDRs.

The RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA and regulating discharges to ensure compliance with the water quality standards. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments in their jurisdictions, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants, which are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired, and the standards cannot be met through point source or non-source point controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs) which specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

2.1.3 Local Regulations

Coachella Valley Multiple Species Habitat Conservation Plan

The northern extent of the proposed Project falls within the Plan Area of the Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP). The CVMSHCP encompasses the entire Coachella Valley and was designed to provide a streamlined pathway for the issuance of environmental permits and take authorization of threatened and endangered species covered under the CVMSHCP. The purpose of the CVMSHCP is to maximize environmental protection and mitigate impacts to state and federally listed species while also achieving development objectives for the region. The CVWD is a Local Permittee to the CVMSHCP.

Although approximately 14.4 acres (7.7%) of the Project are located within the CVMSHCP area, the Project area does not occur within any of the Plan's designated Conservation Areas (CVCC 2007). In addition, the Highway 86 Water Transmission Main Phase 2 environmental document evaluated the segment of the pipeline within Riverside County and found it to be a Covered Activity and consistent with the CVMSHCP. The Project continues to qualify as a Covered Activity as outlined under Section 7.1 of the CVMSHCP. Take of federally and/or state listed species is not anticipated to result from this Project; as such, coordination for take authorization under the

Plan's Section 10(a) Permit and Natural Community Conservation Plan (NCCP) Permit is not anticipated. No other MSHCPs are applicable to this Project.

2.2 Resource Identification Efforts

2.2.1 Literature Search

Prior to field work, literature research was conducted through the USFWS Information for Planning and Consultation (IPaC) (Appendix A. USFWS Species List), the CDFW California Natural Diversity Database (CNDDB) (Appendix B. CNDDB Species List), and the CNPS Electronic Inventory of Rare and Endangered Plants (Appendix C. CNPS Species List), to identify habitats and special-status species having the potential to occur within the Project area. Section 3.2 of this report provides a comprehensive list of the species generated from the online database searches and presents specific characteristics, habitat requirements, and potential for occurrence for each species.

2.2.2 Field Surveys

Prior to field surveys, a Biological Study Area (BSA) was defined as the proposed center line plus a 50-foot buffer. Field study methods consisted of walking meandering transects through the BSA, observing and mapping the boundary of vegetation communities, compiling notes on observed flora and fauna, photographing the site, and assessing the potential for existing habitat to support sensitive plants and wildlife species. All plant and wildlife observations were recorded and are discussed in Chapter 3.

In addition, Dokken biologists conducted delineations of the Waters of the U.S. and State following the technical methods outlined in *A Field Guide to the Identification of the Ordinary High-Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar 2008). A follow up delineation was completed in 2024 to map resources that were inaccessible during the 2022 surveys. Biological field studies and jurisdictional delineations were conducted between April 25 and April 27, 2022 by Dokken biologists Hanna Sheldon and Vincent Chevreuil. Supplemental jurisdictional delineations were conducted on February 9, 2024 by Dokken biologists Vincent Chevreuil and Jeff Harris. Following field delineations, ephemeral washes were found to not be waters of the U.S. or subject to federal regulation under the Sackett v. EPA ruling by the Supreme Court. Delineated desert washes are still considered waters of the State and subject to state regulation.

2.3 Limitations That May Influence Results

Biological surveys were conducted in April, which is within the typical blooming season for most local plant species and within the usual nesting bird season; as such, no temporal limitations are anticipated to substantially influence the findings of this document. All surveys were conducted during appropriate weather and temperature conditions.

Sensitive wildlife species with the potential to occur in the BSA may be difficult to detect, transient, or migratory species. The population size and locations of sensitive species may fluctuate through time. Because of this, the data collected for this biological resource technical report represents a "snapshot" in time and may not precisely reflect future conditions, however this approach is accepted as the industry standard for the purposes of evaluating project impacts under CEQA.

Chapter 3. Results: Environmental Setting

3.1 Study Area Description

Prior to field surveys, the BSA was defined as the Project centerline with an approximate 50-foot buffer. The BSA runs roughly parallel to Highway 86 for approximately 15 miles and measures approximately 100 feet across. The total acreage of the BSA for proposed alignment is approximately 185.98 acres (Figure 3. Vegetation Communities).

3.1.1 Physical Conditions

Regionally, the Project is located within the Coachella Valley, directly west of the Salton Sea and roughly adjacent to southbound Highway 86. The Project begins in Riverside County directly south of Oasis, California, and terminates approximately 12.5 miles south near Salton City, California. The Project occurs within the Sonoran Desert Floristic Province (Jepson 2023).

The Coachella Valley experiences a desert climate that consists of hot, dry summers and cool, winters with little precipitation and occasional monsoons. The average annual high temperature is approximately 89 degrees Fahrenheit (°F), and the average annual low temperature is approximately 60°F. The region averages 4.83 inches of precipitation annually (U.S. Climate Data 2024). The elevation of the Project ranges between approximately 40 feet above mean sea level to 220 below mean sea level.

3.1.2 Vegetation Communities and Land Cover

Vegetation communities within the BSA include disturbed desert scrub, orchard, and urban/barren land cover types. In addition, the proposed pipeline alignment crosses a total of 38 desert washes (Figure 3. Vegetation Communities; Appendix D. Representative Photographs). Plant and wildlife species observed within the BSA during the April 2022 biological survey efforts were used to define habitat types based on composition, abundance, and cover (Table 1. Species Observed).

Disturbed Desert Scrub

The BSA is primarily disturbed desert scrub habitat. Construction of rural communities and supporting infrastructure, regional agricultural, and invasion by non-native plants have modified this habitat community so that it reflects different species composition and density than what you would expect to find in less disturbed examples of desert scrub. In addition, the southern portion of the BSA is adjacent to the Ocotillo Wells State Vehicular Recreation Area and this portion of desert scrub exhibited lots of damage from off-highway vehicles and illegal dumping. Vegetative cover is approximately 5 to 15%. Common species include native plants such as creosote bush (*Larrea tridentata*), cheesebrush (*Ambrosia salsola*), and cattle saltbush (*Atriplex polycarpa*), as well as the non-native and invasive saltcedar (*Tamarix ramosissima*). Disturbed desert scrub habitat comprises approximately 88.73 acres (48%) of the BSA.

Orchard

Orchard habitat primarily occurs north of 86th Avenue, in the northern extent of the BSA. Orchard habitat within the BSA consists of exclusively date palms (*Phoenix dactylifera*). This habitat type comprises approximately 6.13 acres (3%) of the BSA.

Desert Wash Habitat

This habitat community is formed and maintained by the runoff from the Santa Rosa Mountains west of the Project. Vegetation within desert wash habitat is sparse but includes scattered desert

Proposed Alignment
County Boundaries
Water Resources

Salton Sea

Riverside County
Imperial County

Page 2
Page 3
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Page 11

Desert Shores
Salton Sea Beach
Salton City

86

Riverside County
San Diego County
Imperial County
San Diego County

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Source: ESRI Maps Online; Dokken Engineering 3/21/2024; Created By: vchevreuil

1 inch = 5,000 feet

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Figure 3
Vegetation Communities
Page 1 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: lbraen

1 inch = 500 feet

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Figure 3
Vegetation Communities
Page 2 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: lbraen

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Figure 3
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Page 3 of 11
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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: lbraen

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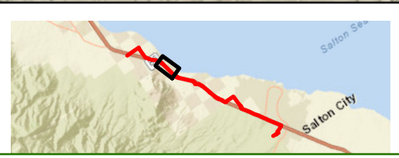

Figure 3
Vegetation Communities
Page 4 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

Biological Study Area (185.98 acres)

Vegetation Communities

Disturbed Desert Scrub (88.73 acres)

Urban/Barren (84.23 acres)

Desert Wash (6.89 acres)

Orchard (6.13 acres)

Matchline - See Page4

Coolidge Springs

Zanthe Ditch

Parosa Ditch

Romney Ditch

Ambig Ditch

Matis Ditch

Calyx Ditch

Godetia Ditch

86

Coolidge Springs Road

Matchline - See Page6

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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: lbraen

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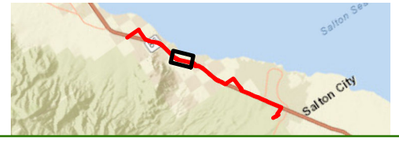

Figure 3
Vegetation Communities
Page 5 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

Biological Study Area (185.98 acres)

Vegetation Communities

- Disturbed Desert Scrub (88.73 acres)
- Urban/Barren (84.23 acres)
- Desert Wash (6.89 acres)
- Orchard (6.13 acres)

86

Godetia Ditch

Encilia Ditch

Incienso Ditch

Floris Ditch

Folius Ditch

Torif Ditch

Farinosa

Matchline - See Page5

Brawley Avenue

Matchline - See Page7

Bexar Ditch

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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: Ibraen

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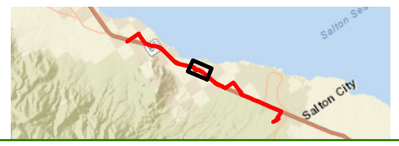
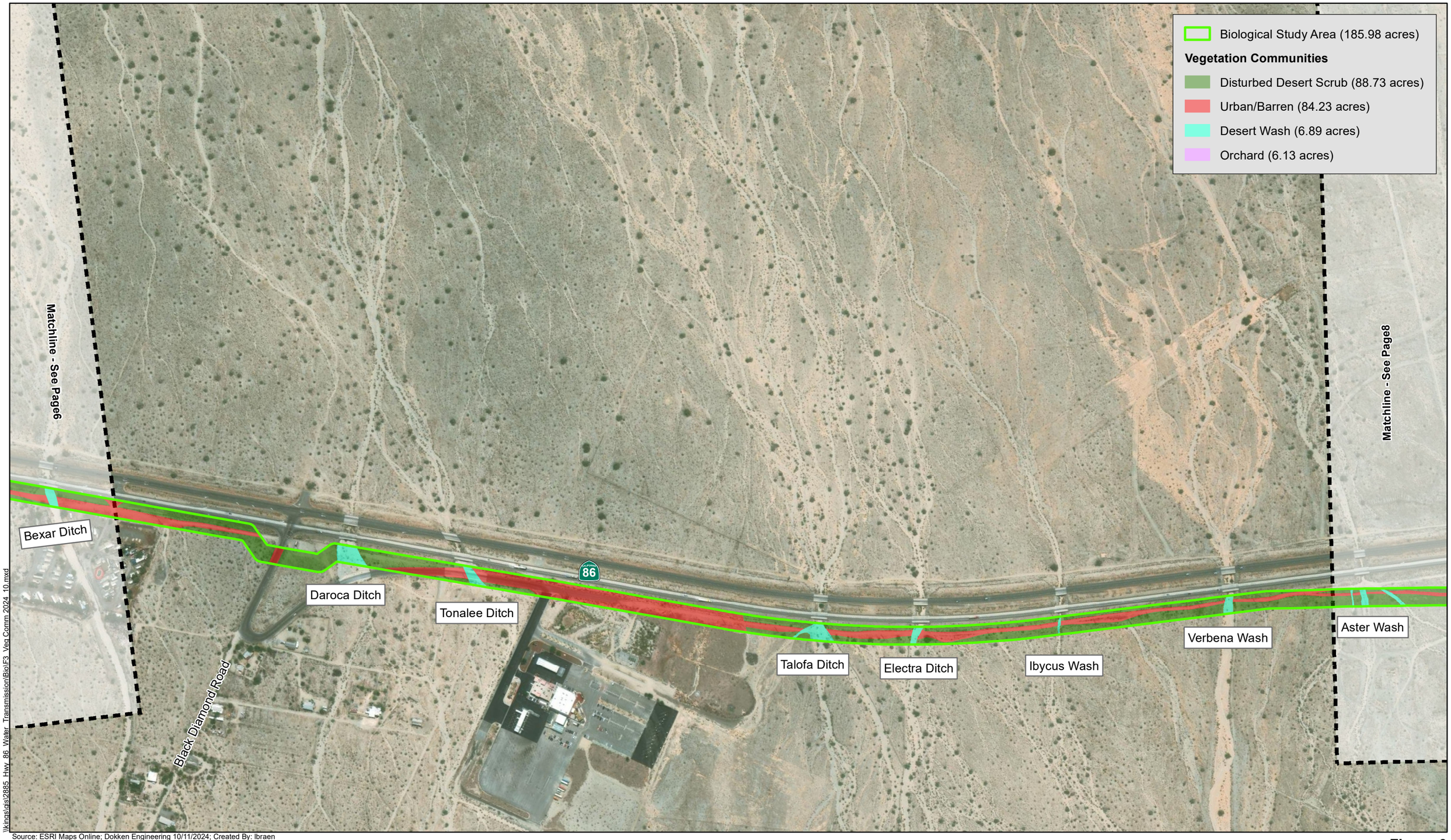


Figure 3
Vegetation Communities
Page 6 of 11

Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California



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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: lbraen

1 inch = 500 feet

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Figure 3
Vegetation Communities
Page 7 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: Ibraen

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Figure 3
Vegetation Communities
Page 8 of 11
Coachella Valley Water District
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Riverside and Imperial Counties, California

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Figure 3
Vegetation Communities
Page 9 of 11
Coachella Valley Water District
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Riverside and Imperial Counties, California

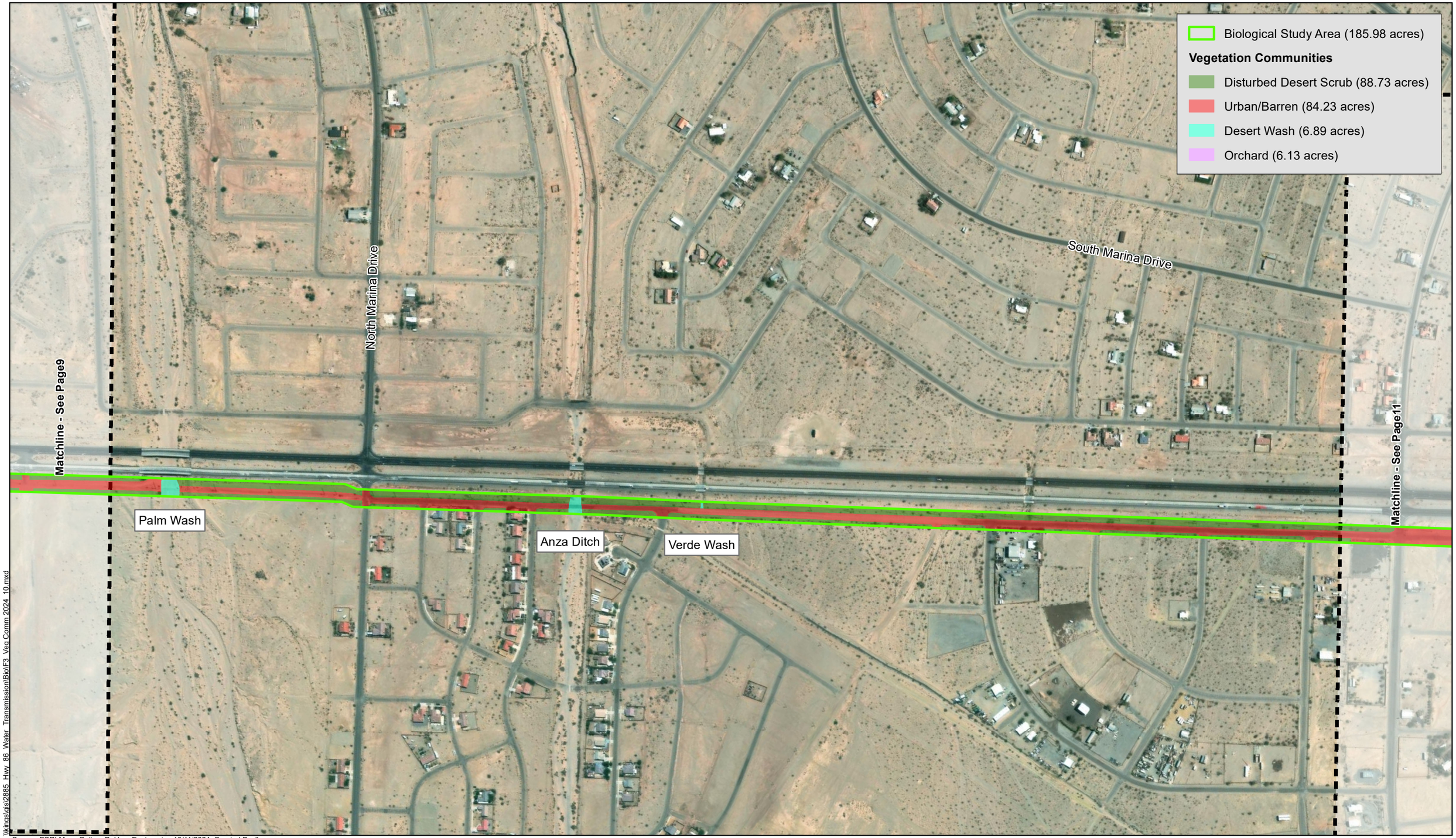

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Figure 3
Vegetation Communities
Page 10 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

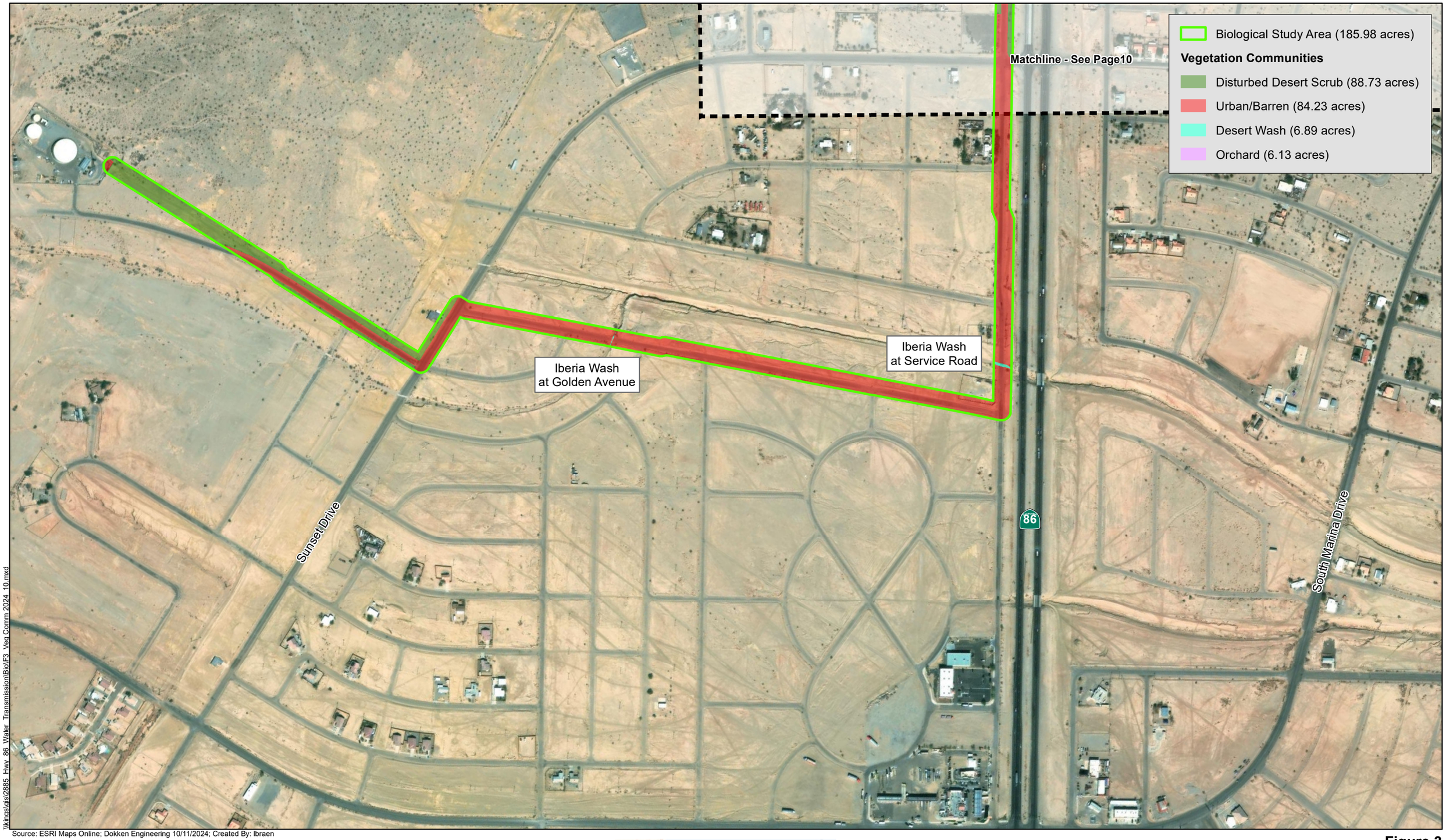

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Figure 3
Vegetation Communities
Page 11 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

shrubs/trees that serve as habitat and food sources for local wildlife populations. Typical vegetation within this habitat includes blue paloverde (*Parkinsonia florida*), smoketree (*Psorothamnus spinosus*), cattle saltbush, saltcedar, and creosote bush. The proposed alignment crosses 38 desert washes, many of which are highly disturbed by off-road vehicular recreation. The BSA contains approximately 6.89 acres (4%) of desert wash habitat.

Urban/Barren

Roadways and other barren areas are interspersed throughout the BSA and primarily include Highway 86 and associated frontage roads. In addition, the BSA includes roadways associated with urban centers adjacent to Highway 86. Roadways within the BSA are either paved or barren and are devoid of any vegetation. Urban facilities exist along the entire BSA, but primarily occur within the communities of Desert Shores and Salton City. The BSA contains approximately 84.23 acres (45%) of urban/barren land.

3.1.3 Species Observed

Wildlife observed within the BSA includes common bird species such as the American goldfinch (*Spinus tristis*), American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura*), and house sparrow (*Passer domesticus*), among others. In addition, western side-blotched lizards (*Uta stansburiana elegans*) were observed throughout the BSA. Disturbed desert scrub and desert wash habitat provides ample foraging habitat for local bird and reptile species. In addition, the date palm orchards in the northern extent of the Project provide adequate cover and foraging habitat for a variety of birds. Small mammal burrows were sparsely observed throughout the proposed alignment; however, no mammalian species were observed.

Table 1. Species Observed

Common Name	Scientific Name	Native (N)/ Non-Native (X)[1]
Plant Species		
Blue paloverde	*Parkinsonia florida*	N
Brittlebush	*Encelia farinosa*	N
Brownplume wirelettuce	*Stephanomeria pauciflora*	N
Castor bean	*Ricinus communis*	X [Limited][1]
Cattle saltbush	*Atriplex polycarpa*	N
Cheesebrush	*Ambrosia salsola*	N
Creosote bush	*Larrea tridentata*	N
Date palm	*Phoenix dactylifera*	X
Desert thornapple	*Datura discolor*	N
Desert tobacco	*Nicotiana obtusifolia*	N
Indigo bush	*Psorothamnus schotti*	N
Honey mesquite	*Prosopis glandulosa*	N
Mexican fan palm	*Washingtonia robusta*	X [Moderate][1]
Narrow-leaved johnstonella	*Johnstonella angustifolia*	N
Nettle leaf goosefoot	*Chenopodium murale*	X
Oleander	*Nerium oleander*	X
Saltcedar	*Tamarix ramosissima*	X [High][1]
Smoketree	*Psorothamnus spinosus*	N
Sweetbush	*Bebbia juncea*	N
Thick leaved ground cherry	*Physalis crassifolia*	N

Common Name	Scientific Name	Native (N)/ Non-Native (X)[1]
Thurber's sandpaper plant	*Petalonyx thurberi*	N
Tumbleweed	*Salsosa tragus*	X [Limited][1]
Western sea purslane	*Sessuvium verrucosum*	N
White bursage	*Ambrosia dumosa*	N
Wildlife Species		
American crow	*Corvus brachyrhynchos*	N
American goldfinch	*Spinus tristis*	N
Black-chinned hummingbird	*Archilochus alexandri*	N
Brown-headed cowbird	*Molothrus ater*	N
Cliff swallow	*Petrochelidon pyrrhonota*	N
Common yellowthroat	*Geothlypis trichas*	N
House sparrow	*Passer domesticus*	N
Mourning dove	*Zenaida macroura*	N
Red-tailed hawk	*Buteo jamaicensis*	N
Western side-blotched lizard	*Uta stansburiana elegans*	N
Verdin	*Auriparus flaviceps*	N

[1]California Invasive Plant Council (Cal-IPC) Rating

3.1.4 Habitat Connectivity

The CDFW Biogeographic Information & Observation System (CDFW 2024a) was reviewed to determine if the BSA is located within an Essential Connectivity Area. The highest ranking that occurs within the BSA is Terrestrial Connectivity Rank 3 – Connections with implementation flexibility. This ranking indicates that the area has been identified for its connectivity importance but has not been specifically designated as a channelized area, species corridor, or habitat linkage. The proposed Project will install an underground pipeline and would not permanently fragment any existing natural habitats; therefore, the Project would not impact existing habitat connectivity networks.

3.2 Special Status Species Potential

Plant and animal species have special status if they have been listed as such by federal or state agencies or by one or more special interest groups, such as CNPS. Literature searches were conducted using USFWS IPaC, CDFW CNDDB, and CNPS databases to identify regionally sensitive species with potential to occur within the BSA. The CNDDB, NMFS, and CNPS databases were queried using all USGS 7.5-minute quadrangles that intersect the project area. The USFWS IPaC list was queried by uploading the project area into IPaC. Table 2 on the following pages provides the list of regional special status species returned by the database searches, describes the habitat requirements for each species, and states if the species was determined to have potential to occur within the BSA based on available habitat and the distribution of documented occurrences of the species. There were 12 plant species and 34 wildlife species returned by the database searches. Of these, six species were determined to have the potential to occur within the BSA: burrowing owl (*Athene cunicularia*), LeConte's thrasher (*Toxostoma lecontei*), Palm Springs pocket mouse (*Perognathus longimembris bangsi*), western yellow bat (*Lasiurus xanthinus*), Colorado Desert fringe-toed lizard (*Uma nonata*), and flat-tailed horned lizard (*Phrynosoma mcallii*). Potential project effects to these species are discussed in Chapter 4.

Table 2. Special Status Species with Potential to Occur in the Project Vicinity

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
Amphibian Species						
Couch's spadefoot	*Scaphiopus couchii*	Fed: State: CDFW:	-- -- SSC	Inhabits arid and semi-arid habitats of the southwest, occurring along desert washes, in desert riparian, palm oasis, desert succulent shrub, and desert scrub habitats; may occur in cultivated cropland areas. Also associated with mesquite, creosote bush, and thorn forests. Requires friable soils for burrow excavation, often below plants or surface debris for heat protection. The species spends 8-10 months of the year burrowing in the ground, emerging for summer rains. Breeding sites often in proximity to refuges and require temporary pools that last a minimum of 7 days. Adequate insect prey, especially termites must be available (0-1,120 feet).	HP	**Presumed Absent:** The BSA is largely comprised of disturbed desert scrub and desert wash habitat and includes mesquite and creosote bush. However, the BSA falls outside the geographic range of the species which is concentrated along the Colorado River Basin.
Bird Species						
Black skimmer	*Rynchops niger*	Fed: State: CDFW:	-- -- SSC	The species occurs as a summer migrant along the Salton Sea from April through October. The San Diego Bay colony is resident year-round. The species utilizes unvegetated sandy beaches, gravel bars and low islets for nesting and roosting. Requires shallow, calm water for foraging. Eggs are laid in hollows or sand scrapes above high water. Nesting at the south end of Salton Sea begins in June and has continued into October.	A	**Presumed Absent:** The BSA does not include any shoreline of the Salton Sea and is approximately 0.6 miles from the shore at the closest point. As such, the species is presumed absent from the BSA due to a lack of suitable habitat.
Black-tailed gnatcatcher	*Polioptila melanura*	Fed: State: CDFW:	-- -- WL	The black-tailed gnatcatcher is a fairly common resident in desert wash habitat from Palm Springs to Joshua	A	**Presumed Absent:** The BSA does not include wooded desert wash habitat. The mesquite and paloverde that occur within

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				Tree National Park and along the Colorado River at elevations below 300 m (1,000 ft). A rare resident in the eastern Mojave Desert north to the Amargosa River. Primarily nests in wooded desert wash habitat but is infrequently known to occur within desert scrub habitat - specifically in winter. More common in areas with dense mesquite, paloverde, and acacia. Absent from areas where saltcedar and other exotic vegetation occurs.		the BSA are sparse individual trees and not dense cover. Furthermore, saltcedar was found throughout the BSA. Due to lack of suitable habitat, the species is presumed absent.
Burrowing owl	*Athene cunicularia*	Fed: State: CDFW:	-- -- SSC	The species inhabits arid, open areas with sparse vegetation cover such as deserts, abandoned agricultural areas, grasslands, and disturbed open habitats. Can be associated with open shrub stages of pinyon-juniper and ponderosa pine habitats. Nests in old small mammal burrows but may dig own burrow in soft soil. Nests are lines with excrement, pellets, debris, grass, and feathers. The species may use pipes, culverts, and nest boxes, and even buildings where burrows are scarce. Breeding occurs March through August (below 5,300 feet).	HP	**High Potential:** The BSA includes arid, open areas that are sparsely vegetated. In addition, the BSA includes gently sloping terrain with soft soils, and sparsely spaced mammal burrows were found throughout the BSA. There is a recent (2021) eBird occurrence located directly adjacent to Highway 86 and North Marina Drive, approximately 230 feet west of the BSA and numerous other recent occurrences south of the BSA near the Sonny Bono Salton Sea National Wildlife Refuge. No burrowing owl or signs of burrowing owl were observed during the survey. However, due to the presence of potentially suitable habitat and recent local occurrences, burrowing owls have a high potential to occur within the BSA.
California brown pelican	*Pelecanus occidentalis californicus*	Fed: State: CDFW:	DL DL FP	A permanent resident of the coastal marine environment on the Pacific Coast, with the range extending from British Columbia, Canada, south to Nayarit, Mexico. Typically found on rocky, sandy, or vegetated offshore	A	**Presumed Absent:** The BSA does not include any shoreline or aquatic habitat of the Salton Sea associated with this species. As such, the species is presumed absent from the BSA.

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				islands, beaches, open sea (for feeding), harbors, marinas, estuaries, and breakwaters. Nesting colonies are established on islands without mammalian predators and permanent human habitation. The bulk of the California brown pelican population (estimated to be about 90%) nests in Mexico. The only breeding colonies of California brown pelicans in the western United States are within the Channel Islands National Park on West Anacapa and Santa Barbara islands. The nesting season historically began in March and extended through late summer or early fall, but in recent years has often surpassed 11 months. Normal clutch size is three eggs.		
Crissal thrasher	*Toxostoma crissale*	Fed: State: CDFW:	-- -- SSC	The species inhabits a variety of desert riparian and scrub habitats, specifically with dense, low scrubby vegetation. At lower elevations, typically inhabits riparian scrub or woodland. At high elevations, typically inhabits the upper reaches of desert scrub, below pinyon-juniper foothills. Often utilizes mesquite, screwbean mesquite, ironwood, catclaw acacia, and arrowweed for nesting and cover. Can also use agricultural edges for foraging when adjacent to native vegetation. Nests in the densest portions of shrubs, from February to June (sea level to over 6,000 feet).	A	**Presumed Absent:** The BSA is sparsely vegetated and does not include dense riparian scrub or woodland habitat. All regional occurrences of the species are in dense riparian habitat along the Whitewater River or in the heavily irrigated farmland around Brawley. The nearest occurrence is approximately 10 miles from the BSA. The species is presumed absent from the BSA due to lack of suitable habitat.
Gull-billed tern	*Gelochelidon nilotica*	Fed: State:	-- --	Uncommon California summer resident known only to nest at the Salton Sea. Forages over fresh and	A	**Presumed Absent:** The BSA does not include any shoreline or aquatic habitat of

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
		CDFW:	SSC	saline emergent wetlands, lakes, mudflats, croplands, grasslands, and, rarely, brushlands. Nests are shallow depressions in soft sand, soil, or dry mud, usually lined with grasses, seaweed, or other vegetation. Species arrives in March, nests in May, and departs by September.		the Salton Sea. As such, the species is presumed absent from the BSA.
LeConte's thrasher	*Toxostoma lecontei*	Fed: State: CDFW:	-- -- SSC	An uncommon desert resident inhabiting open desert wash, desert scrub, alkali desert scrub, desert succulent shrub and Joshua tree habitats with scattered desert shrubs and cacti. Often nests in dense, spiny shrub or densely branched cactus in desert wash habitat, usually 2-8 feet above ground. Breeds January through June. The species is especially wary of human disturbance.	A	**Low to Moderate Potential:** There is a recent (2019) eBird occurrence of this species approximately 7 miles west of the BSA. The BSA includes disturbed desert scrub habitat with scattered shrubs as well as open space. Due to the presence of suitable habitat and a recent nearby occurrence, LeConte's thrasher has a low to moderate potential to occur within the BSA.
Least Bell's vireo	*Vireo bellii pusillus*	Fed: State: CDFW:	E E --	Summer resident of southern California inhabiting low elevation riparian habitats in the vicinity of water and dry river bottoms. Prefers willows, baccharis, mesquite and other low, dense vegetation as nesting site. Forages in dense brush and occasionally treetops. The species is known to occur in all four southern California national forests, with the largest population in the Los Padres National Forest (below 2,000 feet).	A	**Presumed Absent:** The BSA does not contain desert riparian vegetation or dense brush stands. In addition, no permanent sources of water are present within the BSA. The species is presumed absent from the BSA.
Mountain plover	*Charadrius montanus*	Fed: State: CDFW:	-- -- SSC	California winter resident from September to March. Found on short grassland and plowed fields on the Central Valley from Sutter and Yuba counties southward. Does not nest in California.	A	**Presumed Absent:** The BSA does not contain any grasslands or plowed fields associated with the species. The species is presumed absent from the BSA due to a lack of potentially suitable habitat.

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
Prairie falcon	*Falco mexicanus*	Fed: State: CDFW:	-- -- WL	Uncommon California permanent resident. Species associated primarily with perennial grasslands, savannahs, rangeland, agricultural fields and desert scrub. Inhabits dry, open terrain, either level or hilly. Requires sheltered cliff ledges. Breeding sites are located on cliffs, canyons, escarpments, and rock outcrops. The species is known to forage far afield. Nests on old raven or eagle stick nests. Breeds mid-February through mid-September.	A	**Presumed Absent:** The BSA does not have canyons, ledges, or rocky outcroppings which are required habitat for this species. As such, the species is presumed absent from the BSA.
Southwestern willow flycatcher	*Empidonax traillii extimus*	Fed: State: CDFW:	E E --	Breeds in riparian habitats characterized by dense vegetation in proximity to open water or saturated soil. Species is associated with dense willow-covered islands and riparian habitats at elevations up to 8,000 feet. Often in proximity to rivers, swamps, lakes, reservoirs, and other wetlands. Historically, the species nested in native vegetation, but will also use thickets of non-native tamarisk and Russian olive. Breeds in April through August.	A	**Presumed Absent:** The BSA does not include dense riparian vegetation or perennial water features. The species is presumed absent due to lack of suitable habitat.
Western snowy plover	*Charadrius nivosus*	Fed: State: CDFW:	T -- SSC	Inhabits sandy or gravelly beaches along the coast, on estuarine salt ponds, and the shores of large alkali lakes. Species requires sandy, gravelly or friable soil substrate for nesting. Nests are often in proximity to driftwood, rocks, or defoliated bushes. Breeding occurs above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely vegetated dunes, and salt pans. Breeds April to August.	A	**Presumed Absent:** The BSA does not include any shoreline or aquatic habitat of the Salton Sea. The species is presumed absent from the BSA due to the lack of potentially suitable habitat.

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
White-faced ibis	*Plegadis chihi*	Fed: State: CDFW:	-- -- WL	Inhabits rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Prefers open grasslands, meadows or marshes for foraging close to isolated, dense-topped trees for nesting and perching. Feeds in fresh emergent wetlands, shallow lacustrine waters, muddy ground of wet meadows, and irrigated or flooded pastures and croplands. Nests are built amidts tall marsh plants and sometimes mounds of vegetation. Breeds February through October.	A	**Presumed Absent:** The BSA does not include deciduous woodland habitat and is not near any marshes or perennial rivers. In addition, the BSA does not include wetlands that would provide foraging habitat for this species. The species is presumed absent from the BSA due to a lack of habitat.
Yellow-breasted chat	*Icteria virens*	Fed: State: CDFW:	-- -- SSC	An uncommon summer resident of coastal California and in foothills of the Sierra Nevada, arriving in April and departing by late September. Requires riparian thickets of willow and other brushy tangles near watercourses for nesting and foraging. Nests in dense shrubs along streams and rivers. Breeds from May-August.	A	**Presumed Absent:** The BSA does not include any riparian thickets near perennial water sources. The species is presumed absent due to lack of suitable habitat.
Yuma Ridgeway's rail	*Rallus obsoletus yumanensis*	Fed: State: CDFW:	E T FP	Inhabits fresh and brackish water emergent wetlands along the Colorado River from Needles southward, and around the Salton Sea from April to September. Prefers emergent wetland dominated by pickleweed and cordgrass. Within the brackish emergent wetlands of the Colorado River and Salton Sea, the species prefers mature stands of cattail and bulrush for nesting and foraging. Requires shallow water and mudflats for foraging, with adjacent higher vegetation for cover during high water. Breeds from March-July.	A	**Presumed Absent:** The BSA does not include any shoreline of the Salton Sea and lacks stands of cattail/bulrush for nesting and mudlfats for foraging. The species is presumed absent due to lack of suitable habitat.

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
Fish Species						
Desert pupfish	*Cyprinodon macularius*	Fed: State: CDFW:	E E --	Species is only found in small, isolated populations in the Salton Sea watershed and inhabits desert ponds, springs, marshes and streams of Southern California. The species can survive in fresh water to water with salinities up to 68 PPT and withstand temperatures from 48° to 113° F and dissolved Oxygen levels as low as 0.1 PPM. Prefers calm waters but may be found in polluted and fluctuating conditions. Spawning occurs from April-October when water temperatures begin to exceed 68° F.	A	**Presumed Absent:** The desert washes that occur within the BSA are ephemeral and are unable to support this species. There are no pools or ponds present within the BSA.
Razorback sucker	*Xyrauchen texanus*	Fed: State: CDFW:	E E FP	In California, species occurs in large, warm-water, slow moving sections of the Colorado River drainage and a few scattered lakes and basins. The species is not found in smaller tributaries and headwater streams. Species is adapted to swimming in swift currents but requires quiet waters. Spawns in shallow water with sand, gravel, mud, or rocks from December to February.	A	**Presumed Absent:** The desert washes that occur within the BSA are ephemeral and are unable to support this species. There are no pools or ponds present within the BSA.
Mammal Species						
American badger	*Taxidea taxis*	Fed: State: CDFW:	-- -- SSC	Prefers treeless, dry, open stages of most shrub and herbaceous habitats with friable soils and a supply of rodent prey. Species also inhabits forest glades, meadows, marshes, brushy areas, hot deserts, and mountain meadows. Species maintains burrows within home ranges estimated between 338-1,700 acres, dependent on seasonal activity. Burrows are	A	**Presumed Absent:** The BSA includes dry, open, desert scrub habitat; however, there have been no occurrences of this species within the Coachella Valley since 1986. Despite the presence of suitable habitat, the species is locally extirpated and presumed absent from the BSA.

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				frequently re-used, but new burrows may be created nightly. Young are born in March and April within burrows dug in relatively dry, often sandy, soil, usually in areas with sparse overstory cover. Species is somewhat tolerant of human activity, but is sensitive to automobile mortality, trapping, and persistent poisons (up to 12,000 feet).		
Pallid bat	*Antrozous pallidus*	Fed: State: CDFW:	-- -- SSC	Inhabits low elevations of deserts, grasslands, shrub lands, woodlands and forests year-round. Most common in open, dry habitats with rocky areas for roosting. Forages over open ground within 1-3 miles of day roosts. Prefers caves, crevices, and mines for day roosts, but may utilize hollow trees, bridges and buildings. Roosts must protect bats from high temperatures. Sensitive to disturbance of roosting sites. Maternity colonies form early April and young are born April-July (below 10,000 feet).	A	**Presumed Absent:** The BSA lacks caves, crevices, mines, and rocky areas that would provide potentially suitable roosting habitat for this species. Due to lack of suitable habitat, the species is presumed absent from the BSA.
Pallid San Diego pocket mouse	*Chatodipus fallax pallidus*	Fed: State: CDFW:	-- -- SSC	Species inhabits arid habitats including desert wash, pinon and juniper woodlands, and Sonoran Desert scrub communities. Species strongly associated with rocky slopes and sandy soils, which are required for burrow construction. Breeds March to May (0-4,500 feet).	A	**Presumed Absent:** This species is strongly associated with rocky slopes, which do not occur within the BSA. As such, it is presumed absent due to a lack of suitable roosting habitat.
Palm Springs pocket mouse	*Perognathus longimembris bangsi*	Fed: State: CDFW:	-- -- SSC	Species occurs only in the Coachella Valley. Inhabits flat to gently sloping topography, sparse to moderate vegetative cover, and loosely packed or sandy soils of desert wash, Sonoran Desert scrub communities with preference to creosote dominated	A	**Low to Moderate Potential:** Within the BSA, disturbed desert scrub is comprised primarily of saltbush and creosote bush, providing potentially suitable habitat for this species. In addition, there is a recent (2015) CNDDB occurrence of this species approximately 4 miles southwest the

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				desert scrub. Species is unlikely to utilize areas with compacted, stony, and cobbly soils, in saltbush dominated communities, or in areas of human disturbance. Hibernation is believed to occur below ground from October to March.		Project. Due to the presence of potentially suitable habitat and recent local occurrences, the species has a low to moderate potential to occur within the Project area.
Palm Springs round-tailed ground squirrel	*Xerospermophilus tereticaudus chlorus*	Fed: State: CDFW:	-- -- SSC	A diurnal species restricted to the Coachella Valley. Inhabits desert succulent scrub, desert wash, Sonoran Desert scrub, chenopod scrub and alkali scrub communities. Prefers open, flat, grassy areas in fine textured, sandy soil and will burrow at the base of shrubs. Population density is correlated with the quantity of winter rainfall. Found at elevations as low as -180 feet.	A	**Presumed Absent:** The BSA does not include flat grassy areas. Furthermore, there are no CNDDB observations of this species within 10 miles of the BSA and all known occurrences of the species are in the northern section of the Coachella Valley. Due to lack of suitable habitat or recent local occurrences, the species is presumed absent from the BSA.
Peninsular bighorn sheep	*Ovis canadensis nelson pop. 2*	Fed: State: CDFW:	E E FP	Peninsular bighorn sheep occur in the Peninsular Ranges, from the San Jacinto and Santa Rosa Ranges in Riverside County south into Mexico. Bighorns prefer open areas of low-growing vegetation for feeding, with steep, rugged terrain nearby as a means of escape. Requires an adequate source of water. Preferential to low sage, sagebrush, desert scrub, subalpine conifer, perennial grassland, montane chaparral, and montane riparian habitat communities.	A	**Presumed Absent:** The BSA is relatively flat and does not include steep, rugged terrain. As such, the species is presumed absent from the BSA due to the lack of habitat.
Pocketed free-tailed bat	*Nyctinomops femerosaccus*	Fed: State: CDFW:	-- -- SSC	Inhabits pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis communities. Prefers rocky desert areas with high cliffs or rock	A	**Presumed Absent:** The BSA does not include high cliffs or rocky outcrops that would provide suitable habitat for this species. Due to the lack of habitat features, the species is presumed absent from the BSA.

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				outcrops and frequently selects roosts in cliff rock crevices. Species must have an adequate drop from the roost to gain flight. Maternity sites are located in rock crevices, caverns and buildings. Young are born June-July.		
Spotted bat	*Euderma maculatum*	Fed: State: CDFW:	-- -- SSC	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests. Foraging habitat includes marshes, meadows, riparian zones, shrub-steppe, and open ponderosa pine forest. Prefers rock crevices in cliffs or caves for roosting. Species is solitary but may roost with other species. Mates in autumn and births before June (sea level-10,000 feet).	A	**Presumed Absent:** The BSA does not include high cliffs or rocky outcrops that would provide suitable habitat for this species. In addition, no suitable foraging habitat is located in proximity to the BSA. Due to the lack of critical habitat features, the species is presumed absent.
Townsend's big-eared bat	*Corynorhinus townsendii*	Fed: State: CDFW:	-- -- SSC	Species occurs throughout California in all habitats except subalpine and alpine communities. Requires caves, mines tunnels, buildings or man-made structures for day and night roosts. Rarely roots in tree cavities, limited to males and non-reproductive females. Young born May-June (0-6,561 feet 10,800 feet elevation).	A	**Presumed Absent:** The BSA does not have high cliffs, caves, or mines which would provide suitable habitat for this species. Due to the lack of critical habitat features, the species is presumed absent from the BSA.
Western mastiff bat	*Eumops perotis californicus*	Fed: State: CDFW:	-- -- SSC	Inhabits many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral. Prefers open, rugged, rocky areas where suitable crevices are available for day roosts. Roots in cliff face crevices (usually granite or consolidated sandstone), high buildings, trees and tunnels. Roosting sites must have a minimum 10-foot vertical drop. Births	A	**Presumed Absent:** The BSA does not include cliffs, crevices, trees, or tunnels that would provide suitable habitat for this species. Due to a lack of suitable habitat, the species is presumed absent.

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				early April through August or September (sea level-8,475 feet).		
Western yellow bat	*Lasiurus xanthinus*	Fed: State: CDFW:	-- -- SSC	Species known in California only in Los Angeles and San Bernardino Counties south to the Mexican border. Inhabits valley foothill riparian, desert riparian, desert wash, and palm oasis habitats in proximity to water. Species utilizes trees and palms for roosting and maternity colonies. Births in June and July (below 2,000 feet).	A	**Low to Moderate Potential:** There is a historic (1976) CNDDB occurrence of this species in Oasis, CA, approximately 1.2 miles north of the BSA. The northern extent of the BSA includes orchards of date palms that may provide suitable roosting habitat for this species. In addition, agricultural reservoirs near the northern part of the BSA may provide additional prey base for the species. Due to the presence of potentially suitable habitat features and the local historic occurrence, the species is presumed to have a low to moderate potential to occur within the northern section of the BSA where date palms are present.
Reptile Species						
Coachella Valley fringe-toed lizard	*Uma inornata*	Fed: State: CDFW:	T E --	The species is restricted to sandy habitats of the Coachella Valley floor. Requires un-stabilized, fine, wind-blown sands for burrowing with widely spaced shrubs, often within high mesquite dunes and creosote bush sand hummocks. The species spends November through February in burrows and in the sand. Breeding occurs from March through May with egg laying occurring from April to September.	A	**Presumed Absent:** The distribution of this species is limited to sand dunes in the northern part of the Coachella Valley approximatey 30 miles north of the project. The BSA does not have the aeolian sand habitat required by the species.
Colorado Desert fringe-toed lizard	*Uma notata*	Fed: State: CDFW:	-- -- SSC	Found in the Colorado and Sonoran deserts south of the Salton Sea in Imperial and San Diego County. Restricted to fine sand dunes, dry lakebeds, desert washes, and sparse desert scrub habitat communities.	HP	**Low to Moderate Potential:** The BSA is largely comprised of sparse desert scrub habitat with fine sandy soils that may be suitable for the species. In addition, the Project falls within the northern range of this species and there are recent (2018)

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				Fringe-toed lizards utilize shrubs and rodent burrows for cover. Escapes from predators via running bipedally or burrowing into the sand.		research-grade iNaturalist occurrences within 2 miles of the BSA. As such, the species has a low to moderate potential to occur.
Desert tortoise	*Gopherus agassizii*	Fed: State: CDFW:	T T --	Species inhabits a variety of habitats from flats and slopes within creosote bush scrub at lower elevations to rocky slopes in blackbrush scrub and juniper woodland at higher elevations within Mojavean desert scrub and Sonoran Desert scrub communities. Species prefers creosote bush scrub with a high diversity of perennials and high production of ephemeral plant species. Requires friable soil for burrow and nest construction, but adequately firm to prevent burrow collapse. Feeding activity is short and occurs in the spring. Mating occurs in March and April, with eggs laid in May to July at the openings of burrows. Prefers elevations at 1,000-3,000 feet but has been documented from below sea level to 7, 300 feet.	A	**Presumed Absent:** Creosote scrub habitat is present; however, the distribution of this species is limited to the Mojave and Sonoran Deserts north and east of the Salton Sea and it is not found on the western side of the Coachella Valley.
Flat-tailed horned lizard	*Phrynosoma mcallii*	Fed: State: CDFW:	-- -- SSC	Species inhabits desert scrub, desert wash, succulent shrub, and alkali scrub habitats. Common in sandy desert hardpan, gravel flats with scattered vegetation, and areas with fine windblown sand (but rarely dunes). Requires an adequate source of ants for food; species is an ant specialist, particularly Harvester ants. Hibernation occurs as early as October and can extend to March but may emerge in January or February. Breeds in early spring and may produce multiple clutches within a	HP	**Low to Moderate Potential:** The BSA has desert scrub habitat with scattered vegetation and fine sandy soils. Furthermore, there are multiple recent (2002-2014) CNDDB occurrences of this species located in the vicinity of the Project, the closest being a 2009 occurrence approximately 1.7 miles west of the Project. Due to recent local occurrences and presence of potentially suitable habitat, the species is presumed to have a low to moderate potential to occur within the BSA.

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				breeding season; young appear in July through September (below sea level-750 feet).		
Sandstone night lizard	*Xantusia gracilis*	Fed: State: CDFW:	-- -- SSC	Originally identified as a subspecies of *X. henshawi*, this species was recognized as a full species in 2001. Distribution of *X. gracilis* is limited to the Truckhaven Rocks in Anza-Borrego Desert State Park in San Diego County. The limited distribution of this species increases the risk for extinction. Will utilize small burrows and rocks for cover. Rocky refuge habitat is a critical component for habitat of this species.	A	**Presumed Absent:** The range of this species is limited to the Truckhaven Rocks about 8 miles west of the BSA.
Plant Species						
Abrams' spurge	*Euphorbia abramsiana*	Fed: State: CDFW:	-- -- 2B.2	An annual herb found in creosote bush scrub within the Mojave and Sonoran Deserts. Blooms September-November (-15-4,300 feet).	A	**Presumed Absent:** The BSA includes desert scrub habitat within the Sonoran Desert; however, the population of this species is primarily west of Blythe, 70 miles east of the BSA. Local occurrences are limited to south of Highway 78 and within the foothills of the Anza-Borrego Desert State Park. There are no CNDDB occurrences within 10 miles of the BSA. The species is presumed absent from the BSA because it is outside of the known range of the species.
California ayenia	*Ayenia compacta*	Fed: State: CDFW:	-- -- 2B.3	A perennial herb inhabiting sandy, gravelly, rocky washes and dry canyons of Mojavean desert scrub and Sonoran Desert scrub communities. Blooms March-April (500-3,600 feet).	A	**Presumed Absent:** The species is restricted to foothills and mountains above 500 feet in elevation. The BSA is about 460 feet below the documented elevation range of the species.
Coachella Valley milk-vetch	*Astragalus lentiginosus var. coachellae*	Fed: State: CDFW:	-- -- SSC	An annual herb, inhabiting loose, wind-blown, or alluvial sands of desert dunes and Sonoran Desert scrub	A	**Presumed Absent:** All occurrences of this species are north of the Salton Sea a minimum of 11 miles north of the BSA. The BSA is outside of the known

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
				communities. Blooms February-May (0-2,150 feet).		distribution of this species and the species is presumed absent.
Gravel milk-vetch	*Astralagus sabulonum*	Fed: State: CDFW:	-- -- 2B.2	An annual to perennial herb inhabiting sandy and sometimes gravelly soils of flats, washes and roadsides within desert dune, Mojavean scrub, and Sonoran Desert scrub communities. Species has some salt tolerance. Blooms February-June (-200-3,050 feet).	A	**Presumed Absent:** The BSA includes flats, washes, and roadsides of Sonoran Desert scrub habitat; however, recent observations of this species are limited to Inyo County and all local observations of the species are at least 40 years old. In addition, no milk-vetch species were observed during biological surveys which were timed to fall during the bloom period for this species. Despite the historic distribution of this species, the species is presumed absent from the BSA.
Mecca-aster	*Xylorhiza cognata*	Fed: State: CDFW:	-- -- 1B.2	A perennial herb inhabiting arid canyons and washes of creosote-bush scrub and Sonoran Desert scrub communities. Species is known mostly from Indio Hills and Mecca Hills. Blooms January-June (65-1,300 feet).	A	**Presumed Absent:** All occurrences of this species are in the foothills on the eastern side of the Coachella Valley near Mecca and Indio. The BSA is outside of the known distribution of the species.
Narrow-leaf sandpaper plant	*Petalonyx linearis*	Fed: State: CDFW:	-- -- 2B.3	A perennial shrub inhabiting sandy or rocky canyons of Mojavean desert scrub and Sonoran Desert scrub communities. Species generally occurs in creosote-bush scrub. Blooms March-May (-80-3,660 feet).	A	**Presumed Absent:** The BSA does not include any sandy or rocky canyons. As such, the species is presumed absent due to lack of suitable habitat.
Orcutt's woody-aster	*Xylorhiza orcutti*	Fed: State: CDFW:	-- -- 1B.2	A perennial herb native to California and Baja California. Known to inhabit arid canyons, barren slopes, and creosote-scrub habitat. Flowers January-May (<1,200 feet).	A	**Presumed Absent:** All local occurrences of this species are west of the BSA in the foothills of the Santa Rosa Mountains. The species is presumed absent based on the BSA being located outside of the documented distribution of the species.
Parish's desert thorn	*Lycium parishii*	Fed: State: CDFW:	-- -- 2B.3	A perennial shrub inhabiting coastal scrub and Sonoran Desert scrub. Flowers March-April (1,000-3,280 feet).	A	**Presumed Absent:** The Project falls outside of the elevational range of this species. As such, the species is presumed absent from the BSA.

Common Name	Species Name	Status		General Habitat Description	Habitat Present	Potential for Occurrence and Rationale
Peirson's pincushion	*Chaenactis carphoclinia var. peirsonii*	Fed: State: CDFW:	-- -- 1B.3	An annual herb endemic to California. Occurs in open habitats with rocky or gravelly slopes or in flats. Flowers March-April (<600 feet).	A	**Presumed Absent:** All local occurrences of this species are west of the BSA in the foothills of the Santa Rosa Mountains. The species is presumed absent based on the BSA being located outside of the documented distribution of the species.
Sand evening-primrose	*Chylismia arenaria*	Fed: State: CDFW:	-- -- 2B.2	An annual or bushy perennial herb that occurs in sandy washes, rocky slopes, or desert scrub habitat in the Sonoran Desert. Flowers March-April (500-1,400 feet).	A	**Presumed Absent:** A single historic occurrence of the species was documented on the west side of the Coachella Valley in 1976 with the exact location unknown. All other occurrences of the species are in the Chocolate Mountains on the east side of the Coachella Valley. In addition, the BSA is below the accepted elevation range of the species listed on CNDDB. The species is presumed absent from the BSA based on the project being located outside of the documented range of the species.
Singlewhorl burrobush	*Ambrosia monogyra*	Fed: State: CDFW:	-- -- 2B.2	A perennial shrub inhabiting sandy soils within chaparral and Sonoran Desert scrub communities. Blooms August-November (30-1,640 feet).	A	**Presumed Absent:** The BSA includes sandy soils and is comprised of desert scrub habitat. However, all recent occurrences of this species have been limited to San Diego County and the nearest occurrence of this species is historic (1922) 10 miles from the BSA. The species is presumed absent from the BSA due to its pattern of occurrence.
Slender woolly heads	*Nemacaulis denudata var. gracilis*	Fed: State: CDFW:	-- -- 2B.2	An annual herb inhabiting sandy soils of coastal dunes, desert dunes, and Sonoran Desert scrub communities. Blooms March-May (-160-1,640 feet).	A	**Presumed Absent:** The BSA includes sandy soils and is comprised of desert scrub habitat; however, occurrences of this species are limited to east of Joshua Tree National Park and the project is not within the range of the species.

Federal Designations (Fed): (FESA, USFWS) **E:** Federally listed, endangered **T:** Federally listed, threatened **DL**: Federally listed, delisted	**State Designations (CA):** (CESA, CDFW) **E:** State-listed, endangered **T:** State-listed, threatened
Other Designations CDFW_SSC: CDFW Species of Special Concern CDFW_FP: CDFW Fully Protected CDFW_WL: CDFW Watchlist **California Native Plant Society (CNPS) Designations:** ***Note: according to CNPS (Skinner and Pavlik 1994), plants on Lists 1B and 2 meet definitions for listing as threatened or endangered under Section 1901, Chapter 10 of the California Fish and Game Code. This interpretation is inconsistent with other definitions.*** **1A:** Plants presumed extinct in California. **1B:** Plants rare and endangered in California and throughout their range. **2:** Plants rare, threatened, or endangered in California but more common elsewhere in their range. **3:** Plants about which need more information; a review list. **Plants 1B, 2, and 4 extension meanings:** _**.1 Seriously** endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat) _**.2 Fairly** endangered in California (20-80% occurrences threatened) _**.3** Not very endangered in California (<20% of occurrences threatened or no current threats known)	
Habitat Potential Absent [A] - No habitat present and no further work needed. Habitat Present [HP] - Habitat is or may be present. The species may be present. Critical Habitat [CH] – Project is within designated Critical Habitat.	
Potential for Occurrence Criteria: **Present**: Species was observed on site during a site visit or focused survey. **High**: Habitat (including soils and elevation factors) for the species occurs on site and a known occurrence has been recorded within 5 miles of the site. **Low to Moderate**: Either low quality habitat (including soils and elevation factors) for the species occurs on site and a known occurrence exists within 5 miles of the site; or suitable habitat strongly associated with the species occurs on site, but no records were found within the database search. **Presumed Absent**: Focused surveys were conducted, and the species was not found, or species was found within the database search but habitat (including soils and elevation factors) do not exist on site, or the known geographic range of the species does not include the survey area.	
Source: (CDFW 2024b), (CNPS 2024), (Calflora 2024), (Jepson 2024), (USFWS 2024).	

Chapter 4. Results: Biological Resources, Discussion of Impacts, and Mitigation

4.1 Habitats and Natural Communities of Special Concern

The proposed pipeline alignment crosses 38 ephemeral desert washes. These washes have a fluvially defined bed, bank and channel; however, in the wake of the 2023 Sackett v. EPA Supreme Court ruling, these channels no longer meet the definition of a Water of the United States. They still are Waters of the State and are thus still a natural community of special concern discussed in detail below. Table 3. Temporary Impacts to Sensitive Natural Habitats and Figure 4. Project Impacts outline the temporary impacts anticipated to affect this habitat community. Avoidance, minimization, and mitigation measures for the impacted desert washes are discussed in this section.

4.1.1 Desert Wash Habitat

Desert washes are closely associated with sparsely vegetated arid environments down slope from steep mountains or hills. Soils in these watersheds are typically poorly developed, consisting of course sand and gravel with very little organic material and very low water holding capacity. The lack of vegetative cover in these watersheds combined with the poor water holding capacity of the soil means that precipitation that falls on upslope areas rapidly runs off resulting in rapid flood events that dissipate just a few hours or days after rain events.

Vegetation within desert wash habitat usually consist of spiny arborescent shrubs. The ultimate composition of a desert wash community is dictated by local precipitation as well as the size of the associated watershed (CDFW 2021). This habitat within the BSA is approximately 90% barren ground and 10% of vegetative cover. Observed flora included blue paloverde and smoketree; however, a majority of vegetation in this community is small shrubs including cattle saltbush, creosote bush, and non-native and invasive saltcedar.

Project Impacts to the Desert Wash Habitat

The Project is anticipated to temporarily impact 3.32 acres of desert wash during construction (Figure 4. Project Impacts). Approximately 0.93 acres of these temporary impacts fall within the right of way (ROW) of Caltrans (Appendix E. Project Impacts within Caltrans ROW). Impacts to each channel, starting at the northern end of the BSA, are outlined in Table 3 below. Temporary impacts will include linear excavation to install the proposed pipeline which will then be buried four feet deep with native material and the top surface will be regraded to pre-construction contours. To quantify temporary impacts, it was assumed that a 50-foot-wide corridor along the pipeline would need to be disturbed to accommodate trenching, spoil piles, equipment access, and material staging. Temporary access routes, staging areas, and stockpile/spoil locations would be located outside of stream channels when possible to minimize the temporary construction footprint within desert wash habitats. Most of the desert washes within the BSA are sparsely vegetated, meaning very little vegetation along these channels will be disturbed by construction. As such, the project would not permanently alter the ecological functions or values of these washes and the project would only temporarily disturb these areas. With the inclusion of seasonal restrictions, no water quality impacts are anticipated.

Table 3. Temporary Impacts to Sensitive Natural Habitats

Name of Desert Wash[1]	Temporary Impacts
	Impact Size[2]
Cophy Ditch	0.28 acres
Travertine Palms Wash	0.03 acres
Perone Ditch	0.06 acres
Dinal Ditch	0.07 acres
Avertine Ditch	0.04 acres
Shoreline Ditch	0.03 acres
Coolidge Springs	0.04 acres
Zanthe Ditch	0.04 acres
Parosa Ditch	0.21 acres
Romney Ditch	0.15 acres
Ambig Ditch	0.03 acres
Matis Ditch	0.10 acres
Calyx Ditch	0.08 acres
Godetia Ditch	0.04 acres
Farinosa Drainage	0.19 acres
Encilia Ditch	0.06 acres
Incienso Ditch	0.07 acres
Floris Ditch	0.02 acres
Folius Ditch	0.04 acres
Torif Ditch	0.27 acres
Bexar Ditch	0.07 acres
Daroca Ditch	0.17 acres
Tonalee Ditch	0.09 acres
Talofa Ditch	0.17 acres
Electra Ditch	0.05 acres
Ibycus Wash	0.02 acres
Verbena Wash	0.06 acres
Aster Wash	0.10 acres
Virgo Wash	0.08 acres
Valerie Wash Tributary	0.05 acres
Tesla Wash Tributaries	0.12 acres
Gravel Wash	0.17 acres
Coral Wash	0.07 acres
Palm Wash	0.12 acres
Anza Ditch	0.09 acres
Verde Ditch	0.01 acres
Iberia Wash at Service Road	0.02 acres
Iberia Wash at Golden Avenue	0.01 acres
Total	**3.32 acres**

[1] The naming of the desert wash corresponds to the labels on Figure 4.

[2] Impacts rounded to the nearest 0.01. The 3.32-acre impact total reflects the un-rounded total.

Proposed Alignment
County Boundaries
Water Resources

Salton Sea

Riverside County
Imperial County

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Desert Shores
Salton Sea Beach
Salton City

86

Riverside County
San Diego County
Imperial County
San Diego County

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Source: ESRI Maps Online; Dokken Engineering 3/21/2024; Created By: vchevreuil

1 inch = 5,000 feet

0 5,000 10,000 15,000 20,000 25,000 Feet

Figure 4
Project Impacts
Page 1 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

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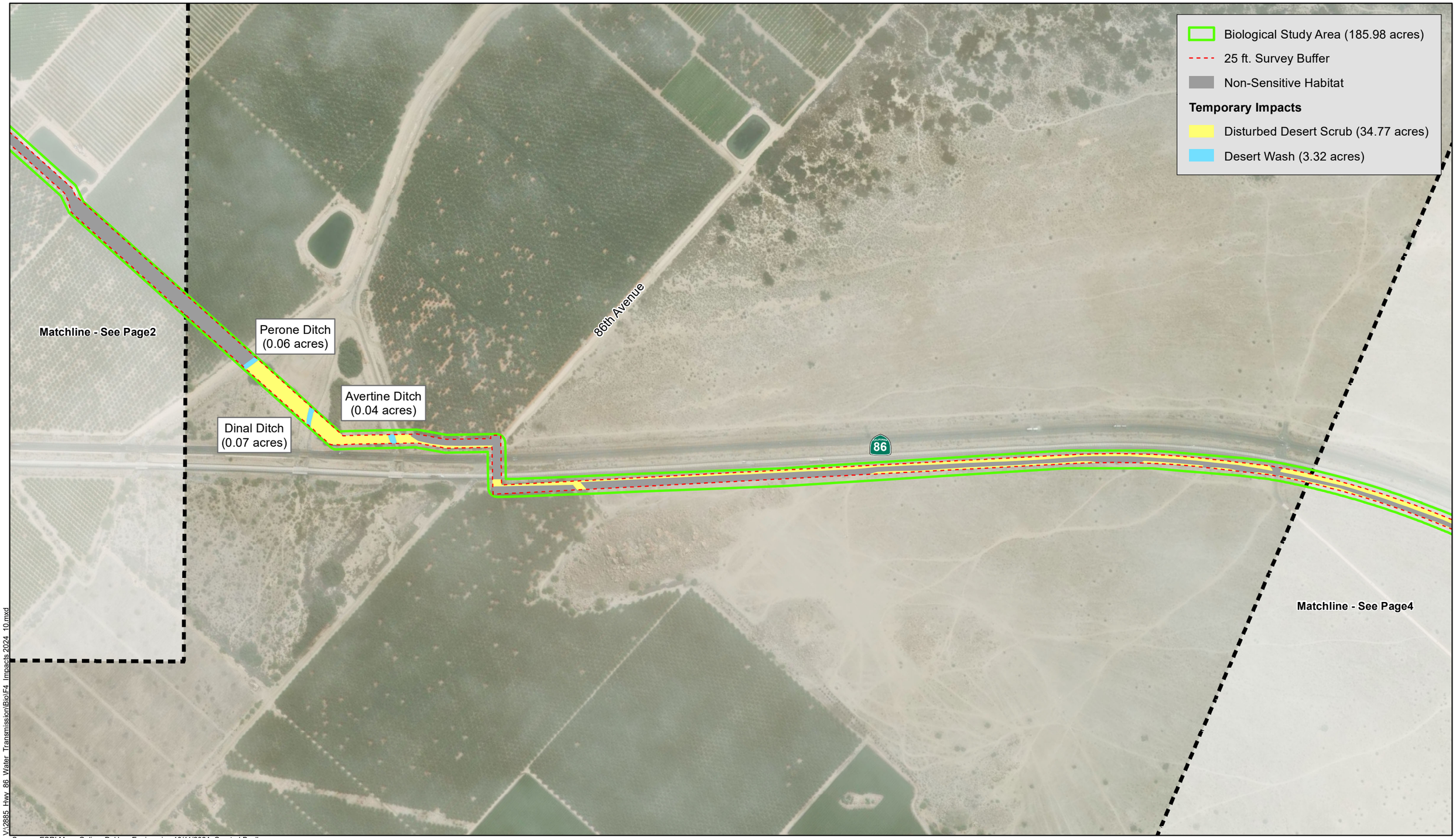
Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: lbraen

1 inch = 500 feet

0 500 1,000 1,500 2,000 2,500 Feet

Figure 4
Project Impacts
Page 2 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California



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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: Ibraen

1 inch = 500 feet

0 500 1,000 1,500 2,000 2,500 Feet

Figure 4
Project Impacts
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Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: lbraen

1 inch = 500 feet

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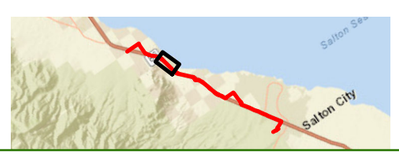

Figure 4
Project Impacts
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Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

Biological Study Area (185.98 acres)
25 ft. Survey Buffer
Non-Sensitive Habitat
Temporary Impacts
Disturbed Desert Scrub (34.77 acres)
Desert Wash (3.32 acres)

Matchline - See Page4

Coolidge Springs
(0.04 acres)

Zanthe Ditch
(0.04 acres)

Ambig Ditch
(0.03 acres)

86

Parosa Ditch
(0.21 acres)

Romney Ditch
(0.15 acres)

Matis Ditch
(0.10 acres)

Calyx Ditch
(0.08 acres)

Godetia Ditch
(0.04 acres)

Coolidge Springs Road

Matchline - See Page6

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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: lbraen

1 inch = 500 feet

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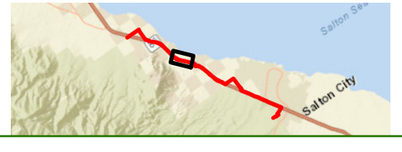

Figure 4
Project Impacts
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Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

Biological Study Area (185.98 acres)
25 ft. Survey Buffer
Non-Sensitive Habitat
Temporary Impacts
Disturbed Desert Scrub (34.77 acres)
Desert Wash (3.32 acres)

86

Godetia Ditch (0.04 acres)

Encilia Ditch (0.06 acres)

Incienso Ditch (0.07 acres)

Floris Ditch (0.02 acres)

Folius Ditch (0.04 acres)

Farinosa (0.19 acres)

Torif Ditch (0.27 acres)

Bexar Ditch (0.07 acres)

Matchline - See Page5

Matchline - See Page7

Brawley Avenue

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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: Ibraen

1 inch = 500 feet

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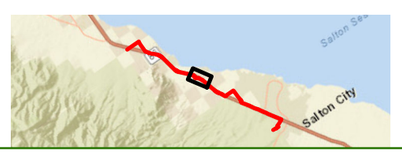

Figure 4
Project Impacts
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Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

Biological Study Area (185.98 acres)
25 ft. Survey Buffer
Non-Sensitive Habitat
Temporary Impacts
Disturbed Desert Scrub (34.77 acres)
Desert Wash (3.32 acres)

Matchline - See Page6

Matchline - See Page8

Bexar Ditch (0.07 acres)

Daroca Ditch (0.17 acres)

Tonalee Ditch (0.09 acres)

Talofa Ditch (0.17 acres)

Electra Ditch (0.05 acres)

Ibycus Wash (0.02 acres)

Verbena Wash (0.06 acres)

Aster Wash (0.10 acres)

Black Diamond Road

86

V:\2885_Hwy_86_Water_Transmission\Bio\F4_Impacts_2024_10.mxd

Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: lbraen

1 inch = 500 feet

0 500 1,000 1,500 2,000 2,500 Feet

Figure 4
Project Impacts
Page 7 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

Biological Study Area (185.98 acres)
25 ft. Survey Buffer
Non-Sensitive Habitat
Temporary Impacts
Disturbed Desert Scrub (34.77 acres)
Desert Wash (3.32 acres)

Tesla Wash Tributaries (0.12 acres)
Valerie Wash Tributary (0.05 acres)
Virgo Wash (0.08 acres)
Aster Wash (0.10 acres)
Gravel Wash (0.17 acres)
Treadwell Boulevard
86
Matchline - See Page7
Matchline - See Page9

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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: Ibraen

1 inch = 500 feet

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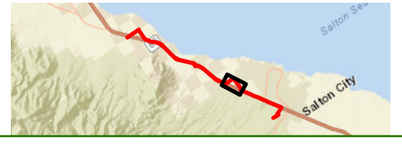

Figure 4
Project Impacts
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Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: Ibraen

1 inch = 500 feet

0 500 1,000 1,500 2,000 2,500 Feet

Figure 4
Project Impacts
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Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: Ibraen

1 inch = 500 feet

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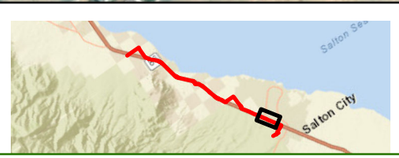

Figure 4
Project Impacts
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Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

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Source: ESRI Maps Online; Dokken Engineering 10/11/2024; Created By: Ibraen

1 inch = 500 feet

0 500 1,000 1,500 2,000 2,500 Feet

Figure 4
Project Impacts
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Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

Avoidance and Minimization Efforts for Desert Wash Habitat

The following avoidance and minimization measures will be incorporated into the Project design and Project management to reduce potential impacts to the desert washes that occur within the Project alignment:

BIO-1: Every individual working on the Project must attend a Worker Environmental Awareness Program training session delivered by the Project biologist prior to starting work on the job site. This training program will include information regarding the sensitive habitats and special status species with the potential to occur within the Project area, as well as the avoidance and minimization measures that must be complied with.

BIO-2: Best Management Practices (BMPs) will be incorporated to minimize impacts on the environment including erosion and the release of pollutants (e.g. oils, fuels):

- Exposed soils and material stockpiles must be stabilized through watering or other measures to prevent the movement of dust at the Project site caused by wind and construction activities such as off road driving, excavation, and grading activities;
- All vehicle and equipment fueling/maintenance must be sited outside any desert wash;
- Equipment used in and around desert wash habitat must not have any leaks;
- Raw cement, concrete or concrete washings, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to aquatic life must not enter any of the desert washes;
- Any accidental spills of hazardous materials must be cleaned up immediately;
- All construction materials must be hauled off-site after completion of construction;
- Upon completion of construction activities, any temporary barriers/materials within desert wash habitat must be removed in a manner that would allow flow to pass downstream with the least disturbance to the substrate.

Compensatory Mitigation for Desert Wash Habitat

No permanent impacts to desert wash habitat are anticipated as a result from the Project. In addition, temporary impacts to desert wash habitat will be returned to pre-construction conditions following the completion of construction activities. No compensatory mitigation for impacts to desert wash habitat is proposed.

4.2 Special-Status Plant Species

Prior to field surveys, a list of regional special status plant species with potential to occur within the Project vicinity was compiled from the CNPS Electronic Inventory of Rare and Endangered Plants (Appendix C. CNPS Species List). The potential for each species to occur within the BSA was determined by analyzing the habitat requirements of each species and comparing them with available habitat within the BSA and analyzing the distribution of known populations. It was determined that no special status plants have potential to be present within the BSA. Furthermore, no special status plants were identified during the biological survey conducted between April 25 and April 27, 2022. No Project-related impacts to special status plant species are anticipated.

4.3 Special-Status Wildlife Species

Prior to field surveys, a list of regional special-status wildlife species with potential to occur within the Project vicinity was compiled from the USFWS IPaC (Appendix A. USFWS Species List) and the CDFW CNDDB (Appendix B. CNDDB Species List). The potential for each species to occur within the BSA was determined by analyzing the habitat requirements of each species and comparing them with available habitat within the BSA and analyzing the distribution of known occurrences of each species. Six special status wildlife species were determined to have potential to occur within the BSA. Each species with the potential to occur within the BSA is discussed in more detail below.

4.3.1 Discussion of Burrowing Owl

The burrowing owl is not a state or federally listed species but is a CDFW Species of Special Concern and a USFWS Migratory Nongame Bird of Management Concern. In addition, burrowing owls are protected by the MBTA and CFG Code §3513 and are considered a Covered Species under the CVMSHCP. Burrowing owls were historically common throughout much of California; however, due to habitat degradation and urbanization, populations have been drastically reduced. The owl is a migrant or yearlong resident occupying disturbed open, arid habitats, particularly grasslands, deserts, and abandoned agricultural areas. The species requires friable soils for burrow construction and an adequate prey base (Zeiner et al. 1988). Burrowing owls rely on California ground squirrels (*Otospermophilus beecheyi*) and other fossorial mammals for burrow construction. Although active throughout the day, burrowing owls mainly forage nocturnally for small vertebrate and invertebrate prey including mammals, lizards, birds, and beetles (Shuford 2008). Occupied burrowing owl nests can be identified by the presence of owl excrement, pellets, debris, grass, and feathers in the vicinity of a burrow. Human development threatens burrowing owl populations by reducing available nesting habitat and decreasing rodent populations, which serve as the owl's main food source.

Survey Results

Due to the transient nature of the species and unknown temporal distance between the environmental clearance phase and construction phases of the project, a protocol breeding season survey was not completed. Instead, a habitat assessment survey was completed to identify and map the portions of the BSA that provide potentially suitable habitat and assess the distribution of burrowing owl occurrences in the region in order to determine the potential for burrowing owl to use the site.

The paved or compacted roadways and date palm orchards within the survey area do not provide suitable habitat for this species. However, the disturbed desert scrub and desert wash habitat are arid, open, and sparsely vegetated, and may provide suitable habitat for burrowing owls. These habitat communities are comprised of friable soils with mammal burrows that may serve as potentially suitable nesting habitat for this species. Disturbed desert scrub and desert wash habitat cumulatively provide approximately 95.62 acres of potential burrowing owl habitat within the BSA (Figure 3. Vegetation Communities).

There is a recent (2021) eBird occurrence of this species located at the intersection of Highway 86 and North Marina Drive, directly adjacent to the BSA. In addition, there is a recent (2006) CNDDB occurrence of this species located approximately 1 mile east of Iberia Wash as it crosses Service Road, near the southern end of the Project. Evidence of burrowing owls was not observed during the biological surveys; however, the presence of potentially suitable habitat features as

well as the recent local occurrences of the species indicate that burrowing owls have a high potential to occur during construction.

Project Impacts to Burrowing Owl

The Project is anticipated to temporarily impact approximately 34.77 acres of disturbed desert scrub habitat and approximately 3.32 acres of desert wash habitat (Figure 4. Project Impacts). Approximately 16.05 acres of temporary impacts to disturbed desert scrub and approximately 0.93 acres of temporary impacts to desert wash habitat fall within Caltrans ROW (Appendix E. Project Impacts within Caltrans ROW). Temporary impacts to these habitat communities will result from the temporary construction disturbance associated with local construction access as well as the installation of the proposed pipeline. The pipeline will be installed underground via open trench and subsurface boring; as such, no permanent impacts to disturbed desert scrub or desert wash habitat are anticipated to result following the completion of this Project. All temporary impacts within these habitat types will be restored to preconstruction conditions.

Avoidance and Minimization Efforts for Burrowing Owl

In addition to avoidance and minimization measure BIO-1, the following avoidance and minimization measures will be incorporated into the Project to minimize potential impacts to individual burrowing owl and their habitat:

BIO-3: A qualified biologist must conduct a take avoidance survey in accordance with the 2012 CDFW *Staff Report on Burrowing Owl Mitigation* within 2 months and again within 14 days prior to the start of ground disturbance for each phase of construction. Surveys must be conducted in all portions of the Project footprint that encompass suitable habitat for the species, with an approximate 50 meter buffer. If no active burrows are discovered, no further avoidance or minimization measures are required.

If burrows are detected but determined to be inactive or it is outside the burrowing owl breeding season (February 1 - August 31), exclusion methods will be implemented to prevent owls from occupying the burrows during Project activities. If active burrows are identified, a no work buffer will be placed around the burrow and CVWD must notify CDFW within 48 hours of the discovery. The buffer must be 200 meters between April 1 – Oct 15 and 50 meters between Oct 16 – Mar 31. The buffer must be demarcated with temporary high visibility fencing installed under the supervision of a biologist.

Compensatory Mitigation for Burrowing Owl

No permanent impacts to burrowing owl habitat are anticipated. The pipe alignment and temporary staging and work areas will be returned to pre-construction conditions following the completion of construction activities. No compensatory mitigation for burrowing owl is proposed.

4.3.2 Discussion of LeConte's Thrasher

LeConte's thrasher is not a state or federally listed species but is a CDFW Species of Special Concern and is protected by the MBTA and CFG Code §3513. In addition, the species is considered a Covered Species under the CVMSHCP The species is a large, long-tailed songbird found rarely in arid desert scrub habitats in southeastern California, southern Nevada, and western Arizona. The species is a year-round resident throughout most of its range. The species nests in shrubs, with some preference shown for cholla and other cacti. Pairs typically lay three to four eggs per clutch and have between one and three clutches a year. The diet of the species

is predominantly insects and other arthropods. Conversion of arid desert habitats to irrigated farmland threatens the species by allowing competing bird species to encroach into their habitat.

Survey Results

The BSA includes disturbed desert scrub habitat that consists of scattered shrubs and barren space, which may serve as potentially suitable nesting and/or foraging habitat for this species (Figure 3. Vegetation Communities). In addition, there is a recent (2019) eBird occurrence of this species located near the Santa Rosa Mountain foothills, approximately 7 miles west of the BSA. No LeConte's thrashers were observed during the biological survey conducted between April 25 and April 27, 2022; however, the species is presumed to have a low to moderate potential to occur within the BSA due to the presence of potentially suitable habitat as well as the recent eBird occurrence.

Project Impacts to LeConte's Thrasher

The Project is anticipated to temporarily impact approximately 34.77 acres of disturbed desert scrub habitat, which may serve as suitable nesting and foraging habitat for LeConte's thrasher (Figure 4. Project Impacts). Approximately 16.05 acres of temporary impacts to disturbed desert scrub habitat fall within Caltrans ROW (Appendix E). Temporary impacts to this habitat type will result from the temporary construction disturbance associated with local construction access as well as the installation of the proposed pipeline. The pipeline will be installed underground via open trench and subsurface boring; as such, no permanent impacts to disturbed desert scrub habitat are anticipated to result following the completion of this Project. All temporary impacts within this habitat type will be restored to preconstruction conditions.

Avoidance and Minimization Efforts for LeConte's Thrasher

The implementation of BIO-1 will serve to reduce impacts to this species. In addition, the following avoidance and minimization measure will be incorporated into the Project design and Project management to reduce potential impacts to LeConte's thrasher habitat that occur within the Project alignment:

BIO-4: Prior to vegetation removal or initial ground disturbance during the nesting bird season (March 1 – September 15 for passerine species and January 1 – September 15 for raptors) a pre-construction nesting bird survey must be conducted by a Project biologist prior to the start of work. The nesting bird survey must include the Project area plus a 100-foot buffer, where feasible. Within 14 days of the nesting bird survey, all project impact areas surveyed by the Project biologist must be cleared of vegetation by the contractor or a follow-up nesting bird survey is required.

A minimum 100 foot no-disturbance buffer will be established around any active nest of migratory birds and a minimum 250 foot no-disturbance buffer will be established around any nesting special status species including LeConte's thrasher and burrowing owl. The contractor must immediately stop work in the buffer area until the appropriate buffer is established and is prohibited from conducting work that could disturb the birds (as determined by the Project biologist and in coordination with wildlife agencies) in the buffer area until a qualified biologist determines the young have fledged. A reduced buffer can be established if determined appropriate by the Project biologist.

Compensatory Mitigation for LeConte's Thrasher

No permanent impacts to disturbed desert scrub habitat are anticipated to result from the Project.. No compensatory mitigation for LeConte's thrasher is proposed.

4.3.3 Discussion of Palm Springs Pocket Mouse

The Palm Springs pocket mouse is not a state or federally listed species but is a CDFW Species of Special Concern and is considered a Covered Species under the CVMSHCP. The subspecies has historically ranged from the San Gorgonio Pass to the Little San Bernardino Mountains, and south along the Peninsular Range to Borrego Valley; however, their current distribution within the Coachella Valley is not well known. Individuals typically hibernate from October to March but can also become dormant for short periods when experiencing environmental stress. The species has typically been observed within creosote scrub, desert scrub, and grassland communities with loosely packed or sandy soils. The species is less likely to occur in habitats comprised of cobbly soils and saltbush (*Atriplex*) species. Local population density of the Palm Springs pocket mouse can vary greatly, including observations of approximately 400 individuals per acre (Bolster 1998).

Survey Results

Within the BSA, disturbed desert scrub habitat is comprised primarily of cattle saltbush and creosote bush, providing marginally suitable habitat for this species (Figure 3. Vegetation Communities). In addition, there is a recent (2015) CNDDB occurrence of this species located approximately 4 miles west of the southern terminus of the Project. Due to the presence of potentially suitable habitat features as well as the recent local occurrence, the species is presumed to have a low to moderate potential to occur within the Project area.

Project Impacts to Palm Springs Pocket Mouse

The Project is anticipated to temporarily impact approximately 34.77 acres of potentially suitable Palm Springs pocket mouse habitat (Figure 4. Project Impacts). Approximately 16.05 acres of temporary impacts to disturbed desert scrub habitat fall within Caltrans ROW (Appendix E). Temporary impacts to this habitat type will result from the temporary construction disturbance associated with local construction access as well as the installation of the proposed pipeline. The pipeline will be installed underground via open trench as such, no permanent loss of disturbed desert scrub habitat are anticipated. All temporary impacts within this habitat type will be restored to preconstruction conditions.

Avoidance and Minimization Efforts for Palm Springs Pocket Mouse

The implementation of BIO-1 will serve to reduce impacts to this species. No additional avoidance and minimization measures to reduce potential impacts to Palm Springs pocket mouse and its habitat are proposed.

Compensatory Mitigation for Palm Springs Pocket Mouse

No permanent impacts to disturbed desert scrub habitat are anticipated to result from the Project. No compensatory mitigation for Palm Springs pocket mouse is proposed for this Project.

4.3.4 Discussion of Western Yellow Bat

The western yellow bat is not a Federally or State listed species but is a CDFW Species of Special Concern. Western yellow bats are a rare yearlong southern California resident from Los Angeles and San Bernardino Counties south to the Mexican border. This species occupies a range of habitats of extremely arid areas to dry areas. Western yellow bats inhabit savannas, secluded woodlands, regions dominated by pasture or croplands, and can tolerate residential areas. Typically, the species occurs close to water resources within riparian, desert riparian, desert wash and palm oasis habitats. Females usually give birth to two young in early June-July, and pregnant females have been found as early as late April. Breeding time is unknown; however, it is thought

that females store sperm and both males and females probably can breed within their first year. The species is insectivorous, feeding on a variety of insects: ants, wasps, bees, flies, mosquitoes, butterflies, moths, beetles, grasshoppers, crickets, and others. They are known to leave day roosts and begin foraging at dusk (Zeiner et al. 1988). Populations of western yellow bats are threatened and eliminated from many areas in Riverside County due to cosmetic trimming of palm fronds. The use of pesticides in date palm and other orchards may also constitute a threat to both roosting bats as well as their food sources (Cardoso 2020).

Survey Results

There is a historic (1976) CNDDB occurrence of western yellow bat located approximately 1.2 miles north of the BSA in Oasis, California. The BSA north of 86th Avenue passes through a date palm orchard, a habitat type known to be used by maternal colonies of this species (Figure 3. Vegetation Communities). Furthermore, proximal water sources are present adjacent to the BSA in the form of local agricultural reservoirs. Due to the presence of potentially suitable habitat features as well as the local historic occurrence, the species is presumed to have a low to moderate potential to occur in the date orchards in the northern portion of the BSA.

Project Impacts to Western Yellow Bat

Construction will not remove any date palms, which serve as suitable habitat for this species. Roosting bats may be temporarily disturbed by the presence of construction equipment and personnel; however, with the inclusion of appropriate avoidance and minimization measures, no direct impacts to this species are anticipated.

Avoidance and Minimization Efforts for Western Yellow Bat

The implementation of BIO-1 will serve to reduce indirect impacts to this species. In addition, measure BIO-5 will eliminate potential impacts to western yellow bat nesting habitat. No species-specific avoidance and minimization measures are proposed.

BIO-5: Removal or trimming of date palms (*Phoenix dactylifera*) should not occur during the maternity season for Western yellow bat (June 1 – July 31). If date palms must be trimmed or removed during the maternity season, the subject tree must be surveyed within 24 hours prior to the trimming or removal by a biologist with specialized experience working with bats. If evidence of current bat occupation is found, the tree cannot be removed until after the maternity season.

Compensatory Mitigation for Western Yellow Bat

No permanent impacts to western yellow bat habitat are anticipated to result from the Project. Temporary impacts to western yellow bat habitat will be returned to pre-construction conditions following the completion of construction activities in accordance with measure BIO-5. No compensatory mitigation for western yellow bat is proposed for this Project.

4.3.5 Discussion of Colorado Desert Fringe-Toed Lizard

The Colorado Desert fringe-toed lizard is not a Federal or State listed species but is a CDFW Species of Special Concern. This species occurs in the Colorado and Sonoran deserts south of the Salton Sea, in Imperial and San Diego County. This species requires loose, wind-blown sand for burrowing in order to seek refuge from predators or for hibernating during the winter. Individuals are found in sand dunes, dry lakebeds, desert washes, and sparse desert scrub habitat. As primarily insectivores, fringe-toed lizards likely require a minimum level of vegetation

within the habitat to support the arthropods found in their diet. This species is diurnal, although levels of activity fluctuate depending on the local temperature and season. Predators include roadrunners, badgers, American kestrels, and coyotes, which fringe-toed lizards avoid by running bipedally away or by diving into the sand (Zeiner et al. 1988).

Survey Results

The BSA is largely comprised of sparse desert scrub and desert wash habitat with fine sandy soils that would serve to support this species (Figure 3. Vegetation Communities). Furthermore, the BSA falls within the northern range of this species and there are several recent (2018) iNaturalist occurrences of this species within two miles of the BSA's southern extent. Due to the presence of potentially suitable habitat features as well as the recent local occurrences of this Colorado Desert fringe-toed lizard, it is anticipated that the species has a low to moderate potential to occur within the BSA.

Project Impacts to Colorado Desert Fringe-Toed Lizard

The Project is anticipated to temporarily impact approximately 3.32 acres of desert wash habitat and approximately 34.77 acres of disturbed desert scrub habitat, which may serve as suitable habitat for Colorado Desert fringe-toed lizard (Figure 4. Project Impacts). Temporary impacts to these habitats will result from construction including noise and ground disturbance from personnel and equipment. The pipeline will be installed underground via open trench and subsurface boring; as such, no permanent impacts to either desert wash or disturbed desert scrub habitat are anticipated to result following the completion of this Project. All temporary impacts within these habitat types will be restored to preconstruction conditions.

Avoidance and Minimization Efforts for Colorado Desert Fringe-Toed Lizard

The implementation of BIO-1 will serve to reduce potential impacts to this species. In addition, the following avoidance and minimization measures are proposed for Colorado Desert fringe-toed lizard:

BIO-6: To avoid inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches greater than 6 inches deep must be covered at the end of the day or contain at least one escape ramp made of earth fill or wooden planks. All holes must be inspected at the beginning of each workday and before the holes and trenches are filled. Anything stored within the holes or trenches overnight must be inspected for special status species (Colorado Desert fringe-toed lizard, flat-tailed horned lizard) before being moved.

Compensatory Mitigation for Colorado Desert Fringe-Toed Lizard

Permanent impacts to potentially suitable Colorado Desert fringed-toed lizard habitat are not anticipated as result of the Project. Compensatory mitigation for Colorado Desert fringe-toed lizard is not proposed.

4.3.6 Discussion of Flat-Tailed Horned Lizard

The flat-tailed horned lizard is not a Federally or State listed species but is a CDFW Species of Special Concern and is considered a Covered Species under the CVMSHCP. This species inhabits areas of fine sand in desert washes and flats in the desert areas of San Diego, Imperial, and Riverside counties in California, southwestern Arizona, and northern Baja California, and in Sonora, Mexico. This lizard typically occurs in flat sparse desert scrub habitats dominated by creosote bush and bursage on fine, sandy, alkaline soils. Most of the species' current known

range occurs from north of the Algodones Dunes, south to the Mexican border. The flat-tailed horned lizard is also known to occur along the north edge of the Salton Sea, in the vicinity of Thousand Palms, and south of I-10 at the north end of Palm Springs (Zeiner et al. 1988).

Survey Results

The BSA encompasses desert scrub and desert wash habitat with scattered vegetation and fine, sandy soils (Figure 3. Vegetation Communities). Furthermore, there are multiple recent (2002-2014) CNDDB occurrences of this species located in the vicinity of the Project, the closest being a 2009 occurrence located approximately 1.7 miles west of the Project. Due to the recent local occurrences and presence of potentially suitable habitat features, the species is presumed to have a low to moderate potential to occur within the BSA.

Project Impacts to Flat-Tailed Horned Lizard

The Project is anticipated to temporarily impact approximately 3.32 acres of desert wash habitat and approximately 34.77 acres of disturbed desert scrub habitat, which may serve as suitable habitat for flat-tailed horned lizard (Figure 4. Project Impacts). Temporary impacts to these habitats will result from construction including noise and ground disturbance from personnel and equipment. The pipeline will be installed underground via open trench and subsurface boring; as such, no permanent impacts to either desert wash or disturbed desert scrub habitat are anticipated to result following the completion of this Project. All temporary impacts within these habitat types will be restored to preconstruction conditions.

Avoidance and Minimization Efforts for Flat-Tailed Horned Lizard

The implementation of BIO-1 will serve to reduce potential impacts to this species. additional avoidance and minimization measures are proposed for flat-tailed horned lizard.

Compensatory Mitigation for Flat-Tailed Horned Lizard

Permanent impacts to potentially suitable flat-tailed horned lizard habitat are not anticipated as result of the Project. Compensatory mitigation for flat-tailed horned lizard is not proposed.

Chapter 5. Conclusions and Regulatory Determinations

5.1 Federal Endangered Species Act Consultation Summary

Table 4. Federally Listed Species Determinations lists the eight federally listed species that were returned via database searches and the effect determinations made for each species. No federally listed species are anticipated to occur within the BSA; as such, consultation with the USFWS regarding federally listed species is not required.

Table 4. Federally Listed Species Determinations

Common Name	Scientific Name	Potential	Fed. Status	Determination
Coachella Valley fringe-toed lizard	*Uma inornata*	Absent	Threatened	No Effect
Desert pupfish	*Cyprinodon macularius*	Absent	Endangered	No Effect
Desert tortoise	*Gopherus agassizii*	Absent	Threatened	No Effect
Least Bell's vireo	*Vireo bellii pusillus*	Absent	Endangered	No Effect
Peninsular bighorn sheep	*Ovis canandensis pop. 2*	Absent	Endangered	No Effect
Razorback sucker	*Xyrauchen texanus*	Absent	Endangered	No Effect
Western snowy plover	*Charadrius nivosus nivosus*	Absent	Threatened	No Effect
Yuma Ridgeway's rail	*Rallus obsoletus obsoletus*	Absent	Endangered	No Effect

5.2 California Endangered Species Act Consultation Summary

No state-listed species are anticipated to occur within the BSA; as such, consultation with CDFW under California Fish and Game Code Section 2081 is not required.

5.3 Wetlands and Other Waters Coordination Summary

As discussed in Section 2.1.1, the ephemeral desert washes and drainages within the Project Area are no longer considered WOTUS in the wake of the Sackett ruling; however, these features are still considered Waters of the State. CDFW and the Colorado River Basin regional Water Board retain regulatory authority over these areas. As such, a §1600 Streambed Alteration Agreement from CDFW and a Waste Discharge Requirement are still required prior to the commencement of work. The Regional Water Board, at their discretion, may decide that due to the small scale of impacts, these crossings are exempt from obtaining a WDR but that decision will be made after final design in coordination with the Board.

5.4 Invasive Species

In February 1999, EO 13112 was signed, requiring Federal agencies to work on preventing and controlling the introduction and spread of invasive species. Measure BIO-7 will be incorporated into the Project plans to ensure that invasive species are not introduced or spread.

BIO-7: Prior to arrival at the Project site and prior to leaving the Project site, construction equipment that may contain invasive plants and/or seeds will be cleaned to reduce the spreading of noxious weeds.

5.5 Other

5.5.1 General Wildlife

To minimize and avoid potential effects to local wildlife, the following measures BIO-8 and BIO-9 have been incorporated into the Project design.

BIO-8: All food-related trash must be disposed into closed containers and must be removed from the Project area daily. Construction personnel must not feed or otherwise attract wildlife to the Project area.

BIO-9: The contractor must not apply rodenticide or herbicide within the Project area during construction.

5.5.2 Migratory Birds

Native birds are protected by the MBTA and CFG Code §3513. The implementation of measure BIO-4 would avoid all potential impacts to migratory birds.

Chapter 6. References

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Appendix A: USFWS Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
Phone: (760) 431-9440 Fax: (760) 431-5901

In Reply Refer To: March 07, 2024
Project Code: 2024-0059056
Project Name: Highway 86 Water Transmission Main Phases 3 and 4 Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated 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 (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, 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 Act, 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 IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through IPaC by completing the same process used to receive the enclosed list.

The purpose of the Act 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 Act 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 (or other undertakings having similar physical impacts) 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. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal 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: https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service (fws.gov).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

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:

Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
(760) 431-9440

PROJECT SUMMARY

Project Code: 2024-0059056
Project Name: Highway 86 Water Transmission Main Phases 3 and 4 Project
Project Type: Water Supply Pipeline - New Constr - Below Ground
Project Description: The CVWD proposes to install a 30-inch water transmission main as part of the Highway 86 Water Transmission Main Phases 3 and 4 Project (Project) in Riverside County and Imperial County, California

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@33.3604341,-116.0200252596653,14z

Counties: Imperial and Riverside counties, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 7 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
Peninsular Bighorn Sheep *Ovis canadensis nelsoni* Population: Peninsular CA pop. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4970	Endangered

BIRDS

NAME	STATUS
Least Bell's Vireo *Vireo bellii pusillus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5945	Endangered
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened
Yuma Ridgway's Rail *Rallus obsoletus yumanensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3505	Endangered

REPTILES

NAME	STATUS
Desert Tortoise *Gopherus agassizii*	Threatened

Population: Wherever found, except AZ south and east of Colorado R., and Mexico
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/4481

FISHES

NAME	STATUS
Desert Pupfish *Cyprinodon macularius*	Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/7003

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Dokken Engineering
Name: Vincent Chevreuil
Address: 110 Blue Ravine Road #200
City: Folsom
State: CA
Zip: 95630
Email vchevreuil@dokkenengineering.com
Phone: 9168580642

Appendix B: CNDDB Species List

Selected Elements by Common Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Truckhaven (3311538) OR Seventeen Palms (3311631) OR Oasis (3311641) OR Fonts Point (3311632) OR Rabbit Peak (3311642) OR Salton (3311548) OR Borrego Mountain (3311622) OR Shell Reef (3311621) OR Kane Spring NW (3311528))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Abrams' spurge *Euphorbia abramsiana*	PDEUP0D010	None	None	G4	S2	2B.2
Active Desert Dunes *Active Desert Dunes*	CTT22100CA	None	None	G4	S2.2	
Algodones Dunes sunflower *Helianthus niveus ssp. tephrodes*	PDAST4N0Z2	None	Endangered	G4T2T3	S1	1B.2
burrowing owl *Athene cunicularia*	ABNSB10010	None	None	G4	S2	SSC
California ayenia *Ayenia compacta*	PDSTE01020	None	None	G4	S3	2B.3
California brown pelican *Pelecanus occidentalis californicus*	ABNFC01021	Delisted	Delisted	G4T3T4	S3	
chaparral sand-verbena *Abronia villosa var. aurita*	PDNYC010P1	None	None	G5T2?	S2	1B.1
cheeseweed owlfly (cheeseweed moth lacewing) *Oliarces clara*	IINEU04010	None	None	G1G3	S2	
Colorado Desert fringe-toed lizard *Uma notata*	ARACF15020	None	None	G3	S2	SSC
Desert Fan Palm Oasis Woodland *Desert Fan Palm Oasis Woodland*	CTT62300CA	None	None	G3	S3.2	
desert pupfish *Cyprinodon macularius*	AFCNB02060	Endangered	Endangered	G1	S1	
flat-tailed horned lizard *Phrynosoma mcallii*	ARACF12040	None	None	G3	S3	SSC
Gander's cryptantha *Cryptantha ganderi*	PDBOR0A120	None	None	G2G3	S1	1B.1
great blue heron *Ardea herodias*	ABNGA04010	None	None	G5	S4	
Le Conte's thrasher *Toxostoma lecontei*	ABPBK06100	None	None	G4	S3	SSC
little-leaf elephant tree *Bursera microphylla*	PDBUR01020	None	None	G4	S2	2B.3
mountain plover *Charadrius montanus*	ABNNB03100	None	None	G3	S2	SSC
narrow-leaf sandpaper-plant *Petalonyx linearis*	PDLOA04010	None	None	G4	S3?	2B.3

Selected Elements by Common Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Orcutt's woody-aster *Xylorhiza orcuttii*	PDASTA1040	None	None	G3?	S3	1B.2
Palm Springs pocket mouse *Perognathus longimembris bangsi*	AMAFD01043	None	None	G5T2	S1	SSC
Parish's desert-thorn *Lycium parishii*	PDSOL0G0D0	None	None	G4	S1	2B.3
Peirson's milk-vetch *Astragalus magdalenae var. peirsonii*	PDFAB0F532	Threatened	Endangered	G3G4T1	S1	1B.2
Peirson's pincushion *Chaenactis carphoclinia var. peirsonii*	PDAST20042	None	None	G5T2	S2	1B.3
Peninsular bighorn sheep DPS *Ovis canadensis nelsoni pop. 2*	AMALE04012	Endangered	Threatened	G4T3Q	S2	FP
prairie falcon *Falco mexicanus*	ABNKD06090	None	None	G5	S4	WL
razorback sucker *Xyrauchen texanus*	AFCJC11010	Endangered	Endangered	G1	S2	FP
sand evening-primrose *Chylismia arenaria*	PDONA03020	None	None	G4?	S2S3	2B.2
sandstone night lizard *Xantusia gracilis*	ARACK01040	None	None	G1	S2	SSC
Santa Rosa Mountains leptosiphon *Leptosiphon floribundus ssp. hallii*	PDPLM090J3	None	None	G4T1T2	S1S2	1B.3
Stabilized and Partially Stabilized Desert Dunes *Stabilized and Partially Stabilized Desert Dunes*	CTT22200CA	None	None	G4	S3.2	
Thurber's pilostyles *Pilostyles thurberi*	PDRAF01010	None	None	G5	S4	4.3
western mastiff bat *Eumops perotis californicus*	AMACD02011	None	None	G4G5T4	S3S4	SSC
western snowy plover *Charadrius nivosus nivosus*	ABNNB03031	Threatened	None	G3T3	S3	SSC
western yellow bat *Lasiurus xanthinus*	AMACC05070	None	None	G4G5	S3	SSC
white-faced ibis *Plegadis chihi*	ABNGE02020	None	None	G5	S3S4	WL

Record Count: 35

Appendix C: CNPS Species List

CALIFORNIA NATIVE PLANT SOCIETY

CNPS Rare Plant Inventory

Search Results

21 matches found. Click on scientific name for details

Search Criteria: Quad is one of [**3311538:3311631:3311632:3311642:3311548:3311622:3311621:3311528:3311641**]

▲ COMMON NAME	SCIENTIFIC NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
Abrams' spurge	*Euphorbia abramsiana*	Euphorbiaceae	annual herb	(Aug)Sep-Nov	None	None	G4	S2	2B.2		2001-01-01	No Photo Available
Algodones Dunes sunflower	*Helianthus niveus* ssp. *tephrodes*	Asteraceae	perennial herb	Sep-May	None	CE	G4T2T3	S1	1B.2		1974-01-01	 © 2014 Keir Morse
Borrego milk-vetch	*Astragalus lentiginosus* var. *borreganus*	Fabaceae	annual herb	Feb-May	None	None	G5T5?	S4	4.3		1974-01-01	No Photo Available
California ayenia	*Ayenia compacta*	Malvaceae	perennial herb	Mar-Apr	None	None	G4	S3	2B.3		1974-01-01	No Photo Available
chaparral sand-verbena	*Abronia villosa* var. *aurita*	Nyctaginaceae	annual herb	(Jan)Mar-Sep	None	None	G5T2?	S2	1B.1		2001-01-01	 © 2011 Aaron E. Sims
Cooper's rush	*Juncus cooperi*	Juncaceae	perennial herb	Apr-May(Aug)	None	None	G4	S3	4.3		1974-01-01	 © 2018 Neal Kramer
Gander's cryptantha	*Cryptantha ganderi*	Boraginaceae	annual herb	Feb-May	None	None	G2G3	S1	1B.1		1974-01-01	No Photo Available
little-leaf elephant tree	*Bursera microphylla*	Burseraceae	perennial deciduous tree	Jun-Jul	None	None	G4	S2	2B.3		1980-01-01	No Photo Available
narrow-leaf sandpaper-plant	*Petalonyx linearis*	Loasaceae	perennial shrub	(Jan-Feb)Mar-May(Jun-Dec)	None	None	G4	S3?	2B.3		2016-09-16	No Photo Available

Newberry's velvet-mallow	*Horsfordia newberryi*	Malvaceae	perennial shrub	Feb-Dec	None	None	G5	S4	4.3		2001-01-01	No Photo Available
Orcutt's woody-aster	*Xylorhiza orcuttii*	Asteraceae	perennial herb	Mar-Apr	None	None	G3?	S2	1B.2		1974-01-01	No Photo Available
Parish's desert-thorn	*Lycium parishii*	Solanaceae	perennial shrub	Mar-Apr	None	None	G4	S1	2B.3		1980-01-01	No Photo Available
Peirson's milk-vetch	*Astragalus magdalenae* var. *peirsonii*	Fabaceae	perennial herb	Dec-Apr	FT	CE	G3G4T1	S1	1B.2		1974-01-01	No Photo Available
Peirson's pincushion	*Chaenactis carphoclinia* var. *peirsonii*	Asteraceae	annual herb	Mar-Apr	None	None	G5T2	S2	1B.3	Yes	1994-01-01	No Photo Available
pink velvet-mallow	*Horsfordia alata*	Malvaceae	perennial shrub	Feb-Dec	None	None	G5	S4	4.3		2001-01-01	No Photo Available
ribbed cryptantha	*Johnstonella costata*	Boraginaceae	annual herb	Feb-May	None	None	G4G5	S4	4.3		1974-01-01	No Photo Available
Salton milk-vetch	*Astragalus crotalariae*	Fabaceae	perennial herb	Jan-Apr	None	None	G4G5	S4	4.3		1974-01-01	No Photo Available
sand evening-primrose	*Chylismia arenaria*	Onagraceae	annual/perennial herb	Nov-May	None	None	G4?	S2S3	2B.2		2001-01-01	No Photo Available
Santa Rosa Mountains leptosiphon	*Leptosiphon floribundus* ssp. *hallii*	Polemoniaceae	perennial herb	May-Jul(Nov)	None	None	G4T1T2	S1S2	1B.3	Yes	1988-01-01	 © 2016 Keir Morse
slender-lobed four o'clock	*Mirabilis tenuiloba*	Nyctaginaceae	perennial herb	(Feb)Mar-May	None	None	G5	S4	4.3		1974-01-01	No Photo Available
Thurber's pilostyles	*Pilostyles thurberi*	Apodanthaceae	perennial herb (parasitic)	Dec-Apr	None	None	G5	S4	4.3		1974-01-01	No Photo Available

Showing 1 to 21 of 21 entries

Suggested Citation:

California Native Plant Society, Rare Plant Program. 2024. Rare Plant Inventory (online edition, v9.5). Website https://www.rareplants.cnps.org [accessed 7 March 2024].

Appendix D: Representative Photographs

Photo 1. Representative photograph of the disturbed desert scrub habitat that occurs within the BSA. This habitat community is sparsely vegetated by low-lying shrubs (April 2022).

Photo 2. Representative photograph of a typical roadway crossing over a desert wash channel along the alignment. Taken of Virgo Wash (April 2022).

Photo 3. Representative photograph of the Valerie Wash tributary, which occurs within the disturbed desert scrub habitat between Highway 86 and Lesser Drive (February 2024).

Photo 4. Typical OHWM indicators of desert washes included changes in soil texture and composition, sediment sorting, and shelving along the banks of the channel, as seen above. Channels were highly disturbed due to vehicular activity. Taken of Zanthe Ditch (April 2022).

Photo 5. Representative photograph of the vehicle disturbance that is present throughout the natural communities found within the BSA. Photo is of Coral Wash (April 2022).

Photo 6. Representative photograph of the barren access route present along the utility corridor adjacent to Highway 86 (April 2022).

Photo 7. Barren habitat present south of Sunset Drive in Salton City (April 2022).

Appendix E: Project Impacts within Caltrans ROW

Proposed Alignment
County Boundaries
Water Resources

Salton Sea

Riverside County
Imperial County

Page 2
Page 3
Page 4
Page 5
Page 6
Page 7
Page 8
Page 9
Page 10
Page 11

Desert Shores
Salton Sea Beach
Salton City

86

Riverside County
San Diego County
Imperial County
San Diego County

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Source: ESRI Maps Online; Dokken Engineering 3/21/2024; Created By: vchevreuil

1 inch = 5,000 feet

0 5,000 10,000 15,000 20,000 25,000 Feet

Figure 5
Project Impacts within Caltrans ROW
Page 1 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

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Source: ESRI Maps Online; Dokken Engineering 9/3/2024; Created By: scotts

1 inch = 500 feet

0 500 1,000 1,500 2,000 2,500 Feet

Figure 5
Project Impacts within Caltrans ROW
Page 2 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

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Source: ESRI Maps Online; Dokken Engineering 9/3/2024; Created By: scotts

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Figure 5
Project Impacts within Caltrans ROW
Page 3 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
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Source: ESRI Maps Online; Dokken Engineering 9/3/2024; Created By: scotts

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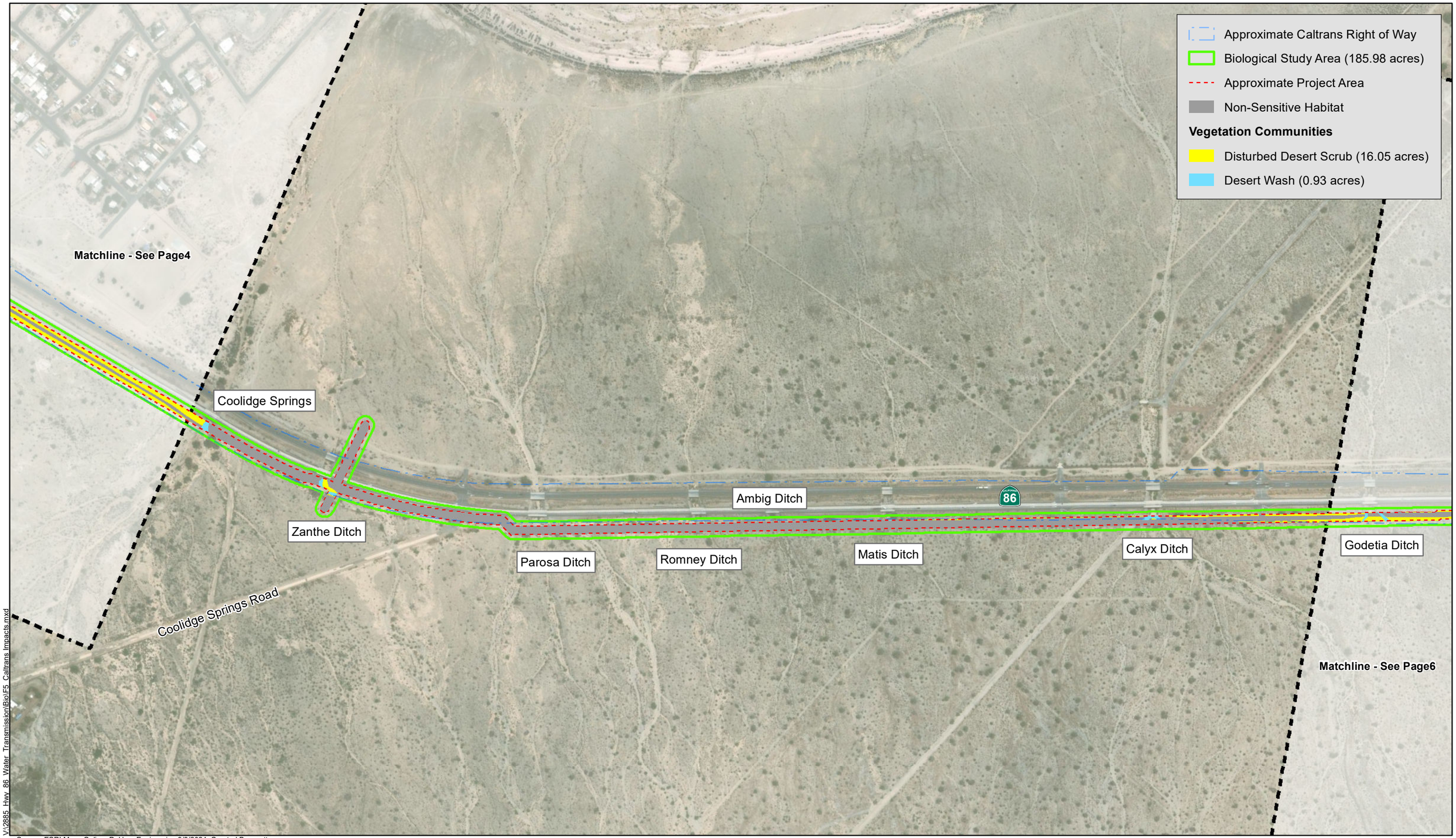
Figure 5
Project Impacts within Caltrans ROW
Page 4 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California



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Source: ESRI Maps Online; Dokken Engineering 9/3/2024; Created By: scotts

1 inch = 500 feet

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Figure 5
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Riverside and Imperial Counties, California

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Source: ESRI Maps Online; Dokken Engineering 9/3/2024; Created By: scotts

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Figure 5
Project Impacts within Caltrans ROW
Page 6 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

Approximate Caltrans Right of Way
Biological Study Area (185.98 acres)
Approximate Project Area
Non-Sensitive Habitat

Vegetation Communities

Disturbed Desert Scrub (16.05 acres)
Desert Wash (0.93 acres)

Matchline - See Page6

Matchline - See Page8

Bexar Ditch

Daroca Ditch

Tonalee Ditch

Talofa Ditch

Electra Ditch

Ibycus Wash

Verbena Wash

Aster Wash

Black Diamond Road

86

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Source: ESRI Maps Online; Dokken Engineering 9/3/2024; Created By: scotts

1 inch = 500 feet

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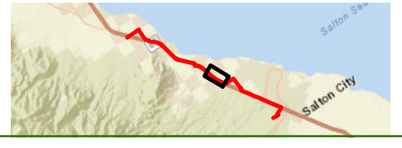

Figure 5
Project Impacts within Caltrans ROW
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Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

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Source: ESRI Maps Online; Dokken Engineering 9/3/2024; Created By: scotts

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Figure 5
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Source: ESRI Maps Online; Dokken Engineering 9/3/2024; Created By: scotts

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Figure 5
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Figure 5
Project Impacts within Caltrans ROW
Page 11 of 11
Coachella Valley Water District
Highway 86 Water Transmission Main Phases 3 and 4
Riverside and Imperial Counties, California

Appendix F: Avoidance and Minimization Measures

BIO-1: Every individual working on the Project must attend a Worker Environmental Awareness Program training session delivered by the Project biologist prior to starting work on the job site. This training program will include information regarding the sensitive habitats and special status species with the potential to occur within the Project area, as well as the avoidance and minimization measures that must be complied with.

BIO-2: Best Management Practices (BMPs) will be incorporated to minimize impacts on the environment including erosion and the release of pollutants (e.g. oils, fuels):

- Exposed soils and material stockpiles must be stabilized through watering or other measures to prevent the movement of dust at the Project site caused by wind and construction activities such as off road driving, excavation, and grading activities;
- All vehicle and equipment fueling/maintenance must be sited outside any desert wash;
- Equipment used in and around desert wash habitat must not have any leaks;
- Raw cement, concrete or concrete washings, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to aquatic life must not enter any of the desert washes;
- Any accidental spills of hazardous materials must be cleaned up immediately;
- All construction materials must be hauled off-site after completion of construction;
- Upon completion of construction activities, any temporary barriers/materials within desert wash habitat must be removed in a manner that would allow flow to pass downstream with the least disturbance to the substrate.

BIO-3: A qualified biologist must conduct a take avoidance survey in accordance with the 2012 CDFW *Staff Report on Burrowing Owl Mitigation* within 2 months and again within 14 days prior to the start of ground disturbance for each phase of construction. Surveys must be conducted in all portions of the Project footprint that encompass suitable habitat for the species, with an approximate 50 meter buffer. If no active burrows are discovered, no further avoidance or minimization measures are required.

If burrows are detected but determined to be inactive, exclusion methods will be implemented to prevent owls from occupying the burrows during Project activities. If active burrows are identified, a no work buffer will be placed around the burrow and CVWD must notify CDFW within 48 hours of the discovery. The buffer must be 200 meters between April 1 – Oct 15 and 50 meters between Oct 16 – Mar 31. The buffer must be demarcated with temporary high visibility fencing installed under the supervision of a biologist.

BIO-4: Prior to vegetation removal or initial ground disturbance during the nesting bird season (March 1 – September 15 for passerine species and January 1 – September 15 for raptors) a pre-construction nesting bird survey must be conducted by a Project biologist prior to the start of work. The nesting bird survey must include the Project area plus a 100-foot buffer, where feasible. Within 14 days of the nesting bird survey, all project impact areas surveyed by the Project biologist must be cleared of vegetation by the contractor or a follow-up nesting bird survey is required.

A minimum 100 foot no-disturbance buffer will be established around any active nest of migratory birds and a minimum 250 foot no-disturbance buffer will be established around any nesting special status species including LeConte's thrasher and burrowing owl. The contractor must immediately stop work in the buffer area until the appropriate buffer is established and is prohibited from conducting work that could disturb the birds (as determined by the Project biologist and in coordination with wildlife agencies) in the buffer area until a qualified biologist determines the young have fledged. A reduced buffer can be established if determined appropriate by the Project biologist.

BIO-5: Removal or trimming of date palms (Phoenix dactylifera) should not occur during the maternity season for Western yellow bat (June 1 – July 31). If date palms must be trimmed or removed during the maternity season, the subject tree must be surveyed within 24 hours prior to the trimming or removal by a biologist with specialized experience working with bats. If evidence of current bat occupation is found, the tree cannot be removed until after the maternity season.

BIO-6: To avoid inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches greater than 6 inches deep must be covered at the end of the day or contain at least one escape ramp made of earth fill or wooden planks. All holes must be inspected at the beginning of each workday and before the holes and trenches are filled. Anything stored within the holes or trenches overnight must be inspected for special status species (Colorado Desert fringe-toed lizard, flat-tailed horned lizard) before being moved.

BIO-7: Prior to arrival at the Project site and prior to leaving the Project site, construction equipment that may contain invasive plants and/or seeds will be cleaned to reduce the spreading of noxious weeds.

BIO-8: All food-related trash must be disposed into closed containers and must be removed from the Project area daily. Construction personnel must not feed or otherwise attract wildlife to the Project area.

BIO-9: The contractor must not apply rodenticide or herbicide within the Project area during construction.

Appendix C

Cultural Resources Inventory Report

This document contains information that is considered to be confidential due to the sensitivity of historical and archaeological resources. Therefore, this document is not included in published versions of the Technical Appendices for this IS/MND.

Appendix D

Energy Calculations

Table 1 – Total Construction-Related Fuel Consumption

Highway 86 Water Transmission Main

Fuel	Consumption	
Diesel		
On-Road Construction Trips[1]	25,545	Gallons
Off-Road Construction Equipment[2]	50,600	Gallons
Diesel Total	**76,145**	**Gallons**
Gasoline		
On-Road Construction Trips[1]	3,590	Gallons
Off-Road Construction Equipment[3]	-	Gallons
Gasoline Total	**3,590**	**Gallons**

Notes:

1. On-road mobile source fuel use based on vehicle miles traveled (VMT) from CalEEMod for construction in 2024 and fleet-average fuel consumption in gallons per mile from EMFAC2021 web based data for Salton Sea Air Basin. See Table 2 for calculation details.
2. Off-road mobile source fuel usage based on a fuel usage rate of 0.05 gallons of diesel per horsepower (HP)-hour, based on SCAQMD CEQA Air Quality Handbook, Table A9-3E.
3. All emissions from off-road construction equipment were assumed to be diesel.

Table 2 – On-Road Construction Trip Estimates

Highway 86 Water Transmission Main

Trip Type	Trips	Trip length	Vehicle Miles Traveled (VMT)	Fuel Efficiency	Annual Fuel Usage[1]	
	(trips)	(miles)	(miles)	(mpg)	(Fuel)	(gallon)
Worker[2,3]	6,116	14.6	89,294	24.3	Gasoline	3,590
Vendor[4]	6,176	6.2	38,291	7.6	Diesel	5,264
Hauling[5]	6,176	20	123,520	6.1	Diesel	20,281

Notes:

1. On-road mobile source fuel use based on vehicle miles traveled (VMT) from CalEEMod output for construction and fleet-average fuel consumption in gallons per mile from EMFAC2021 web based data for 2023 in Salton Sea Air Basin.
2. Worker trips were assumed to be 100% gasoline powered vehicles.
3. Per CalEEMod, worker Trips were assumed to be 50% LDA, 25% LDT1, and 25% LDT2.
4. Vendor trips were assumed to be 50% MHDT and 50% HHDT, split evenly between the MHDT and HHDT construction categories.
5. Per CalEEMod, hauling trips were assumed to be 100% HHDT.

Appendix E

Geotechnical Investigation Report

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Science
Inspection & Testing Services

GEOTECHNICAL INVESTIGATION REPORT

HIGHWAY 86 WATER TRANSMISSION MAIN, PHASES 3 & 4

Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

CONVERSE PROJECT NO. 21-81-260-02

Prepared For:

ALBERT A. WEBB ASSOCIATES
3788 McCray Street
Riverside, CA 92506

Presented By:

CONVERSE CONSULTANTS
2021 Rancho Drive, Suite 1
Redlands, CA 92373
909-796-0544

September 12, 2023

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

September 12, 2023

Mr. Shane Bloomfield, PE
Senior Engineer
Albert A. Webb Associates
3788 McCray Street
Riverside, CA 92506

Subject: **GEOTECHNICAL INVESTIGATION REPORT**
Highway 86 Water Transmission Main, Phases 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
Converse Project No. 21-81-260-02

Dear Mr. Bloomfield:

Converse Consultants (Converse) is pleased to submit this geotechnical investigation report to assist with the design and construction of Highway 86 Water Transmission Main, Phases 3 & 4 project, located in the Riverside and Imperial Counties, California. This report is prepared in accordance with our revised proposal dated October 20, 2021, and your Subconsultant Agreement for Professional Services dated January 17, 2022.

Based upon our field investigation, laboratory data, and analyses, the proposed project is considered feasible from a geotechnical standpoint, provided the recommendations presented in this report are incorporated into the design and construction of the project.

We appreciate the opportunity to be of continued service to Albert A. Webb Associates (Webb), and Coachella Valley Water District (CVWD). Should have any questions, please contact the undersigned at 909-474-2847.

CONVERSE CONSULTANTS

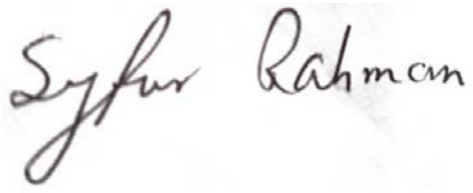
Hashmi S. E. Quazi, PhD, PE, GE
Principal Engineer

Dist.: 1-Electronic-PDF/Addressee
HSQ/EH/SR/kvg

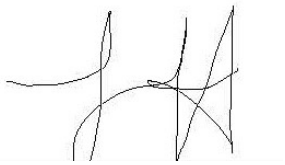
PROFESSIONAL CERTIFICATION

This report has been prepared by the following professionals whose seals and signatures appear herein.

The findings, recommendations, specifications and professional opinions contained in this report were prepared in accordance with the generally accepted professional engineering and engineering geologic principle and practice in this area of Southern California. We make no other warranty, either expressed or implied.



SK Syfur Rahman, PhD, EIT
Sr. Staff Engineer



Elizabeth Hernandez
Staff Geologist

Hashmi S. E. Quazi, PhD, PE, GE
Principal Engineer

TABLE OF CONTENTS

FIGURES

Following Page No.

TABLES

Page No.

APPENDICES

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation performed by Converse for the Highway 86 Water Transmission Main, Phases 3 & 4 project, located in the Riverside and Imperial Counties, California. The project location is shown in Figure No. 1a through 1g, *Approximate Alignment Location Maps.*

The purpose of this investigation was to evaluate the nature and engineering properties of the subsurface soils and groundwater conditions, and to provide geotechnical recommendations for the design and construction of the proposed pipeline.

This report was prepared for the project described herein and is intended for use solely by Albert A. Webb Associates, and Coachella Valley Water District (CVWD), and their authorized agents. This report may be made available to the prospective bidders for bidding purposes. However, the bidders are responsible for their own interpretation of the alignment conditions between and beyond the boring locations, based on factual data contained in this report. This report may not contain sufficient information for use by others and/or other purposes.

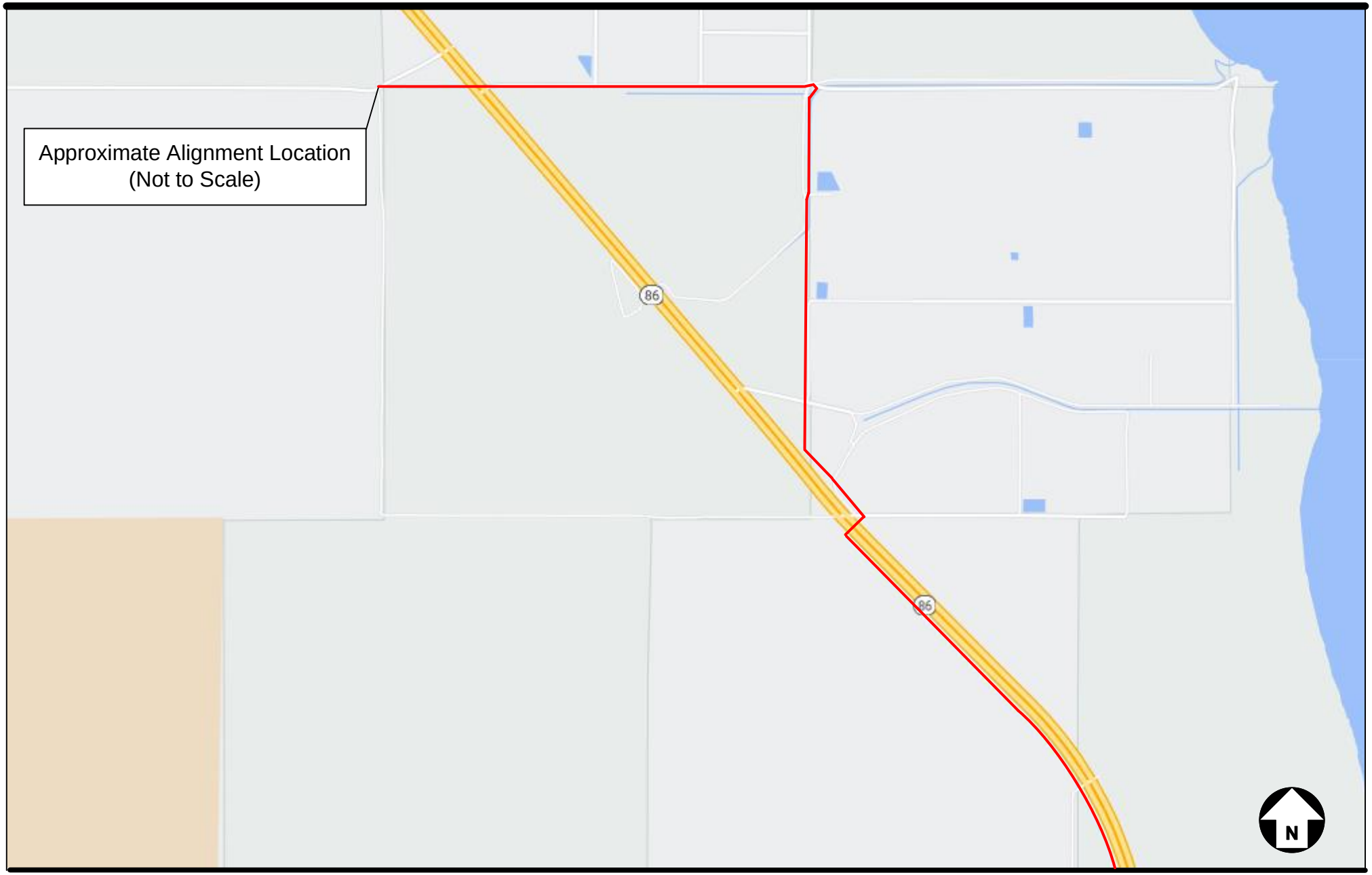
2.0 PROJECT DESCRIPTION

The project is intended to identify various opportunities and constraints in order to determine a preferred pipeline alignment that minimizes right-of-way acquisition, clearly identifies permit requirements, minimize potential tribal and environmental impacts, is cost-effective, and provides the necessary environmental approvals to secure state and federal funding.

According to the information provided by Albert A. Webb Associates, the Highway 86 Water Transmission, Phases 3 & 4 project, will require a preliminary engineering report, final plans, specifications, cost estimate and final design document. Phases 3 & 4 will replace approximately 13.4 miles of existing 16-inch and 18-inch diameter transmission mains.

The depth of pipe invert will be between 7.0-8.0 feet below existing ground surface (bgs). At existing structures crossings, the pipe will be installed using the bore and jack technique. It is anticipated that at 4 locations the pipe will be installed using the bore and jack technique.

The existing pipeline is currently within Caltrans right-of-way. We understand that Caltrans may not allow the new transmission main to be placed longitudinally within their right-of-way. In addition, the new pipeline alignment may cross tribal lands.



Project: Highway 86 Water Transmission Main, Phase 3 & 4

Location: 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

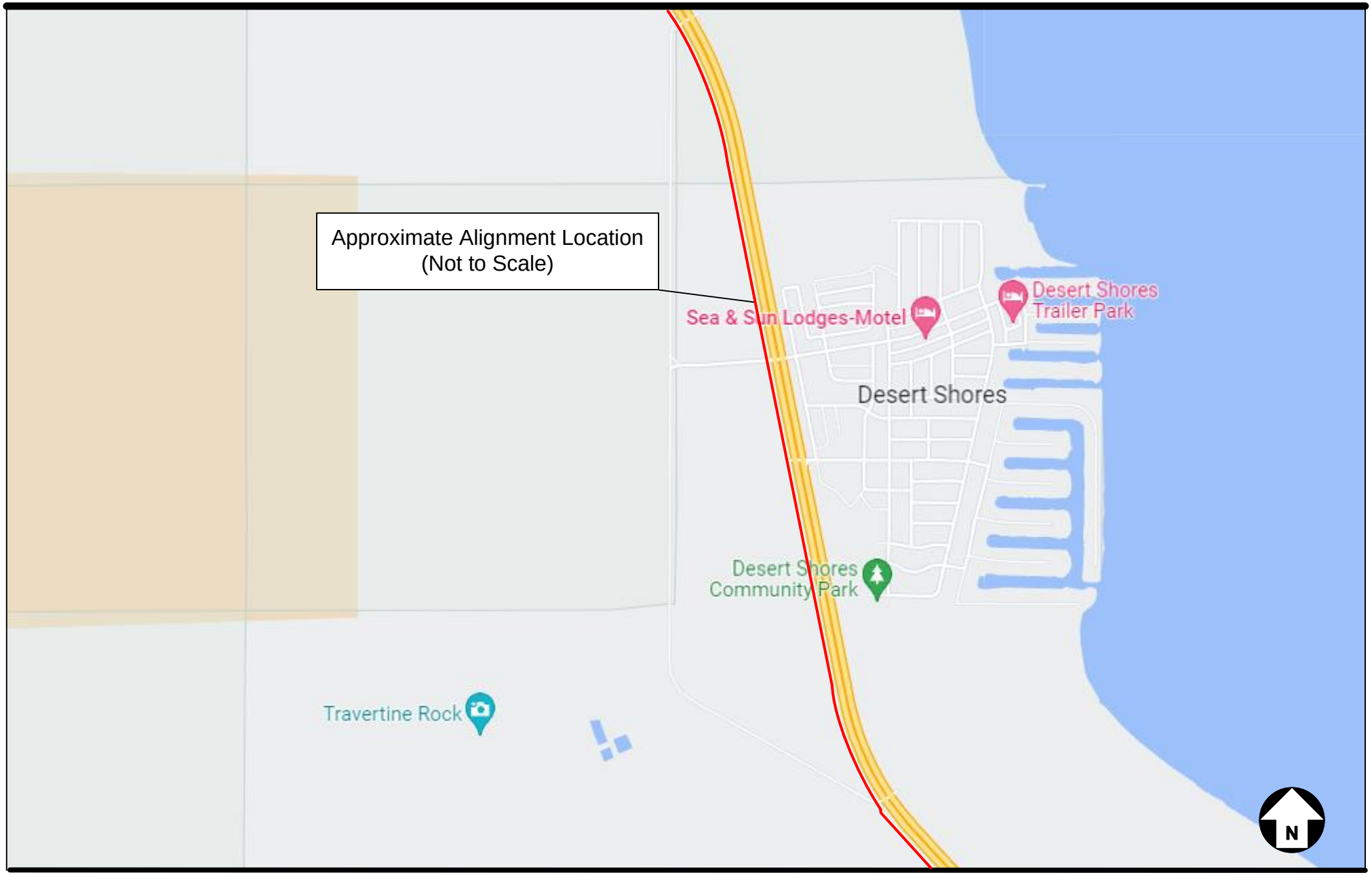
For: Albert A. Webb Associates

Approximate Alignment Location Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
1a



Project: Highway 86 Water Transmission Main, Phase 3 & 4

Location: 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

For: Albert A. Webb Associates

Approximate Alignment Location Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
1b

Project: Highway 86 Water Transmission Main, Phase 3 & 4

Location: 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

For: Albert A. Webb Associates

Approximate Alignment Location Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
1c

Project: Highway 86 Water Transmission Main, Phase 3 & 4

Location: 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

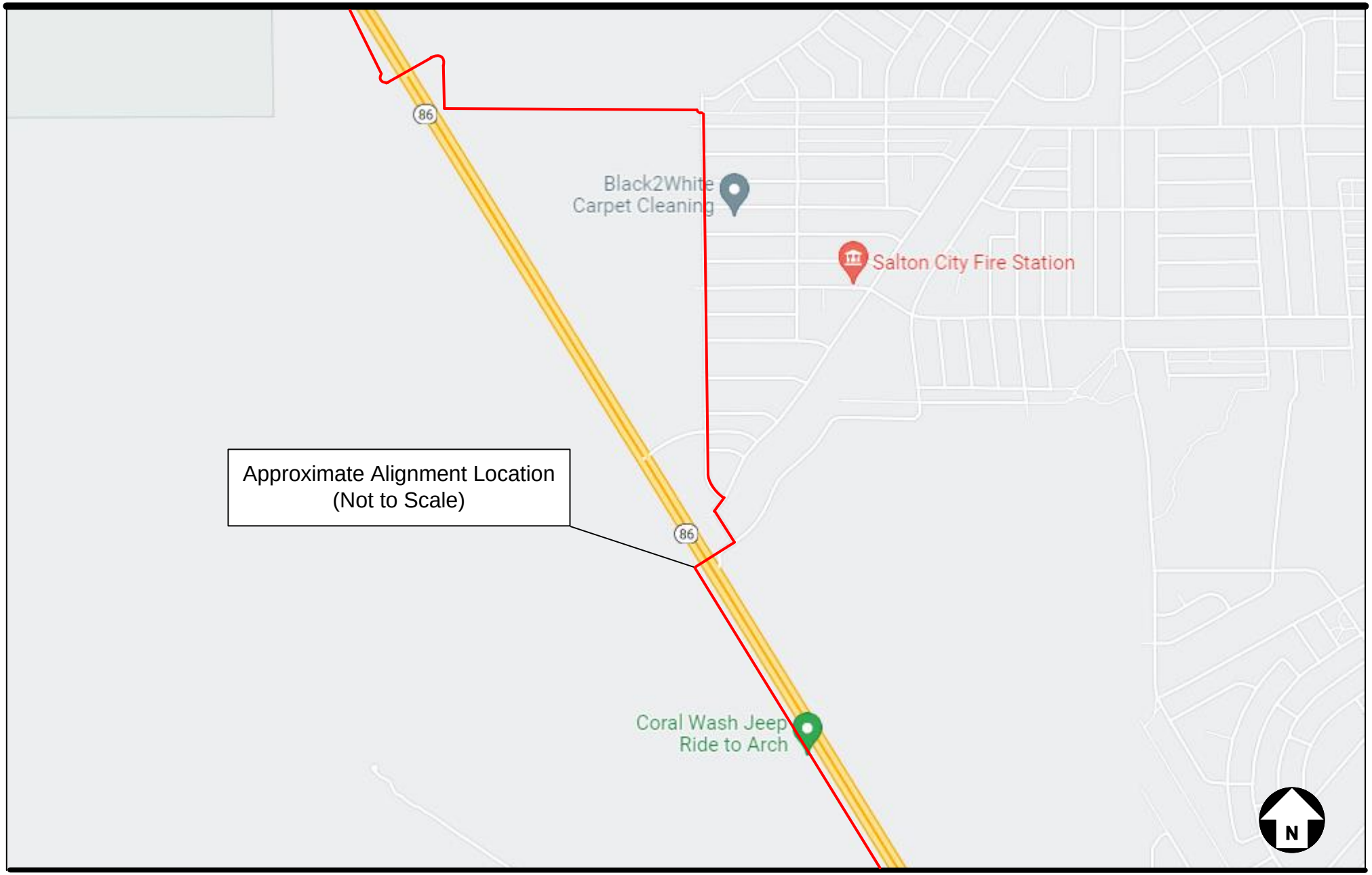
For: Albert A. Webb Associates

Approximate Alignment Location Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
1d



Project: Highway 86 Water Transmission Main, Phase 3 & 4

Location: 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

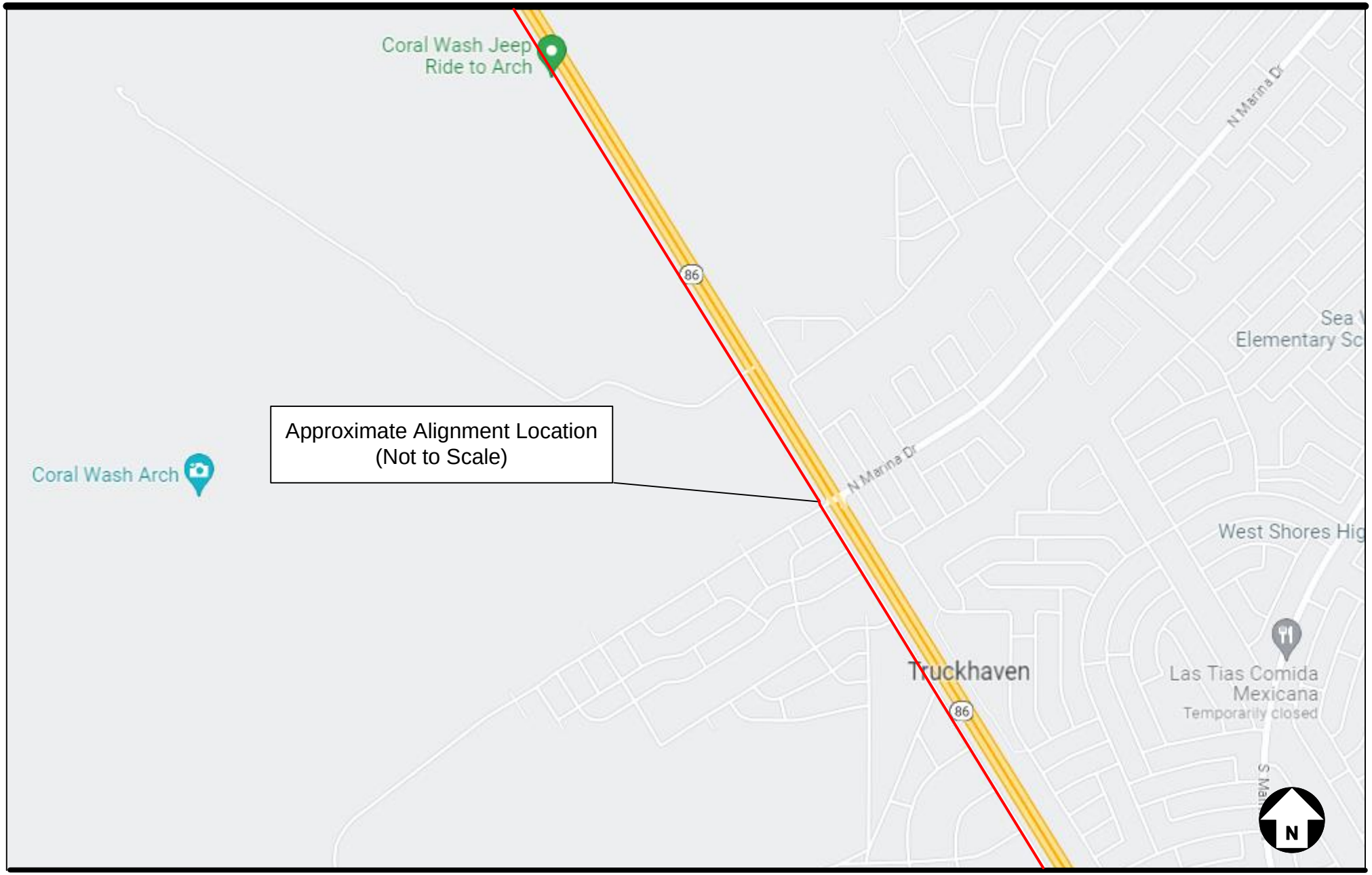
For: Albert A. Webb Associates

Approximate Alignment Location Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
1e



Project: Highway 86 Water Transmission Main, Phase 3 & 4

Location: 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

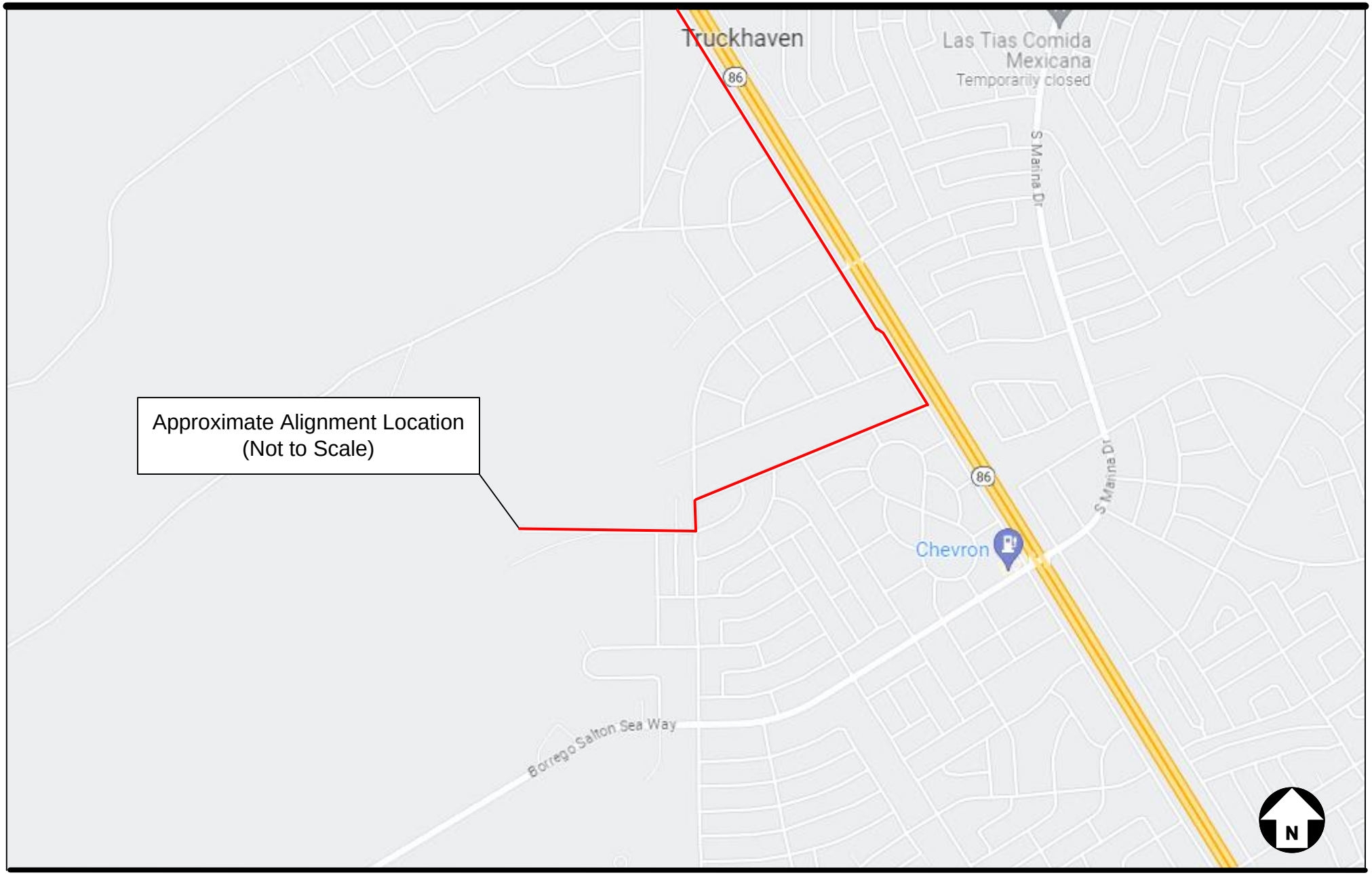
For: Albert A. Webb Associates

Approximate Alignment Location Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
1f



Project: Highway 86 Water Transmission Main, Phase 3 & 4

Location: 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

For: Albert A. Webb Associates

Approximate Alignment Location Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
1g

3.0 SCOPE OF WORK

The scope of this investigation included project set-up, subsurface exploration, laboratory testing, engineering analysis, and preparation of this report, as described in the following sections.

3.1 Project Set-up

As part of the project setup, we conducted the following.

- Conducted an alignment reconnaissance within the project area and marked the borings so that drill rig access to all the locations was available.
- Obtained permit from Riverside County Transportation Department and California Department of Transportation (Caltrans).
- Notified Underground Service Alert (USA) at least 48 hours prior to the investigation to clear the locations of any conflict with existing underground utilities.
- Engaged a California-licensed driller to drill exploratory borings.

3.2 Subsurface Exploration

The subsurface exploration included borings and test pits.

Borings

Nineteen exploratory borings (BH-01 through BH-17, BH-01A and BH-06A) were drilled from July 10, 2023, to July 14, 2023, to investigate the subsurface conditions. The planned depths of the borings were between 15.0 and 30.0 feet below ground surface (bgs). The borings were drilled to the maximum depths between 3.5 and 31.5 feet bgs. Due to refusal on potential gravel, cobbles, and boulder, some of the borings were terminated at shallower depths. The borings details are presented in the following table.

Table No. 1, Summary of Borings

Boring No.	Boring Depth (ft., bgs)		Groundwater Depth (ft., bgs)	Date Completed
	Proposed	Completed		
BH-01	15.0	6.0	N/E	7/11/23
BH-01A	15.0	13.0	N/E	7/11/23
BH-02	25.0	26.5	N/E	7/14/23
BH-03	25.0	26.5	N/E	7/10/23
BH-04	30.0	31.5	N/E	7/12/23
BH-05	15.0	16.5	N/E	7/10/23
BH-06	15.0	3.5	N/E	07/10/23
BH-06A	15.0	15.5	N/E	07/10/23

Boring No.	Boring Depth (ft., bgs)		Groundwater Depth (ft., bgs)	Date Completed
	Proposed	Completed		
BH-07	15.0	15.5	N/E	07/10/23
BH-08	25.0	26.5	N/E	07/10/23
BH-09	30.0	31.5	N/E	07/11/23
BH-10	25.0	25.5	N/E	07/12/23
BH-11	25.0	26.5	N/E	07/14/23
BH-12	15.0	16.5	N/E	07/11/23
BH-13	15.0	16.5	N/E	07/11/23
BH-14	15.0	16.5	N/E	07/11/23
BH-15	15.0	16.5	N/E	07/13/23
BH-16	15.0	16.3	N/E	07/13/23
BH-17	15.0	15.7	N/E	07/13/23

Test Pits

Four exploratory test pits (TP-01 through TP-04) were excavated on August 3, 2023, using a backhoe equipped with a 3 feet-wide bucket. The test pits were excavated between 10.0 feet and 10.4 feet below the existing ground surface (bgs). The test pits details are presented in the following tables.

Table No. 2, Summary of Test Pits

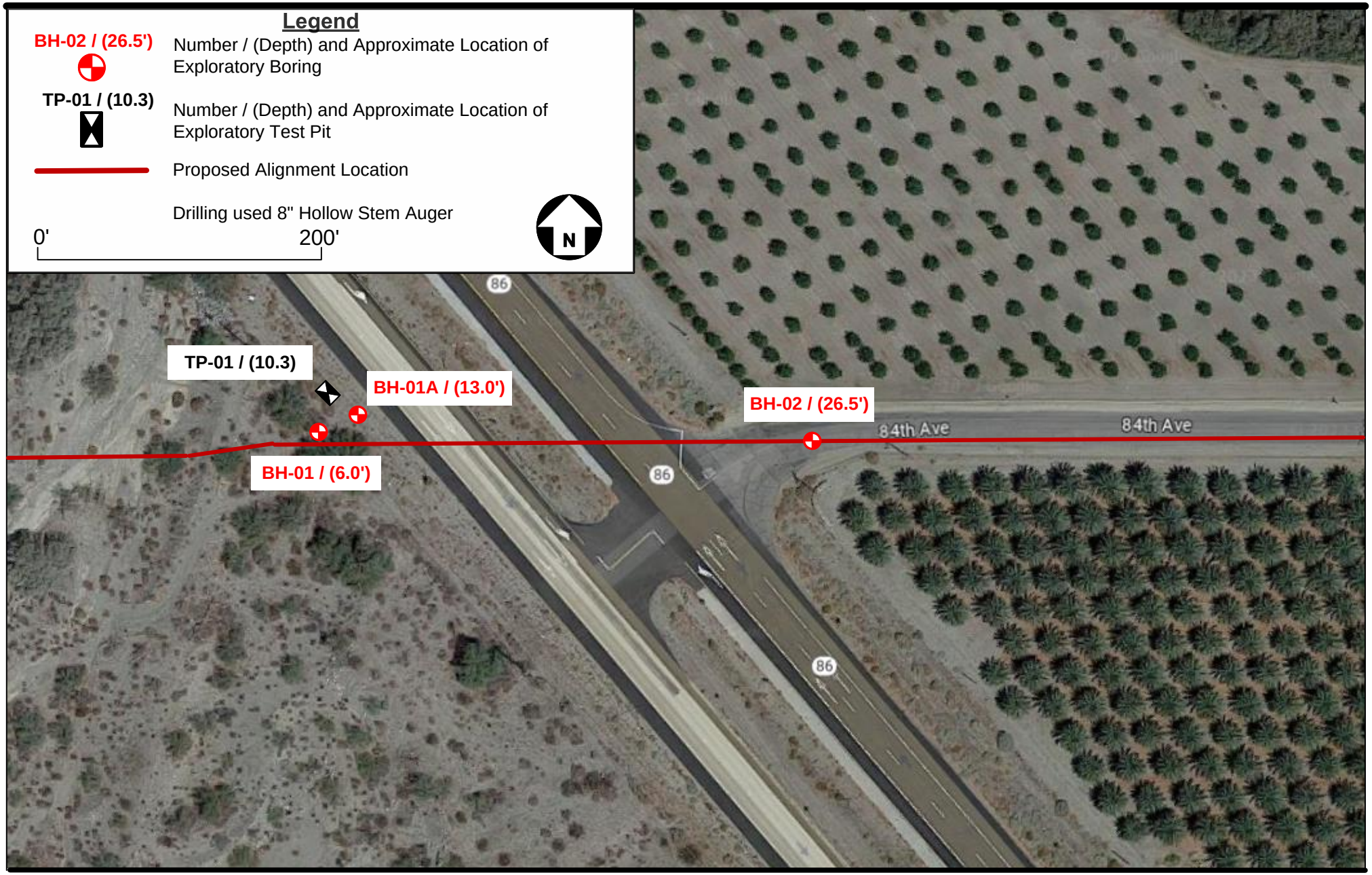
Test Pit No.	Test Pit Depth (ft., bgs)		Groundwater Depth (ft., bgs)	Date Completed
	Proposed	Completed		
TP-01	10.0	10.3	N/E	08/03/23
TP-02	10.0	10.0	N/E	08/03/23
TP-03	10.0	10.3	N/E	08/03/23
TP-04	10.0	10.4	N/E	08/03/23

Approximate boring and test pit locations are indicated in Figure Nos. 2a through 2k, *Approximate Boring and Test Pit Locations Maps*. For a description of the field exploration and sampling program, see Appendix A, *Field Exploration*.

3.3 Laboratory Testing

Representative soil samples of the project were tested in the laboratory to aid in the soils classification and to evaluate the relevant engineering properties of the soils. These tests included the following.

- *In*-situ moisture contents and dry densities (ASTM D2216 and ASTM D2937)
- Soil corrosivity (California Tests 643, 422, and 417)



Project: Highway 86 Water Transmission Main, Phase 3 & 4

Location: 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

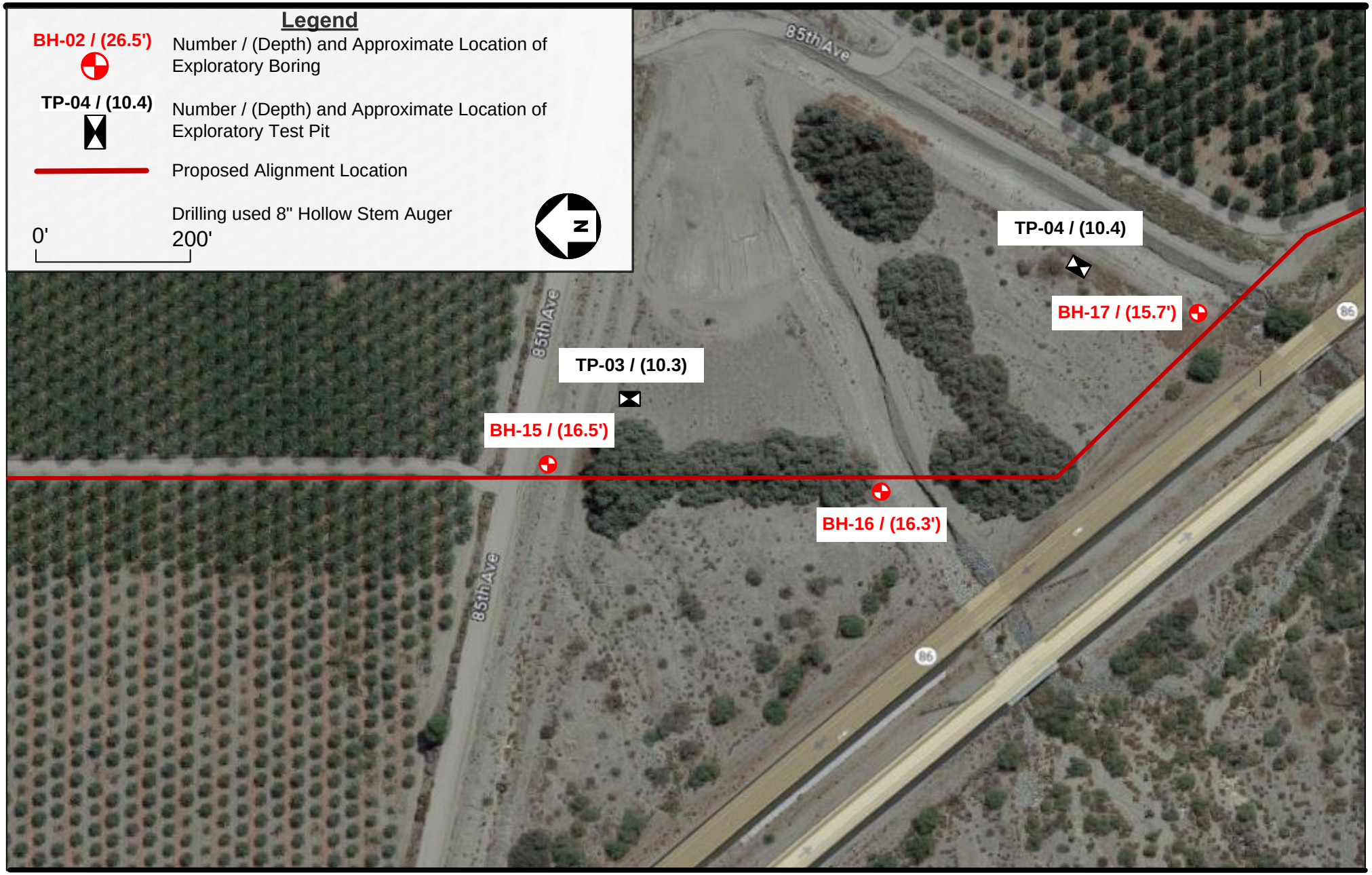
For: Albert A. Webb Associates

Approximate Boring and Test Pit Locations Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
2a



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Approximate Boring and Test Pit Locations Map

Project No.
21-81-260-02

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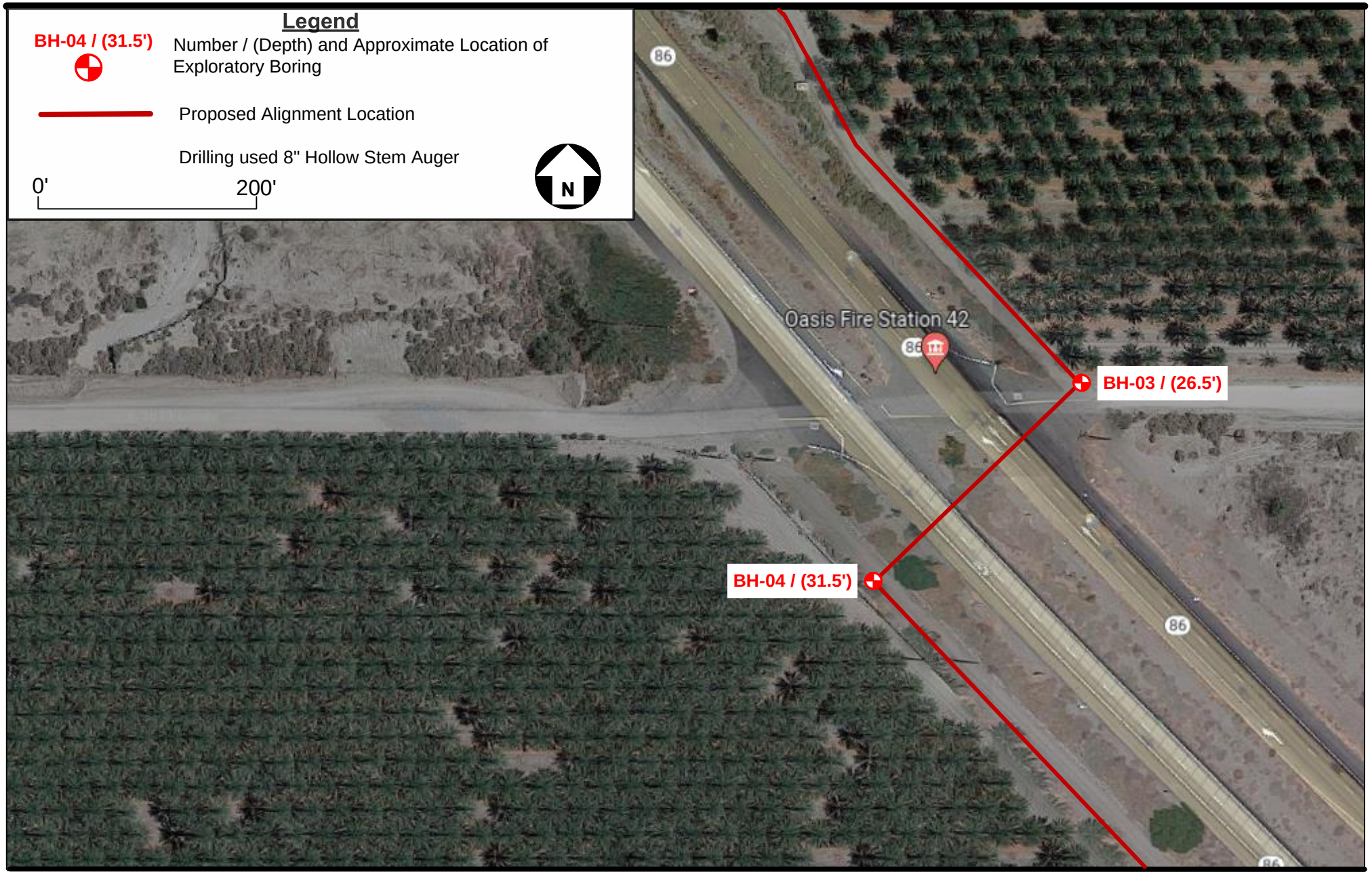
Figure No.
2b



Project: Highway 86 Water Transmission Main, Phase 3 & 4

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Riverside and Imperial Counties, California

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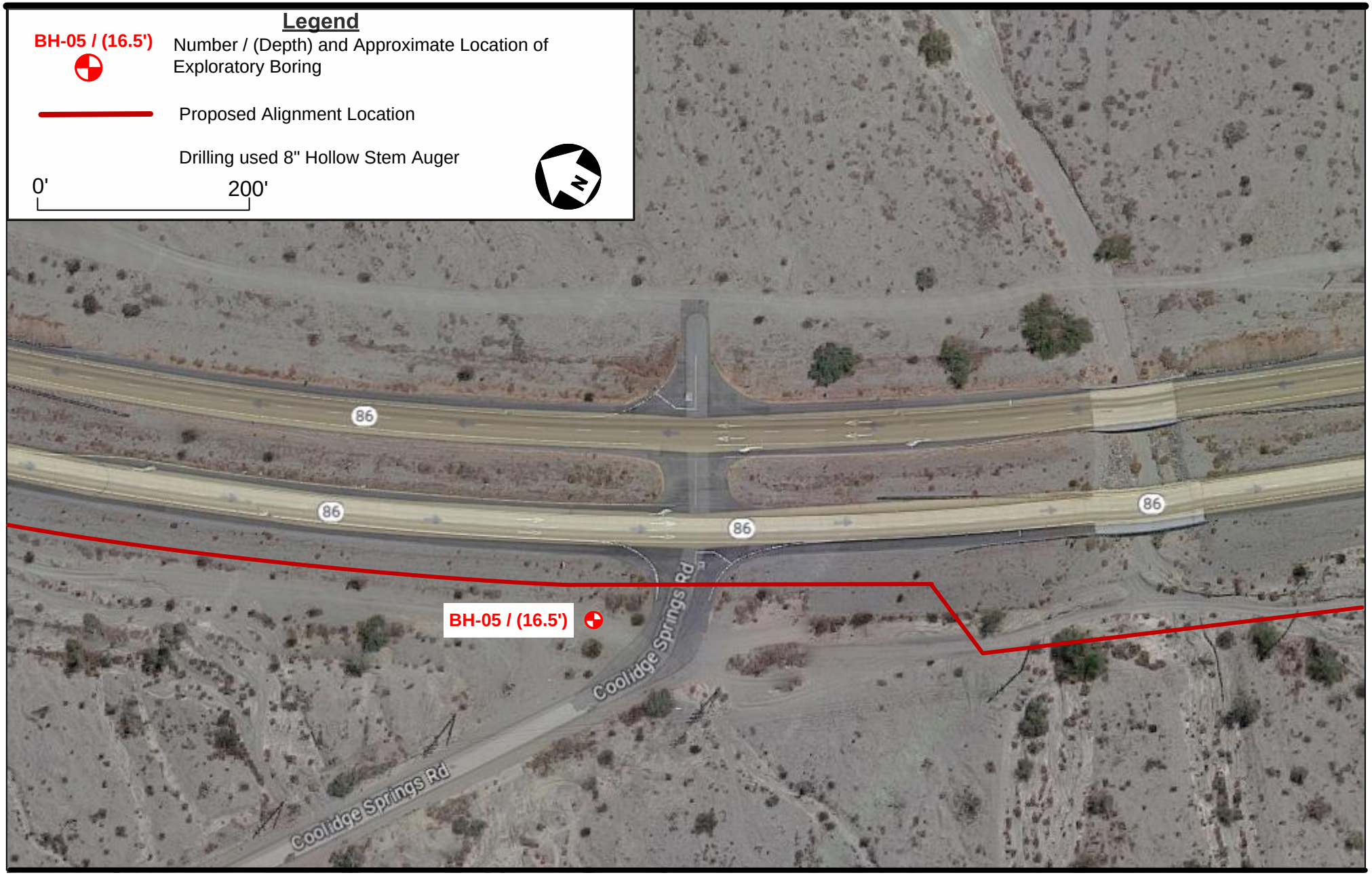
Approximate Boring and Test Pit Locations Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
2c



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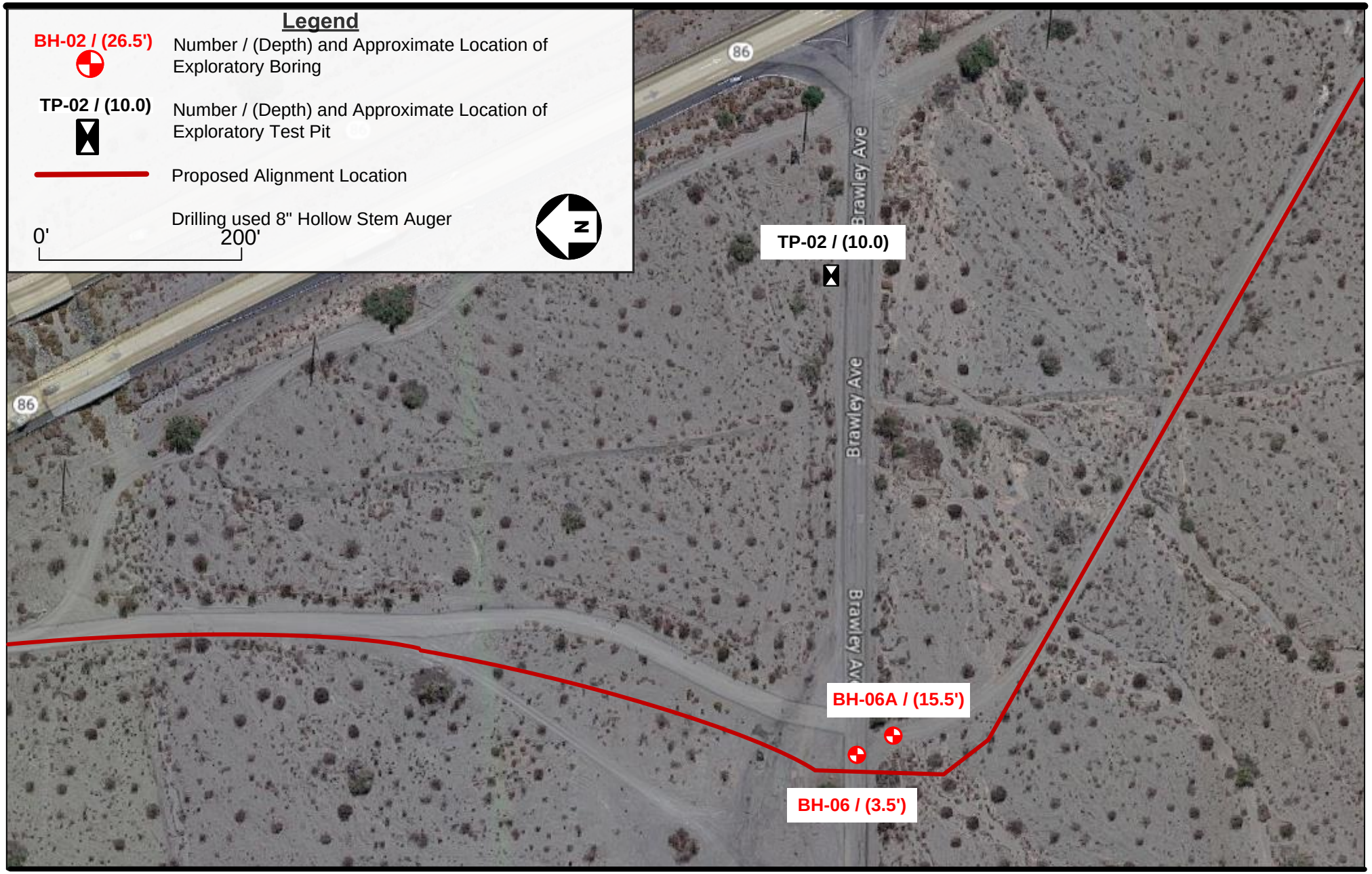
Approximate Boring and Test Pit Locations Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
2d



Project: Highway 86 Water Transmission Main, Phase 3 & 4

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Approximate Boring and Test Pit Locations Map

Project No.
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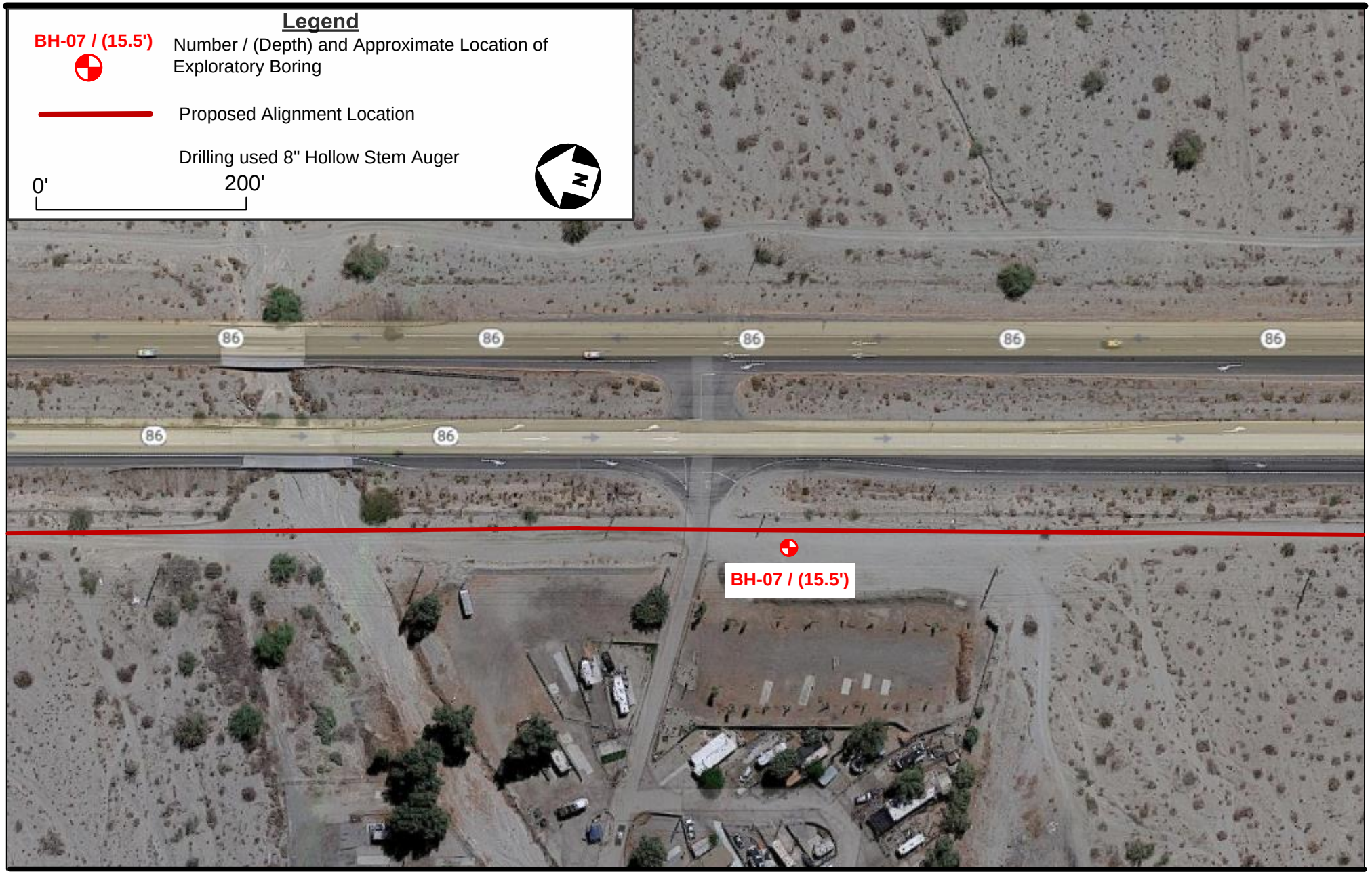
Figure No.
2e



Project: Highway 86 Water Transmission Main, Phase 3 & 4

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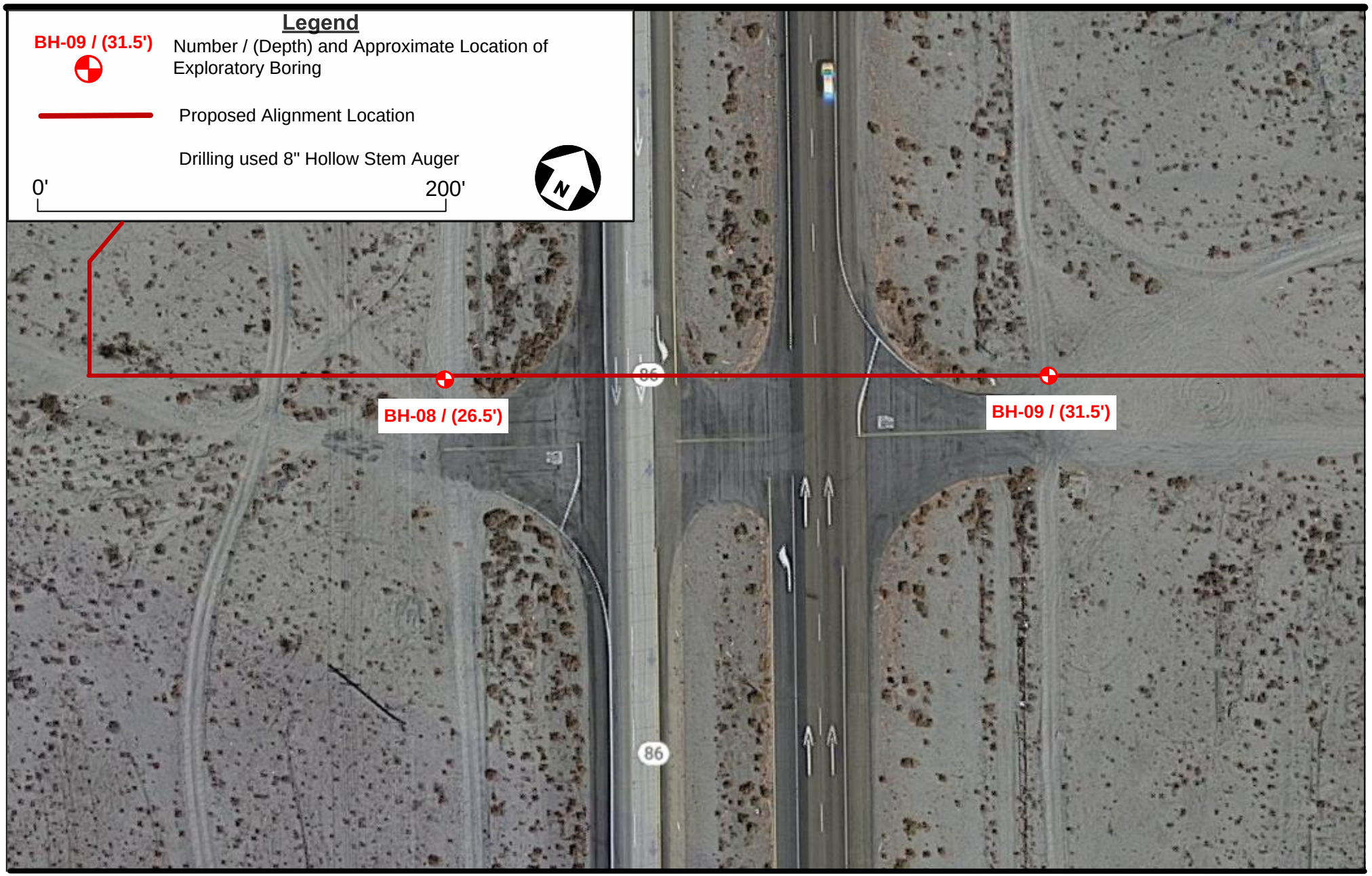
Approximate Boring and Test Pit Locations Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
2f



Project: Highway 86 Water Transmission Main, Phase 3 & 4

Location: 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

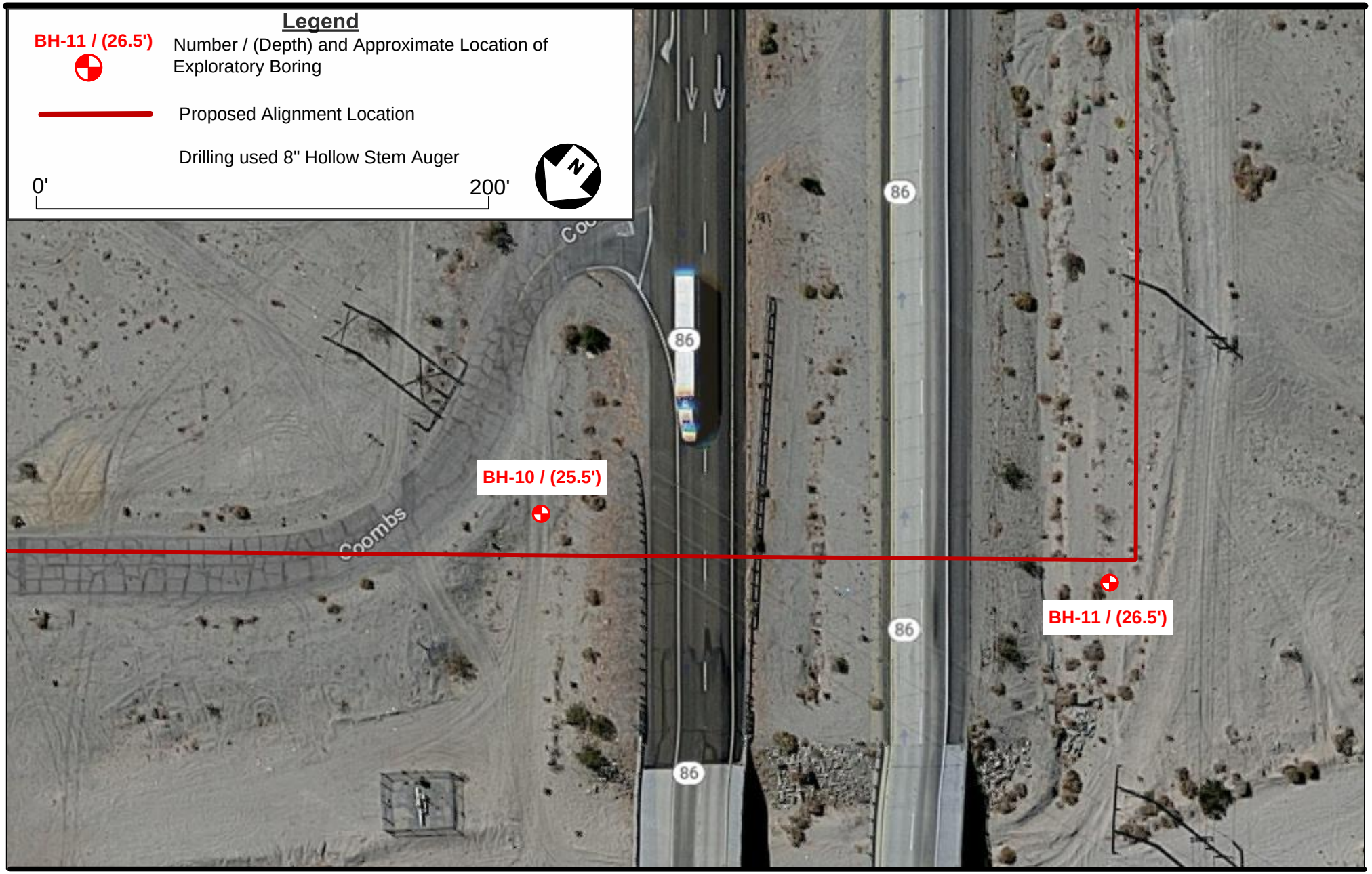
For: Albert A. Webb Associates

Approximate Boring and Test Pit Locations Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
2g



Project: Highway 86 Water Transmission Main, Phase 3 & 4

Location: 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

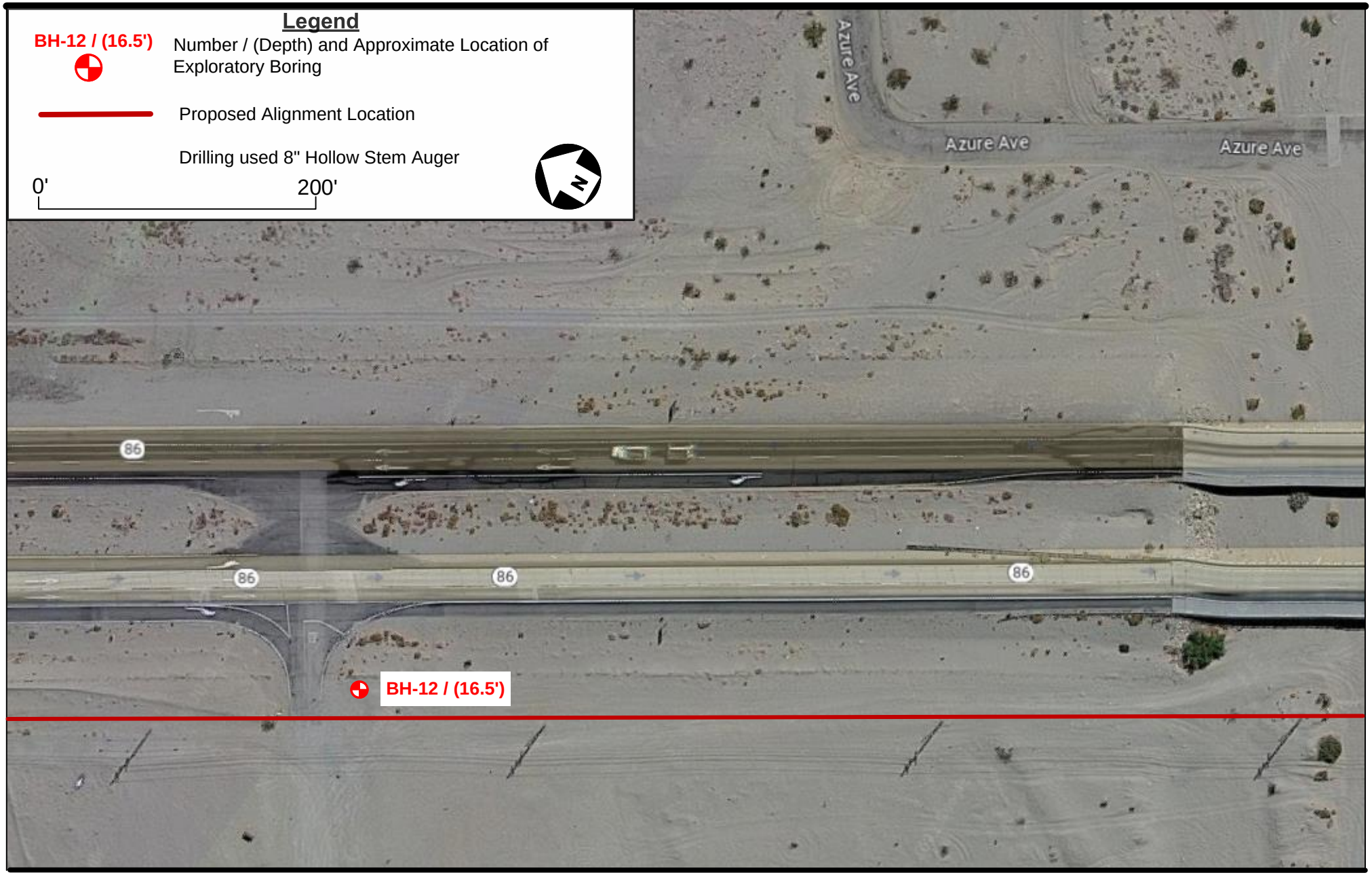
For: Albert A. Webb Associates

Approximate Boring and Test Pit Locations Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
2h



Project: Highway 86 Water Transmission Main, Phase 3 & 4

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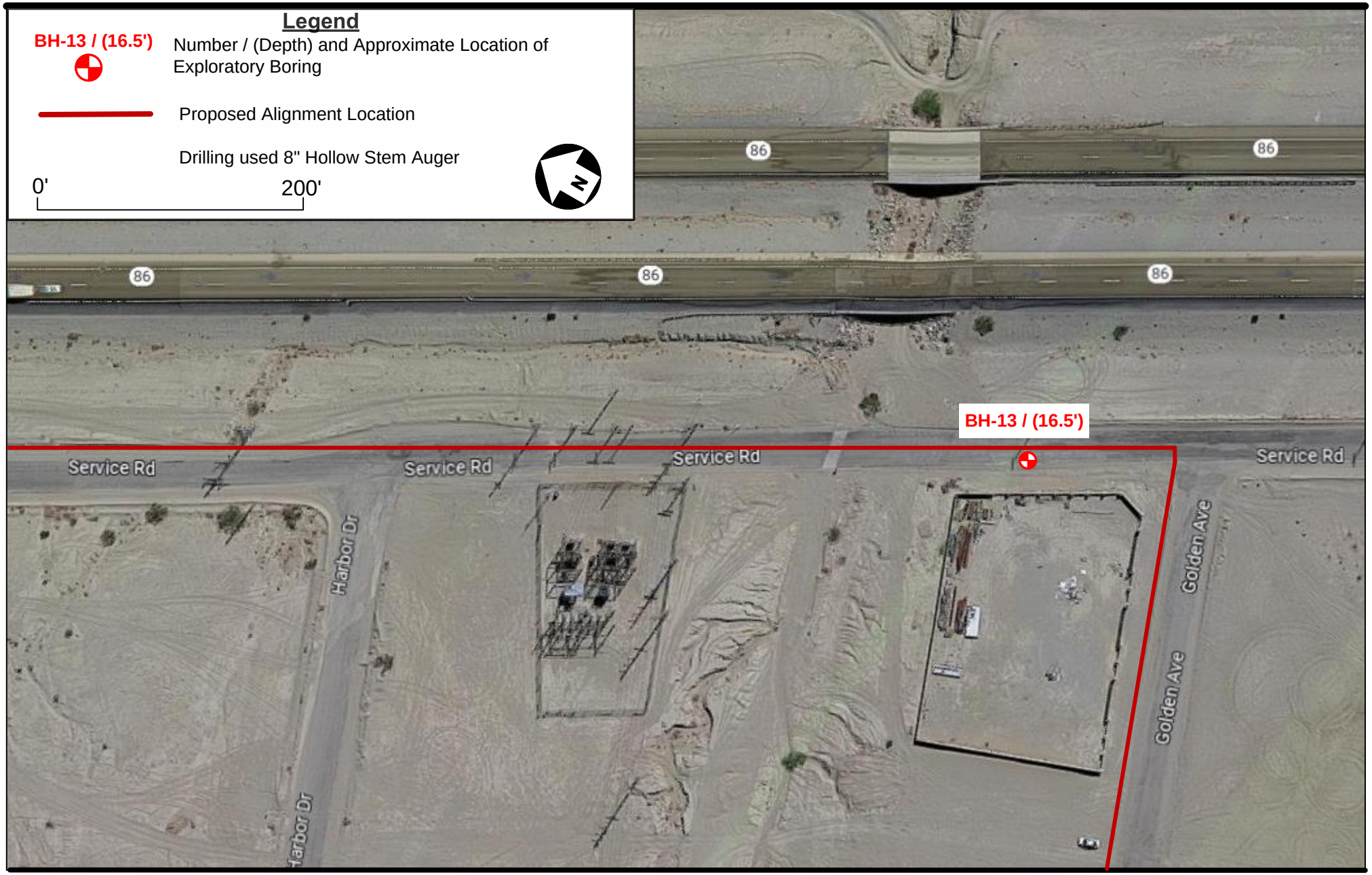
Approximate Boring and Test Pit Locations Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
2i



Project: Highway 86 Water Transmission Main, Phase 3 & 4

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Riverside and Imperial Counties, California

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Approximate Boring and Test Pit Locations Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
2j

Project: Highway 86 Water Transmission Main, Phase 3 & 4

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Approximate Boring and Test Pit Locations Map

Project No.
21-81-260-02

Converse Consultants

Figure No.
2k

- Sieve Analysis (ASTM D6913)
- Maximum dry density and optimum-moisture content (ASTM D1557)
- Direct shear (ASTM D3080)

For *in-situ* moisture and dry density data, see the Logs of Borings and Test Pits in Appendix A, *Field Exploration*. For a description of the laboratory test methods and test results, see Appendix B, *Laboratory Testing Program.*

3.4 Analysis and Report Preparation

Data obtained from the field exploration and laboratory testing program was compiled and evaluated. Geotechnical analyses of the compiled data were performed, and this report was prepared to present our findings, conclusions, and recommendations for the proposed project.

4.0 SURFACE CONDITIONS ALONG THE ALIGNMENT

The proposed pipeline alignment will connect 84th Avenue south to the CVWD Reservoir 1092 site located at the Salton Sea, Imperial County, California. The project is generally located along Highway 86 on the west side of the Salton Sea at the eastern Coachella Valley in Riverside County, California.

Within the project limit Highway 86 has two lanes in each direction with shoulders that are intersected by local collectors and streets. Desert vegetation, trees, wire fencing, and overhead utilities were observed along the alignment. Several locations have residential and commercial properties bounding the proposed pipeline location. The approximate elevation within the project limit is between -215 feet and 40 feet above mean sea level (amsl). *Photograph Nos. 1 through 3* presents some alignment conditions.

Photograph No. 1: Present alignment conditions.

Photograph No. 2: Present alignment conditions, facing southeast along Highway 86.

Photograph No. 3: Present alignment conditions, facing east towards Diamond Ave.

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4.1 Subsurface Profile

Based on the exploratory borings, test pits and laboratory test results, the subsurface soil within the project area primarily consisted of a mixture of sand, silt, clay, gravel up to 2.75 inches, cobbles up to 12 inches and boulders up to 24 inches in largest dimensions. See Photograph Nos. 1 through 7 in Appendix C, *Excavated Soil Photos* for the sizes of excavated soils.

Discernible fill soils were not identified in our subsurface exploration; however, the site may have been previously graded for the existing development (pavement) and fill soil is likely present in some locations. If present, the fill soils were likely derived from on-site sources and are similar to the native soils in composition and density.

For a detailed description of the subsurface materials encountered in the exploratory borings, see Drawings No. A-2 through A-24, Logs of Borings and Test Pits, in Appendix A, Field Exploration.

4.2 Excavatability

The surface and subsurface soil materials for the proposed project are expected to be excavatable by conventional heavy-duty earth moving equipment. Excavation will be difficult where concentrations of gravel, cobbles and boulders are higher.

The phrase “conventional heavy-duty excavation equipment” is intended to include commonly used equipment such as excavators, scrapers, and trenching machines. It does not include hydraulic hammers (“breakers”), jackhammers, blasting, or other specialized equipment and techniques used to excavate hard earth materials. The selection of appropriate excavation equipment models should be done by an experienced earthwork contractor.

4.3 Groundwater

Groundwater was not encountered during the investigation to the maximum explored depth of 31.5 feet bgs. Regional conditions were reviewed using the general coordinates (33.440460, -116.074756; 33.360277, -116.019309; and 33.279827, -115.978665) to estimate expected groundwater depths in the vicinity of the proposed project.

For comparison, regional groundwater data from the GeoTracker database (SWRCB, 2023) was reviewed to evaluate the current and historical groundwater levels. No site with groundwater data was identified within a 1.0-mile radius of the project site.

The National Water Information System (USGS, 2023) was reviewed for current and historical groundwater data from sites within an approximately 1.0-mile radius of the proposed alignment and no data was found.

The California Department of Water Resources database (DWR, 2023) was reviewed using general coordinates (33.440460, -116.074756) for historical groundwater data from sites within a 1.0-mile radius of the project site. One site was identified within a 1.0-mile radius of the project site that contained groundwater elevation data. Details of that record are listed below.

- Well No. KW_056 (Station 334523N1160836W001), located approximately 5,073 feet northwest of the project site, reported groundwater at a depth ranging from 10.7 to 114 feet bgs between 1965 and 2023.

Based on available data, the historical high groundwater level reported at wells within approximately one mile of the project area was approximately 10.7 feet bgs. Current groundwater is expected to be deeper than 33.5 feet bgs. Groundwater is not expected to be encountered during construction. It should be noted that the groundwater level could vary depending upon the seasonal precipitation and possible groundwater pumping activity in the vicinity. Shallow perched groundwater may be present locally, particularly following precipitation or irrigation events.

4.4 Subsurface Variations

Based on results of the subsurface exploration and our experience, some variations in the continuity and nature of subsurface conditions within the project area should be anticipated. Because of the uncertainties involved in the nature and depositional characteristics of the earth material, care should be exercised in interpolating or extrapolating subsurface conditions between or beyond the boring locations.

5.0 ENGINEERING GEOLOGY

The regional and local geology within the proposed project area is discussed below.

5.1 Regional Geology

The project area is located in the Colorado Desert Province of Southern California.

The Colorado Desert Geomorphic Province consists of a low-lying barren desert basin dominated by the Salton Sea bounded in the north by the Little San Bernardino Mountains, on the west by the Santa Rosa Mountains, on the east by the Salton Sea, and in the south by the US-Mexican Border.

The province is a seismically active region characterized by a series of southeast-trending strike-slip faults. The most prominent of the nearby fault zones include the San Andreas, San Jacinto, and Elsinore Fault, all of which have been known to be active during Quaternary time.

Topography within the province is generally characterized by broad alluvial valleys separated by linear mountain ranges. This southeast-trending linear fabric is created by the regional faulting within the granitic basement rock of the Southern California Batholith. Broad, linear, alluvial valleys have been formed by erosion of these principally granitic mountain ranges.

5.2 Local Geology

Review of geologic maps indicate the proposed project alignment is underlain by Holocene-aged alluvial sediments (Qa) consisting of alluvial sand and clay in valley areas (Dibblee and Minch, 2008).

5.3 Flooding

Review of National Flood Insurance Rate Maps indicates that the proposed project area is within Flood Hazard Zones "A" and “AO”. The Zone “A” in this area is designated as a “Special Flood Hazard Area Without Base Flood Elevation (BFE)”. The Zone “AO” in this area is designated as a “Special Flood Hazard Area Regulatory Floodway” including areas of “Cross Sections with 1% Annual Chance” (FEMA, 2008).

6.0 FAULTING AND SEISMICITY

The location of the faults with respect to the project area and its impact is discussed in the following sections.

6.1 Faulting

The proposed project area is situated in a seismically active region. As is the case for most areas of Southern California, ground-shaking resulting from earthquakes associated with nearby and more distant faults may occur at the project area. During the life of the project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking within the project area. Review of recent seismological and geophysical publications indicates that the seismic hazard for the project is high.

The proposed project area is not located within a currently mapped State of California Earthquake Fault Zone for surface fault rupture. Table No. 3, *Summary of Regional Faults,* summarizes selected data of known faults capable of seismic activity within 100 kilometers of the project area. The data presented below was calculated using generalized coordinates 33.360277°N latitude and 116.019309°W longitude, the National Seismic Hazard Maps Database (USGS, 2008) and other published geologic data.

Table No. 3, Summary of Regional Faults

Fault Name	Closest Distance (km)	Slip Sense	Length (km)	Slip Rate (mm/year)	Maximum Magnitude
S. San Andreas	19.19	strike slip	548	n/a	8.18
San Jacinto	23.94	strike slip	241	n/a	7.88
Elmore Ranch	35.15	strike slip	29	1.0	6.70

Fault Name	Closest Distance (km)	Slip Sense	Length (km)	Slip Rate (mm/year)	Maximum Magnitude
Superstition Hills	37.92	strike slip	36	4.0	6.80
Earthquake Valley	48.69	strike slip	20	2.0	6.80
Elsinore	52.03	strike slip	241	n/a	7.85
Imperial	64.92	strike slip	46	20	7.00
Laguna Salada	71.35	strike slip	99	3.5	7.30
Burnt Mtn	72.48	strike slip	21	0.6	6.80
Eureka Peak	73.07	strike slip	19	0.6	6.70
Pinto Mtn	83.04	strike slip	74	2.5	7.30
Pisgah-Bullion Mtn-Mesquite Lk	86.17	strike slip	88	0.8	7.30
So Emerson-Copper Mtn	89.72	strike slip	54	0.6	7.10
Calico-Hidalgo	90.97	strike slip	117	1.8	7.40
Landers	97.07	strike slip	95	0.6	7.40

(Source: https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/)

6.2 CBC Seismic Design Parameters

Seismic parameters based on the California Building Code (CBC, 2022) and ASCE 7-16 are provided in the following table. These parameters were determined using coordinates North Bound (33.405305N, 116.045923W), Center Bound (33.354534N, 116.017749W), and South Bound (33.300943N, 115.980861W) and the Seismic Design Maps online application ATC tool.

Table No. 4, CBC Seismic Design Parameters

Parameter	Value		
	North Bound	Center Bound	South Bound
Site Coordinates	33.405305N, 116.045923W	33.354534N, 116.017749W	33.300943N, 115.980861W
Risk Category	II	II	II
Site Class	D	D	D
Mapped Short period (0.2-sec) Spectral Response Acceleration, S_s	1.500g	1.500g	1.500g
Mapped 1-second Spectral Response Acceleration, S_1	0.589g	0.595g	0.600g

Parameter	Value		
	North Bound	Center Bound	South Bound
Site Coefficient (Table 1613A.3.3.(1)), F_a	1.000	1.000	1.000
Site Coefficient (Table 1613A.3.3.(2)), F_v	1.705	1.711	1.700
MCE 0.2-sec period Spectral Response Acceleration, S_{Ms}	1.500g	1.500g	1.500g
MCE 1-second period Spectral Response Acceleration, S_{M1}	1.000g	1.000g	1.000g
Design Spectral Response Acceleration for short period S_{ds}	1.004g	1.018g	1.020g
Design Spectral Response Acceleration for 1-second period, S_{d1}	0.669g	0.769g	0.680g
Site Modified Peak Ground Acceleration, PGA_M	0.550g	0.550g	0.581g

6.3 Secondary Effects of Seismic Activity

In addition to ground shaking, effects of seismic activity on a project site may include surface fault rupture, soil liquefaction, landslides, lateral spreading, seismic settlement, tsunamis, seiches and earthquake-induced flooding. Results of a site-specific evaluation of each of the above secondary effects are explained below.

Surface Fault Rupture: The proposed project area is not located within a currently designated State of California Fault Zone (CGS, 2007). The project site is located approximately 16 miles from an active fault zone and is adjacent to the Santa Rosa Mountains that are assigned a moderate earthquake hazard level by the San Diego County Know Your Hazards Map (San Diego County, 2023). The potential for surface rupture resulting from the fault activity is considered to be low to moderate.

Liquefaction: Liquefaction is defined as the phenomenon in a soil mass, because of the development of excess pore pressures, soil mass suffers a substantial reduction in its shear strength. During earthquakes, excess pore pressures in saturated soil deposits may develop as a result of induced cyclic shear stresses, resulting in liquefaction. Soil liquefaction occurs in submerged granular soils during or after strong ground shaking. There are several requirements for liquefaction to occur. They are as follows.

- Soils must be submerged,
- Soils must be primarily granular,
- Soils must be contractive, that is, loose to medium-dense,
- Ground motion must be intense,
- Duration of shaking must be sufficient for the soils to lose shear resistance.

The proposed project area is not located within a zone designated as susceptible to liquefaction by the State of California (CGS, 2007).

Seismic Settlement: Dynamic dry settlement may occur in loose, granular, unsaturated soils during a large seismic event. Based on the relatively dense and occasional cohesive soil conditions, the potential of seismic settlement is considered low.

Landslides: Seismically induced landslides and other slope failures are common occurrences during or after earthquakes in areas of significant relief. The proposed project area is adjacent to hillsides but is not designated in a State of California landslide area (CGS, 2007). In the absence of significantly steep ground slopes, the potential for seismically induced landslides to affect the proposed project area is considered to be low.

Lateral Spreading: Seismically induced lateral spreading involves primarily lateral movement of earth materials due to ground shaking. It differs from slope failure in that complete ground failure involving large movement does not occur due to the relatively smaller gradient of the initial ground surface. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. Due to low liquefaction potential, the risk for lateral spreading to affect the project area is considered low.

Tsunamis: Tsunamis are tidal waves generated in large bodies of water by fault displacement or major ground movement. The project site is not designated in a State of California Tsunami Hazard Area (CGS, 2007), tsunamis do not pose a hazard to this project area.

Seiches: Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Review of the project area indicates that there is one up gradient body of water with the potential of flooding the project area. The Salton Sea is less than 1 mile east of the project site. Due to the enclosed water body near the proposed project area, seiches may pose a hazard to this project area.

Earthquake-Induced Flooding: This is flooding caused by the failure of dams or other water-retaining structures as a result of earthquakes. The proposed project area is not located in a designated State of California Dam Inundation Zone (DWR, 2021). The potential for flooding of the project due to dam failure is considered to be low.

7.0 LABORATORY TEST RESULTS

Results of physical and chemical tests performed for this project are presented below.

7.1 Physical Testing

Results of the various laboratory tests are presented in Appendix B, *Laboratory Testing Program,* except for the results of *in-situ* moisture and dry density tests which are presented on the Logs of Borings in Appendix A, *Field Exploration.* The results are also discussed below.

- In-situ Moisture and Dry Density: In-situ dry densities and moisture contents of the site soils were determined in accordance with ASTM Standard D2216 and D2937. Dry densities of the upper 15 feet alluvium soils ranged from 83 to 147 pounds per cubic foot (pcf) with moisture contents of 1 to 15 percent.
- Sand Equivalent: Ten representative soil samples were tested in accordance with the ASTM Standard D2419 test method to determine the sand equivalent. The test results ranged from SE of 2 to 53.
- Grain Size Analysis: Ten representative samples were tested to determine the relative grain size distribution in accordance with the ASTM Standard D6913. The test results are graphically presented in Drawing No. B-1a and B-1b, *Grain Size Distribution Results.*
- Maximum Dry Density and Optimum Moisture Content: Typical moisture-density relationship tests were performed on six representative samples in accordance with ASTM D1557. The results are presented in Drawing No. B-2a and B-2b, *Moisture-Density Relationship Results*, in Appendix B, *Laboratory Testing Program*. The laboratory maximum dry densities were between 115.0 and 130.0 pcf and the optimum moisture contents between 6.0 and 17.0 percent.
- Direct Shear: Five direct shear tests were performed on undisturbed and remolded representative ring samples under soaked moisture condition in accordance with ASTM Standard D3080. The results are presented in Drawings No. B-3 through B-7, *Direct Shear Test Results* in Appendix B, *Laboratory Testing Program*.

7.2 Chemical Testing - Corrosivity Evaluation

Seven soil samples were tested to determine minimum electrical resistivity, pH, and chemical contents, including soluble sulfate and chloride concentrations. The purpose of these tests was to determine the corrosion potential of soils when placed in contact with common construction materials. These tests were performed by AP Engineering and Testing, Inc. (Pomona, CA) in accordance with California Test Methods 643, 422, and 417. The test results are summarized in the following table and are presented in Appendix B, *Laboratory Testing Program.*

- The pH measurements of the samples tested were between 8.5 and 9.8.
- The sulfate contents of the samples tested were between 20 and 2023 ppm.
- The chloride concentrations of the samples tested were 18 and 1287 ppm.
- The minimum electrical resistivities when saturated were 207 and 5,564 ohm-cm.

8.0 EARTHWORK RECOMMENDATIONS

Earthwork for the project will include the following.

8.1 General

Prior to the start of construction, all existing underground utilities and appurtenances should be located within the project alignment. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications. All excavations should be conducted in such a manner as not to cause loss of bearing and/or lateral support of existing structures or utilities.

Deleterious material, including organics and debris generated during excavation, should not be placed as fill.

Migration of fines from the surrounding native soils, in the case of water leaks from the pipe, must be considered in selecting the gradation of the materials placed within the trench, including bedding, pipe zone and trench zone backfill, as defined in the following sections. Such migration of fines may deteriorate pipe support and may result in settlement/ground loss at the surface.

It should be the responsibility of the contractor to maintain safe working conditions during all phases of construction.

Observations and field tests should be performed by the project soils consultant to confirm that the required degree of compaction has been obtained. Where compaction is less than specified, additional compactive effort should be made with adjustment of the moisture content as necessary, until the specified compaction is obtained.

8.2 Pipeline Subgrade Preparation

The final subgrade surface should be level, firm, uniform, free of loose materials, and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. Protruding oversize particles, larger than 3 inches in dimension, if any, should be removed from the trench bottom and replaced with compacted on-site materials.

Any loose, soft and/or unsuitable materials encountered at the pipe sub-grade should be removed and replaced with an adequate bedding material.

During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom for as near its full length as is practicable.

8.3 Pipe Bedding

Bedding is defined as the material supporting and surrounding the pipe to one foot above the pipe. Pipe bedding should follow the Coachella Valley Water District Standards. The following specifications are recommended to provide a basis for quality control during the placement of pipe bedding.

To provide uniform and firm support for the pipe, compacted granular materials such as clean sand, gravel or ¾-inch crushed aggregate, or crushed rock may be used as pipe bedding material. Typically, soils with sand equivalent value of 30 or more are used as pipe bedding material. Based on laboratory test results, the soils along the alignments may be suitable for use as bedding material. The pipe designer should determine if the soils are suitable as pipe bedding material.

The type and thickness of the granular bedding placed underneath and around the pipe, if any, should be selected by the pipe designer. The load on the rigid pipes and deflection of flexible pipes and, hence, the pipe design, depends on the type and the amount of bedding placed underneath and around the pipe.

Bedding materials should be vibrated in-place to achieve compaction. Care should be taken to densify the bedding material below the springline of the pipe. Prior to placing the pipe bedding material, the pipe subgrade should be uniform and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom for as near its full length as is practicable.

Migration of fines from the surrounding native and/or fill soils must be considered in selecting the gradation of any imported bedding material. We recommend that the pipe bedding material should satisfy the following criteria to protect migration of fine materials.

i. $\frac{D15(F)}{D85(B)} \leq 5$

ii. $\frac{D50(F)}{D50(B)} < 25$

iii. Bedding Materials must have less than 5 percent minus 75 µm (No. 200) sieve to avoid internal movement of fines.

Where,

F = Bedding Material
B = Surrounding Native and/or Fill Soils
*D*15(F) = Particle size through which 15% of bedding material will pass
*D*85(B) = Particle size through which 85% of surrounding soil will pass
*D*50(F) = Particle size through which 50% of bedding material will pass

*D*50(B) = Particle size through which 50% of surrounding soil will pass

If the above criteria do not satisfy, commercially available geofabric used for filtration purposes (such as Mirafi 140N or equivalent) may be wrapped around the bedding material encasing the pipe to separate the bedding material from the surrounding native or fill soils.

8.4 Backfill Materials

Backfill materials should follow the Coachella Valley Water District Standards and Caltrans specifications. Additional information, if required, is presented below.

The native soils encountered within the pipeline alignment, free of debris or organic matter are suitable as compacted fill after proper processing and removal of oversize materials to meet the following criteria.

- No particles larger than 3 inches in largest dimension.
- Rocks larger than one inch should not be placed within the upper 12 inches of subgrade soils.
- Free of all organic matter, debris, or other deleterious material.
- Expansion index of 30 or less.
- Sand Equivalent greater than 15 (greater than 30 for pipe bedding).
- Contain less than 30 percent by weight retained in 3/4-inch sieve.
- Contain less than 40 percent fines (passing #200 sieve).

Based on field investigation and laboratory testing results, on-site soils may not be suitable for pipe bedding. However, on-site soils may be suitable as structural fill materials provided appropriate corrosion mitigation will be applied.

Imported soils, if used as fill, should be predominantly granular and meet the above criteria. Any imported fill should be tested and approved by geotechnical representative prior to delivery to the alignments.

8.5 Compacted Fill Placement

Fill soils should be thoroughly mixed, and moisture conditioned to within ±3 percent of optimum moisture content for coarse soils and 0 to 2 percent above optimum moisture content for fine soils and compacted to at least 90 percent of the laboratory maximum dry density.

At least the upper 12 inches of subgrade soils underneath pavements intended to support vehicle loads should be scarified, moisture conditioned, and compacted to at least 95 percent of the laboratory maximum dry density.

Fill materials should not be placed, spread or compacted during unfavorable weather conditions. When work is interrupted by heavy rain, filling operations should not resume until the geotechnical consultant approves the moisture and density conditions of the previously placed fill.

8.6 Trench Zone Backfill

The trench zone is defined as the portion of the trench above the pipe bedding extending up to the final grade level of the trench surface. Excavated on-site soils free of oversize particles and deleterious matter may be used to backfill the trench zone. Trench backfills should follow Coachella Valley Water District Standards. The following specifications are recommended to provide a basis for quality control during the placement of trench backfill.

- Trench excavations to receive backfill should be free of trash, debris or other unsatisfactory materials at the time of backfill placement.
- Trench zone backfill should be compacted to at least 90 percent of the laboratory maximum dry density as per ASTM D1557 test method. At least the upper 1 foot of trench backfill underlying pavement should be compacted to at least 95 percent of the laboratory maximum dry density as per ASTM D1557 test method.
- Particles larger than 3 inches should not be placed within 12 inches of the pavement subgrade. No more than 30 percent of the backfill volume should be larger than ¾-inch in the largest dimension. Gravel should be well mixed with finer soil. Rocks larger than 6 inches in the largest dimension should not be placed as trench backfill.
- Trench backfill should be compacted by mechanical methods, such as sheepsfoot, vibrating or pneumatic rollers or mechanical tampers to achieve the density specified herein. The backfill materials should be brought to within ± 3 percent of optimum moisture content for coarse-grained soil, and between optimum and 2 percent above optimum for fine-grained soil, then placed in horizontal layers. The thickness of uncompacted layers should not exceed 8 inches. Each layer should be evenly spread, moistened or dried as necessary, and then tamped or rolled until the specified density has been achieved.
- The contractor should select the equipment and processes to be used to achieve the specified density without damage to adjacent ground, structures, utilities and completed work.
- The field density of the compacted soil should be measured by the ASTM D1556 (Sand Cone) or ASTM D6938 (Nuclear Gauge) or equivalent.
- Trench backfill should not be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations should not resume until field tests by the project's geotechnical consultant indicate that the moisture content and density of the fill are in compliance with project specifications.

8.7 Backfill of Jacking and Receiving Pits

The bore-and-jack crossings (BH-01A, BH-02 through BH-04, and BH-08 through BH-11) will require jacking and receiving pits. We anticipate that the depths of the boring/jacking and receiving pits will be approximately 8 to 12 feet below the existing grade. The pits should be backfilled following construction of the pipe crossings.

The pit bottoms should be free of trash, debris or other unsatisfactory materials at the time of backfill placement. The bottoms of the excavations should be scarified to a minimum depth of 12 inches below subgrade, moisture conditioned to within 3 percent of optimum moisture content, and recompacted to at least 90 percent of the laboratory maximum dry density.

The backfill soils should be well-blended, and moisture conditioned to within 3 percent of optimum moisture content. Particles larger than 6 inches should not be used as backfill materials. The backfill should be placed in loose lifts not exceeding 8 inches in thickness and compacted to at least 90 percent of the laboratory maximum dry density per ASTM Standard D1557. If the ground surface is to be paved, the backfill within 12 inches of the pavement subgrade should be compacted to at least 95 percent of the laboratory maximum dry density. Shoring should be removed gradually while backfilling to prevent side soils from caving.

The contractor should select the equipment and processes to be used to achieve the specified density without damage to adjacent ground, existing facilities, utilities, or completed work.

9.0 DESIGN RECOMMENDATIONS

General design recommendations, resistance to lateral loads, pipe design parameters, bearing pressures, and soil corrosivity are discussed in the following subsections.

9.1 General

Where pipes connect to rigid structures and are subjected to significant loads as the backfill is placed to finish grade, we recommend that provisions be incorporated in the design to provide support of these pipes where they exit the structures. Consideration can be given to flexible connections, concrete slurry support beneath the pipes where they exit the structures, overlaying the pipes with a few inches of compressible material, (i.e. Styrofoam, or other materials), or other techniques.

The various design recommendations provided in this section are based on the assumption that the above earthwork recommendations will be implemented.

9.2 Resistance to Lateral Loads

Resistance to lateral loads can be assumed to be provided by passive earth pressures and friction between construction materials and native soils. The resistance to lateral loads were estimated by using on-site native soils strength parameters obtained from laboratory testing. The resistance to lateral loads recommended for use in design of thrust blocks are presented in the following table.

Table No. 5, Resistance to Lateral Loads

Soil Parameters	Value
Passive earth pressure (psf per foot of depth)	250
Maximum allowable bearing pressure against native soils (psf)	2,500
Coefficient of friction between formed concrete and native soils, fs	0.30

9.3 Soil Parameters for Pipe Design

Structural design requires proper evaluation of all possible loads acting on pipe. The stresses and strains induced on buried pipe depend on many factors, including the type of soil, density, bearing pressure, angle of internal friction, coefficient of passive earth pressure, and coefficient of friction at the interface between the backfill and native soils. The recommended values of the various soil parameters for design are provided in the following table.

Table No. 6, Soil Parameters for Pipe Design

Soil Parameters	Value
Average compacted fill total unit weight (assuming 92% relative compaction), γ (pcf)	127.0
Angle of internal friction of soils, ϕ	31
Soil cohesion, c (psf)	0
Coefficient of friction between concrete and native soils, fs	0.40
Coefficient of friction between CML&C steel pipe and native soils, fs	0.30
Bearing pressure against native soils (psf)	2,500
Coefficient of passive earth pressure, Kp	3.12
Coefficient of active earth pressure, Ka	0.32
Modulus of Soil Reaction E’ (psi)	1,500

9.4 Bearing Pressure for Anchor and Thrust Blocks

An allowable net bearing pressure presented in Table No. 6, *Soil Parameters for Pipe Design* may be used for anchor and thrust block design against alluvial soils. Such thrust blocks should be at least 18 inches wide.

If normal code requirements are applied for design, the above recommended bearing capacity and passive resistances may be increased by 33 percent for short duration loading such as seismic or wind loading.

9.5 Soil Corrosivity

Seven representative soil samples were evaluated for corrosivity with respect to common construction materials such as concrete and steel. The test results are presented in Appendix B, *Laboratory Testing Program* and design recommendations pertaining to soil corrosivity are presented below.

The sulfate contents of the sampled soils correspond to American Concrete Institute (ACI) exposure category S0 and S2 (ACI 318-14, Table 19.3.1.1). No concrete type restrictions are specified for exposure category S0 (ACI 318-14, Table 19.3.2.1). A minimum compressive strength of 2,500 psi is recommended for S0. Concrete type restrictions are specified for exposure category S2 (ACI 318-14, Table 19.3.2.1). A minimum compressive strength of 4,500 psi is recommended for S2.

We anticipate that concrete structures will be exposed to moisture from precipitation and irrigation. Based on the project location and the results of chloride testing of the soils, we do not anticipate that concrete structures will be exposed to external sources of chlorides, such as deicing chemicals, salt, brackish water, or seawater. ACI specifies exposure category C1 where concrete is exposed to moisture, but not to external sources of chlorides (ACI 318-14, Table 19.3.1.1). ACI provides concrete design recommendations in ACI 318-14, Table 19.3.2.1, including a compressive strength of at least 2,500 psi and a maximum chloride content of 0.3 percent.

According to Romanoff, 1957, the following table provides general guidelines of soil corrosion based on electrical resistivity.

Table No. 7, Correlation Between Resistivity and Corrosion

Soil Resistivity (ohm-cm) per Caltrans CT 643	Corrosivity Category
Over 10,000	Mildly corrosive
2,000 – 10,000	Moderately corrosive
1,000 – 2,000	Corrosive
Less than 1,000	Severe corrosive

The measured values of the minimum electrical resistivity of the samples when saturated were between 207 and 5,564 ohm-cm. This indicates that the soils tested are Severe to Moderately corrosive to ferrous metals in contact with the soil (Romanoff, 1957). Converse does not practice in the area of corrosion consulting. A qualified corrosion consultant should provide appropriate corrosion mitigation measures for any ferrous metals in contact with the site soil.

9.6 Asphalt Concrete Pavement

Based on the soil type we assumed an R-value of 50 and Traffic Indices (Tis) ranging from 5 to 10 in pavement design.

Based on the above information, asphalt concrete and aggregate base thickness are determined using the *Caltrans Highway Design Manual (Caltrans, 2022)*, Chapter 630 with a safety factor of 0.2 for asphalt concrete/aggregate base section and 0.1 for full depth asphalt concrete section. Preliminary asphalt concrete pavement sections for each street are presented in the following table.

Table No. 8, Recommended Preliminary Pavement Sections

Design R-value	Traffic Index (TI)	Pavement Section		
		Asphalt Concrete (inches)	Aggregate Base (inches)	Full AC Section (inches)
50	5.0	3.0	2.0	4.0
	6.0	3.5	3.5	5.0
	7.0	4.0	4.5	6.5
	8.0	5.0	5.0	7.5
	9.0	6.0	5.5	8.5
	10.0	7.0	6.0	9.5

Pavement sections should follow Coachella Valley Water District Standards and Caltrans Standards, or Table No. 8, *Recommended Preliminary Pavement Sections*, whichever is determined to be applicable. At or near the completion of trench backfill, the street subgrade should be tested to evaluate the actual subgrade R-value for final pavement design.

Prior to placement of aggregate base or asphalt concrete, at least the upper 12 inches of subgrade soils should be scarified, moisture-conditioned if necessary, and recompacted to at least 95 percent of the laboratory maximum dry density as defined by ASTM Standard D1557 test method.

Base materials should conform to Section 200-2.2,"*Crushed Aggregate Base*," of the current Standard Specifications for Public Works Construction (SSPWC; Public Works Standards, 2021) or Coachella Valley Water District Standards, whichever is applicable and should be placed in accordance with Section 301-2 of the SSPWC.

Asphaltic concrete materials should conform to Section 203 of the SSPWC or the Coachella Valley Water District Standards, whichever is applicable and should be placed in accordance with Section 302-5 of the SSPWC.

9.7 Rigid Pavement Recommendations

Based on the soil type we assumed an R-value of 50 and Traffic Indices (Tis) ranging from 5 to 10 in pavement design. We recommend that the project structural engineer consider the loading conditions at various locations and select the appropriate pavement sections from the following table.

Table No. 9, Rigid Pavement Structural Sections

Design R-Value	Design Traffic Index (TI)	PCCP Pavement Section (inches)
50	5.0	6.0
	6.0	6.5
	7.0	6.5
	8.0	7.0
	9.0	7.5
	10.0	7.5

Prior to placement of aggregate base, at least 2 feet to 3 feet of the soils below existing grade should be removed, processed, and replaced as compacted fill prior to placing addition fill to reach finish grade, and recompacted to at least 95 percent of the laboratory maximum dry density as defined by ASTM Standard D1557 test method.

Positive drainage should be provided away from all pavement areas to prevent seepage of surface and/or subsurface water into pavement base and/or subgrade.

At or near the completion of grading, subsurface samples should be tested to evaluate the actual subgrade R-value for final pavement design.

The concrete pavement section is based on a minimum 28-day Modulus of Rupture (M-R) of 550 psi and a compressive strength of 3,000 psi. The third point method of testing beams should be used to evaluate modulus of rupture. The concrete mix design should contain a minimum cement content of 5.5 sacks per cubic yard. Recommended maximum and minimum values of slump for pavement concrete are three inches and one inch, respectively.

Transverse contraction joints should not be spaced more than 15 feet and should be cut to a depth of ¼ the thickness of the slab. Longitudinal joints should not be spaced more than 12 feet apart. A longitudinal joint is not necessary in the pavement adjacent to the curb and gutter section.

Concrete materials should conform to Section 201 of the 2021 Standard Specifications for Public Works Construction (SSPWC; Public Works Standards, 2018), and concrete pavement should be constructed in accordance with Section 302-6, “Portland Cement Concrete Pavement” of the SSPWC.

9.8 Jacking Force

The pipe jacking force is function of ground behavior, soil conditions, over burden pressure, pipe weight, size, annular space between pipe and soil, lubricant of the pipe, and installation time. The jacking force is equal to penetration resistance plus frictional resistance. Proper assessment of jacking force is required to design and select jacking pipes and thrust block.

The penetration resistance varies along the bore-and-jack depending on soil type and shape and steering action of the boring head.

Presence of concentrated gravel in the path of bore-and-jack operation can bring a sudden increase in the jacking force. Therefore, installation of pressure relief valves at the pit and indicators on the control panel is desirable to ensure that the allowable jacking force is not exceeded.

Design parameters presented Table No. 10, *Jacking System Design Parameters*, may be used to design jacking force system.

Table No. 10, Jacking System Design Parameters

Parameter	Value
Bearing Pressure (psf)	2,500
At-rest Lateral Earth Pressure (psf)	61
Passive Earth Pressure (psf)	250
Soil Unit weight (pcf)	135
Friction, between soil and steel	0.35

We recommend that the ultimate compressive strength of the pipe should be at least 2.5 times the design jacking loads of the pipe.

The pipe designer should determine an appropriate factor of safety to be incorporated into the design of thrust block. The bore-and-jack contractor is responsible for selection of jacking force system and the final design of thrust blocks.

The jacking operations should always be controlled to minimize loss of ground. Steel casing sections should be jacked forward concurrently with the boring operation to provide continuous ground support.

A welded steel pipe casing is required to be installed at the crossing location. The annulus should be injected with cellular concrete or grout to fill any possible voids created by the crossing operation.

10.0 CONSTRUCTION CONSIDERATIONS

Construction recommendations are presented below.

10.1 General

Prior to the start of construction, all existing underground utilities should be located along the project area. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications.

Vertical braced excavations are feasible within the project area. Sloped excavations may not be feasible in locations adjacent to existing utilities (if any).

Where the side of the excavation is a vertical cut, it should be adequately supported by temporary shoring to protect workers and any adjacent structures.

All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act, current amendments, and the Construction Safety Act should be met. The soil exposed in cuts should be observed during excavation by the owner's representative and the competent person employed by the contractor in accordance with regulations. If potentially unstable soil conditions are encountered, modifications of slope ratios for temporary cuts may be required.

10.2 Temporary Sloped Excavations

Temporary open-cut trenches may be constructed in areas not adjacent to existing underground utilities improvements with side slopes as recommended in the table below. Temporary cuts encountering soft and wet fine-grained soils, dry loose, cohesionless soils, or loose fill from trench backfill may have to be constructed at a flatter gradient than presented below.

Table No. 11, Slope Ratios for Temporary Excavations

Soil Type	OSHA Soil Type	Depth of Cut (feet)	Recommended Maximum Slope (Horizontal:Vertical)[1]
Silty Sand (SM), Clayey Sand (SC), Sandy Silt (ML), Sand with Silt and Gravel (SP-SM)	C	0-12	1.5:1
		12-20	2:1

[1] Slope ratio is assumed to be constant from top to toe of slope, with level adjacent ground.

For shallow excavations up to 4 feet bgs, slope can be vertical. For steeper temporary construction slopes or deeper excavations, or unstable soil encountered during the excavation, shoring or trench shields should be provided by the contractor as necessary to protect the workers in the excavation.

Surfaces exposed in sloped excavations should be kept moist but not saturated to retard raveling and sloughing during construction. Adequate provisions should be made to protect the slopes from erosion during periods of rainfall. Surcharge loads, including construction materials, should not be placed within 5 feet of the unsupported slope edge. Stockpiled soils with a height higher than 6 feet will require greater distance from trench edges.

10.3 Shoring Design

Temporary shoring will be required where open sloped excavations will not be feasible due to unstable soils or due to nearby existing structures or facilities. Temporary shoring may consist of conventional soldier piles and lagging or sheet piles or any piles selected by contractor. The shoring for the pipe excavations may be laterally supported by walers and cross bracing or may be cantilevered. Drilled excavations for soldier piles will require the use of drilling fluids to prevent caving and to maintain an opened hole for pile installation.

The active earth pressure behind any shoring depends primarily on the allowable movement, type of backfill materials, backfill slopes, wall inclination, surcharges, and any hydrostatic pressures.

The lateral earth pressures to be used in the design of shoring is presented in the following table.

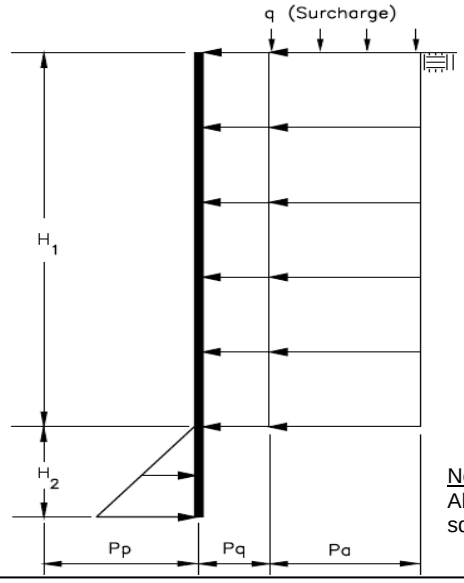
Table No. 12, Lateral Earth Pressures for Temporary Shoring

Lateral Resistance Soil Parameters*	Value
Active Earth Pressure (Braced Shoring) (psf) (A)	27
Active Earth Pressure (Cantilever Shoring) (psf) (B)	41
At-Rest Earth Pressure (Cantilever Shoring) (psf) (C)	61
Passive earth pressure (psf per foot of depth) (D)	250
Maximum allowable bearing pressure against native soils (psf) (E)	2,000
Coefficient of friction between sheet pile and native soils, fs (F)	0.25

* Parameters A through F are used in Figures No. 3 and 4 below.

Restrained (braced) shoring systems should be designed based on Figure No. 3, *Lateral Earth Pressures for Temporary Braced Excavation* to support a uniform rectangular lateral earth pressure.

Figure No. 3, Lateral Earth Pressures for Temporary Braced Excavation



Total Earth Pressure, P

P = Pq + Pa

Pq = 0.5q - incremental surcharge pressure

Pa = (A)H_1 - active earth pressure (Braced walls)

Lateral Pressure Resistance

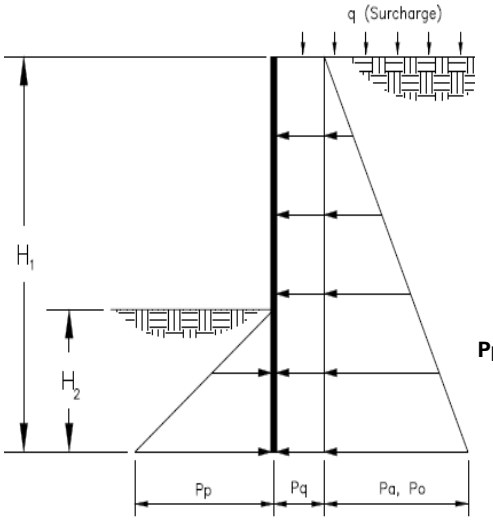
Pp = (D) H_2 ≤ (E) psf - passive earth pressure (on native soils)

μ = (F) - ultimate friction coefficient between steel sheet piles and soil

Note:
All values of height (H) in feet, pressure (P) and surcharge (q) in pounds per square foot (psf).

Unrestrained (cantilever) design of cantilever shoring consisting of soldier piles spaced at least two diameters on-center or sheet piles, can be based on Figure No. 4, *Lateral Earth Pressures on Temporary Cantilever Wall*.

Figure No. 4, Lateral Earth Pressures on Temporary Cantilever Wall



Total Earth Pressure, P

P = Pq + Pa, Po

Pq = 0.5q - incremental surcharge pressure

Pa = (B)H_1 - active earth pressure (Un-restrained)

Po = (C)H_1 - at rest earth pressure (Restrained)

Lateral Pressure Resistance

Pp = (D) H_2 ≤ (E) psf - passive earth pressure (on native soils)

μ = (F) - ultimate friction coefficient between steel sheet piles and soil

Note:
All values of height (H) in feet, pressure (P) and surcharge (q) in pounds per square foot (psf).

The provided pressures assume no hydrostatic pressures. If hydrostatic pressures are allowed to build up, the incremental earth pressures below the ground-water level should be reduced by 50 percent and added to hydrostatic pressure for total lateral pressure.

Passive resistance includes a safety factor of 1.5. The upper 1 foot for passive resistance should be ignored unless the surface is confined by a pavement or slab.

In addition to the lateral earth pressure, surcharge pressures due to miscellaneous loads, such as soil stockpiles, vehicular traffic or construction equipment located adjacent to the shoring, should be included in the design of the shoring. A uniform lateral pressure of 100 psf should be included in the upper 10 feet of the shoring to account for normal vehicular and construction traffic within 10 feet of the trench excavation. As previously mentioned, all shoring should be designed and installed in accordance with state and federal safety regulations.

The contractor should have provisions for soldier pile and sheet pile removal. All voids resulting from removal of shoring should be filled. The method for filling voids should be selected by the contractor, depending on construction conditions, void dimensions and available materials. The acceptable materials, in general, should be non-deleterious, and able to flow into the voids created by shoring removal (e.g., concrete slurry, “pea” gravel, etc.).

Excavations for the proposed pipeline should not extend below a 1:1 horizontal:vertical (H:V) plane extending from the bottom of any existing structures, utility lines or streets. Any proposed excavation should not cause loss of bearing and/or lateral supports of the existing utilities or streets.

If the excavation extends below a 1:1 (H:V) plane extending from the bottom of the existing structures, utility lines or streets, a maximum of 10 feet of slope face parallel to the existing improvement should be exposed at a time to reduce the potential for instability. Backfill should be accomplished in the shortest period of time and in alternating sections.

10.4 Trenchless Pipe Crossing Recommendations

Trenchless pipe crossing recommendations are presented in the following subsections.

10.4.1 Ground Classification for Trenchless Pipe Crossing

The Tunnelman’s Ground Classification (USDOT, 2009) categorizes predictive soil behaviors for saturated and unsaturated conditions as presented in Table No. 13, *Tunnelman’s Ground Classification for Soils*.

Table No. 13, Tunnelman's Ground Classification for Soils

Ground Classification	Ground Behavior	Typical Soil Types
Hard	Tunnel heading may be advanced without roof support.	Cemented sand and gravel and over-consolidated clay above the ground water table.
Firm	Heading can be advanced without initial support, and final lining can be constructed before ground starts to move.	Loess above water table; hard clay, marl, cemented sand and gravel when not highly overstressed.
Raveling	Chunks or flakes of material begin to drop out of the arch or walls sometime after the ground has been exposed, due to loosening or to over-stress and "brittle" fracture (ground separates or breaks along distinct surfaces, opposed to squeezing ground). In fast raveling ground, the process starts within a few minutes, otherwise the ground is slow raveling.	Residual soils or sand with small amounts of binder may be fast raveling below the water, slow raveling above. Stiff fissured clays may be slow or fast raveling depending upon degree of overstress.
Squeezing	Ground squeezes or extrudes plastically into tunnel, without visible fracturing or loss of continuity, and without perceptible increase in water content. Ductile, plastic yield and flow due to overstress.	Ground with low frictional strength. The rate of squeeze depends on degree of overstress. Occurs at shallow to medium depth in clay of very soft to medium consistency. Stiff to hard clay under high cover may move in combination of raveling at excavation surface and squeezing at depth behind surface.
Swelling	Ground absorbs water, increases in volume, and expands slowly into the tunnel.	Highly pre-consolidated clay with plasticity index in excess of about 30, generally containing significant percentages of montmorillonite.
Running	Granular materials without cohesion are unstable at a slope greater than their angle of repose (approx. 30º -35º). When exposed at steeper slopes they run like granulated sugar or dune sand until the slope flattens to the angle of repose.	Clean, dry angular materials.
Cohesive Running	Granular materials without cohesion are unstable at a slope greater than their angle of repose (approx. 30º -35º). When exposed at steeper slopes they run like granulated sugar or dune sand until the slope flattens to the angle of repose.	Apparent cohesion in moist sand, or weak cementation in any granular soil, may allow the material to stand for a brief period of raveling before it breaks down and runs.

Ground Classification	Ground Behavior	Typical Soil Types
Flowing	A mixture of soil and water flows into the tunnel like a viscous fluid. The material can enter the tunnel from the invert as well as from the face, crown, and walls, and can flow for great distances, completely filling the tunnel in some cases.	Below the water table in silt, sand, or gravel without enough clay content to give significant cohesion and plasticity. May also occur in highly sensitive clay when such material is disturbed.

It is our opinion that trenchless construction at the proposed location can be accomplished by an experienced contractor using bore and jack equipment. Provisions for controlling raveling and running sandy soils should be provided during the trenchless operation to minimize ground loss and ground subsidence.

It is the contractor's responsibility to design and select the appropriate bore and jack construction method, support system and to follow the requirements of the health and safety rules of the State of California pertaining to tunnel construction and permit requirements of the San Diego County, and other local agencies, if applicable.

10.4.2 Bore and Jack Construction Recommendations

Bore-and-jack is a trenchless construction method for installing pipes where open-cut technique is not feasible. This is a multi-stage process of construction which includes a temporary horizontal jacking platform and a starting alignment track in an entrance pit at a desired elevation. Manual control is used to jack the pipe at the starting point of the alignment with simultaneous excavation of the soil being accomplished by a rotating cutting head in the leading edge of the pipe's annular space.

The selection of trenchless pipe crossing methods and equipment depends on pipe material, length of crossing, and anticipated ground conditions, and should be made by the contractor. Bore-and-jack pipe construction operations involve the initial construction of a jacking/tunneling pit and a receiving pit at each end of the pipe segment to be jacked. Site-specific ground conditions and soil classifications pertaining to this project are presented in the following table.

Table No. 14, Site-Specific Ground Classifications

Boring No.	Boring Depth (Feet)	Soil Types Anticipated Near Casing Profile	Ground Classification Near Casing Profile
BH-01A	13.0	SP	Blows 50-6". Moisture 1 and 7 percent. No groundwater encountered.
BH-02	26.5	SM	Blows 6/7/9 and 4/9/12. Moisture 1 percent. No groundwater encountered.

Boring No.	Boring Depth (Feet)	Soil Types Anticipated Near Casing Profile	Ground Classification Near Casing Profile
BH-03	26.5	SM	Blows 4/9/8 and 5/7/8. Moisture 2 percent. No groundwater encountered.
BH-04	31.5	SM	Blows 7/13/15 and 7/9/12. Moisture 4 and 19 percent. No groundwater encountered.
BH-08	26.5	SP and SM	Blows 26/27/25 and 21/23/30. Moisture 1 and 3 percent. No groundwater encountered.
BH-09	31.5	SP	Blows 4750-2” and 50-6”. Moisture 2 and 6 percent. No groundwater encountered.
BH-10	25.5	SP-SM and SM	Blows 21/38/35 and 25/50-6”. Moisture 2 and 17 percent. No groundwater encountered.
BH-11	26.5	SP	Blows 28/35/32 and 22/50-5”. Moisture 1 and 2 percent. No groundwater encountered.

The working/access shafts are utilized to remove the spoil and to transport the construction materials and personnel for a bore-and-jack project. The vertical face of the working shaft may be shored with sheet piles and/or soldier piles and lagging. The face of the shaft also can be supported by ribs and laggings. The design of sheet piling, soldier beam and lagging system may be designed according to the recommendations provided in Section 10.3, *Shoring Design*. Frequent contact grouting may be necessary to reinforce the support during construction.

The total load that can be developed in the jacking plate would depend on the depth and area of the plate. The jacking equipment should not impose a reaction of more than the allowable net bearing pressure summarized in Table No. 10, *Jacking System Design Parameters* on the stabilized soils within the jacking pit.

Grouting through the pipe casing after jacking is recommended to fill any possible voids created by the jacking operation. Jacking operations should be performed in accordance with the Standard Specifications for Public Works Construction, Sections 306-2 and 306-3 (Public Works Standards, 2021). Contractors should maintain the standard grouting method so that no heave occurs.

Excavation procedures and shoring systems should be properly designed and implemented/installed to minimize the effect of settlement during construction. The contractor is responsible for minimizing impacts of crossing operations. Ground distress potential along a crossing alignment depends on a number of factors, including type of soils, type of face support, internal pressure maintained to support the face, length of unlined zone, if any, and the amount of gap between the shield and the surrounding soils. The potential of any significant ground distress at the surface can be minimized by selecting the proper equipment and construction method.

The zone of influence of properly performed pipe crossing should be limited to a distance of about 2D above the crown of the shield, where D is the diameter of the shield. When the depth of crown cover is about 2D or more, maximum ground surface settlement, if any, can be expected to be less than the thickness of the gap around the pipe. Higher ground settlement may occur for less depth of cover and inadequately supported pits can induce significant ground movement or even collapse.

It is the contractor's responsibility to document the existing pre-construction conditions of streets and any facilities and monitor deformations during construction. We recommend that the ground surface above crossing operations be continuously monitored during construction using a surface settlement monument to make sure any vertical and horizontal movements are within allowable limits. Corrective action will be required by the contractor if deformations exceed the allowable limits.

11.0 GEOTECHNICAL SERVICES DURING CONSTRUCTION

The project geotechnical consultant should review plans and specifications as the project design progresses. Such review is necessary to identify design elements, assumptions, or new conditions which require revisions or additions to our geotechnical recommendations.

The project geotechnical consultant should be present to observe conditions during construction. Testing should be performed to determine density and moisture of the during pipeline installation. Geotechnical observation and testing should be performed as needed to verify compliance with project specifications. Additional geotechnical recommendations may be required based on subsurface conditions encountered during construction.

12.0 CLOSURE

This report is prepared for the project described herein and is intended for use solely by Albert A. Webb Associates and their authorized agents, to assist in the design and construction of the proposed project. Our findings and recommendations were obtained in accordance with generally accepted professional principles practiced in geotechnical engineering. We make no other warranty, either expressed or implied.

Converse Consultants is not responsible or liable for any claims or damages associated with interpretation of available information provided to others. Field exploration identifies actual soil conditions only at those points where samples are taken, when they are taken. Data derived through sampling and laboratory testing is extrapolated by Converse employees who render an opinion about the overall soil conditions. Actual conditions in areas not sampled may differ. In the event that changes to the project occur, or additional, relevant information about the project is brought to our attention, the recommendations contained in this report may not be valid unless these changes and additional relevant information are reviewed, and the recommendations of this

report are modified or verified in writing. In addition, the recommendations can only be finalized by observing actual subsurface conditions revealed during construction. Converse cannot be held responsible for misinterpretation or changes to our recommendations made by others during construction.

As the project evolves, continued consultation and construction monitoring by a qualified geotechnical consultant should be considered an extension of geotechnical investigation services performed to date. The geotechnical consultant should review plans and specifications to verify that the recommendations presented herein have been appropriately interpreted, and that the design assumptions used in this report are valid. Where significant design changes occur, Converse may be required to augment or modify the recommendations presented herein. Subsurface conditions may differ in some locations from those encountered in the explorations, and may require additional analyses and, possibly, modified recommendations.

Design recommendations given in this report are based on the assumption that the recommendations contained in this report are implemented. Additional consultation may be prudent to interpret Converse's findings for contractors, or to possibly refine these recommendations based upon the review of the actual site conditions encountered during construction. If the scope of the project changes, if project completion is to be delayed, or if the report is to be used for another purpose, this office should be consulted.

13.0 REFERENCES

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Appendix A

Field Exploration

APPENDIX A

FIELD EXPLORATION

Our field investigation included an alignment reconnaissance and a subsurface exploration program consisting of drilling soil borings and excavation of test pits. During the reconnaissance, the surface conditions were noted, and the borings and test pit locations were marked at locations reviewed and approved by Mr. Shane Bloomfield with Albert A. Webb Associates. The selected locations should be considered accurate only to the degree implied by the method used to locate them in the field.

Nineteen exploratory borings (BH-01 through BH-17, BH-01A and BH-06A) were drilled from July 10, 2023, to July 14, 2023, to investigate the subsurface conditions. The planned depths of the borings were between 15.0 and 30.0 feet below ground surface (bgs). The borings were drilled to the maximum depths between 3.5 and 31.5 feet bgs. Due to refusal on potential gravel, cobbles and boulder, some of the borings were terminated at shallower depths. The borings details are presented in the following tables.

Table No. A-1, Summary of Borings

Boring No.	Boring Depth (ft., bgs)		Groundwater Depth (ft., bgs)	Date Completed
	Proposed	Completed		
BH-01	15.0	6.0	N/E	7/11/23
BH-01A	15.0	13.0	N/E	7/11/23
BH-02	25.0	26.5	N/E	7/14/23
BH-03	25.0	26.5	N/E	7/10/23
BH-04	30.0	31.5	N/E	7/12/23
BH-05	15.0	16.5	N/E	7/10/23
BH-06	15.0	3.5	N/E	07/10/23
BH-06A	15.0	15.5	N/E	07/10/23
BH-07	15.0	15.5	N/E	07/10/23
BH-08	15.0	26.5	N/E	07/10/23
BH-09	25.0	31.5	N/E	07/11/23
BH-10	30.0	25.5	N/E	07/12/23
BH-11	25.0	26.5	N/E	07/14/23
BH-12	15.0	16.5	N/E	07/11/23
BH-13	15.0	16.5	N/E	07/11/23
BH-14	15.0	16.5	N/E	07/11/23
BH-15	15.0	16.5	N/E	07/13/23

Boring No.	Boring Depth (ft., bgs)		Groundwater Depth (ft., bgs)	Date Completed
	Proposed	Completed		
BH-16	15.0	16.3	N/E	07/13/23
BH-17	15.0	15.7	N/E	07/13/23

The borings were advanced using a truck-mounted drill rig equipped with 8-inch diameter hollow-stem augers for soils sampling. Encountered materials were continuously logged by a Converse Engineer and classified in the field by visual classification in accordance with the Unified Soil Classification System. Where appropriate, the field descriptions and classifications have been modified to reflect laboratory test results.

Relatively undisturbed samples were obtained using California Modified Samplers (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The steel ring sampler was driven into the bottom of the borehole with successive drops of a 140-pound driving weight falling 30 inches. Blow counts at each sample interval are presented on the boring logs. Samples were retained in brass rings (2.4 inches inside diameter and 1.0 inch in height) and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. Bulk samples of typical soil types were also obtained.

The exact depths at which material changes occur cannot always be established accurately. Unless a more precise depth can be established by other means, changes in material conditions that occur between drive samples are indicated on the logs at the top of the next drive sample.

Four exploratory test pits (TP-01 through TP-04) were excavated on August 3, 2023 using a backhoe equipped with 3 feet-wide bucket to investigate the subsurface conditions on April 21, 2022. The test pits were excavated between 10.0 feet and 10.4 feet below the existing ground surface (bgs). Photos 1 through 7 in appendix C depict the size of the excavated materials. The test pits details are presented in the following tables.

Table No. A-2 Summary of Test Pits

Test Pit No.	Test Pit Depth (ft., bgs)		Groundwater Depth (ft., bgs)	Date Completed
	Proposed	Completed		
TP-01	10.0	10.3	N/E	08/03/23
TP-02	10.0	10.0	N/E	08/03/23
TP-03	10.0	10.3	N/E	08/03/23
TP-04	10.0	10.4	N/E	08/03/23

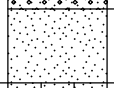
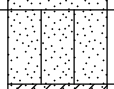
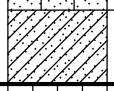
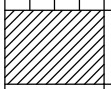
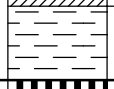
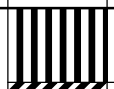
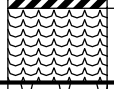
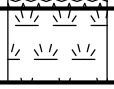
During exploration, encountered materials were continuously logged by a Converse geologist and classified in the field by visual classification in accordance with the Unified

Soil Classification System. Where appropriate, the field descriptions and classifications have been modified to reflect laboratory test results.

Following the completion of logging and sampling, the borings were backfilled with soil cuttings, and then compacted by pushing down with augers using drill rig weight. Following the completion of test pits, they were backfilled in lifts with excavated soil, tamped, and then wheel rolled at the surface using the bucket under the weight of the backhoe. If construction is delayed, the surface may settle over time. We recommend the owner monitor the boring locations and backfill any depressions that might occur or provide protection around the boring locations to prevent trip and fall injuries from occurring near the area of any potential settlement.

For a key to soil symbols and terminology used in the boring logs and test pits, refer to Drawing Nos. A-1a and A-1b, *Unified Soil Classification and Key to Boring Logs and Test Pits Symbols*. For logs of borings and test pits, see Drawings No. A-2 through A-24, *Log of Borings*. Elevation used in boring logs are based on above mean sea level (amsl).

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435)
CL	Collapse Potential (ASTM D 4546)
CP	Compaction Curve (ASTM D 1557)
CR	Corrosion, Sulfates, Chlorides (CTM 643-99; 417; 422)
CU	Consolidated Undrained Triaxial (ASTM D 4767)
DS	Direct Shear (ASTM D 3080)
EI	Expansion Index (ASTM D 4829)
M	Moisture Content (ASTM D 2216)
OC	Organic Content (ASTM D 2974)
P	Permeablility (ASTM D 2434)
PA	Particle Size Analysis (ASTM D 6913 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (ASTM D 4318)
PL	Point Load Index (ASTM D 5731)
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value (CTM 301)
SE	Sand Equivalent (ASTM D 2419)
SG	Specific Gravity (ASTM D 854)
SW	Swell Potential (ASTM D 4546)
TV	Pocket Torvane
UC	Unconfined Compression - Soil (ASTM D 2166)
	Unconfined Compression - Rock (ASTM D 7012)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850)
UW	Unit Weight (ASTM D 2937)
WA	Passing No. 200 Sieve

BORING LOG SYMBOLS

SAMPLE TYPE

- STANDARD PENETRATION TEST — Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method
- DRIVE SAMPLE — 2.42" I.D. sampler (CMS).
- DRIVE SAMPLE — No recovery
- BULK SAMPLE
- GROUNDWATER WHILE DRILLING
- GROUNDWATER AFTER DRILLING

DRILLING METHOD SYMBOLS

 Auger Drilling

 Mud Rotary Drilling

 Dynamic Cone or Hand Driven

 Diamond Core

UNIFIED SOIL/BEROCK CLASSIFICATION AND KEY TO BORING LOG AND TEST PIT SYMBOLS

Converse Consultants

Project ID: 21-81-260-02.GPJ;Template: KEY

Highway 86 Water Transmission Main, Phase 3 & 4
13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. **21-81-260-02**

Drawing No. **A-1a**

CONSISTENCY OF COHESIVE SOILS

Descriptor	Unconfined Compressive Strength (tsf)	SPT Blow Counts	Pocket Penetrometer (tsf)	CA Sampler	Torvane (tsf)	Field Approximation
Very Soft	<0.25	< 2	<0.25	<3	<0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	2 - 4	0.25 - 0.50	3 - 6	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	5 - 8	0.50 - 1.0	7 - 12	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	9 - 15	1.0 - 2.0	13 - 25	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	16 - 30	2.0 - 4.0	26 - 50	1.0 - 2.0	Readily indented by thumbnail
Hard	>4.0	>30	>4.0	>50	>2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS

Descriptor	SPT N_{60}- Value (blows / foot)	CA Sampler
Very Loose	<4	<5
Loose	4- 10	5 - 12
Medium Dense	11 - 30	13 - 35
Dense	31 - 50	36 - 60
Very Dense	>50	>60

MOISTURE

Descriptor	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OF PROPORTION OF SOILS

Descriptor	Criteria
Trace (fine)/ Scattered (coarse)	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

SOIL PARTICLE SIZE

Descriptor		Size
Boulder		> 12 inches
Cobble		3 to 12 inches
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. No. 40 Sieve
Silt and Clay		Passing No. 200 Sieve

PLASTICITY OF FINE-GRAINED SOILS

Descriptor	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CEMENTATION/ Induration

Descriptor	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

NOTE: This legend sheet provides descriptions and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

UNIFIED SOIL/BEROCK CLASSIFICATION AND KEY TO BORING LOG AND TEST PIT SYMBOLS

Log of Boring No. BH-01

Date Drilled: 7/11/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -132 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SAND WITH SILT AND GRAVEL (SP-SM):** fine to coarse-grained, gravel up to 2.0" maximum dimension, very dense, dry, brown.	■	▨	27/40/40	1		*disturbed
5					50-6"			*no recovery
		End of boring at 6.0' below ground surface due to refusal. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/11/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-2

Log of Boring No. BH-01A

Date Drilled: 7/11/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -132 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM: **SAND WITH SILT AND GRAVEL (SP-SM):** fine to coarse-grained, gravel up to 2.0" maximum dimension, dense, dry, brown.						PA, SE *no recovery
5		**SAND WITH GRAVEL (SP):** fine to coarse-grained, gravel up to 2.0" maximum dimension, dense, dry, brown. very dense			24/25/28 50-6"			*disturbed *no recovery
10		- at 10.0': cobble/gravel aggregate.			50-6" 50-6"	1 7		*disturbed
		End of boring at 13.0' below ground surface due to refusal. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/11/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-3

Log of Boring No. BH-02

Date Drilled: 7/14/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -137 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM: **SILTY SAND (SM):** few gravel up to 2.0" maximum dimension, dense, dry, brown.	■	▨	8/12/24	1		CP *disturbed
5		dense, moist.	■		12/17/29	9	107	
		medium dense, dry.	■		6/7/9	1		CR, *disturbed
10			■		4/9/12	1	107	DS, *disturbed
15			■		6/16/17	1		*disturbed
20		very dense, dry.	■		19/21/33	1	129	
25		**CLAYEY SAND (SC):** fine to coarse grained, dense, moist, brown.	■		13/19/28	29	92	
		End of boring at 26.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/14/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-4

Log of Boring No. BH-03

Date Drilled: 7/10/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -132 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		3 INCHES ASPHALT CONCRETE / NO AGGREGATE BASE						PA, SE
		ALLUVIUM: **SILTY SAND (SM):** fine to medium-grained, medium dense, moist, gray.	■		5/6/6	3	90	
5			■		9/10/11	2	94	
			■		4/9/8	2	94	
10			■		5/7/8	1		*disturbed
15		**SAND (SP):** fine to coarse-grained, brown.			4/18/32	1		*disturbed
20		**SANDY SILT (ML):** fine-grained sand, very dense, olive.	■		20/31/38	5	115	
25			■		10/15/23	10	113	
		End of boring at 26.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/10/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-5

Log of Boring No. BH-04

Date Drilled: 7/12/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -128 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND (SM):** fine to coarse-grained, medium dense, moist, brown.						CP
			■		11/14/15	3	101	
5			■		8/8/12	18	97	
			■		7/13/15	19	107	
10			■		7/9/12	4	98	CR
15			■		8/9/22	8	95	
20			■		11/13/18	7	103	
25			■		10/14/17	14	79	
30					18/19/23	9	91	
		End of boring at 31.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/12/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-6

Log of Boring No. BH-05

Date Drilled: 7/10/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -197 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM: **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 0.5" in maximum dimension, medium dense, dry, gray.	■	▨	3/4/7	1		PA,SE *disturbed
5		dense, moist.	■		5/7/13	3	90	
			■		10/13/13	1	99	DS
10			■		6/10/12	3	86	
15			■		10/19/25	5	103	
		End of boring at 16.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/10/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-7

Log of Boring No. BH-06

Date Drilled: 7/10/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -160 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SAND (SP):** fine to coarse-grained, cobbles up to 5.0" maximum dimension, very dense, gray.			40/50-6"			*no recovery
		End of boring at 3.5' below ground surface due to refusal. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/10/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-8

Log of Boring No. BH-06A

Date Drilled: 7/10/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -161 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SAND WITH SILT AND GRAVEL (SP-SM):** fine to coarse-grained, gravel up to 2.0" maximum dimension, very dense, moist, gray.	■		20/33/50			CP, CR
5		**SAND WITH GRAVEL (SP):** gravel up to 2.0" maximum dimension, very dense, moist, gray.	■		24/44/50			
					50-6"			*no recovery
10			■		40/50-6"			
15					50-6"			*no recovery
		End of boring at 15.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/10/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-9

Log of Boring No. BH-07

Date Drilled: 7/10/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -138 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SAND WITH SILT AND GRAVEL (SP-SM):** fine to medium-grained, some gravel up to 2.5" maximum dimension, very dense, moist, brown.	■	▨	9/23/40	4	123	PA,SE
5		**SILTY SAND (SM):** fine to medium-grained, some gravel up to 2.5" maximum dimension, very dense, moist, brown.	■		25/29/40	2	105	
			■		22/38/40	1	103	
10			■		37/40/42	1		*disturbed
15			■		50-6"	2		*disturbed
		End of boring at 15.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/10/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-10

Log of Boring No. BH-08

Date Drilled: 7/10/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -95 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		5.5 INCHES ASPHALT CONCRETE / 6.5 INCH AGGREGATE BASE						
		ALLUVIUM: **SILTY SAND (SM):** fine to coarse-grained, some gravel up to 2.0" maximum dimension, very dense, dry, brown.	■	▨	20/40/50	1		*disturbed
5			■		23/20/21	1		*disturbed
			■		26/27/25			
10		moist.	■		21/23/30	3	106	DS
15		dry.	■		18/50-6"	1		*disturbed
20		moist.	■		50-6"	7	106	
25			■		20/35/50	6	106	
		End of boring at 26.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/10/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. **21-81-260-02** Drawing No. **A-11**

Log of Boring No. BH-09

Date Drilled: 7/11/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -99 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SAND WITH SILT AND GRAVEL (SP-SM):** fine to coarse-grained, gravel up to 1.5" in maxiumum dimension, very dense, moist, brown.						PA, SE
					50-5"			*no recovery
5					50-4"			*no recovery
					47/50-2"	6	125	
10					50-6"			*no recovery
15					45/50-6"	2	114	
20					30/30/46	2	113	
25					33/40/50-5"	3	113	
30					28/33/50	5	112	
		End of boring at 31.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/12/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-12

Log of Boring No. BH-10

Date Drilled: 7/12/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -80 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SAND WITH SILT AND GRAVEL (SP-SM):** fine to coarse-grained, gravel up to 3.0" maximum dimension, very dense, moist, brown.	■	▨	30/50-5"	2	95	CP
5					50-6"			*no recovery
			■		21/38/35	2	108	
10		**CLAYEY SAND (SC):** fine to coarse grained, gravel up to 3.0" maximum dimension, very dense, moist,.	■		25/50-6"	17	96	CR
15			■		17/27/41	21	91	
20		**SAND WITH SILT AND GRAVEL (SP-SM):** fine to coarse-grained, gravel up to 3.0" maximum dimension, very dense, moist, brown.	■		40/50-5"	2	114	
25					50-6"			*no recovery
		End of boring at 25.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/12/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. **21-81-260-02** Drawing No. **A-13**

Log of Boring No. BH-11

Date Drilled: 7/14/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -80 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SAND WITH SILT AND GRAVEL (SP-SM):** fine to coarse-grained, gravel up to 2" in maximum dimension, very dense, moist, brown.	■	▨	37/50-4"	1	136	PA, SE
5			■		23/43/35	2	105	
			■		28/35/32	1	111	
10			■		22/50-5"	1	112	
15			■		21/31/42	2		*disturbed
20			■		39/50-6"	2	98	
25			■		34/43/46	1	115	
		End of boring at 26.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/14/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-14

Log of Boring No. BH-12

Date Drilled: 7/11/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -56 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM: **SANDY SILT (ML):** fine to coarse-grained sand, dense, moist, gray.	■		12/17/17	5	107	PA, SE
5		**CLAYEY SAND (SC):** fine to medium-grained, dense, moist, dark brown.	■		10/20/25	17	115	
			■		12/18/30	16	108	
10			■		16/32/30	18	111	
15			■		13/25/35	9	121	
		End of boring at 16.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/14/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-15

Log of Boring No. BH-13

Date Drilled: 7/11/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -79 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		1.5 INCHES ASPHALT CONCRETE / NO AGGREGATE BASE						CP, CR
		ALLUVIUM: **CLAYEY SAND (SC):** fine to coarse-grained, very dense, moist, reddish-brown.	■		13/29/40	17	99	
5			■		14/26/36	19	86	
			■		16/26/40	20	120	DS
10			■		15/24/33	21	107	
15			■		14/27/40	23	96	
		End of boring at 16.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings, compacted with an auger, and patched with asphalt concrete on 7/11/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-16

Log of Boring No. BH-14

Date Drilled: 7/11/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 6 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND WITH GRAVEL (SM):** fine to coarse-grained, gravel up to 2.0" maximum dimension, dense, moist, brown.		■	14/15/16			PA, SE; *no recovery
5			■		10/21/25	5	108	
			■		20/27/35	6	95	
10			■		17/25/44	12	118	
15		**CLAYEY SAND (SC):** fine to coarse grained, gravel up to 2.0" maximum dimension, dense, moist, brown.	■		18/13/23	27	92	
		End of boring at 16.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/11/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-17

Log of Boring No. BH-15

Date Drilled: 7/13/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -144 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM: **SILTY SAND WITH GRAVEL (SM):** fine to coarse-grained, gravel up to 2.5" maximum dimension, dense, moist, brown.			32/20/20			PA, SE *no recovery
5					25/30/40			*no recovery
		dry.			15/32/50	1	107	
10		moist.			5/8/12	8		*disturbed
15					40/40/30	1	112	
		End of boring at 16.5' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/13/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-18

Log of Boring No. BH-16

Date Drilled: 7/13/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -134 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND WITH GRAVEL (SM):** fine to coarse-grained, gravel up to 2.5" maximum dimension, dense, moist, brown.	■	▨	25/17/24	10	85	CP
5			■		30/30/42	1	95	DS
			■		16/24/38	9	79	CR
10			■		12/12/22	6	83	
15			■		32/35/50-4"	5	85	
		End of boring at 16.3' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/13/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-19

Log of Boring No. BH-17

Date Drilled: 7/13/2023 Logged by: Tony Maciel Checked By: Hashmi Quazi

Equipment: CME 75/ 8" HSA Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): -135 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM: **SILTY SAND WITH GRAVEL (SM):** fine to coarse-grained, gravel up to 2.75" maximum dimension, very dense, moist, brown.	■	▨	32/28/26	2	93	PA, SE
5			■		28/32/44	6	88	
			■		20/24/38	1	99	
10			■		10/12/22	3	84	
15			■		20/50-3"	2	92	
		End of boring at 15.7' below ground surface. No groundwater encountered. Borehole backfilled with soil cuttings and then compacted by pushing down with augers using drill rig weight on 7/13/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. 21-81-260-02

Drawing No. A-20

Log of Test Pit No. TP-01

Dates Drilled: 8/3/2023 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: Backhoe with 3' bucket Driving Weight and Drop: N/A

Ground Surface Elevation (ft): -129 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Test Pit and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		NO ASPHALT CONCRETE / 6" AGGREGATE BASE						
		ALLUVIUM:						
		SILTY SAND WITH GRAVEL (SM): fine to coarse-grained, little to some gravel up to 3 inches maximum dimension and cobble up to 12 inches maximum dimension, scattered boulders up to 24 inches maximum dimension, moist, grayish brown.						
5								
		GRAVEL AND COBBLES (GP): mostly gravel up to 2 inches maximum dimension and cobble up to 12 inches maximum dimension, scattered boulders up to 24 inches maximum dimension, few silt and sand, moist, grayish brown.						
10		End of test pit at 10.3 feet below ground surface. No groundwater encountered. Backfill using soil cuttings and tamped with backhoe weight on 8/3/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
13.4 Miles of 30-inch Pipeline
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Project No. 21-81-260-02

Drawing No. A-21

Log of Test Pit No. TP-02

Dates Drilled: 8/3/2023 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: Backhoe with 3' bucket Driving Weight and Drop: N/A

Ground Surface Elevation (ft): -170 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Test Pit and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM:						
		SAND WITH SILT (SW-SM): few gravel and cobble up to 8 inches maximum dimension, scattered boulders up to 18 inches maximum dimension, caliche, moist, grayish brown.						
		- @ 3.0': abandoned PVC pipe going east and west.						
5		**SILTY SAND WITH GRAVEL AND COBBLES (SM):** fine to coarse-grained, little to some gravel and cobbles up to 12 inches maximum dimension, scattered boulders up to 24 inches maximum dimension, moist, grayish brown.						
		SAND WITH SILT (SW-SM): few gravel and cobble up to 6 inches maximum dimension, moist, brown.						
10		End of test pit at 10.0 feet below ground surface. No groundwater encountered. Backfill using soil cuttings and tamped with backhoe weight on 8/3/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
13.4 Miles of 30-inch Pipeline
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Project No. 21-81-260-02

Drawing No. A-22

Log of Test Pit No. TP-03

Dates Drilled: 8/3/2023 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: Backhoe with 3' bucket Driving Weight and Drop: N/A

Ground Surface Elevation (ft): -140 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
5		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Test Pit and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
10		**ALLUVIUM:** **SILTY SAND WITH GRAVEL AND COBBLES (SM):** fine to coarse-grained, little to some gravel and cobbles up to 12 inches maximum dimension, scattered boulders up to 18 inches maximum dimension, roots and rootlets, moist, grayish brown.						
		End of test pit at 10.3 feet below ground surface. No groundwater encountered. Backfill using soil cuttings and tamped with backhoe weight on 8/3/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

Project No. 21-81-260-02

Drawing No. A-23

Log of Test Pit No. TP-04

Dates Drilled: 8/3/2023 Logged by: Stephen McPherson Checked By: Hashmi Quazi

Equipment: Backhoe with 3' bucket Driving Weight and Drop: N/A

Ground Surface Elevation (ft): -137 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Test Pit and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM:						
		SAND WITH SILT (SW-SM): fine to coarse-grained, few gravel up to 3 inches maximum dimension, few cobble up to 12 inches maximum dimension, scattered boulders up to 36 inches maximum dimension, roots and rootlets, moist, grayish brown.						
5		**SAND (SP):** fine to coarse-grained, roots and rootlets, moist, dark brown.						
		SAND WITH SILT (SW-SM): fine to coarse-grained, few gravel and cobbles up to 12 inches maximum dimension, scattered boulders up to 36 inches maximum dimension, roots and rootlets, moist, grayish brown.						
10		End of test pit at 10.4 feet below ground surface. No groundwater encountered. Backfill using soil cuttings and tamped with backhoe weight on 8/3/2023.						

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California

Project No. 21-81-260-02

Drawing No. A-24

Appendix B

Laboratory Testing Program

APPENDIX B

LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their physical properties and engineering characteristics. The amount and selection of tests were based on the geotechnical parameters required for this project. Test results are presented herein and on the Logs of Borings, in Appendix A, *Field Exploration*. The following is a summary of the various laboratory tests conducted for this project.

***In-Situ* Moisture Content and Dry Density**

In-situ dry density and moisture content tests were performed on relatively undisturbed ring samples in accordance with ASTM Standard D2216 and D2937 test method. This test is used in soil classification and provides qualitative information on strength and compressibility characteristics of soils at the location tested. For test results, see the Logs of Borings in Appendix A, *Field Exploration*.

Sand Equivalent (SE)

Ten representative soil samples were tested in accordance with the ASTM Standard D2419 test method to determine the sand equivalent. The test results are presented in the following table.

Table No. B-1, Sand Equivalent Test Results

Boring No.	Depth (feet)	Soil Description	Sand Equivalent
BH-01A	0-5	Sand with Silt and Gravel (SP-SM)	39
BH-03	0-5	Silty Sand (SM)	15
BH-05	0-5	Silty Sand (SM)	50
BH-07	0-5	Sand with Silt and Gravel (SP-SM)	32
BH-09	0-5	Sand with Silt and Gravel (SP-SM)	33
BH-11	0-5	Sand with Silt and Gravel (SP-SM)	53
BH-12	0-5	Sandy Silt (ML)	2
BH-14	0-5	Silty Sand with Gravel (SM)	5
BH-15	0-5	Silty Sand with Gravel (SM)	47
BH-17	0-5	Silty Sand with Gravel (SM)	24

Soil Corrosivity Test (CR)

Seven representative soil samples were tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of these tests was to determine the corrosion potential of

the soils when placed in contact with common construction materials. These tests were performed by AP Engineering and Testing, Inc. (Pomona, CA) Laboratory in accordance with California Tests CT643, 422, and 417. Test results are presented in the table below.

Table No. B-2, Summary of Soil Corrosivity Test Results

Boring No.	Depth (feet)	pH	Chloride (ppm)	Sulfate (ppm)	Minimum Electrical Resistivity (ohm-cm)
BH-02	7	9.3	52	42	4,416
BH-04	10	8.9	52	59	4,239
BH-06A	0-5	9.2	32	84	5,209
BH-09	7	9.4	25	55	4,780
BH-10	10	9.8	18	20	5,564
BH-13	0-5	8.9	1287	2023	207
BH-16	7	8.5	597	150	773

Grain-Size Analyses (PA)

To assist in classification of soils, mechanical grain-size analyses were performed on ten select samples in accordance with the ASTM Standard D6913 test method. Grain-size curves are shown in Drawing No. B-1a and B-2a, *Grain Size Distribution Results* and are presented in the following table.

Table No. B-3, Grain Size Distribution Test Results

Boring No.	Depth (ft)	Soil Classification	% Gravel	% Sand	%Silt	%Clay
BH-01A	0-5	Sand with Silt and Gravel (SP-SM)	35.0	54.2	10.8	
BH-03	0-5	Silty Sand (SM)	1.0	55.8	43.2	
BH-05	0-5	Silty Sand (SM)	1.0	74.8	24.2	
BH-07	0-5	Sand with Silt and Gravel (SP-SM)	29.0	62.8	8.2	
BH-09	0-5	Sand with Silt and Gravel (SP-SM)	27.0	64.2	8.2	
BH-11	0-5	Sand with Silt and Gravel (SP-SM)	31.0	59.9	9.1	
BH-12	0-5	Sandy Silt (ML)	0.0	11.9	88.1	
BH-14	0-5	Silty Sand with Gravel (SM)	26.0	44.3	29.7	
BH-15	0-5	Silty Sand with Gravel (SM)	34.0	37.5	28.5	
BH-17	0-5	Silty Sand with Gravel (SM)	21.0	63.8	15.2	

Maximum Density and Optimum Moisture Content (CP)

Laboratory maximum dry density-optimum moisture content relationship tests were performed on six representative bulk soil samples in accordance with the ASTM Standard D1557 test method. The test results are presented in Drawing No. B-2a and B-2b, *Moisture-Density Relationship Results,* and are summarized in the following table.

Table No. B-4, Summary of Moisture-Density Relationship Results

Boring No.	Depth (feet)	Soil Description	Optimum Moisture (%)	Maximum Dry Density (pcf)
BH-02	0-5	Silty Sand (SM), Brown	8.5	124.0
BH-04	0-5	Silty Sand (SM), Brown	8.5	122.0
BH-06A	0-5	Sand with Silt and Gravel (SP-SM), Gray	6.0	130.0
BH-10	0-5	Sand with Silt and Gravel (SP-SM), Brown	8.0	119.0
BH-13	0-5	Clayey Sand (SC), Reddish Brown	17.0	115.0
BH-16	0-5	Silty Sand with Gravel (SM), Brown	15.0	116.0

Direct Shear (DS)

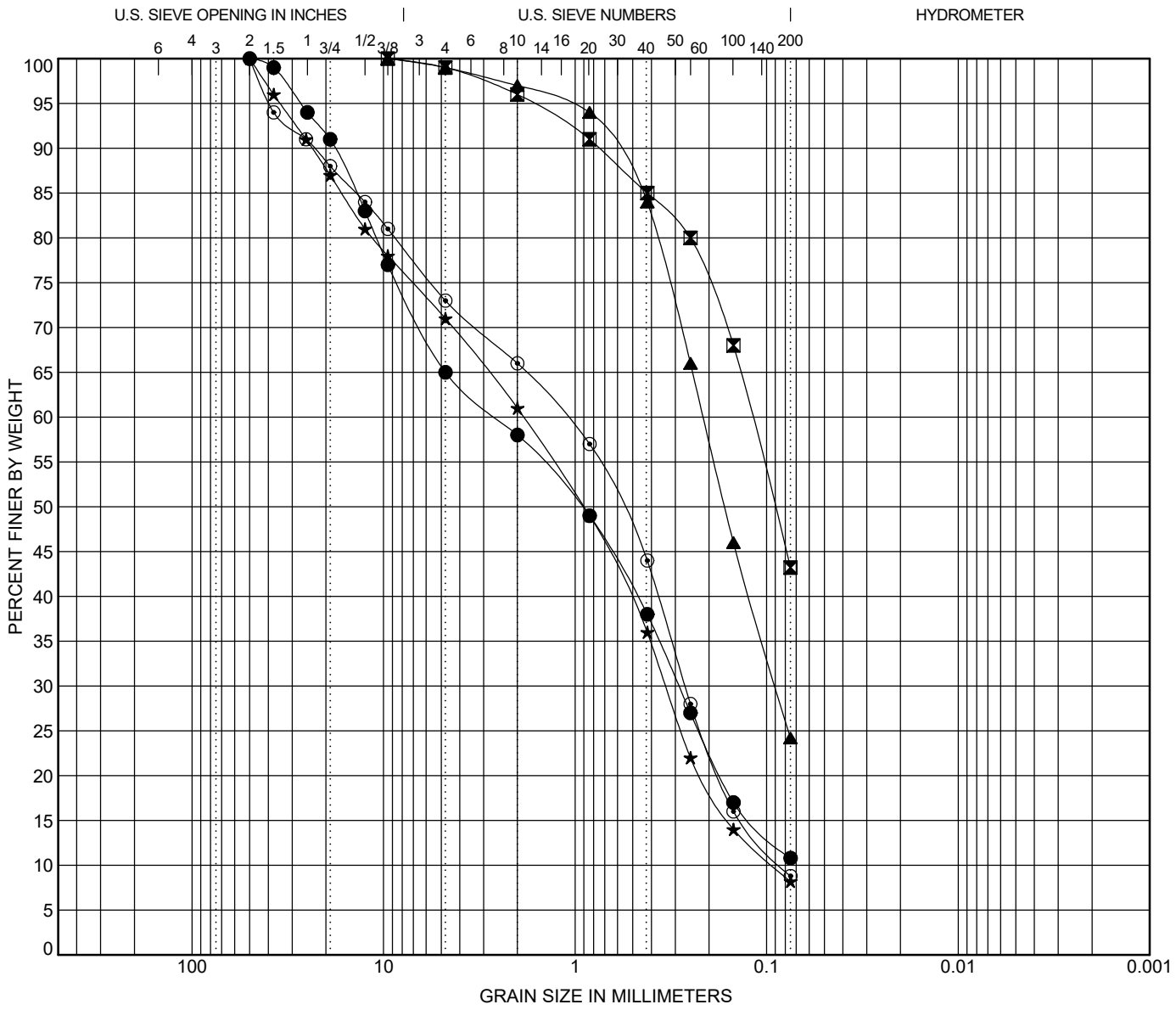
Five direct shear tests were performed on relatively undisturbed representative ring samples under soaked moisture condition in accordance with the ASTM D3080 procedure. For each test, three samples contained in brass sampler rings were placed, one at a time, directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The samples were then sheared at a constant strain rate of 0.02 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Ultimate strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample density and moisture content, see Drawings No. B-3 through B-7*, Direct Shear Test Results,* and the following table.

Table No. B-5, Summary of Direct Shear Test Results

Boring No.	Depth (feet)	Soil Description	Ultimate Strength Parameters	
			Friction Angle (degrees)	Cohesion (psf)
BH-02	10.0-11.5	Silty Sand (SM)	31	50
BH-05	7.0-8.5	Silty Sand (SM)	35	40
BH-08	10.0-11.5	Silty Sand (SM)	31	100
BH-13	7.0-8.5	Clayey Sand (SC)	34	490
BH-16	5.0-6.5	Silty Sand with Gravel (SM)	31	10

Sample Storage

Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring No.	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	**BH-01A**	**0-5**	**Sand with Silt and Gravel (SP-SM)**				**0.47**	**37.31**
⊠	**BH-03**	**0-5**	**Silty Sand (SM)**					
▲	**BH-05**	**0-5**	**Silty Sand (SM)**					
★	**BH-07**	**0-5**	**Sand with Silt and Gravel (SP-SM)**				**0.65**	**20.05**
⊙	**BH-09**	**0-5**	**Sand with Silt and Gravel (SP-SM)**				**0.75**	**13.34**

	Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH-01A**	**0-5**	**50**	**2.561**	**0.288**		**35.0**	**54.2**	**10.8**	
⊠	**BH-03**	**0-5**	**9.5**	**0.119**			**1.0**	**55.8**	**43.2**	
▲	**BH-05**	**0-5**	**9.5**	**0.214**	**0.09**		**1.0**	**74.8**	**24.2**	
★	**BH-07**	**0-5**	**50**	**1.861**	**0.336**	**0.093**	**29.0**	**62.8**	**8.2**	
⊙	**BH-09**	**0-5**	**50**	**1.122**	**0.267**	**0.084**	**27.0**	**64.2**	**8.8**	

GRAIN SIZE DISTRIBUTION RESULTS

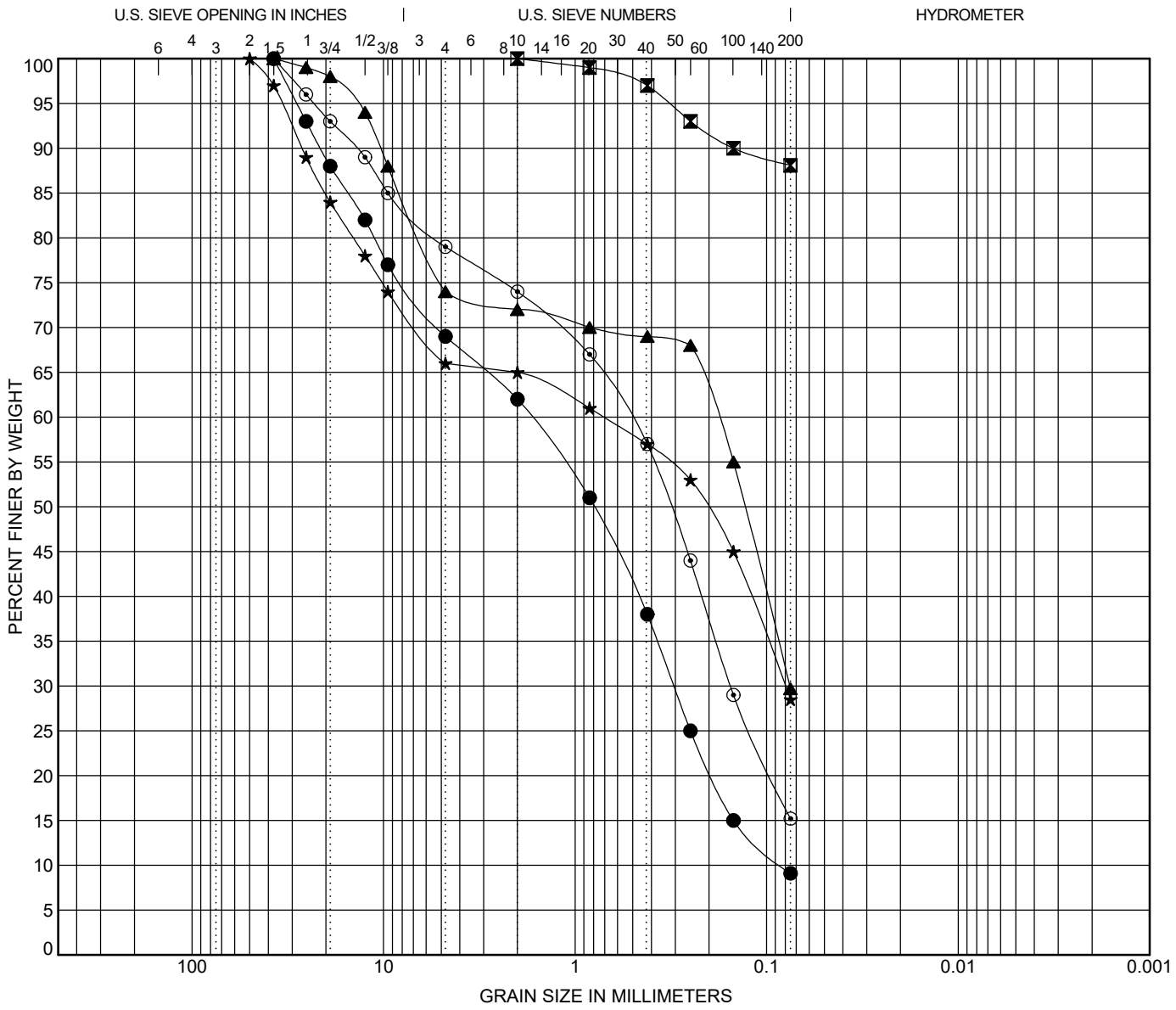
Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. **21-81-260-02**

Drawing No. **B-1a**

Project ID: 21-81-260-02.GPJ; Template: GRAIN SIZE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring No.	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	**BH-11**	**0-5**	**Sand with Silt and Gravel (SP-SM)**				**0.65**	**20.51**
⊠	**BH-12**	**0-5**	**Sandy Silt (ML)**					
▲	**BH-14**	**0-5**	**Silty Sand with Gravel (SM)**					
★	**BH-15**	**0-5**	**Silty Sand with Gravel (SM)**					
⊙	**BH-17**	**0-5**	**Silty Sand with Gravel (SM)**					

	Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH-11**	**0-5**	**37.5**	**1.708**	**0.305**	**0.083**	**31.0**	**59.9**	**9.1**	
⊠	**BH-12**	**0-5**	**2**				**0.0**	**11.9**	**88.1**	
▲	**BH-14**	**0-5**	**37.5**	**0.182**	**0.076**		**26.0**	**44.3**	**29.7**	
★	**BH-15**	**0-5**	**50**	**0.706**	**0.08**		**34.0**	**37.5**	**28.5**	
⊙	**BH-17**	**0-5**	**37.5**	**0.517**	**0.154**		**21.0**	**63.8**	**15.2**	

GRAIN SIZE DISTRIBUTION RESULTS

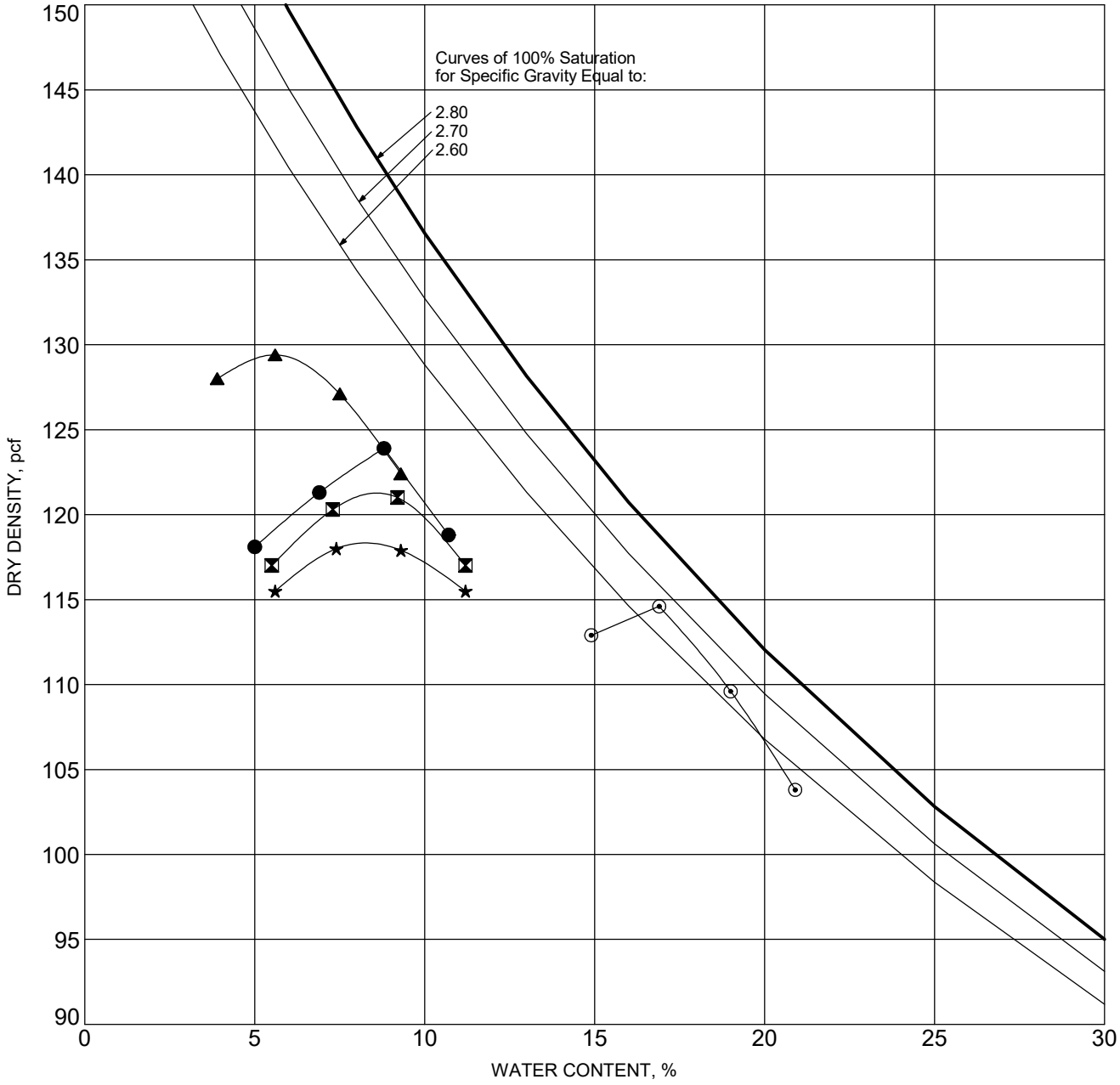
Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. **21-81-260-02**

Drawing No. **B-2b**

Project ID: 21-81-260-02.GPJ; Template: GRAIN SIZE



SYMBOL	BORING NO.	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	**BH-02**	**0-5**	**Silty Sand (SM), Brown**	**D1557 Method B**	**8.5**	**124.0**
⊠	**BH-04**	**0-5**	**Silty Sand (SM), Brown**	**D1557 Method A**	**8.5**	**122.0**
▲	**BH-06A**	**0-5**	**Sand with Silt and Gravel (SP-SM), Gray**	**D1557 Method C**	**6.0**	**130.0**
★	**BH-10**	**0-5**	**Sand with Silt and Gravel (SP-SM), Brown**	**D1557 Method B**	**8.0**	**119.0**
⊙	**BH-13**	**0-5**	**Clayey Sand (SC), Reddish Brown**	**D1557 Method A**	**17.0**	**115.0**

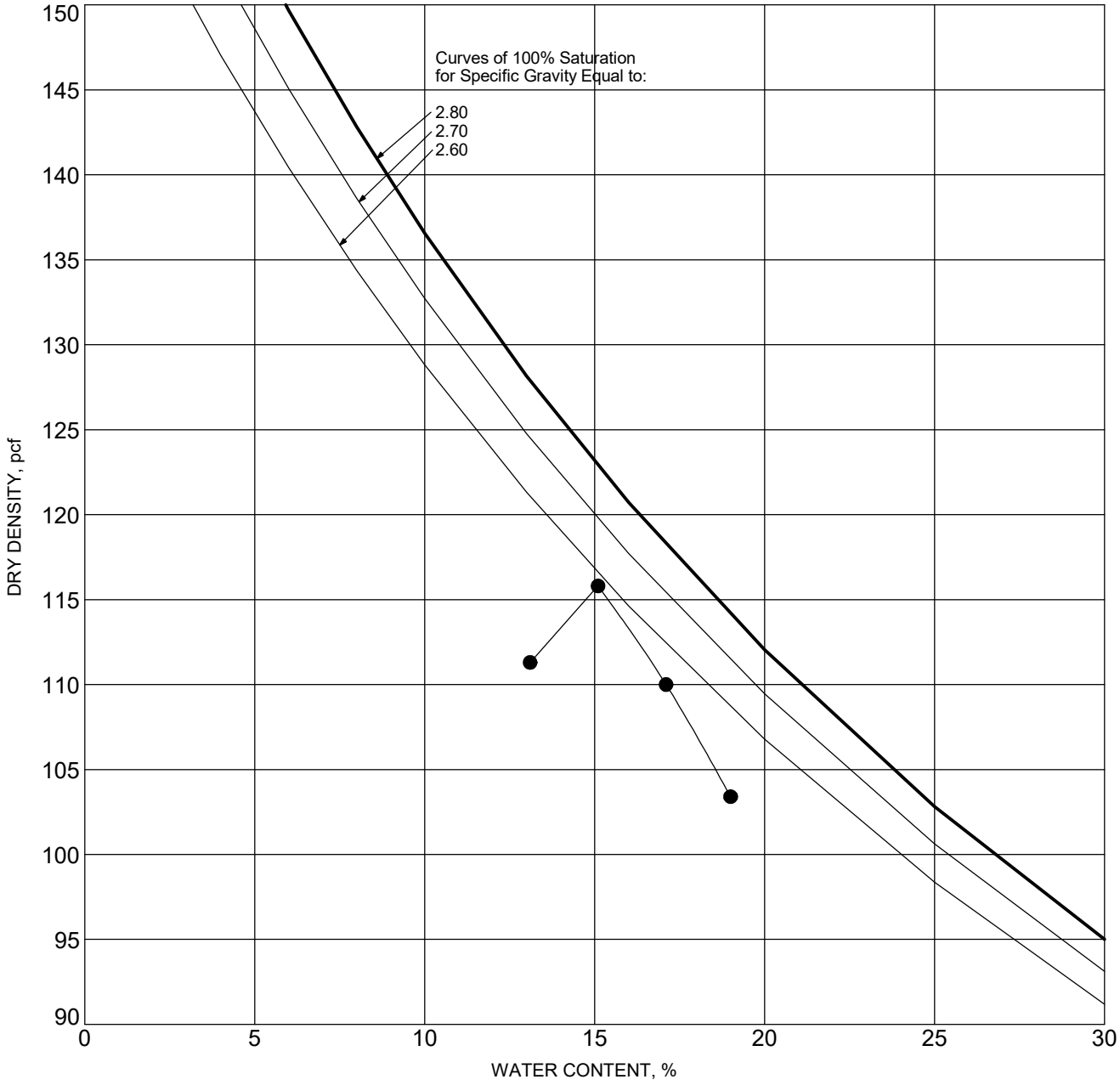
MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. **21-81-260-02**

Drawing No. **B-2a**



SYMBOL	BORING NO.	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	**BH-16**	**0-5**	**Silty Sand with Gravel (SM), Brown**	**D1557 Method A**	**15.0**	**116.0**

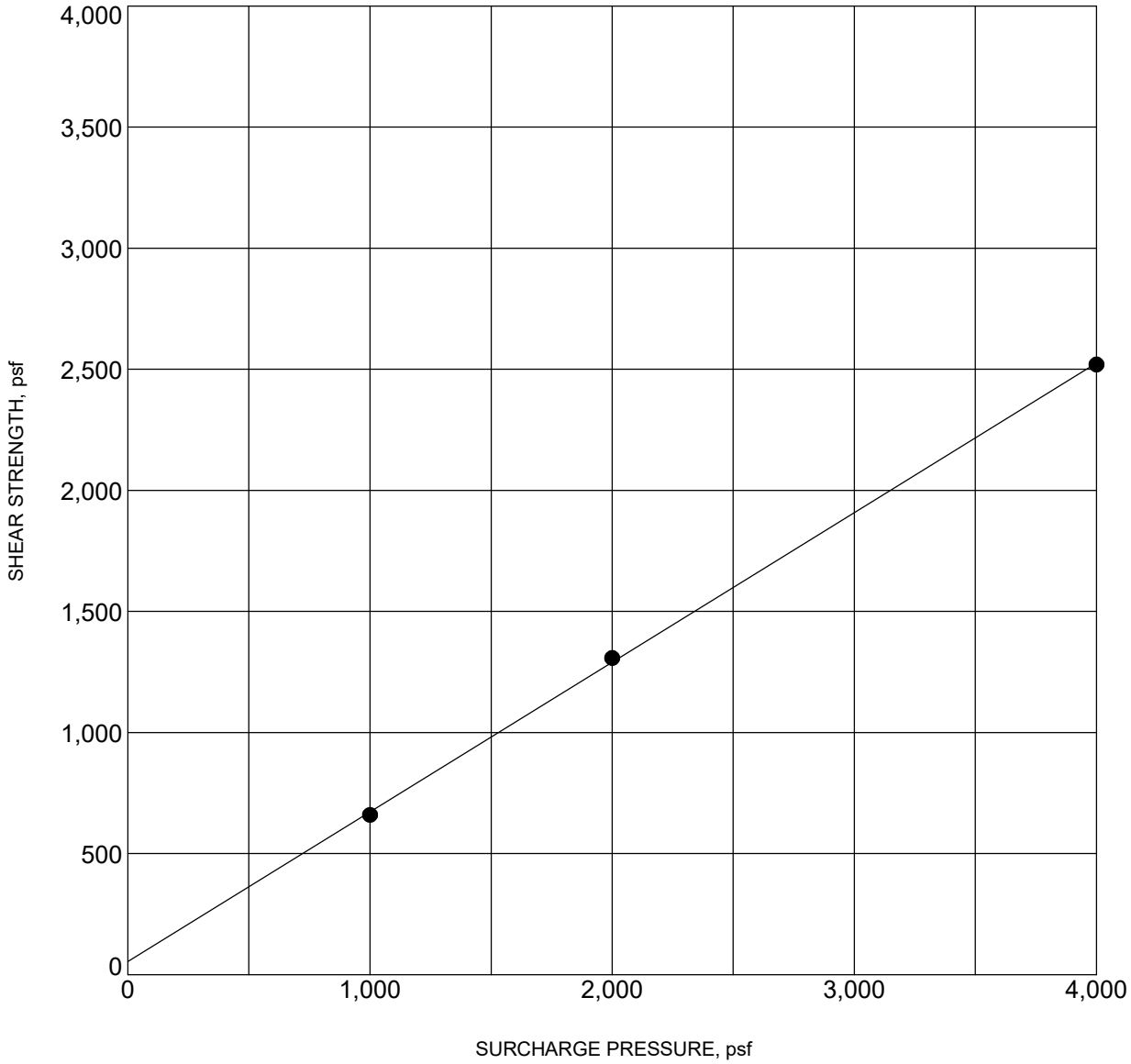
MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. **21-81-260-02**

Drawing No. **B-2b**



BORING NO.	:	**BH-02**	DEPTH (ft)	:	**10.0-11.5**
DESCRIPTION	:	**Silty Sand (SM)**			
COHESION (psf)	:	**50**	FRICTION ANGLE (degrees):		**31**
MOISTURE CONTENT (%)	:	**1.0**	DRY DENSITY (pcf)	:	**107**

NOTE: Ultimate Strength.

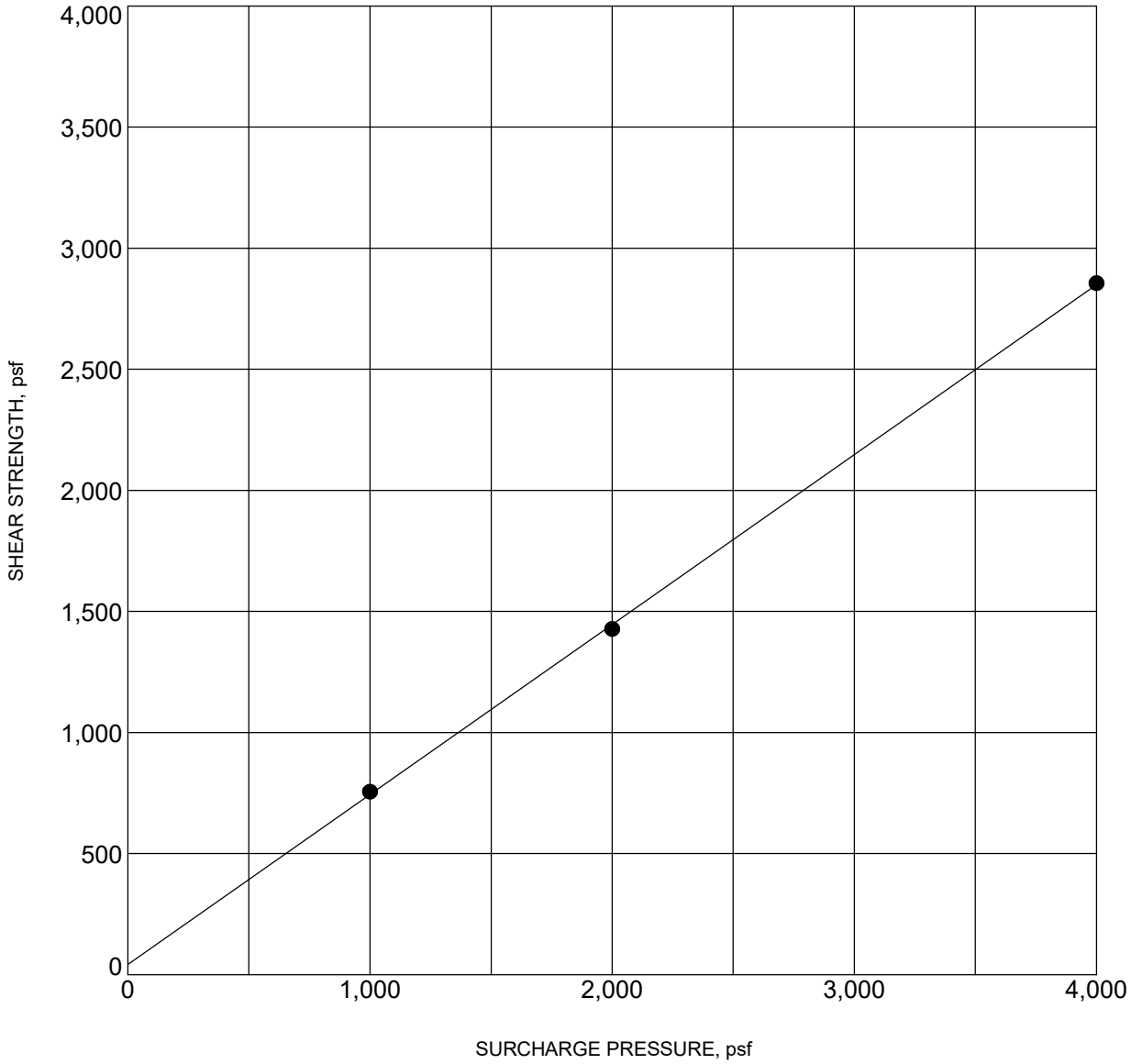
DIRECT SHEAR TEST RESULTS

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. **21-81-260-02**

Drawing No. **B-3**



BORING NO.	:	**BH-05**	DEPTH (ft)	:	**7.0-8.5**
DESCRIPTION	:	**Silty Sand (SM)**			
COHESION (psf)	:	**40**	FRICTION ANGLE (degrees):		**35**
MOISTURE CONTENT (%)	:	**1.0**	DRY DENSITY (pcf)	:	**99**

NOTE: Ultimate Strength.

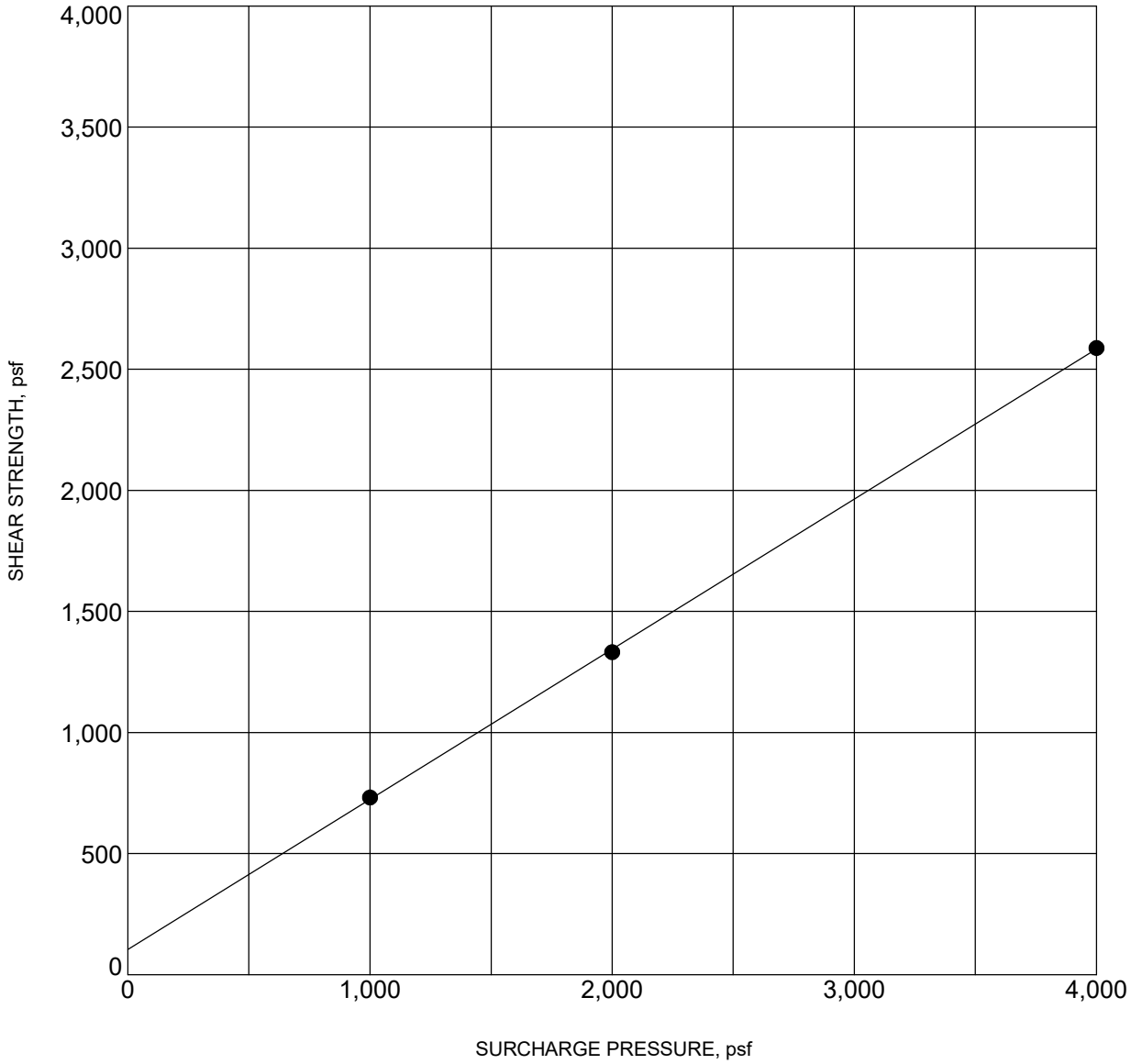
DIRECT SHEAR TEST RESULTS

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. **21-81-260-02**

Drawing No. **B-4**



BORING NO.	:	**BH-08**	DEPTH (ft)	:	**10.0-11.5**
DESCRIPTION	:	**Silty Sand (SM)**			
COHESION (psf)	:	**100**	FRICTION ANGLE (degrees):		**31**
MOISTURE CONTENT (%)	:	**3.0**	DRY DENSITY (pcf)	:	**106**

NOTE: Ultimate Strength.

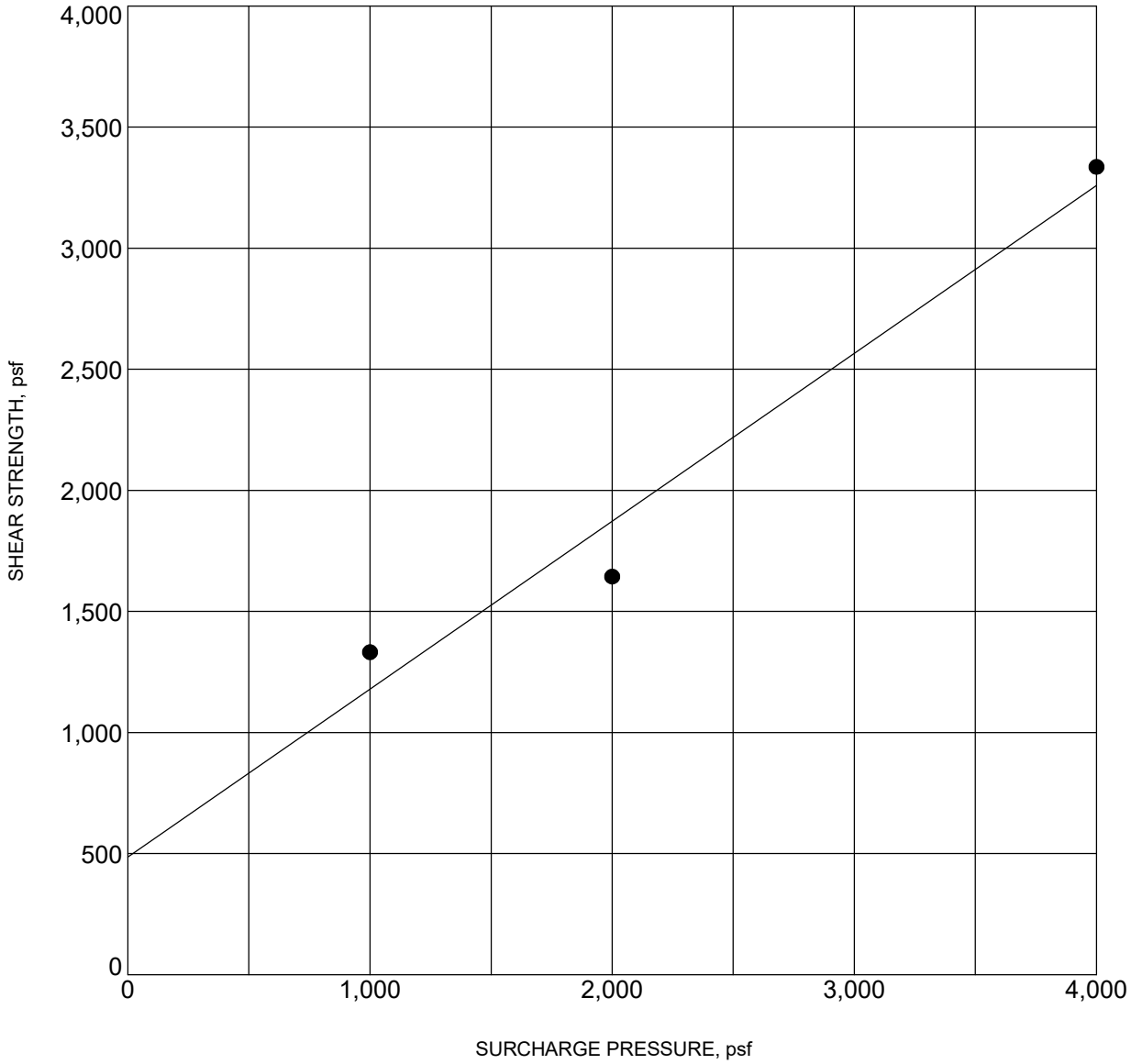
DIRECT SHEAR TEST RESULTS

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. **21-81-260-02**

Drawing No. **B-5**



BORING NO.	:	**BH-13**	DEPTH (ft)	:	**7.0-8.5**
DESCRIPTION	:	**Clayey Sand (SC)**			
COHESION (psf)	:	**490**	FRICTION ANGLE (degrees):		**34**
MOISTURE CONTENT (%)	:	**20**	DRY DENSITY (pcf)	:	**120**

NOTE: Ultimate Strength.

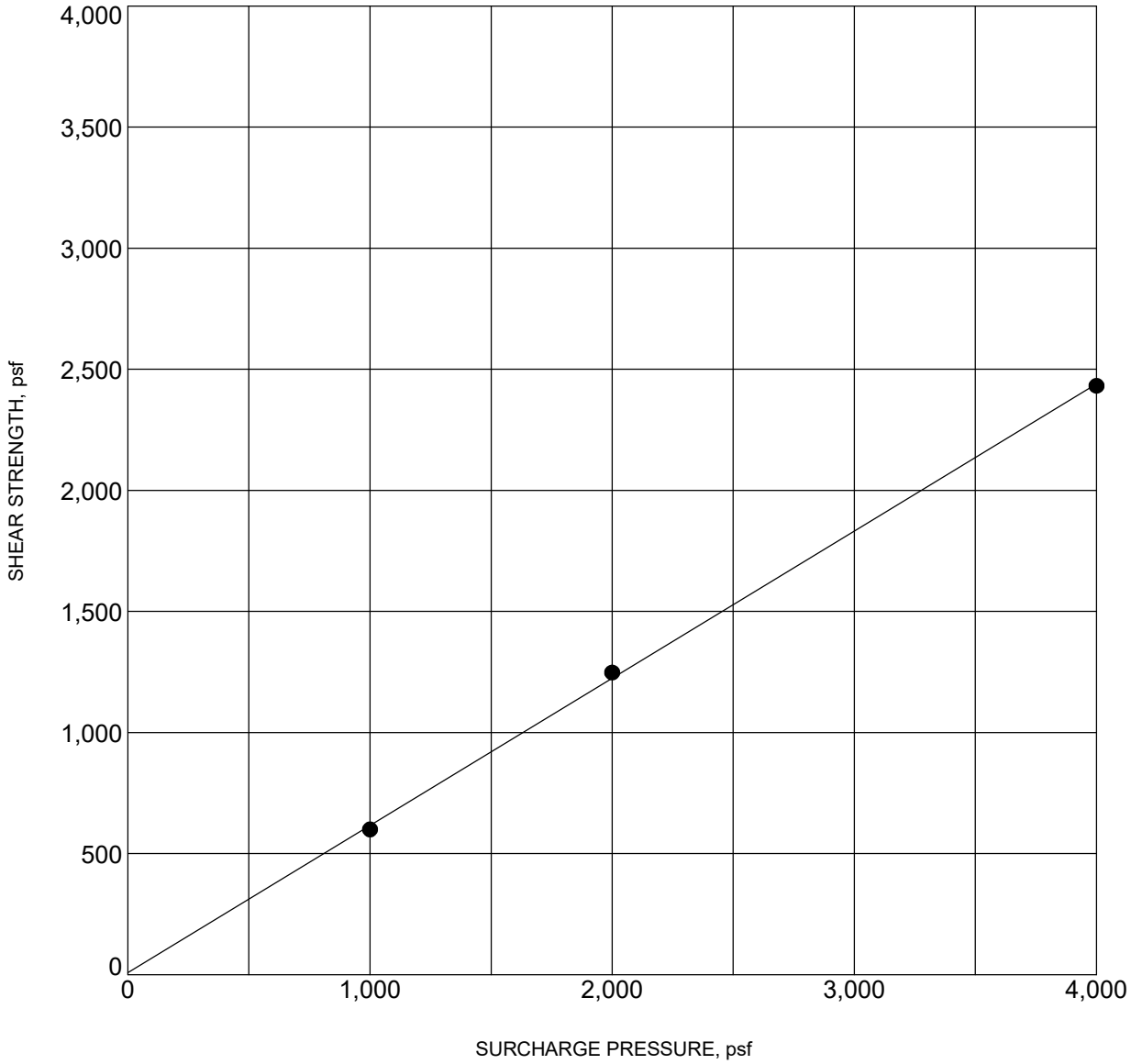
DIRECT SHEAR TEST RESULTS

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. **21-81-260-02**

Drawing No. **B-6**



BORING NO.	:	**BH-16**	DEPTH (ft)	:	**5.0-6.5**
DESCRIPTION	:	**Silty Sand with Gravel (SM)**			
COHESION (psf)	:	**10**	FRICTION ANGLE (degrees):		**31**
MOISTURE CONTENT (%)	:	**1.0**	DRY DENSITY (pcf)	:	**95**

NOTE: Ultimate Strength.

DIRECT SHEAR TEST RESULTS

Converse Consultants

Highway 86 Water Transmission Main, Phase 3 & 4
Approximately 13.4 Miles of 30-inch Pipeline
Riverside and Imperial Counties, California
For: Albert A. Webb Associates

Project No. **21-81-260-02**

Drawing No. **B-7**

Appendix C

Excavated Soil Photos

APPENDIX C

EXCAVATED SOIL PHOTOS

Photo No. 1: Spoils from TP-01.

Photo No. 2: TP-01.

Photo No. 3: Spoils from TP-02.

Photo No. 4: TP-02.

Photo No. 5: Spoils from TP-03.

Photo No. 6: TP-03.

Photo No. 7: Spoils from TP-04.