Appendix D Preliminary Geotechnical Investigation

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PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED RNG PLANT EQUIPMENT AREA
COYOTE CANYON LANDFILL
NEWPORT BEACH, CALIFORNIA

PROJECT NO. 23775.1
DECEMBER 10, 2021

Prepared For:

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Attention: Mr. Shawn Bratt

December 10, 2021

Biofuels Coyote Canyon Biogas, LLC
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Canonsburg, Pennsylvania 15317

Project No. 23775.1

Attention: Mr. Shawn Bratt

Subject: Preliminary Geotechnical Investigation, Proposed RNG Plant Equipment Area, Coyote Canyon Landfill, Newport Beach, California.

LOR Geotechnical Group, Inc., is pleased to present this report of our geotechnical investigation for the subject project. In summary, it is our opinion that the proposed improvements are feasible from a geotechnical perspective, provided the recommendations presented in the attached report are incorporated into design and construction. However, the contents of this summary should not be solely relied upon.

To provide adequate support for the proposed structures, we recommend that a compacted fill mat be constructed beneath structural concrete slabs. The compacted fill mat will provide a dense, high-strength soil layer to uniformly distribute the anticipated foundation loads over the underlying soils. Any undocumented fill material should be removed from structural areas and areas to receive engineered compacted fill. The data developed during this investigation indicates that removals on the order of 0.5 to more than 12.5 feet will be required from the proposed project area. The given removal depths are preliminary and the actual depths of the removals should be determined during the grading operation by observation and/or in-place density testing.

Medium expansion potential and fair to good R-value quality generally characterize the onsite materials tested.

LOR Geotechnical Group, Inc.

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INTRODUCTION

During November and December of 2021, a Preliminary Geotechnical Investigation was performed by LOR Geotechnical Group, Inc., for proposed improvements within the RNG plant site at 20662 Newport Coast Drive in Newport Beach, California. The purpose of this investigation was to conduct a technical evaluation of the geologic setting of the site and to provide geotechnical design recommendations for the proposed improvements. The scope of our services included:

- Review of available geotechnical literature, reports, maps, and agency information pertinent to the study area;
- Interpretation of aerial photographs of the site and surrounding region dated 1938 through 2021;
- Geologic field reconnaissance mapping to verify the areal distribution of earth units and significance of surficial features as compiled from the reviewed documents, literature, and reports;
- A subsurface field investigation to determine the physical soil conditions pertinent to the proposed development;
- Laboratory testing of selected soil samples obtained during the field investigation;
- Development of geotechnical recommendations for site grading and foundation design; and
- Preparation of this report summarizing our findings and providing conclusions and recommendations for site development.

The approximate location of the site is shown on the attached Index Map, Enclosure A-1, within Appendix A.

To orient our investigation at the site, you provided us with a Site Plan showing the proposed boring locations. We have utilized this plan for use as a base map for our field investigation and it is presented as Enclosure A-2, within Appendix A.

PROJECT CONSIDERATIONS

Based on information provided you, an RNG plant equipment area will be built within the subject approximately 2.3 acre site. This property is in a relatively flat condition and, until recently, previously was occupied by a power plant. Remnants from the former facility,

mainly in the form of buried and abandoned utilities and partial foundations, are present locally. On the attached Site Plan, Enclosure A-2, the tentatively proposed improvements have been plotted within the enclosed property.

EXISTING SITE CONDITIONS

As mentioned above, the proposed RNG plant equipment area is the site of a previously existing and recently demolished power plant. The site is upon the top of a local bedrock ridge that was graded and built in the late 1980's to early 1990's. Cut grading appears to have mainly been conducted to create the generally flat plant area. The perimeter of the previously existing and future proposed improvements is defined by an approximately 12-foot high masonry wall that has an access gate at its northwest corner.

While most previously existing improvements have been removed, there are remnants of earlier development still present. In addition to the previously discussed partial foundations and abandoned underground utility lines, active waterlines that serve perimeter area fire hydrants and a remaining metal frame building are still present. The flare yard associated with the former power plant remains in the far northwestern portion and is still in use. In addition, there are two microwave/communication towers on the site - one near the flare yard and one in the far southeast corner of the property.

Beyond the perimeter wall, a 15 to 30 foot wide area of irrigated landscaping is present, followed by mostly natural brush beyond. An approximately 20-foot high cut slope is present just east of the site and an underground water reservoir site that was built in the early 1990's and serves the local water district is located below and to the north and east of the site. Other than the reservoir site to the northeast, vacant, largely undisturbed natural ground is present within other areas around the site. A paved road provides access to the site from the northwest, off of Newport Coast Drive.

AERIAL PHOTOGRAPH ANALYSIS

During our investigation we reviewed aerial photographs available through Google Earth (2021), Historic Aerials (2021), and Continental Aerial Photographs (2021). The dates of the aerial photographs ranged from 1938 through 2021 and were examined in detail to assess the local and regional geologic and geomorphic characteristics of the site and vicinity. During our review, we also noted minor changes that occurred at the site throughout this time span.

The site area remained in a natural condition until grading and site development with the original power plant and access road in the late 1980's through early 1990's. Although it is not clear how much cut grading was conducted to create the present day conditions, it is apparent that a ridge that previously extended roughly northwest-southeast across the site was cut to create the flat area of the site and the graded slope to the east-southeast of the site. Our review of historic aerial photographs did identify evidence for nearby faulting as subtle, linear, vegetational, tonal contrast photo-lineaments. The lineaments trend roughly north-northwest to south-southeast on either side of the site and appear to merge just north of the site. These two faults, shown as mapped by Morton and Miller (1981) on our Regional Geologic Map, Enclosure A-3 within Appendix A, are not considered to be active faults or identified as such by the California Geological Survey. No evidence for onsite or adjacent site mass movements, such as landslides, was noted on the photographs reviewed.

FIELD EXPLORATION PROGRAM

Our subsurface field exploration program was conducted on November 1st and 2nd, 2021 and consisted of the drilling of 11 exploratory borings with a truck-mounted Mobile B-61 drill rig equipped with 8-inch diameter hollow stem augers. The borings were drilled to depths of approximately 11.5 to 21.5 feet below the existing ground surface. The approximate locations of our exploratory borings are presented on the attached Site Plan, Enclosure A-2 within Appendix A.

The subsurface conditions encountered in the exploratory borings were logged by a geologist from this firm. Relatively undisturbed and bulk samples were obtained from our exploratory borings and returned to our geotechnical laboratory in sealed containers for further testing and evaluation. A detailed description of the field exploration program and the boring logs are presented in Appendix B.

LABORATORY TESTING PROGRAM

Selected soil samples obtained during the field investigation were subjected to laboratory testing to evaluate their physical and engineering properties. Laboratory testing included in-place moisture content and dry density, laboratory compaction characteristics, direct shear, sieve analysis, sand equivalent, R-value, expansion index, consolidation, and corrosion. Descriptions of the laboratory testing program and the test results are presented in Appendix C.

GEOLOGIC CONDITIONS

Regional Geologic Setting

The site is located in the northwest part of the Peninsular Ranges geomorphic province, in an area known as the San Joaquin Hills. In general, the San Joaquin Hills are underlain by Paleocene to Pliocene age marine and non marine sedimentary rocks, which have been locally intruded by Miocene dikes and sills of andesite and diabase. These rocks are overlain by Pleistocene and Holocene surficial units. Total thickness of these geologic units is believed to be as much as 22,000 feet.

As discussed further in this report, predominantly siltstone bedrock from the Los Trancos Member of the Topanga formation were encountered during our subsurface investigation.

Earthquake faults in the region include the Pelican Hill fault of the Newport/Inglewood fault zone, located approximately 2.1 kilometers (1.3 miles) to the southwest. The Elsinore fault zone is located approximately 33 kilometers (20.5 miles) to the northeast while the San Jacinto fault zone is located approximately 69 kilometers (43.5 miles) to the northeast. In addition, the San Andreas fault is located approximately 80 kilometers (50 miles) to the northeast.

The geologic conditions of the site and immediate surrounding region as mapped by the U.S.G.S. (Morton and Miller, 1981) is shown on Enclosure A-3, within Appendix A.

Site Geologic Conditions

The site is located in the northwestern San Joaquin Hills and east of Newport Beach. Within the subject property, undocumented fill soils associated with past use and/or demolition operations overlie sedimentary bedrock.

Fill: The proposed RNG equipment site is underlain by a variable thickness of undocumented fill soils that were created mainly during construction and demolition of the former power plant which was present onsite until recently. Although not encountered during our investigation, it is also possible that fill soils may be present within some perimeter areas of the property with this fill created during original site grading. However, for the majority of the site, it appears that cut grading was originally conducted to create the relatively flat pad area. As encountered within our exploratory borings, the fill soils consist of fine to coarse-grained silty sand to sandy silt soils that range from 1.5 to 12.5 feet in thickness. These materials were damp to moist and loose (soft) to medium dense (stiff).

Bedrock: The Los Trancos member of the Topanga formation underlies the site area. This sedimentary bedrock consists of laminated to typically thinly bedded siltstone with much lesser sandstone materials. In the area of the site, the Topanga formation is weakly cemented and moderately inclined to the northwest. Bedding orientations observed within bedrock outcrops below the site showed a fairly consistent dip of approximately 20 to 30 degrees in a northwest direction. The siltstone is typically fine grained and yellowish-brown in color and includes varying percentages of clay and/or sand. Significant amounts of sandstone were encountered only within our exploratory boring, B-1. In this area, the sandstone was found to be moderately cemented and hard, light yellowish-brown in color, and fine to medium grained.

A detailed description of the subsurface conditions as encountered within our exploratory borings is presented on the Boring Logs within Appendix B.

Groundwater Hydrology

Groundwater was not encountered within our exploratory borings advanced to a maximum depth of approximately 21.5 feet. No records for nearby wells were available from the State of California Department of Water Resources online database (CDWR, 2021). Bedrock that underlies the site is generally considered to be non-water bearing.

Surface Runoff

Current surface runoff of precipitation waters across the site area is generally as sheet flow to perimeter areas and local drainage devices.

Mass Movement

The Topanga formation is known for producing bedrock landslides, as indicated on our Regional Geologic Map, Enclosure A-3. However, in the area of the site, few landslides are mapped. Reconnaissance mapping and review of aerial photographs identified no landslide in the site vicinity. In addition, the site is not located within an earthquake-induced landslide zone as identified by the California Geological Survey (1998). The previous regional geologic mapping by others coupled with the findings of our site investigation indicate that the potential for mass movement at the site is low.

Faulting

No active or potentially active faults are known to exist at the subject site. In addition, the subject site does not lie within a current State of California Earthquake Fault Zone (Hart and Bryant, 2007). As previously mentioned, old, inactive faults are mapped as being present very near the western and eastern sides of the site. However, these faults are older faults that were likely developed during formation of the San Joaquin Hills and are not considered to be of significant consequence in relation to the proposed improvements.

As previously mentioned, the Pelican Hill fault Newport/Inglewood fault system is located approximately 2.1 kilometers (1.3 miles) to the southwest. In addition, other relatively close active faults include the Elsinore fault zone, located approximately 33 kilometers (20.5 miles) to the northeast; the San Jacinto fault zone, located approximately 69 kilometers (43.5 miles) to the northeast; and the San Andreas fault, located approximately 80 kilometers (50 miles) to the northeast.

The Newport-Inglewood fault zone on-shore segment is easily noted by the existence of a chain of low lying hills extending from Culver City to Signal Hill and south of Signal Hill it roughly parallels the coastline to just south of Newport Bay, were it heads off-shore and becomes the Newport-Inglewood-Rose Canyon fault. The surface trace of the Newport-Inglewood fault zone is discontinuous in the Los Angeles Basin. The Newport-Inglewood fault is believed to be capable of producing an earthquake magnitude on the order of 6.5 to 7.4.

The Elsinore fault zone includes both the Whittier and Chino faults and is one of the largest in southern California. At its northern end it splays into two segments and at its southern end it is cut by the Yuba Wells fault. The primary sense of slip along the Elsinore fault is right lateral strike-slip. It is believed that the Elsinore fault zone is capable of producing an earthquake magnitude on the order of 6.5 to 7.5.

The San Jacinto fault zone is a sub-parallel branch of the San Andreas fault zone, extending from the northwestern San Bernardino area, southward into the El Centro region. This fault has been active in recent times with several large magnitude events. It is believed that the San Jacinto fault is capable of producing an earthquake magnitude on the order of 6.5 or larger.

The San Andreas fault is considered to be the major tectonic feature of California, separating the Pacific plate and the North American plate. While estimates vary, the San Andreas fault is generally thought to have an average slip rate on the order of 24 mm/yr and capable of generating large magnitude events on the order of 7.5 or greater.

Current standards of practice have included a discussion of all potential earthquake sources within a 100 kilometer (62 mile) radius. While there are other large earthquake faults within a 100 kilometer (62 mile) radius of the site, none of these are considered as relevant as the faults described above, due to their greater distance and/or smaller anticipated magnitudes.

Historical Seismicity

In order to obtain a general perspective of the historical seismicity of the site and surrounding region a search was conducted for seismic events at and around the area within various radii. This search was conducted utilizing the historical seismic search website of the U.S.G.S. (2020). This website conducts a search of a user selected cataloged seismic events database, within a specified radius and selected magnitudes, and then plots the events onto a map. At the time of our search, the database contained data from 1932 through November 29, 2021.

In our first search, the general seismicity of the region was analyzed by selecting an epicenter map listing all events of magnitude 4.0 and greater, recorded since 1932, within a 100 kilometer (62 mile) radius of the site, in accordance with guidelines of the California Division of Mines and Geology. This map illustrates the regional seismic history of moderate to large events. As depicted on Enclosure A-4, within Appendix A, the site lies within a relatively active region with the Newport-Inglewood fault to the northwest showing much activity.

In the second search, the micro seismicity of the area lying within a 15 kilometer (9.3 mile) radius of the site was examined by selecting an epicenter map listing events on the order of 1.0 and greater since 1978. In addition, only the “A” events, or most accurate events were selected. Caltech indicates the accuracy of the “A” events to be approximately 1 kilometer. The results of this search is a map that presents the seismic history around the area of the site with much greater detail, not permitted on the larger map. The reason for limiting the events to the last 40± years on the detail map is to enhance the accuracy of the map. Events recorded prior the mid 1970's are generally considered to be less accurate due to advancements in technology. As depicted on this map, Enclosure A-5, the subject site lies within an area underlain by very numerous small events in the general area.

In summary, the historical seismicity of the site entails numerous small to medium magnitude earthquake events occurring around the subject site, predominately associated with the presence of the faults described within. Any future developments at the subject site should anticipate that moderate to large seismic events could occur very near the site.

Secondary Seismic Hazards

Other secondary seismic hazards generally associated with severe ground shaking during an earthquake include liquefaction, seiches and tsunamis, earthquake induced flooding, landsliding and rockfalls, and seismic-induced settlement.

Liquefaction: The potential for liquefaction generally occurs during strong ground shaking within loose granular sediments where the depth to groundwater is usually less than 50 feet. As groundwater is thought to be in excess of 50 feet beneath the site and is underlain by sedimentary bedrock, the possibility of liquefaction is considered nil.

Seiches/Tsunamis: The potential for the site to be affected by a seiche or tsunami (earthquake generated wave) is considered nil due to the absence of any large bodies of water near the site.

Flooding (Water Storage Facility Failure): There are no large water storage facilities located on or upstream which could possibly rupture during an earthquake and affect the site by flooding.

Seismically-Induced Landsliding: Our research and review of aerial photographs identified no evidence for the presence of landslides within the site area or within the vicinity of the site. Therefore, the potential for seismically-induced landsliding to impact the site is considered to be low.

Rockfalls: No large, exposed, loose, or unrooted boulders that could affect the integrity of the site are present upon or above the site.

Seismically-Induced Settlement: Settlement generally occurs within areas of loose, granular soils with relatively low density. Since the site is underlain by sedimentary bedrock, the potential for settlement is considered low. In addition, the earthwork operations recommended to be conducted during the development of the site will mitigate any near surface loose soil conditions.

SOILS AND SEISMIC DESIGN CRITERIA (California Building Code 2019)

Design requirements for structures can be found within Chapter 16 of the 2019 California Building Code (CBC) based on building type, use and/or occupancy. The classification of use and occupancy of all proposed structures at the site, and thus the design requirements, shall be the responsibility of the structural engineer and the building official.

Site Classification

Chapter 20 of the ASCE 7-16 defines six possible site classes for earth materials that underlie any given site. Bedrock is assigned one of three of these six site classes and these are: A, B, or C. Per ASCE 7-16, Site Class A and Site Class B shall be measured on-site or estimated by a geotechnical engineer, engineering geologist or seismologist for competent rock with moderate fracturing and weathering. Site Class A and Site Class B shall not be used if more than 10 feet of soil is between the rock surface and bottom of the spread footing or mat foundation. Site Class C can be used for very dense soil and soft rock with $\bar{N}$ values greater than 50 blows per foot. Site Class D can be used for stiff soil with $\bar{N}$ values ranging from 15 to 50 blows per foot. Site Class E is for soft clay soils with $\bar{N}$ values less than 15 blows per foot. Our Standard Penetration Test (SPT) data indicate that the materials beneath the site are considered Site Class C.

CBC Earthquake Design Summary

Earthquake design criteria have been formulated in accordance with the 2019 CBC and ASCE 7-16 for the site based on the results of our investigation to determine the Site Class and an assumed Risk Category II. However, these values should be reviewed and the final design should be performed by a qualified structural engineer familiar with the region. In addition, the building official should confirm the Risk Category utilized in our design (Risk Category II). Our design values are provided below:

CBC 2019 SEISMIC DESIGN SUMMARY* Site Location (USGS WGS84) 33.61311, -117.82196, Risk Category II	
Site Class Definition Chapter 20 ASCE 7	C
$\mathbf{S_s}$ Mapped Spectral Response Acceleration at 0.2s Period	1.282
$\mathbf{S_1}$ Mapped Spectral Response Acceleration at 1s Period	0.456
$\mathbf{S_{MS}}$ Adjusted Spectral Response Acceleration at 0.2s Period	1.538
$\mathbf{S_{M1}}$ Adjusted Spectral Response Acceleration at 1s Period	0.684
$\mathbf{S_{DS}}$ Design Spectral Response Acceleration at 0.2s Period	1.025
$\mathbf{S_{D1}}$ Design Spectral Response Acceleration at 1s Period	0.456
$\mathbf{F_a}$ Short Period Site Coefficient at 0.2s Period	1.2
$\mathbf{F_v}$ Long Period Site Coefficient at 1s Period	1.5
PGA_M	0.661
Seismic Design Category	D
*Values obtained from OSHPD Seismic Design Maps tool	

CONCLUSIONS

General

This investigation provides a broad overview of the geotechnical and geologic factors which are expected to influence future site planning and development. On the basis of our field investigation and testing program, it is the opinion of LOR Geotechnical Group, Inc., that the proposed development is feasible from a geotechnical standpoint, provided the recommendations presented in this report are incorporated into design and implemented during grading and construction.

The subsurface conditions encountered in our exploratory borings are indicative of the locations explored. The subsurface conditions presented here are not to be construed as being present the same everywhere across the site.

If conditions are encountered during the construction of the project which differ significantly from those presented in this report, this firm should be notified immediately so we may assess the impact to the recommendations provided.

Foundation Support

Based upon the field investigation and test data, it is our opinion that the existing undocumented fill soils will not, in their present condition, provide uniform and/or adequate support for the proposed improvements. Left as is, this condition could cause unacceptable differential and/or overall settlements upon application of the anticipated foundation loads.

To provide adequate support for the proposed structural improvements, we recommend that a compacted fill mat be constructed beneath foundations and structural concrete slabs. This compacted fill mat will provide a dense, high-strength soil layer to uniformly distribute the anticipated foundation loads over the underlying soils. A structural concrete slab foundation system, (mat foundation) or conventional continuous and/or spread foundations will provide adequate support for the anticipated downward and lateral loads when utilized in conjunction with the recommended fill mat.

Soil Expansiveness

Our borings placed across the site indicate medium expansive soil/bedrock materials, are present. Therefore, for any proposed foundations, mitigation of these conditions will be necessary. If the site is proposed for the receipt of import soils, the engineering characteristics of such should be determined once the source of the import is known. Import materials should have a non-critical expansion potential. Because the on-site medium expansive materials are anticipated at or near foundation and/or improvement levels, mitigation measures are provided here within for planning purposes.

Careful evaluation of on-site soils and any import fill for their expansion potential should be conducted during the grading operation.

Corrosion Potential

Select representative samples from our borings were taken to Project X Corrosion Engineering for full corrosion series testing. Results from soil corrosivity testing completed by Project X Corrosion Engineering are attached and summarized in the table below:

SOIL CORROSIVITY RESULTS					
Boring	**Depth (feet)**	**pH**	**Sulfates (% by weight)**	**Chloride (% by weight)**	**Saturated Resistivity (ohm-cm)**
B-3	2-5	8.4	0.3278	0.0044	570
B-6	4-7	9.2	0.0105	0.0885	938
B-9	1-4	8.3	0.0575	0.0028	804

The corrosivity test results indicate that soluble sulfate concentrations in one sample was above 0.3. These concentrations indicate an exposure class S2 for sulfate. Special mitigation methods are considered necessary.

The corrosivity test results indicate that chloride concentrations were locally above 500 ppm. This concentration indicates an exposure class C2 for chloride. Mitigation measures are considered necessary.

Soil pH for the samples was 8.3 to 9.2, sightly alkaline, respectively, therefore, the need for specialized design is anticipated.

Concentrations of ammonium and nitrate indicate the soil may be slightly aggressive towards copper.

The electrical resistivity (resistance to the flow of electric current) is a major factor in determining the corrosivity of a soil sample. Corrosion currents are inversely proportional to soil resistivity, thus a lower resistivity value for a selected sample translates to a more corrosive material. A qualitative table of this correlation is presented below:

RESISTIVITY – CORROSIVITY CORRELATION	
Soil Resistivity (ohm-cm)	Corrosivity Category
>10,000	Mildly Corrosive
2,000 to 10,000	Moderately Corrosive
1,000 to 2,000	Corrosive
<1,000	Severely Corrosive

When soil is saturated, resistivity is at approximately its lowest value. Therefore, for the laboratory testing, measurements of resistivity were taken after saturation with distilled water. Following the table above, resistivity results for the samples were in the severely corrosive range.

Based on the resistivity results above, this soil is classified as corrosive to ferrous metals and potentially aggressive towards copper. The laboratory data above should be reviewed and corrosion design should be completed by a qualified corrosion engineer.

In lieu of corrosion design for metal piping, ABS/PVC may be used. Soil corrosion is not considered a factor with ABS/PVC materials. ABS/PVC is considered suitable for use due to the corrosion potential of the on-site soils with respect to metals.

LOR Geotechnical does not practice corrosion engineering. If further information concerning the corrosion characteristics, or interpretation of the results submitted herein, is required, then a competent corrosion engineer could be consulted.

Geologic Mitigations

No special mitigation methods are deemed necessary at this time, other than the geotechnical recommendations provided in the following sections.

Seismicity

Seismic ground rupture is generally considered most likely to occur along pre-existing active faults. Since no known faults are known to exist near or project into the site, the probability of ground surface rupture occurring is considered nil.

Due to the close proximity to the faults described above, it is reasonable to expect a relatively strong ground motion seismic event to occur during the lifetime of the proposed development on the site. Large earthquakes could occur on other faults in the general area, but because of their lesser anticipated magnitude and/or greater distance, they are considered less significant than the faults described above from a ground motion standpoint.

The effects of ground shaking anticipated at the subject site should be mitigated by the seismic design requirements and procedures outlined in Chapter 16 of the California Building Code. However, it should be noted that the current building code requires the minimum design to allow a structure to remain standing after a seismic event, in order to

allow for safe evacuation. A structure built to code may still sustain damage which might ultimately result in the demolishing of the structure (Larson and Slosson, 1992).

RECOMMENDATIONS

Geologic Recommendations

No special geologic recommendations are deemed necessary at this time, other than the geotechnical recommendations provided in the following sections.

General Site Grading

It is imperative that no additional clearing and/or grading operations be performed without the presence of a qualified geotechnical engineer. An on-site, pre-job meeting with the owner, the contractor, and geotechnical engineer should occur prior to all grading related operations. Operations undertaken at the site without the geotechnical engineer present may result in exclusions of affected areas from the final compaction report for the project.

Grading of the subject site should be performed in accordance with the following recommendations as well as applicable portions of the California Building Code, and/or applicable local ordinances.

All areas to be graded should be stripped of significant vegetation and other deleterious materials. It is our recommendation that all existing fills under any proposed flatwork and/or paved areas be removed and replaced with engineered compacted fill. If this is not done, premature structural distress (settlement) of the flatwork and pavement may occur. Any undocumented fills encountered during grading should be completely removed and cleaned of significant deleterious materials. These may then be reused as compacted fill.

Cavities created by removal of undocumented fill soils and/or subsurface obstructions should be thoroughly cleaned of loose soil, organic matter and other deleterious materials, shaped to provide access for construction equipment, and backfilled as recommended in the following Engineered Compacted Fill section of this report.

Initial Site Preparation

All undocumented fill material should be removed from all proposed structural and/or fill areas. The data developed during this investigation indicates that removals on the order of 0.5 to 12.5 feet, and likely deeper locally, will be required from the proposed

development area in order to encounter competent bedrock upon which engineered compacted fill can be placed. As indicated on our boring logs, removal depths are anticipated to vary considerably across the site and the given removal depths are preliminary. The actual depths of the removals should be determined during the grading operation by observation and/or in-place density testing. All independent structural areas should have a fill thickness ratio of 3:1 or less beneath footings and/or slabs. For example, if the maximum fill thickness across a given structural area is 15 feet, the minimum fill thickness across this area should be 5 feet.

Preparation of Fill Areas

After completion of the removals described above and prior to placing fill, the surfaces of all areas to receive fill should be scarified to a depth of at least 6 inches. The scarified soil should be brought to near optimum moisture content and compacted to a relative compaction of at least 90 percent (ASTM D 1557).

Engineered Compacted Fill

The on-site soils and bedrock materials should provide adequate quality fill material, provided they are free from oversized and/or organic matter and other deleterious materials. Unless approved by the geotechnical engineer, rock or similar irreducible material with a maximum dimension greater than 6 inches should not be buried or placed in fills.

If required, import fill should be inorganic, non-expansive granular soils free from rocks or lumps greater than 6 inches in maximum dimension. Sources for import fill should be approved by the geotechnical engineer prior to their use. Fill should be spread in maximum 8-inch uniform, loose lifts, each lift brought to near optimum moisture content, and compacted to a relative compaction of at least 90 percent in accordance with ASTM D 1557.

Preparation of Foundation Areas

The proposed foundation systems, structural concrete slabs (mat foundations), should rest upon at least 24 inches of properly compacted fill material placed over competent native earth materials. In areas where the required fill thickness is not accomplished by the recommended removals, the foundation areas should be further subexcavated to a depth of at least 24 inches below the proposed footing base grade, with the subexcavation extending at least 5 feet beyond the foundation perimeter.

As previously mentioned, the minimum fill thickness across a given structural area beneath footings and/or slabs should be one third of the maximum fill thickness across this area. The bottom of all excavations should be scarified to a depth of 12 inches, brought to near optimum moisture content, and recompacted to at least 90 percent relative compaction (ASTM D 1557) prior to the placement of compacted fill.

Foundation Design

Foundation design is provided for planning purposes and is based upon the engineering properties of the on-site soil/bedrock as found during this investigation. The required import soil should be evaluated, when known, so that appropriate recommendations can be provided.

Due to medium expansive soil conditions, we recommend that all structures be supported on reinforced, stiffened mat foundations resting over 24 inches of engineered compacted fill placed over competent native earth materials.

The design of the structural slab foundation should be performed in conformance to the Wire Reinforcement Institute (WRI) method or the Post-Tensioning Institute (PTI) method. For the application of the WRI method, a minimum effective plasticity index of 22 is recommended for foundation design. The slab thickness should be a minimum of 5 inches and should have a reinforcement of at least Asfy equal to 3,300 pounds. This could consist of #3 reinforcing bars of 60-grade steel placed at a maximum spacing of 18 inches on center, each way or equivalent. Prior to placing concrete slabs, the upper 12 inches of the subgrade soil should be pre-saturated to 2 to 4 percent over optimum moisture content.

These reinforcement, depth, and spacing recommendations should be considered minimum. The actual requirements for slab-on-grade foundations design and construction should be provided by a structural engineer experienced in these matters. These conditions should be verified during the site grading by additional evaluation of on-site and any imported soils for their expansion potential and plasticity characteristics.

If slab-on-grade foundations per the PTI method are proposed, the following geotechnical parameters should be used for design:

- Edge Moisture Variation Distance, em:
  - Center Lift Loading Conditions: 9.0 ft
  - Edge Lift Loading Conditions: 8.5 ft
- Differential Swell, ym:
  - Center Lift 3.5 in
  - Edge Lift 8.5 in

- Subgrade Soil Friction Coefficient, μ: 0.30

The above design parameters are based upon the data collected during our site investigation and are in accordance with Design of Post-Tensioned Slabs-on-Ground, third edition, published by the Post-Tensioning Institute (2008).

For the minimum width and depth, spread foundations may be designed using an allowable bearing pressure of 2,000 pounds per square foot (psf). This bearing pressure may be increased by 200 psf for each additional foot of width, and by 500 psf for each additional foot of depth, up to a maximum of 4,000 psf.

The above values are net pressures; therefore, the weight of the foundations and the backfill over the foundations may be neglected when computing dead loads. The values apply to the maximum edge pressure for foundations subjected to eccentric loads or overturning. The recommended pressures apply for the total of dead plus frequently applied live loads, and incorporate a factor of safety of at least 3.0. The allowable bearing pressures may be increased by one-third for temporary wind or seismic loading. The resultant of the combined vertical and lateral seismic loads should act within the middle one-third of the footing width. The maximum calculated edge pressure under the toe of foundations subjected to eccentric loads or over turning should not exceed the increased allowable pressure. Buildings should be setback from slopes in accordance with the California Building Code.

Resistance to lateral loads will be provided by passive earth pressure and base friction. For footings bearing against compacted fill, passive earth pressure may be considered to be developed at a rate of 260 pounds per square foot per foot of depth. Base friction may be computed at 0.28 times the normal load. Base friction and passive earth pressure may be combined without reduction. These values are for dead load plus live load and may be increased by one-third for wind or seismic loading.

Wall Pressures

The design of footings for retaining walls should be performed in accordance with the recommendations described earlier under Preparation of Foundation Areas and Foundation Design. For design of retaining wall footings, the resultant of the applied loads should act in the middle one-third of the footing, and the maximum edge pressure should not exceed the basic allowable value without increase.

For design of retaining walls unrestrained against movement at the top, we recommend an active pressure of 45 pounds per square foot (psf) per foot of depth be used. This assumes level backfill consisting of recompacted, non-expansive, native soils placed against the structures and within the back cut slope extending upward from the base of the stem at 35 degrees from the vertical or flatter.

Retaining structures subject to uniform surcharge loads within a horizontal distance behind the structures equal to the structural height should be designed to resist additional lateral loads equal to 0.45 times the surcharge load. Any isolated or line loads from adjacent foundations or vehicular loading will impose additional wall loads and should be considered individually.

To avoid over stressing or excessive tilting during placement of backfill behind walls, heavy compaction equipment should not be allowed within the zone delineated by a 45 degree line extending from the base of the wall to the fill surface. The backfill directly behind the walls should be compacted using light equipment such as hand operated vibrating plates and rollers. No material larger than three inches in diameter should be placed in direct contact with the wall.

Wall pressures should be verified prior to construction, when the actual backfill materials and conditions have been determined. Recommended pressures are applicable only to level, non-expansive, properly drained backfill with no additional surcharge loadings.

If inclined backfills are proposed, this firm should be contacted to develop appropriate active earth pressure parameters.

Slab-On-Grade Design

Concrete floor slabs should bear on a minimum of 24 inches of engineered fill compacted to at least 90 percent (ASTM D 1557). The final pad surfaces should be rolled to provide smooth, dense surfaces upon which to place the concrete.

Settlement

Total settlement of individual foundations will vary depending on the width of the foundation and the actual load supported. Maximum settlement of shallow foundations designed and constructed in accordance with the preceding recommendations are estimated to be on the order of 0.5 inch. Differential settlements between adjacent footings should be about one-half of the total settlement. Settlement of all foundations is expected to occur rapidly, primarily as a result of elastic compression of supporting soils as the loads are applied, and should be essentially completed shortly after initial application of the loads.

Short-Term Excavations

Following the California Occupational and Safety Health Act (CAL-OSHA) requirements, excavations 5 feet deep and greater should be sloped or shored. All excavations and shoring should conform to CAL-OSHA requirements.

Short-term excavations 5-feet deep and greater shall conform to Title 8 of the California Code of Regulations, Construction Safety Orders, Section 1504 and 1539 through 1547. Based on our exploratory borings, it appears that Type C soil is the predominant type of soil on the project and all short-term excavations should be based on this type of soil. Deviation from the standard short-term slopes are permitted using Option 4, Design by a Registered Professional Engineer (Section 1541.1).

Short-term slope construction and maintenance are the responsibility of the contractor, and should be a consideration of his methods of operation and the actual soil conditions encountered.

Slope Construction

Preliminary data indicates that cut and fill slopes should be constructed no steeper than two horizontal to one vertical. Fill slopes should be overfilled during construction and then cut back to expose fully compacted soil. A suitable alternative would be to compact the slopes during construction, then roll the final slopes to provide dense, erosion-resistant surfaces.

Slope Protection

Since the site soils are susceptible to erosion by running water, measures should be provided to prevent surface water from flowing over slope faces. Slopes at the project

should be planted with a deep rooted ground cover as soon as possible after completion. The use of succulent ground covers such as iceplant or sedum is not recommended. If watering is necessary to sustain plant growth on slopes, the watering system should be monitored to assure proper operation and to prevent over watering.

Exterior Concrete Flatwork

To provide adequate support, exterior concrete flatwork improvements should rest on a minimum of 12 inches of soil compacted to at least 90 percent (ASTM D 1557).

To resist expansive soil forces, flatwork supported by medium expansive soils should be reinforced with a minimum of # 3 rebar at 18 inches each way. Flatwork areas should be pre-saturated to 2 to 4 percent over optimum prior to placing concrete.

Flatwork surface should be sloped a minimum of 1 percent away from buildings and slopes, to approved drainage structures.

Preliminary Pavement Design

Testing and design for preliminary on-site pavement was conducted in accordance with the California Highway Design Manual. Based upon our preliminary sampling and testing, and upon Traffic Indices typical for such projects, it appears that the structural section tabulated below should provide satisfactory pavement for the subject pavement improvements:

AREA	T.I.*	DESIGN R-VALUE	PRELIMINARY SECTION
Car Parking Areas and Access Lanes (ADTT=1)	5.0	30	0.25' AC / 0.45' AB 4.5" PCC / 4.0" AB
Entrance and Service Lanes (ADTT=25)	7.0	30	0.30' AC / 1.0' AB 6.0" PCC / 4.0" AB
AC - Asphalt Concrete AB - Class 2 Aggregate Base PCC-Portland Cement Concrete, MR = 550 psi *Actual Traffic Index to be determined by others			

The above structural section is predicated upon 90 percent relative compaction (ASTM D 1557) of all utility trench backfills and 95 percent relative compaction (ASTM D 1557) of the upper 12 inches of pavement subgrade soils and of any aggregate base utilized. In addition, the aggregate base should meet Caltrans specifications for Class 2 Aggregate Base.

It should be noted that all of the above pavement design was based upon the results of preliminary sampling and testing and should be verified by additional sampling and testing during construction when the actual subgrade soils are exposed. Improvement of the R-value quality of the soils may be provided through mixing with granular soils observed on-site.

Construction Monitoring

Post investigative services are an important and necessary continuation of this investigation. Project plans and specifications should be reviewed by the project geotechnical consultant prior to construction to confirm that the intent of the recommendations presented herein have been incorporated into the design.

Additional expansion index, R-value, and corrosion potential testing may be required during site rough grading.

During construction, sufficient and timely geotechnical observation and testing should be provided to correlate the findings of this investigation with the actual subsurface conditions exposed during construction. Items requiring observation and testing include, but are not necessarily limited to, the following:

1. Site preparation-stripping and removals.

2. Excavations, including approval of the bottom of excavation prior to processing and/or filling.

3. Processing and compaction of removal and/or over-excavation of bottom soils prior to fill placement.

4. Subgrade preparation for pavements and slabs-on-grade.

5. Placement of engineered compacted fill and backfill, including approval of fill materials and the performance of sufficient density tests to evaluate the degree of compaction being achieved.

6. Foundation excavations.

LIMITATIONS

This report contains geotechnical conclusions and recommendations developed solely for use by Biofuels Coyote Canyon Biogas, LLC, and their design constituents, for the purposes described earlier. It may not contain sufficient information for other uses or the purposes of other parties. The contents should not be extrapolated to other areas or used for other facilities without consulting LOR Geotechnical Group, Inc.

The recommendations are based on interpretations of the subsurface conditions concluded from information gained from subsurface explorations and a surficial site reconnaissance.

The interpretations may differ from actual subsurface conditions, which can vary horizontally and vertically across the site. If conditions are encountered during the construction of the project which differ significantly from those presented in this report, this firm should be notified immediately in order that we may assess the impact to the recommendations provided.

Due to possible subsurface variations, all aspects of field construction addressed in this report should be observed and tested by the project geotechnical consultant.

If parties other than LOR Geotechnical Group, Inc., provide construction monitoring services, they must be notified that they will be required to assume responsibility for the geotechnical phase of the project being completed by concurring with the recommendations provided in this report or by providing alternative recommendations.

The report was prepared using generally accepted geotechnical engineering practices under the direction of a state licensed geotechnical engineer. No warranty, expressed or implied, is made as to conclusions and professional advice included in this report. Any persons using this report for bidding or construction purposes should perform such independent investigations as deemed necessary to satisfy themselves as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project.

TIME LIMITATIONS

The findings of this report are valid as of this date. Changes in the condition of a property can, however, occur with the passage of time, whether they be due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Governmental Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a significant amount of time without a review by LOR Geotechnical Group, Inc., verifying the suitability of the conclusions and recommendations.

CLOSURE

It has been a pleasure to assist you with this project. We look forward to being of further assistance to you as construction begins. Should conditions be encountered during construction that appear to be different than as indicated by this report, please contact this office immediately in order that we might evaluate these conditions.

Should you have any questions regarding this report, please do not hesitate to contact our office at your convenience.

Respectfully submitted,
LOR Geotechnical Group, Inc.

Robert M. Markoff, CEG
Engineering Geologist

John P. Leuer, GE 2030
President

RMM:JPL:ss

Distribution: Addressee (4) and PDF via email sbratt@archaea.energy

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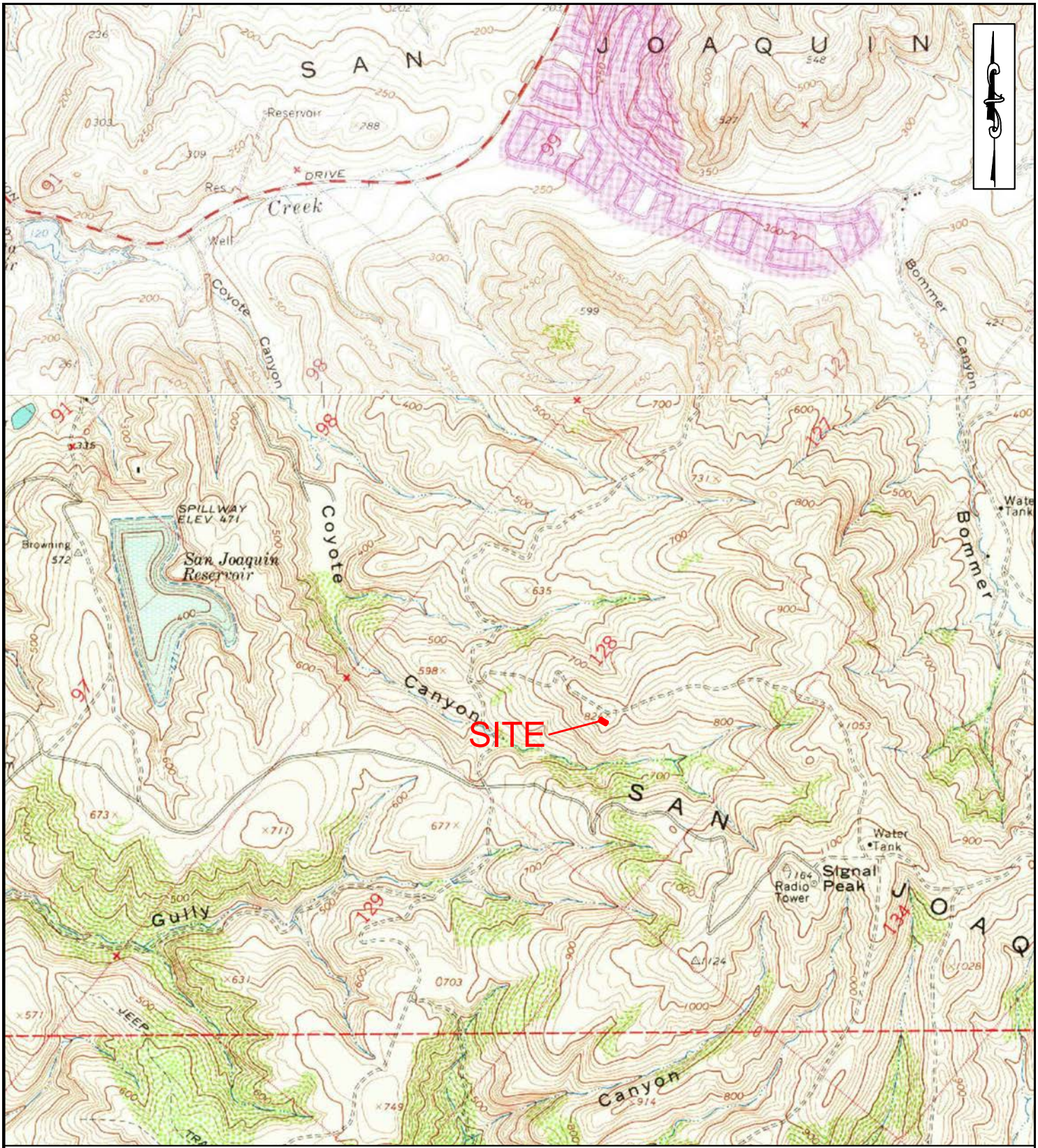
APPENDIX A

Index Map, Site Plan, Regional Geologic Map, and Historical Seismicity Maps



INDEX MAP

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Biofuels Coyote Canyon Biogas, LLC	**ENCLOSURE:**	A-1
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	December 2021
		SCALE:	1" ≈ 2,000'

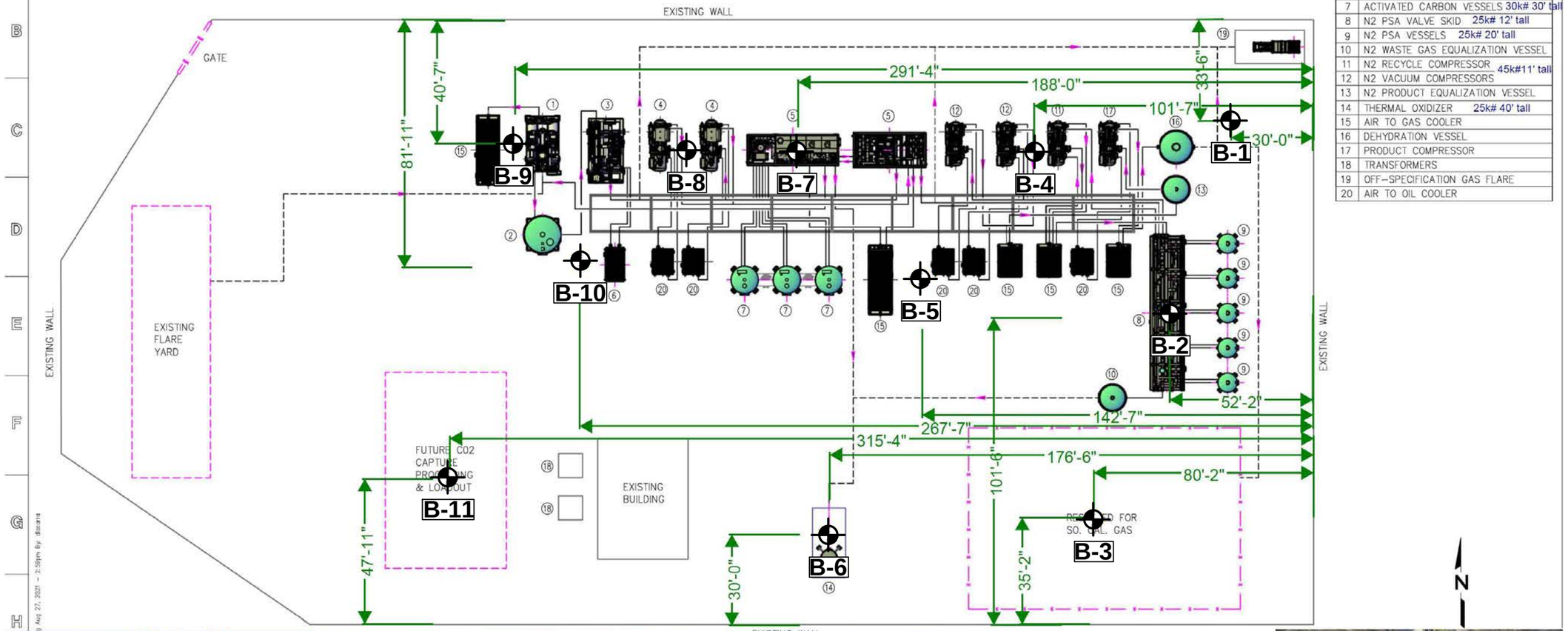
Legend

(Locations Approximate)

Map Symbols

B-11 - Exploratory Boring

RNG PLANT SITE PLAN
20662 Newport Coast Dr., Newport Beach, CA 92657
BORE HOLE LOCATIONS



NO.	EQUIPMENT DESCRIPTION
1	BOOSTER BLOWERS 35k# 12' tall
2	H2S REMOVAL VESSEL 60k# 30' tall
3	CHILLER SKID
4	LFG COMPRESSORS 35k# 12' tall
5	MEMBRANE SKIDS 30k# 15' tall
6	CHILLER CONDENSER
7	ACTIVATED CARBON VESSELS 30k# 30' tall
8	N2 PSA VALVE SKID 25k# 12' tall
9	N2 PSA VESSELS 25k# 20' tall
10	N2 WASTE GAS EQUALIZATION VESSEL
11	N2 RECYCLE COMPRESSOR 45k#11' tall
12	N2 VACUUM COMPRESSORS
13	N2 PRODUCT EQUALIZATION VESSEL
14	THERMAL OXIDIZER 25k# 40' tall
15	AIR TO GAS COOLER
16	DEHYDRATION VESSEL
17	PRODUCT COMPRESSOR
18	TRANSFORMERS
19	OFF-SPECIFICATION GAS FLARE
20	AIR TO OIL COOLER

COYOTE CANYON GAS, LLC

SHEET TITLE
PIPING TRANSPOSITION

PROJECT TITLE
COYOTE CANYON LANDFILL RNG PROJECT

SITE PLAN

PROJECT NO.: 23775.1
Proposed RNG Plant Equipment Area

ENCLOSURE: A-2
Biofuels Coyote Canyon Biogas, LLC

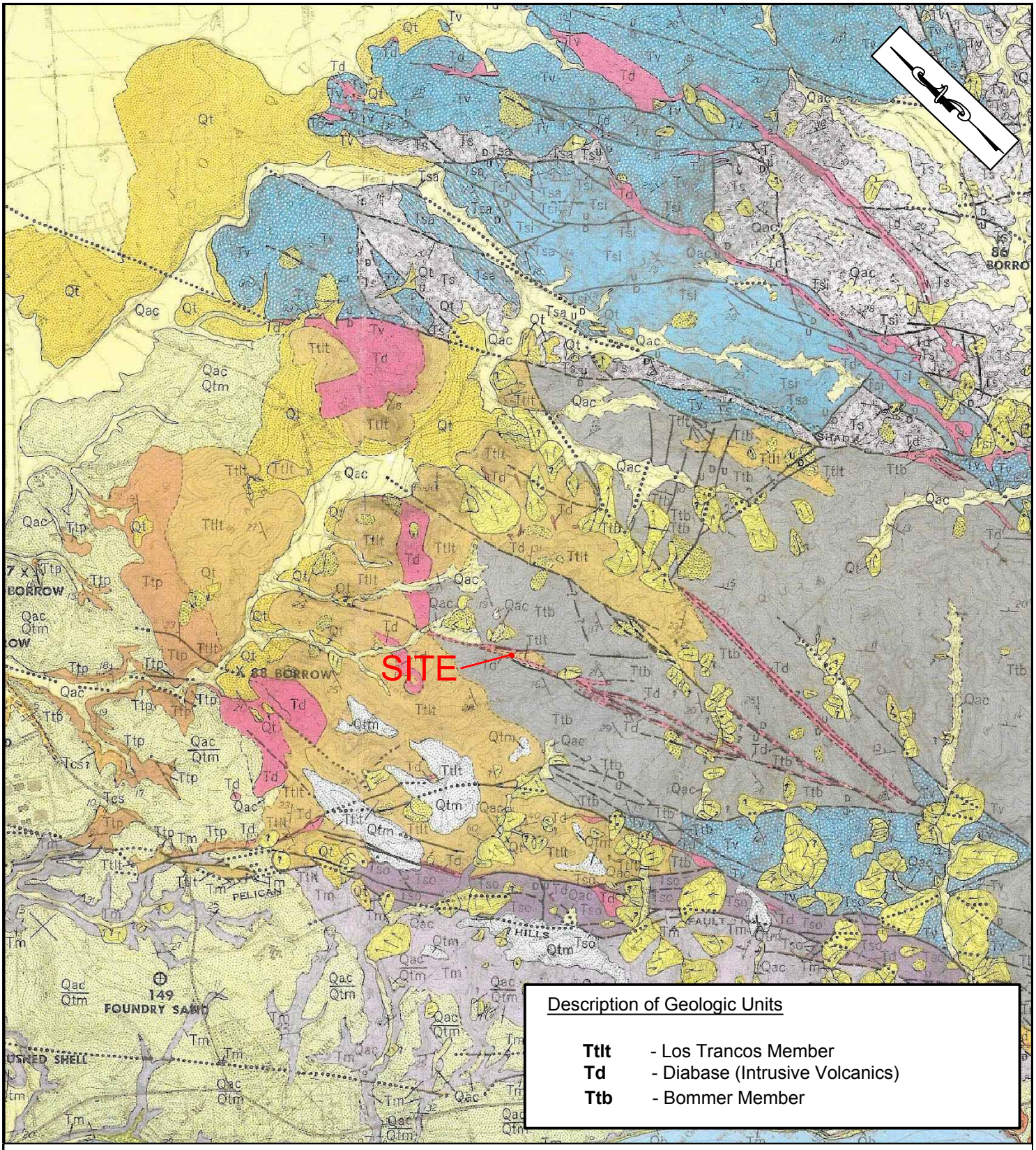
DATE: December 2021

SCALE: 1" ≈ 40'

PROJECT:

CLIENT:

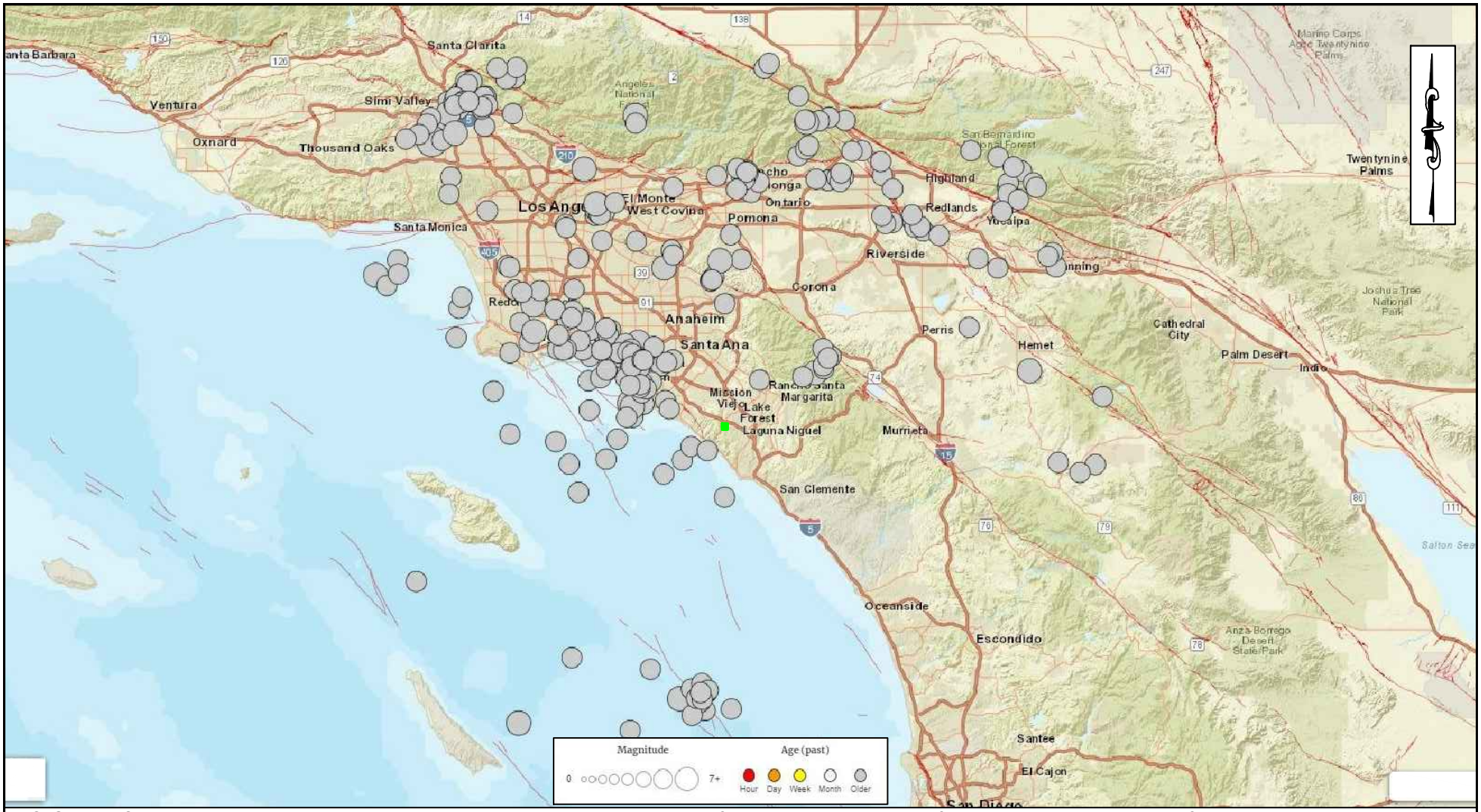
LOR GEOTECHNICAL GROUP, INC.



REGIONAL GEOLOGIC MAP

(Morton & Miller, 1981)

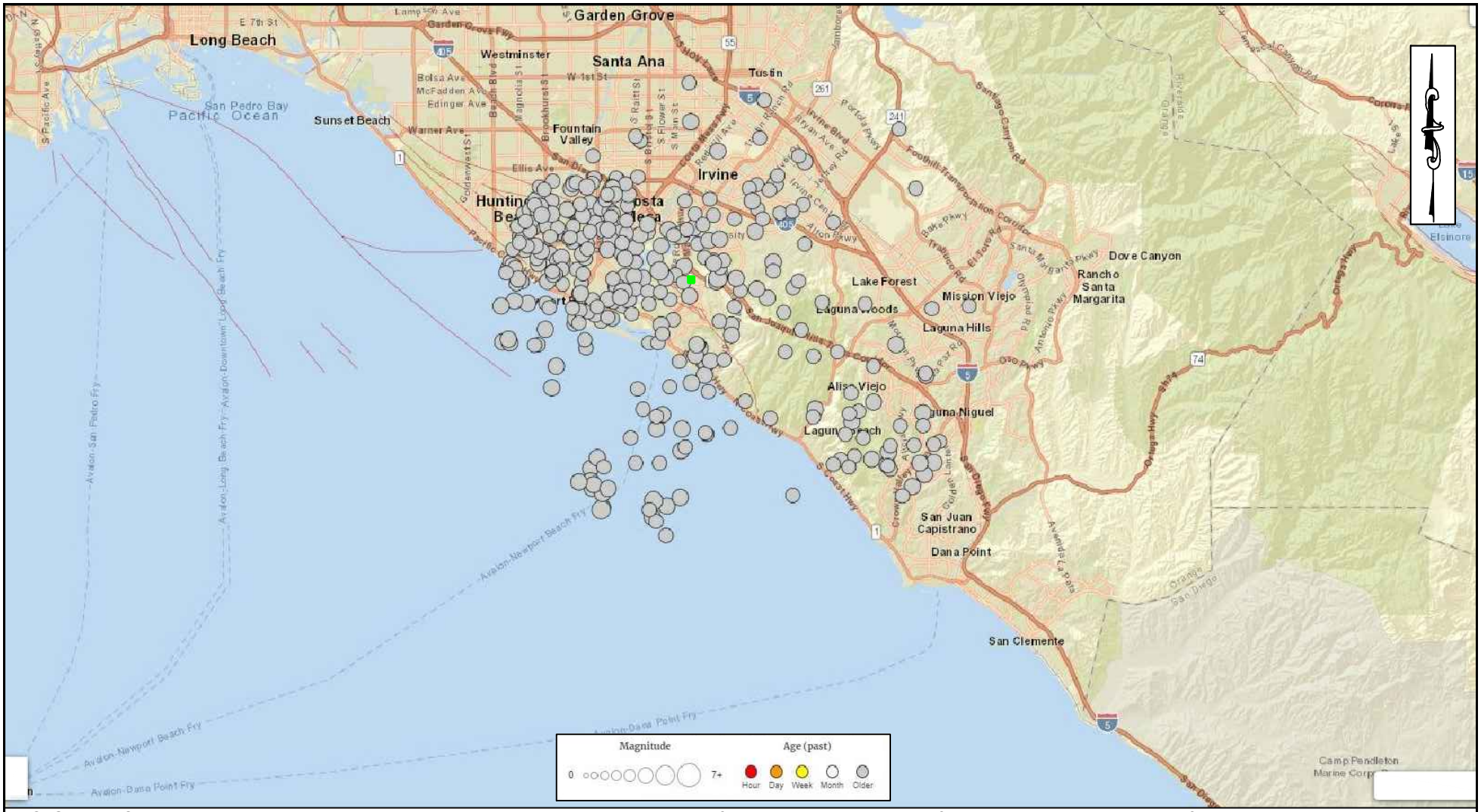
PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Biofuels Coyote Canyon Biogas, LLC	**ENCLOSURE:**	A-3
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	December 2021
		SCALE:	1" ≈ 4,000'



U.S. Geologic Survey (2021) real-time earthquake epicenter map. Plotted are 271 epicenters of instrument-recorded events from 1932 to present (11/29/21) of local magnitude greater than M4.0 within a radius of ~62 miles (100 kilometers) of the site. Location accuracy varies. The site is indicated by the green square. The selected magnitude corresponds to a threshold intensity value where very light damage potential begins. These evens are also generally widely felt by persons. Red lines mark the surface traces of known Quaternary-age faults.

HISTORICAL SEISMICITY MAP - 100km Radius

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Biofuels Coyote Canyon Biogas, LLC	**ENCLOSURE:**	A-4
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	December 2021
		SCALE:	1" ≈ 40km



U.S. Geologic Survey (2021) real-time earthquake epicenter map. Plotted are 334 epicenters of instrument-recorded events from 1932 to present (11/29/21) of local magnitude greater than M1.0 within a radius of ~9.2 miles (15 kilometers) of the site. Location accuracy varies. The site is indicated by the green square. The selected magnitude corresponds to a threshold intensity value where very light damage potential begins. These evens are also generally widely felt by persons. Red lines mark the surface traces of known Quaternary-age faults.

HISTORICAL SEISMICITY MAP - 15km Radius

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Biofuels Coyote Canyon Biogas, LLC	**ENCLOSURE:**	A-5
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	December 2021
		SCALE:	1" ≈ 10km

APPENDIX B

Field Investigation Program and Boring Logs

APPENDIX B
FIELD INVESTIGATION

Subsurface Exploration

The site was investigated on November 1st and 2nd 17, 2021 and consisted of the excavation and logging of 11 exploratory borings to depths ranging from approximately 11.5 feet to 21.5 feet below the existing ground surface. The approximate locations of the borings are shown on Enclosures A-2 within Appendix A.

The drilling exploration was conducted using a Mobile B-61 drill rig equipped with 8-inch diameter hollow stem augers. The soils were continuously logged by our geologist who inspected the site, created detailed logs of the borings, obtained undisturbed, as well as disturbed, soil samples for evaluation and testing, and classified the soils by visual examination in accordance with the Unified Soil Classification System.

Relatively undisturbed samples of the subsoils were obtained at a typical interval of 5 feet. The samples were recovered by using a California split barrel sampler of 2.50 inch inside diameter and 3.25 inch outside diameter or a Standard Penetration Sampler (SPT) from the ground surface to the total depth explored. The samplers were driven by a 140 pound automatic trip hammer dropped from a height of 30 inches. The number of hammer blows required to drive the sampler into the ground the final 12 inches were recorded and further converted to an equivalent SPT N-value. Factors such as efficiency of the automatic trip hammer used during this investigation (80%), borehole diameter (8"), and rod length at the test depth were considered for further computing of equivalent SPT N-values corrected for field procedures (N60) which are included in the boring logs, Enclosures B-1 through B-11.

The undisturbed soil samples were retained in brass sample rings of 2.42 inches in diameter and 1.00 inch in height, and placed in sealed containers. Disturbed soil samples were obtained at selected levels within the borings and placed in sealed containers for transport to our geotechnical laboratory.

All samples obtained were taken to our geotechnical laboratory for storage and testing. Detailed logs of the borings are presented on the enclosed Boring Logs, Enclosures B-1 through B-11. A Boring Log Legend and Soil Classification Chart are presented on Enclosures B-i and B-ii, respectively.

CONSISTENCY OF SOIL

SANDS

SPT BLOWS	CONSISTENCY
0-4	Very Loose
4-10	Loose
10-30	Medium Dense
30-50	Dense
Over 50	Very Dense

COHESIVE SOILS

SPT BLOWS	CONSISTENCY
0-2	Very Soft
2-4	Soft
4-8	Medium
8-15	Stiff
15-30	Very Stiff
30-60	Hard
Over 60	Very Hard

SAMPLE KEY

Symbol	Description
	INDICATES CALIFORNIA SPLIT SPOON SOIL SAMPLE INDICATES BULK SAMPLE INDICATES SAND CONE OR NUCLEAR DENSITY TEST INDICATES STANDARD PENETRATION TEST (SPT) SOIL SAMPLE

TYPES OF LABORATORY TESTS

1	Atterberg Limits
2	Consolidation
3	Direct Shear (undisturbed or remolded)
4	Expansion Index
5	Hydrometer
6	Organic Content
7	Proctor (4", 6", or Cal216)
8	R-value
9	Sand Equivalent
10	Sieve Analysis
11	Soluble Sulfate Content
12	Swell
13	Wash 200 Sieve

BORING LOG LEGEND

PROJECT:	Proposed RNG Plant Equipment Area, Newport Beach, California	**PROJECT NO.:**	23775.1
CLIENT:	Biofuels Coyote Canyon Biogas, LLC	**ENCLOSURE:**	B-i
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	December 2021

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	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
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	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
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	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
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	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

PARTICLE SIZE LIMITS

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	
12"	3"	3/4"	No . 4	No. 10	No. 40	200	

(U.S. STANDARD SIEVE SIZE)

SOIL CLASSIFICATION CHART

PROJECT:	Proposed RNG Plant Equipment Area, Newport Beach, California	**PROJECT NO.:**	23775.1
CLIENT:	Biofuels Coyote Canyon Biogas, LLC	**ENCLOSURE:**	B-ii
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	December 2021

LOG OF BORING B-1

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
	TEST DATA								
0	40 for 3"		2.0			■		SM	@ 0 feet, FILL: SILTY SAND, aproixmately 10% gravel (to 2" diameter), 10% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 20% silty fines, brown, damp, loose.
									@ 1.5 feet, BEDROCK: SANDSTONE, approixmately 5% coarse grained sand, 35% medium grained sand, 55% fine grained sand, 5% silty fines, light yellowish-brown, damp, moderately cemented, hard.
									@ 2 feet, sample disturbed.
5	58 for 2"		3.2			≡			below 6± feet, slightly coarser grained, darker yellowish-brown, damp to moist.
10	65 for 4"		5.6			≡			
15	65 for 4"		7.1			≡			END OF BORING @ 17' due to practical refusal
									Fill to 1.5±'
									No groundwater
									Bedrock @ 1.5'
20									

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Archaea Energy, LLC	**ELEVATION:**	--
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	November 1, 2021
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-1

LOG OF BORING B-2

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0								SM	@ 0 feet, FILL: SILTY SAND, approximately 5% gravel (to 2" diameter), 15% coarse grained sand, 30% medium grained sand, 25% fine grained sand, 15% silty fines, brown, damp, loose.
								SW SM	@ 1 foot, processed import soil, approximately 10% fine gravel, 25% coarse grained sand, 25% medium grained sand, 30% fine grained sand and silty fines, grayish-brown, damp to moist, dense.
	65 for 10"		2.9		123.7				
5	59		3.6		123.2				@ 5 feet, same as above.
	43 for 5"		8.1		94.7				@ 6.5± feet, BEDROCK: SANDSTONE, approximately 30% medium grained sand, 65% fine grained sand, 5% silty fines, yellowish-brown, damp, moderately cemented, hard.
10	46 for 5"		7.3		100.4				below 10 feet, gravelly, harder drilling.
									END OF BORING @ 12' due to practical refusal Fill to 6.5±' No groundwater Bedrock @ 6.5'
15									

TEST DATA

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1	
CLIENT:	Archaea Energy, LLC	**ELEVATION:**	--	
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	November 1, 2021	
		EQUIPMENT:	Mobile B-61	
		HOLE DIA.: 8"	**ENCLOSURE:**	B-2

LOG OF BORING B-3

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
	TEST DATA								
0								SM	@ 0 feet, FILL: SILTY SAND with GRAVEL, approximately 30% gravel (to 1" diameter), 10% coarse grained sand, 20% medium grained sand, 25% fine grained sand, 15% silty fines, light brown, damp, dense.
	26	4, 7, 10, 11	14.5		108.4			CL	@ 1.5 feet, SANDY CLAY, approximately 5% gravel, 5% coarse grained sand, 10% medium grained sand, 20% fine grained sand, 60% clay and silt, brown, moist, stiff.
5	29		15.6		106.6				@ 5± feet, BEDROCK: CLAYEY SILTSTONE, approximately 5% medium grained sand, 25% fine grained sand, 70% silt and clay, thinly bedded to laminated (20±° dip), grayish-brown and brown layers, moist, weakly cemented.
	74 for 11"		13.9		111.2				
10	69		14.2		110.6				
15	77 for 11"		11.5		116.9				END OF BORING @ 15.92' Fill to 5±' No groundwater Bedrock @ 5'
20									

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Archaea Energy, LLC	**ELEVATION:**	--
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	November 1, 2021
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-3

LOG OF BORING B-4

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0	25		9.1		118.5			SM	@ 0 feet, FILL: SILTY SAND with GRAVEL, aproximately 30% gravel (to 1" diameter), 15% coarse grained sand, 20% medium grained sand, 20% fine grained sand, 15% silty fines, light brown, damp, loose to medium dense.
									@ 2.5 feet, BEDROCK: SANDSTONE, approximtely 40% medium grained sand, 55% fine grained sand, 5% sitly fines, light yellowish-brown to light grayish-brown, damp, moderately weathered, weakly cemented.
5	46		11.4		115.6				below 3 feet, becomes dark yellowish-brown, coarser grained sand but also siltier.
									@ 5 feet, fine grained, grayish-brown.
	76 for 11"		9.0		118.0				@ 7 feet, more yellowish-brown, still mostly fine grained.
10	78 for 11"		12.8		115.0				@ 10 feet, includes occasional SILTY SANDSTONE layers, locally oxidized to an orange to reddish-brown color.
									END OF BORING @ 11.42'
									Fill to 2.5'
									No groundwater
									Bedrock @ 2.5'
15									

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Archaea Energy, LLC	**ELEVATION:**	--
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	November 1, 2021
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-4

LOG OF BORING B-5

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0	49 for 6"		8.3					SM	@ 0 feet, FILL: SILTY SAND with GRAVEL, approximately 25% gravel (to 1" diameter), 10% coarse grained sand, 20% medium grained sand, 25% fine grained sand, 25% sitly fines, light brown, damp, loose to medium dense. @ 1.5 feet, becomes more grayish-brown, dense to very dense. @ 2 feet, sample disturbed.
		3, 4, 7, 10, 11							
5	72 for 11"		7.9		97.7				@ 5 feet, very dense.
	16	2	8.8		106.4			SC	@ 7± feet, CLAYEY SAND, approximately 10% fine gravel, 5% coarse grained sand, 15% medium grained sand, 25% fine grained sand, 45% clay and silt, yellowish-brown, moist, loose to medium dense.
10	18		12.9		114.5				@ 10 feet, moist, yellowish-brown.
	61		18.2		106.4				@ 12.5± feet, BEDROCK: SANDY SILTSTONE, fine grained, grayish-brown to yellowish-brown, moist, weakly cemented, low angle dip.
15	75		17.8		106.2				@ 15 feet, includes minor, thin gypsum stingers along fractures.
20	73		14.3		108.6				@ 20 feet, moderately cemented.
									END OF BORING @ 21'
25									Fill to 12.5±' No groundwater Bedrock @ 12.5'

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Archaea Energy, LLC	**ELEVATION:**	--
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	November 1, 2021
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-5

LOG OF BORING B-6

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0								SM	@ 0 feet, FILL: SILTY SAND with GRAVEL, approximately 25% gravel (to 1" diameter), 10% coarse grained sand, 20% medium grained sand, 25% fine grained sand, 20% silty fines, light brown, damp, loose to medium dense.
	52		11.8		116.3				@ 2.5± feet, BEDROCK: SILTY SANDSTONE, approximately 15% medium grained sand, 30% fine grained sand, 55% silt and clay, yellowish-brown, moist, weakly to moderately cemented.
5	70		13.2		111.3				
	60		11.0		105.3				below 7 feet, sandier.
10	79 for 11"		15.8		107.6				@ 10 feet, locally oxidized to an orange/reddish-brown color. END OF BORING @ 10.42' Fill to 2.5' No groundwater Bedrock @ 2.5'
15									

TEST DATA

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Archaea Energy, LLC	**ELEVATION:**	--
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	November 1, 2021
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-6

LOG OF BORING B-7

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0	47		15.6		104.5			SM	@ 0 feet, FILL: SILTY SAND, approximately 25% gravel (to 1" diameter), 10% coarse grained sand, 20% medium grained sand, 25% fine grained sand, 20% silty fines, light brown, damp, loose to medium dense.
									@ 1± foot, BEDROCK: SANDY SILTSTONE, approximately 5% medium grained sand, 20% fine grained sand, 70% silt and clay, laminated to thinly bedded, light yellowish-brown, damp, weakly cemented (moderate drilling).
5	52		16.2		105.0				
	69		17.9		102.5				@ 7 feet, includes local areas oxidized to orange/reddish-brown color.
10	74 for 10"		17.5		103.9				@ 10 feet, sample reveals low to moderate dip amounts.
15	64		21.2		100.3				
20	72		18.1		105.5				@ 20 feet, slight increase in percentage of clay.
									END OF BORING @ 21.5'
25									Fill to 1±' No groundwater Bedrock @ 1'

TEST DATA

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Archaea Energy, LLC	**ELEVATION:**	--
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	November 2, 2021
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-7

LOG OF BORING B-8

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
	TEST DATA								
0	52		11.9		117.6			SM	@ 0 feet, FILL: SILTY SAND with GRAVEL, approximately 15% gravel, 10 % coarse grained sand, 20% medium grained sand, 25% fine grained sand, 20% silty fines, light brown, damp, loose to medium dense.
									@ 2± feet, BEDROCK: SANDY SILTSTONE, approximately 5% medium grained sand, 30% fine grained sand, 65% silty with clay, yellowish-brown to grayish-brown, moist, weakly cemented.
5	53		14.1		115.3				
	76		12.5		118.1				@ 7 feet, slightly sandier.
10	65		14.0		112.0				@ 10 feet, siltier with minor clayey siltstone.
15	36		13.7		108.2				@ 15 feet, includes occasional think (1/8 to 1/4") gypsum stringers.
20	82 for 9"		12.8		104.5				@ 20 feet, sandier.
									END OF BORING @ 21.25'
25									Fill to 2±' No groundwater Bedrock @ 2'

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Archaea Energy, LLC	**ELEVATION:**	--
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	November 2, 2021
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-8

LOG OF BORING B-9

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0									**@ 0 feet, FILL: approximately 1.5" asphalt concrete over gravelly sand.**
	72 for 11"	3, 7, 8 10, 11	9.7		121.3				**@ 0.5 feet, BEDROCK: SANDY SILTSONTE, approximately 40% fine grained sand, 60% silty fines, yellowish-brown, damp, weakly cemented, massive and somewhat fractured.**
5	60		10.0		120.9				
	64		9.8		115.4				
10	76 for 11"		10.6		106.2				**@ 10 feet, weakly to moderately cemented, very few fractures.**
									END OF BORING @ 10.92'
15									**Fill to 0.5'** **No groundwater** **Bedrock @ 0.5'**

TEST DATA

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1	
CLIENT:	Archaea Energy, LLC	**ELEVATION:**	--	
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	November 2, 2021	
		EQUIPMENT:	Mobile B-61	
		HOLE DIA.: 8"	**ENCLOSURE:**	B-9

LOG OF BORING B-10

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0	67 for 11"		12.0		117.9				@ 0 feet, FIL: 1.5± asphalt over gravelly sand asphalt.
									@ 0.5± feet, BEDROCK: SANDY SILTSTONE, approximately 45% fine grained sand, 55% silty fines, overall with some beds consisting of SILTY SANDSTONE, light-yellowish brown to light grayish-brown, damp, weakly to moderately cemented.
5	67 for 11"		10.3		112.9				
	67		12.7		112.6				@ 7 feet, includes occasional thin gypsum lined fractures.
10	74		10.6		116.5				
									below 14± feet, slower drilling, increase in sandstone beds.
15	76 for 8"		7.9						@ 15 feet, sample disturbed.
									END OF BORING @ 18', practical refusal due to slow progress
									Fill to 0.5±'
									No groundwater
20									Bedrock @ 0.5'

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Archaea Energy, LLC	**ELEVATION:**	--
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	November 2, 2021
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-10

LOG OF BORING B-11

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
	TEST DATA								
0	38		10.4		117.8				@ 0 feet, FILL: approximately 1" asphalt concrete over 3" gravel. @ 0.33± feet, BEDROCK: SANDY SILTSTONE, approximately 35% fine grained sand, 65% silty fines, yellowish-brown, damp, thinly bedded, weakly to moderately cemented.
5	33		9.9		118.0				
	71 for 11"		9.0		122.8				below 7 feet, slightly sandier, moderately cemented.
10	72		9.9		123.8				below 10± feet, slower drilling.
15	69		9.6		118.6				@ 15 feet, sandier, trace of gypsum lined fractures.
									END OF BORING @ 16' Fill to 0.33' No groundwater Bedrock @ 0.33'

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Archaea Energy, LLC	**ELEVATION:**	--
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	November 2, 2021
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	**ENCLOSURE:** B-11

APPENDIX C

Laboratory Testing Program and Test Results

APPENDIX C
LABORATORY TESTING

General

Selected soil samples obtained from our borings were tested in our geotechnical laboratory to evaluate the physical properties of the soils affecting foundation design and construction procedures. The laboratory testing program performed in conjunction with our investigation included in-place moisture content and dry density, laboratory compaction characteristics, direct shear, sieve analysis, sand equivalent, R-value, expansion index, consolidation, and corrosion. Descriptions of the laboratory tests are presented in the following paragraphs:

Moisture Density Tests

The moisture content and dry density information provides an indirect measure of soil consistency for each stratum, and can also provide a correlation between soils on this site. The dry unit weight and field moisture content were determined for selected undisturbed samples, in accordance with ASTM D 2922 and ASTM D 2216, respectively, and the results are shown on the Boring Logs, Enclosures B-1 through B-11 for convenient correlation with the soil profile.

Laboratory Compaction

Selected soil samples were tested in the laboratory to determine compaction characteristics using the ASTM D 1557 compaction test method. The results are presented in the following table:

LABORATORY COMPACTION				
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.C.S.)**	**Maximum Dry Density (pcf)**	**Optimum Moisture Content (percent)**
B-3	2-5	(CL) Sandy Clay	113.0	15.5
B-6	4-7	Bedrock: Silty Sandstone	120.5	13.0
B-9	1-4	Bedrock: Silty Sandstone	121.5	11.5

Direct Shear Tests

Shear tests are performed with a direct shear machine in general accordance with ASTM D 3080 at a constant rate-of-strain (usually 0.04 inches/minute). The machine is designed to test a sample partially extruded from a sample ring in single shear. Samples are tested at varying normal loads in order to evaluate the shear strength parameters, angle of internal friction and cohesion. Samples are tested in a remolded condition (90 percent relative compaction per ASTM D 1557) and soaked, to represent the worst case conditions expected in the field.

The results of the shear tests are presented in the following table:

DIRECT SHEAR TESTS				
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.C.S.)**	**Angle of Internal Friction (degrees)**	**Apparent Cohesion (psf)**
B-6	4-7	Bedrock: Silty Sandstone	31	500
B-9	1-4	Bedrock: Silty Sandstone	28	150

Sieve Analysis

A quantitative determination of the grain size distribution was performed for selected samples in accordance with the ASTM D 422 laboratory test procedure. The determination is performed by passing the soil through a series of sieves, and recording the weights of retained particles on each screen. The results of the sieve analyses are presented graphically on Enclosure C-1.

Sand Equivalent

The sand equivalent of selected soils were evaluated using the California Sand Equivalent Test Method, Caltrans Number 217. The results of the sand equivalent tests are presented with the grain size distribution analyses on Enclosure C-1.

R-Value Test

Soil samples were obtained at the probable pavement subgrade level and sieve analysis and sand equivalent tests were conducted. Based on these indicator tests, a selected soil sample was tested to determine its R-value using the California R-Value Test Method, Caltrans Number 301. The result of the R-value test is presented on Enclosure C-1.

C

Expansion Index Tests

Remolded samples are tested to determine their expansion potential in accordance with the Expansion Index (EI) test. The test is performed in accordance with the Uniform Building Code Standard 18-2. The test results are presented in the following table:

EXPANSION INDEX TESTS				
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.C.S.)**	**Expansion Index (EI)**	**Expansion Potential**
B-3	2-5	(CL) Sandy Clay	85	Medium
B-6	4-7	Bedrock: Silty Sandstone	63	Low
Expansion Index:		0-20 Very low / 21-50 Low / 51-90 Medium / 91-130 High		

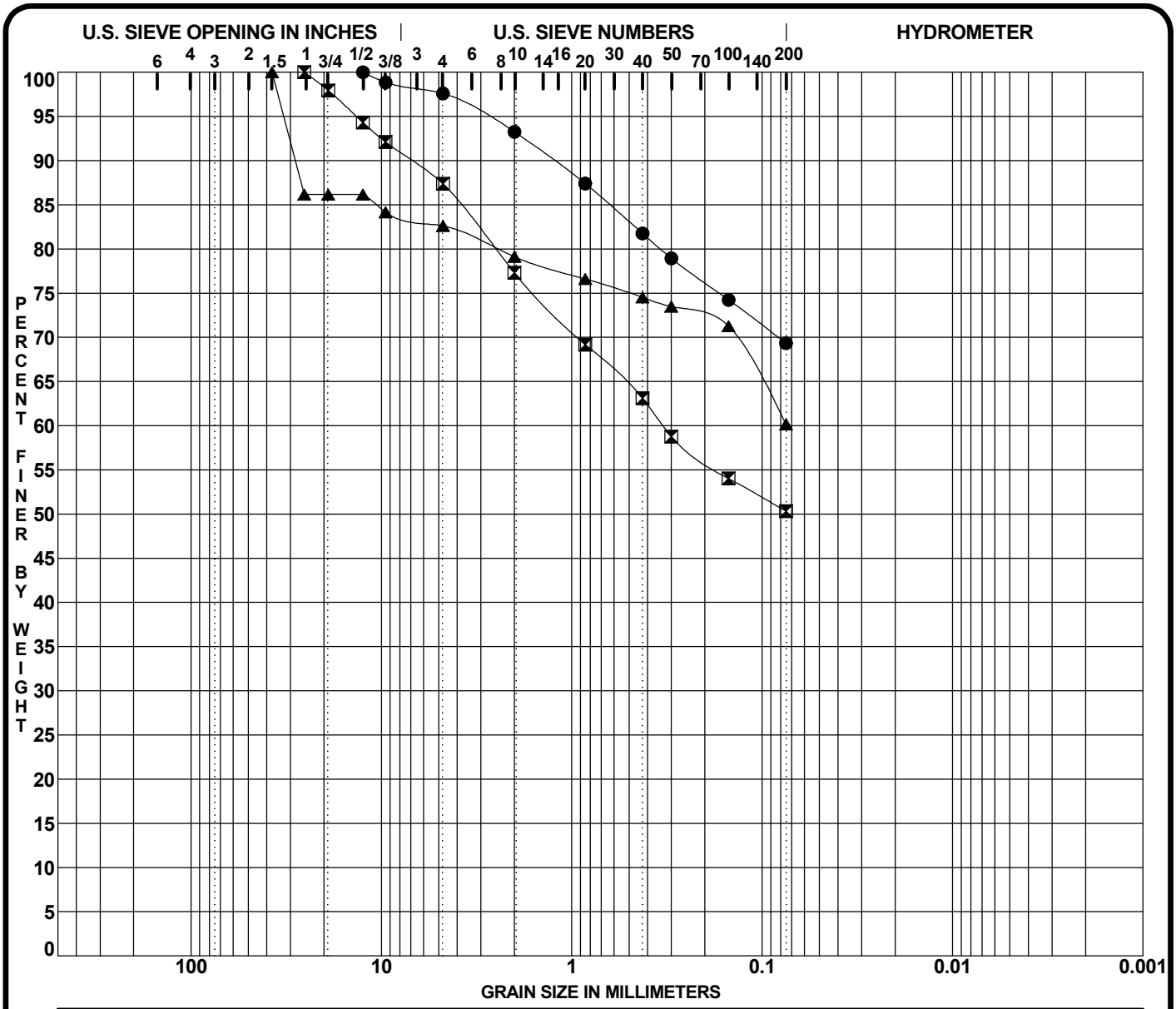
Consolidation Tests

The apparatus used for the consolidation tests (odometer) is designed to test a one-inch high portion of the undisturbed soil sample as contained in a sample ring. Porous stones and filler paper are placed in contact with the top and bottom of the specimen to permit the addition or release of water. Loads are applied to the test specimen in specified increments, and the resulting axial deformations are recorded. The results are plotted as log of axial pressure versus consolidation or compression, expressed as strain or sample height.

Samples are tested at field and greater-than field moisture contents. The results are shown on Enclosure C-2.

Atterberg Limits

Selected samples of the on-site fine grained soils were tested for their Atterberg limits in accordance with ASTM D 4318. The results of these tests are presented on Enclosure C-3.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Soil Classification	SE	RV	PL	PI	Cc	Cu
●	B-03	@ 2-5'	(CL) Sandy Clay	--	--	11	22		
⊠	B-06	@ 4-7'	BEDROCK: Sandy Siltstone	12	--				
▲	B-09	@ 1-4'	BEDROCK: Sandy Siltstone	6	26				

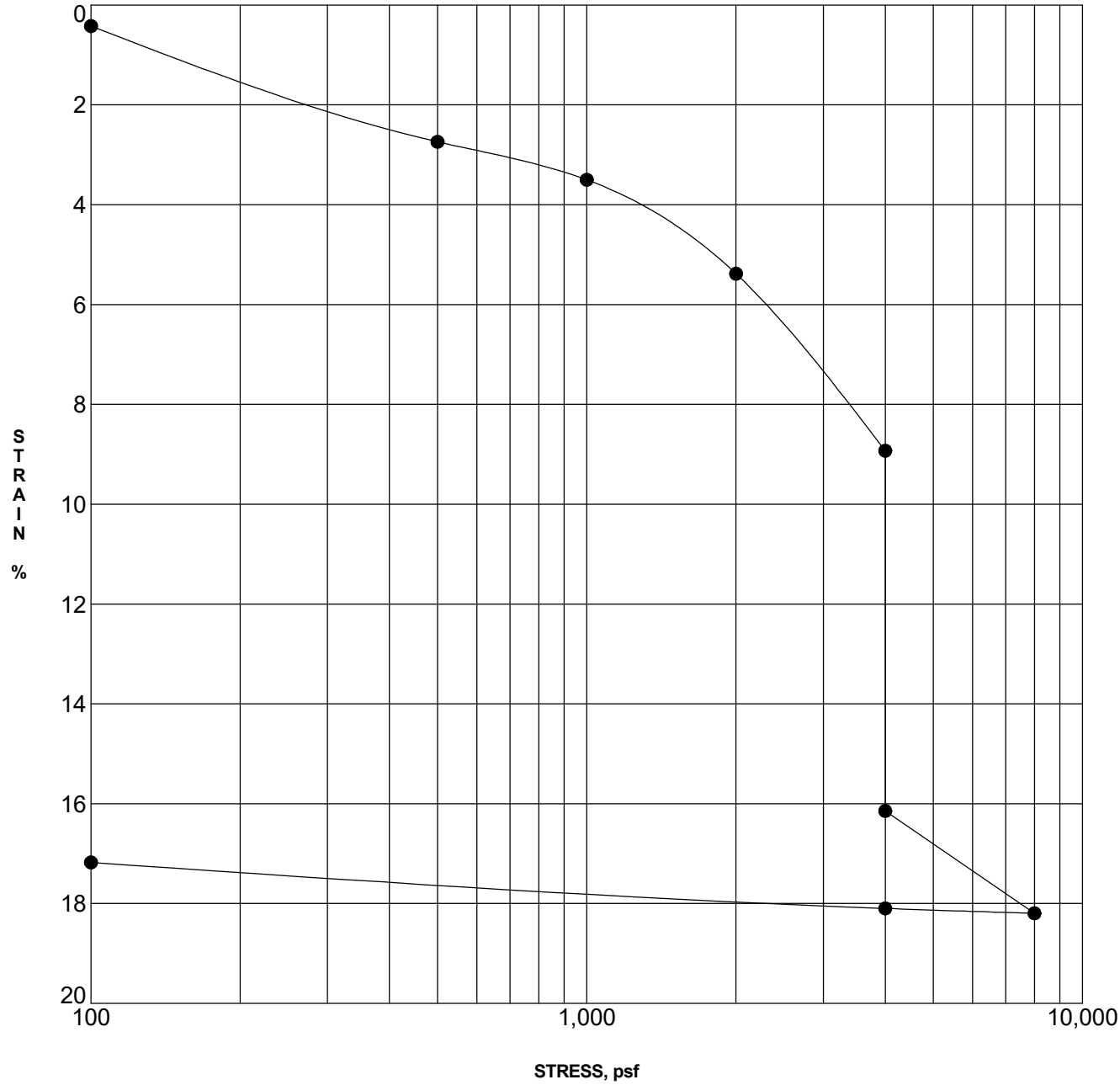
	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-03	@ 2-5'	12.50				2.4	28.3	69.3	
⊠	B-06	@ 4-7'	25.40	0.33			12.6	37.0	50.3	
▲	B-09	@ 1-4'	37.50				17.4	22.5	60.2	

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Archaea Energy, LLC	**DATE:**	December 2021

GRADATION CURVES

LOR GEOTECHNICAL GROUP, INC.

ENCLOSURE: C-1



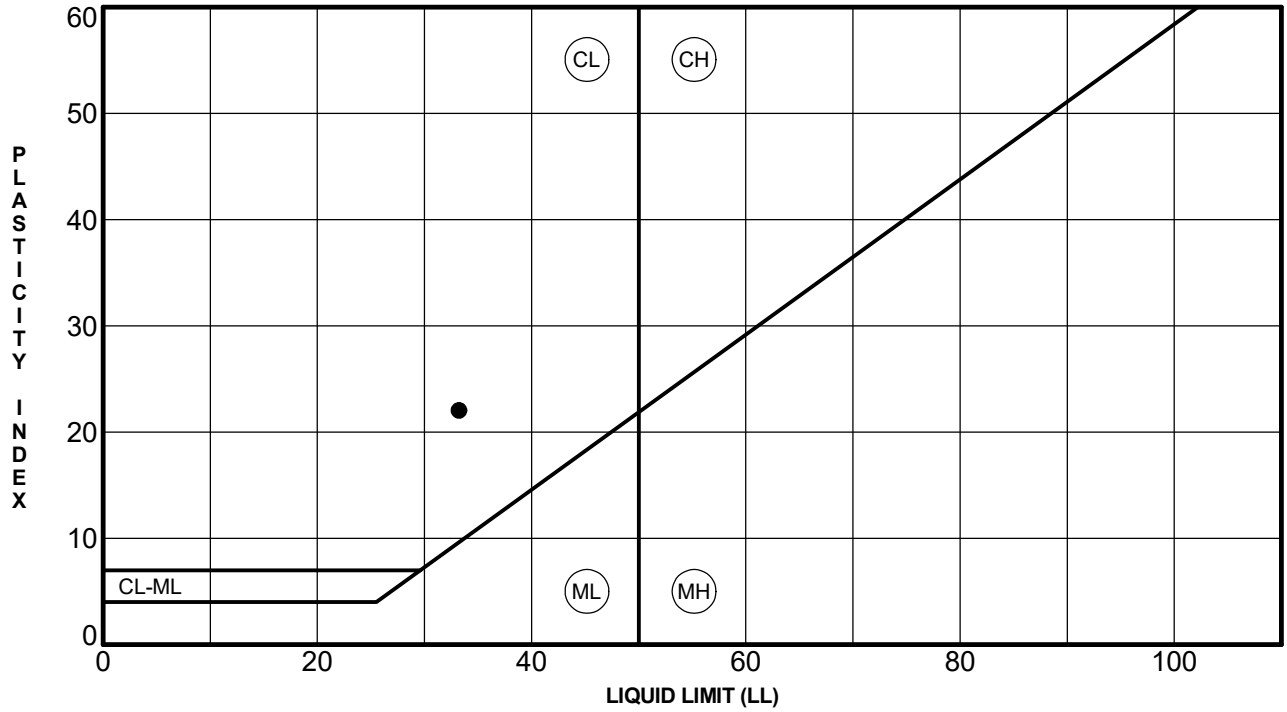
Specimen Identification		Classification	DD	MC%
● B-05	@ 7 ft	*(SC) Clayey Sand*	88	9

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Archaea Energy, LLC	**DATE:**	December 2021

CONSOLIDATION TEST

LOR GEOTECHNICAL GROUP, INC.

ENCLOSURE: C-2



Specimen Identification	LL	PL	PI	Fines	Classification
● B-03 @ 2-5'	33	11	22	69.3	(CL) Sandy Clay

PROJECT:	Proposed RNG Plant Equipment Area	**PROJECT NO.:**	23775.1
CLIENT:	Archaea Energy, LLC	**DATE:**	December 2021

ATTERBERG LIMITS RESULTS

LOR GEOTECHNICAL GROUP, INC.

ENCLOSURE: C-3

Results Only Soil Testing for Biofuels Coyote Canyon Biogas, LLC

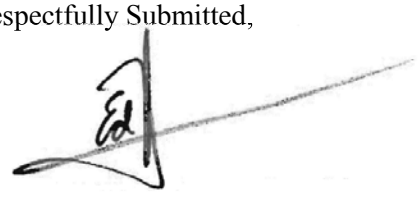
November 30, 2021

Prepared for:

Robb Markoff
LOR Geotechnical
6121 Quail Valley Ct
Riverside, CA
rmarkoff@lorgeo.com

Project X Job#: S211124G
Client Job or PO#: 23775-1

Respectfully Submitted,



Eduardo Hernandez, M.Sc., P.E.
Sr. Corrosion Consultant
NACE Corrosion Technologist #16592
Professional Engineer
California No. M37102
ehernandez@projectxcorrosion.com

Soil Analysis Lab Results

Client: LOR Geotechnical
Job Name: Biofuels Coyote Canyon Biogas, LLC
Client Job Number: 23775-1
Project X Job Number: S211124G
November 30, 2021

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM D4972	ASTM G200	ASTM D4658	ASTM D4327	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D4327	ASTM D4327
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity** As Rec'd | Minimum		**pH**	**Redox**	**Sulfide** S^{2-}	**Nitrate** NO_3^-	**Ammonium** NH_4^+	**Lithium** Li^+	**Sodium** Na^+	**Potassium** K^+	**Magnesium** Mg^{2+}	**Calcium** Ca^{2+}	**Fluoride** F_2^{--}	**Phosphate** PO_4^{3-}
	(ft)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	(Ohm-cm)	(Ohm-cm)		(mV)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BB-3 B-3 (Fill)	2-5	3,278.4	0.3278	43.9	0.0044	3,216	570	8.4	175	<0.01	3.6	2.0	0.03	170.5	6.0	7.0	143.9	4.0	1.6
BB-5 B-6 (Siltstone)	4-7	105.1	0.0105	884.6	0.0885	556,100	938	9.2	135	<0.01	6.6	11.6	0.01	474.3	2.3	1.2	5.1	35.9	4.1
BB-7 B-9 (Siltstone)	1-4	574.5	0.0575	27.7	0.0028	21,440	804	8.3	198	<0.01	1.2	3.4	0.04	236.2	1.9	2.4	2.9	12.4	0.3

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract
PPM = mg/kg (soil) = mg/L (Liquid)

Project X
Corrosion Engineering
Corrosion Control - Soil, Water, and Metallurgy Lab

Lab Request Sheet Chain of Custody
Phone: (213) 928-7213 · Fax (951) 226-1720 · www.projectxcorrosion.com

Ship Samples To: 29990 Technology Dr, Suite 13, Murrieta, CA 92563

Project X Job Number: S211122G LOR 23775-1 Biofuels 3 Full

IMPORTANT: Please complete Project and Sample Identification Data as you would like it to appear in report & include this form with samples.

Company Name:	LOR Geotechnical Group, Inc.	**Contact Name:**	ROBB
Mailing Address:	6121 Quail Valley Court	**Contact Email:**	RMARKOFF@LORGEO.COM
Accounting Contact:	John Leuer	**Invoice Email:**	ATARDIE@LORGEO.COM
Client Project No:	23775.1	**Project Name:**	BIOFUELS COYOTE CANYON BIOGAS, LLC
P.O. #:	--	**Phone No:**	951-653-1760

	3-5 Day Standard	3 Day Guarantee 50% mark-up	24 Hr RUSH 100% mark-up
(Business Days) Turn Around Time:	✓		

Results By: ☐ Phone ☐ Fax ☒ Email

Date & Received by :

Default Method

Special Instructions:

ANALYSIS REQUESTED (Please circle)

	SAMPLE ID - BORE #	DESCRIPTION	DEPTH (ft)	DATE COLLECTED
385	1 BB-3	B-3 (FILL)	2-5'	11-1-21
386	2 BB-5	B-6 (SILTSTONE)	4-7'	11-1-21
387	3 BB-7	B-9 (SILTSTONE)	1-4'	11-2-21
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			
	15			

	Soil Resistivity	pH	Sulfate	Chloride	Redox Potential	Sulfide	Ammonia	Nitrate	Flouride	Phosphate	Lithium	Sodium	Potassium	Magnesium	Calcium	BiCarbonate	Full Corrosion Series	Soil Corrosivity Evaluation Report	Water Corrosivity Mini Report	Moisture Content	Total Alkalinity	Thermal Resistivity	Metallurgical Analysis	Langelier Index	Puckorius Index	XRF Elemental Analysis	Water Hardness
Method	Caltrans CTM643	Caltrans CTM643	Caltrans CTM417	Caltrans CTM422	AASHTO T288	AASHTO T 289	AASHTO T 290	AASHTO T 291	SM 2580B	SM 4500-NH3	SM 4500-NO3	ASTM G187	ASTM G 51	ASTM D4327	ASTM D4327	ASTM G200	SM 4500-S2	ASTM D6919	ASTM D4327	ASTM D4327	ASTM D4327	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	SM 2320B				ASTM D2216	SM 2520B						
Geo Quad	Geo Quad	Geo Quad	Geo Quad	Geo Quad	Full Corrosion Series														Reports								
1																	X											
2																	X											
3																	X											
4																												
5																												
6																												
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11																												
12																												
13																												
14																												
15																												

*Req: Min. 3 Samples, site map, and groundwater info