Geotechnical Engineering Report

Proposed Fred Meyer Fuel Center
2980 River Road N
Salem, Oregon

for
MJC Investment Property XII, LLC and
Fred Meyer Stores, Inc.

January 19, 2022

GeoEngineers

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2980 River Road N
Salem, Oregon

File No. 2831-110-01

January 19, 2022

MJC Investment Property XII, LLC
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1.0 INTRODUCTION

GeoEngineers, Inc. (GeoEngineers) is pleased to submit this geotechnical report for the proposed fueling facility located at 2980 River Road N in Salem, Oregon. A Phase I Environmental Site Assessment (ESA) was completed by GeoEngineers and provided under separate cover. The location of the site is shown in, Figure 1, Vicinity Map.

The project includes installing a pump island canopy, kiosk structure, two underground storage tanks (USTs), and associated reinforced concrete slabs and asphalt pavements. Additional related civil improvements are expected to include site utilities (water, wastewater, and electrical piping and conduit) and stormwater infiltration facilities. A grading plan has not been provided, but based on the surrounding grades, minimal cuts and fills are anticipated as part of the site development.

2.0 SCOPE OF SERVICES

The purpose of our services is to provide geotechnical engineering services for designing and constructing the project. Our specific scope of services is detailed in our December 6, 2021 revised proposal but in general included reviewing relevant geotechnical-related information; exploring subsurface soil and groundwater conditions; collecting representative soil samples; completing relevant laboratory testing; conducting geotechnical analyses; and preparing this geotechnical report with our findings, conclusions and design recommendations.

3.0 SITE CONDITIONS

3.1. Surface Conditions

The subject property is located on an undeveloped parcel northwest of the existing Fred Meyer store located at 2855 Broadway St NE, Salem, Oregon 97303. The parcel, identified as 2980 River Road N, lies east of River Road North and southeast of the intersection of River Road N and Liberty Street NE. The site measures approximately 0.89 acres. The site is generally flat, with overall relief across the site less than 2 feet. The bulk of the site is a portion of the asphalt-paved Fred Meyer parking lot, with a narrow strip of undeveloped land along the east edge of Liberty Street. A Site Plan is provided as Figure 2.

3.2. Site Geology

The geology of the site is mapped by Oregon Department of Geology and Mineral Industries (DOGAMI) Geological Map Series GMS-18b, *Geologic Map of the Rickreall and Salem West Quadrangles, Oregon* (Bela, 1981) as underlain by Quaternary terrace deposits.

These “lower terrace” deposits are described as “unconsolidated to semiconsolidated cobbles, gravel, sand, silt, clay, muck, and organic matter of variable thickness (30-50 feet).”

Our review of the site geology, together with on-site observations, suggest that the site geology largely conforms to the published mapping but that portions of the site are likely to contain a variable mantling of pavement and aggregate base.

3.3. Subsurface Conditions

We completed field explorations at the site on December 13, 2021. Our explorations consisted of two machine-drilled borings to depths of about 21½ feet below ground surface (bgs) and five shallow infiltration test borings drilled to 5 feet bgs at the approximate locations shown in Figure 2, Site Plan. Appendix A summarizes our exploration methods and presents our exploration logs. Laboratory test results are provided on the exploration logs or in Appendix A, Field Explorations and Laboratory Testing.

In general, subsurface conditions consist of a highly variable mantle of terrace deposit alluvium ranging from silt and silty fine sand to silty gravel and poorly graded gravel with sand and silt. The following paragraphs describe these materials in more detail.

3.3.1. Pavement and Aggregate Base

The bulk of the site is mantled by asphaltic concrete pavement. This pavement section typically consisted of about 2 inches of asphaltic concrete over approximately 6 inches of crushed rock aggregate base. Our observations suggest that the pavement is in fair to very poor condition.

3.3.2. Terrace Deposit Alluvium

At the ground surface in IT-4 and IT-5, and below the pavement section in the remaining borings, we encountered highly variable terrace deposit alluvium to the maximum depths explored. The infiltration test borings and the uppermost roughly 10 feet of Borings B-1 and B-2 encountered a mixture of silt, silty fine to medium sand, and poorly grade sand with silt. The infiltration test borings terminated in this surface layer.

Below 20 feet in B-1 and below roughly 9 to 10 feet in B-2, we encountered poorly graded gravel to poorly graded gravel with sand and silt that we interpret as the coarse-grained high-energy phase of the terrace deposits that probably extends to tens of feet bgs.

The silty terrace deposits were generally medium stiff to stiff and the sandy materials ranged from loose to medium dense (occasionally very loose). The gravels were typically medium dense to very dense.

3.4. Groundwater

Groundwater was not encountered in our explorations to the maximum depth explored. Water well log coverage is poor for this site, but a single log from roughly half a mile north as well as soil coloration suggests that the depth to permanent groundwater is not far below 20 feet bgs. Based on our observations of the materials in the explorations, the soils above the permanent groundwater elevations are unlikely to be saturated for more than the wettest portions of the year. Groundwater conditions at the site are expected to vary seasonally due to rainfall events and other factors not observed in our explorations.

4.0 INFILTRATION TESTING

We conducted five infiltration tests at a depth of approximately 5 feet bgs. Test locations are shown in Figure 2. Testing was conducted using the encased falling head method consistent with the procedures outlined in the City of Salem Department of Public Works Administrative Rules, Chapter 109, Division 004, Appendix C. A 2-inch-thick layer of washed bagged gravel was placed in the pipe prior to adding water to reduce disturbance from flowing water at the base of the pipe interior. The test areas were pre-soaked for

approximately 4 hours by repeated addition of water into the pipe when necessary, in order to completely saturate the native soils.

After the saturation period, the pipe was filled with clean water to approximately 12 inches above the soil in the bottom of the boring. The drop in water level was measured for three iterations of 1 hour each. The field test results are summarized in Table 1.

TABLE 1. INFILTRATION TEST RESULTS

Infiltration Test No.	Location	Depth (feet)	USCS Material Type	Field Measured Infiltration Rate[1] (inches/hour)
IT-1	See Site Plan	5	ML	0.0
IT-2	See Site Plan	5	ML	0.6
IT-3	See Site Plan	5	ML	0.2
IT-4	See Site Plan	5	ML	0.1
IT-5	See Site Plan	5	ML	0.2

Notes:

[1] Appropriate factors should be applied to the field measured infiltration rate, based on the design methodology and specific system used.

USCS = Unified Soil Classification System

The infiltration rates shown in Table 1 are field-measured infiltration rates. They represent the short-term measured rates, and factors of safety have not been applied for the type of infiltration system being considered, or for variability that may be present in the on-site soil. In our opinion, and consistent with the state of the practice, correction factors should be applied.

From a geotechnical perspective, we recommend a factor of safety (correction factor) of at least 2 be applied to the field-measured infiltration values to account for potential soil variability with depth and location within the area tested. In addition, the stormwater system design engineer should determine and apply appropriate correction factors to account for repeated wetting and drying that occur in this area, degree of in-system filtration, frequency and type of system maintenance, vegetation, potential for siltation and bio-fouling, etc., as well as system design correction factors for overflow or redundancy, and base and facility size.

5.0 CONCLUSIONS

5.1. General

Based on our explorations, testing, and analyses, it is our opinion that the site is suitable for the proposed project from a geotechnical standpoint, provided the recommendations in this report are included in design and construction. We offer the following conclusions regarding geotechnical design at the site.

- Measured on-site infiltration rates are very low. Stormwater infiltration will likely be impractical and/or require large detention facilities.
- No groundwater was encountered to the maximum depths explored.

- Near surface on-site soils consist primarily of silt, which will be difficult or impossible to compact during the wet season.
- The site soils will become disturbed from earthwork occurring during periods of wet weather or when the moisture content of the soil is more than a few percentage points above optimum. Wet weather construction practices will be required, except possibly during the dry summer months.
- Spread footing foundations bearing on medium stiff or firmer native silt or medium dense or denser sand and gravel are suitable to support the proposed kiosk.
- Drilled pier foundations bearing on medium stiff or firmer native silt or medium dense or denser sand and gravel are suitable to support the proposed canopy structure.
- Standard pavement sections prepared as described in this report will suitably support estimated traffic loads.

6.0 EARTHWORK RECOMMENDATIONS

6.1. Site Preparation

Initial site preparation and earthwork operations will include removing the existing pavements, grading the site, and excavating for utilities, USTs, and foundations.

All existing utilities in the construction area should be identified prior to excavation. Live utility lines identified beneath proposed structures should be relocated. Abandoned utility lines beneath structures should be completely removed or filled with grout in order to reduce potential settlement of new structures. Soft or loose soil encountered in utility line excavations should be removed and replaced with structural fill where it is located within structural areas.

Materials generated during demolition of existing improvements should be transported off site for disposal. Existing voids and new depressions created during site preparation, and resulting from removal of existing utilities, or other subsurface elements, should be cleaned of loose soil or debris down to firm soil and backfilled with compacted structural fill. Disturbance to a greater depth should be expected if site preparation and earthwork are conducted during periods of wet weather.

6.2. Subgrade Preparation and Evaluation

Upon completion of site preparation activities, the exposed subgrade should be proof-rolled with a fully loaded dump truck or similar heavy rubber-tired construction equipment to identify soft, loose, or unsuitable areas. Proof-rolling should be conducted prior to placing fill and should be observed by a representative of GeoEngineers who will evaluate the suitability of the subgrade and identify any areas of yielding that are indicative of soft or loose soil. If soft or loose zones are identified during proof-rolling, these areas should be excavated to the extent indicated by our representative and replaced with structural fill.

During wet weather, or when the exposed subgrade is wet or unsuitable for proof-rolling, the prepared subgrade should be evaluated by observing excavation activity and probing with a steel foundation probe. Observations, probing, and compaction testing should be performed by a member of our staff. Wet soil that has been disturbed because of site preparation activities or soft or loose zones identified during probing should be removed and replaced with compacted structural fill.

6.3. Wet Weather Construction

The fine-grained soils at the site are highly susceptible to moisture. Wet weather construction practices will be necessary if work is performed during periods of wet weather. If site grading will occur during wet weather conditions, it will be necessary to use track-mounted equipment, load removed material into trucks supported on existing pavement, use gravel working pads, and employ other methods to reduce ground disturbance. The contractor should be responsible to protect the subgrade during construction.

6.4. Excavation

Based on the materials encountered in our subsurface explorations, it is our opinion that conventional earthmoving equipment in proper working condition should be capable of making necessary general excavations.

The earthwork contractor should be responsible for reviewing this report including the boring logs, providing their own assessments, and providing equipment and methods needed to excavate the site soils while protecting subgrades.

6.5. Dewatering

As discussed in the "Groundwater" section of this report, groundwater was not encountered in our explorations. However, if excavations extend into saturated/wet soils, they should be dewatered. Sump pumps are expected to adequately address groundwater encountered in shallow excavations. In addition to groundwater seepage, surface water inflow to the excavations during the wet season can be problematic. Provisions for surface water control during earthwork and excavations should be included in the project plans and should be installed prior to commencing earthwork.

6.6. Shoring

All trench excavations should be made in accordance with applicable Occupational Safety and Health Administration (OSHA) and state regulations. In our opinion, on-site silt soils are generally OSHA Type B while on-site granular soils (silty sand and gravel) are generally OSHA Type C. Excavations deeper than 4 feet should be shored or laid back at an inclination of 1H:1V (horizontal to vertical) for Type B soils and 1.5H:1V for Type C soils, or flatter if workers are required to enter. Excavations made to construct footings or other structural elements should be laid back or shored at the surface as necessary to prevent soil from falling into excavations.

Shoring for trenches less than 6 feet deep that are above the effects of groundwater should be possible with a conventional box system. Moderate sloughing should be expected outside the box. Shoring deeper than 6 feet or below the groundwater table should be designed by a registered engineer before installation. Further, the shoring design engineer should be provided with a copy of this report.

It should be expected that unsupported cut slopes will experience some sloughing and raveling if exposed to water. Plastic sheeting, placed over the exposed slope and directing water away from the slope, will reduce the potential for sloughing and erosion of cut slopes during wet weather.

In our opinion, the contractor will be in the best position to observe subsurface conditions continuously throughout the construction process and to respond to the soil and groundwater conditions. Construction site safety is generally the sole responsibility of the contractor, who also is solely responsible for the means,

methods, and sequencing of the construction operations and choices regarding excavations and shoring. Under no circumstances should the information provided by GeoEngineers be interpreted to mean that GeoEngineers is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

6.7. Structural Fill and Backfill

Structural areas include areas beneath foundations, floor slabs, tanks, pavements, retaining walls (including a distance behind the walls equal to the wall height), and any other areas intended to support structures or within the influence zone of structures.

All structural fill soils should be free of debris, clay balls, roots, organic matter, frozen soil, man-made contaminants, particles with greatest dimension exceeding 4 inches, and other deleterious materials. The suitability of soil for use as structural fill will depend on the gradation and moisture content of the soil. As the amount of fines in the soil matrix increases, the soil becomes increasingly more sensitive to small changes in moisture content and achieving the required degree of compaction becomes more difficult or impossible. Recommendations for suitable fill material are provided in the following sections.

6.7.1. On-Site Soils

The on-site soils consist of native silt, silty sand, and poorly graded gravel. The use of on-site silty soils as structural fill may be difficult because the soil is sensitive to small changes in moisture content and is difficult, if not impossible, to adequately compact when the material is just a few percentage points above optimum moisture. Moisture conditioning will likely be required and only possible during the dry summer months (typically mid-July to mid-September). If the material cannot be properly moisture conditioned, we recommend using imported granular material for structural fill.

6.7.2. Imported Select Structural Fill

Select imported granular material may be used as structural fill. The imported material should consist of pit or quarry run rock, crushed rock, or crushed gravel and sand that is fairly well-graded between coarse and fine sizes (approximately 25 to 65 percent passing the U.S. No. 4 sieve). It should have less than 5 percent passing the U.S. No. 200 sieve. During dry weather, the fines content can be increased to a maximum of 12 percent. This is consistent with Fred Meyer's Technical Specifications for imported fill.

6.7.3. Aggregate Base

Aggregate base material located under floor slabs and pavements, crushed rock used in footing overexcavations and retaining wall backfill should consist of imported clean, durable, crushed angular rock. Such rock should be well-graded, have a maximum particle size of 1 inch, have less than 5 percent passing the U.S. No. 200 sieve, and meet the gradation requirements in Table 2 below. In addition, aggregate base shall have a minimum of 75 percent fractured particles according to American Association of State Highway and Transportation Officials (AASHTO) TP-61 and a sand equivalent of not less than 30 percent based on AASHTO T-176.

TABLE 2. RECOMMENDED GRADATION FOR AGGREGATE BASE

Sieve size	Percent Passing (by weight)
1 inch	100
1/2 inch	50 to 65
No. 4	40 to 60
No. 40	5 to 15
No. 200	0 to 5

6.7.4. Trench/Tank Backfill

Backfill for pipe bedding and in the pipe zone and tank bedding should consist of well-graded granular material with a maximum particle size of ¾-inch and less than 5 percent passing the U.S. No. 200 sieve. The material should be free of organic matter and other deleterious materials. Further, the backfill should meet the pipe and tank manufacturer's recommendations. Above the pipe zone and for tank backfill, Imported Select Structural Fill may be used as described above.

6.8. Fill Placement and Compaction

Structural fill should be compacted at moisture contents that are within 3 percent of the optimum moisture content as determined by ASTM International (ASTM) Standard Practices Test Method D 1557 (Modified Proctor). The optimum moisture content varies with gradation and should be evaluated during construction. Fill material that is not near the optimum moisture content should be moisture conditioned prior to compaction.

Fill and backfill material should be placed in uniform, horizontal lifts, and compacted with appropriate equipment. The appropriate lift thickness will vary depending on the material and compaction equipment used. Fill material should be compacted to a minimum of 95 percent of ASTM Test Method D 1557. It is the contractor's responsibility to select appropriate compaction equipment and place the material in lifts that are thin enough to meet these criteria. However, in no case should the loose lift thickness exceed 18 inches.

A representative from GeoEngineers should evaluate compaction of each lift of fill. Compaction should be evaluated by compaction testing unless other methods are proposed for oversized materials and are approved by GeoEngineers during construction. These other methods typically involve procedural placement and compaction specifications together with verifying requirements such as proof-rolling.

7.0 PAVEMENT RECOMMENDATIONS

7.1. General

Pavement subgrades should be prepared in accordance with the "Earthworks Recommendations" section of this report. Our pavement design is based on an estimated traffic volume for this facility of 4,000 cars and light duty trucks per day and up to two tanker trucks per day for fueling operations. Light-duty pavement areas are considered those accessed only by auto traffic (i.e., parking areas). Heavy-duty pavement areas include those within the drive path of fuel tankers.

The pavement subgrade is expected to consist of medium stiff or firmer silt, or structural fill placed over this material. Areas of soft or loose soil should be excavated to a medium stiff or medium dense bearing condition, or as indicated by a GeoEngineers representative, and replaced with structural fill. The design of the recommended pavement section is based on an assumed California Bearing Ratio (CBR) of 3. Further, our design assumes that construction will be completed during an extended period of dry weather and with subgrade soils prepared as described elsewhere in this report. Wet weather construction may require an increased thickness of aggregate base or other measures.

Construction traffic should not be allowed on new pavements but kept on haul roads or non-structural areas. If construction traffic is allowed on new pavements, allowance for the additional loading and wear should be included in the design section.

7.2. AC Pavements

The recommended minimum asphalt and aggregate base thicknesses are provided in Table 3 for both light and heavy-duty pavement areas. These design values meet the minimum thickness requirements in the Fred Meyer/Kroger Specifications.

TABLE 3. MINIMUM PAVEMENT DESIGN REQUIREMENTS

	Minimum Asphalt Thickness (inches)	Minimum Base Thickness (inches)
Light-Duty Paving (parking areas)	3.0	10.0
Heavy-Duty (fuel tanker areas)	4.0	9.0

The aggregate base course should conform to the "Aggregate Base" section of this report and be compacted to at least 95 percent of the maximum dry density determined in accordance with AASHTO T-180/ASTM Test Method D 1557.

The AC pavement should conform to Section 00745 of the most current edition of the Oregon Department of Transportation (ODOT) Standard Specifications for Highway Construction. The Job Mix Formula should meet the requirements for a 1/2-inch Dense Graded Level 2 Mix. The AC should be PG 64-22 grade meeting the ODOT Standard Specifications for Asphalt Materials. AC pavement should be compacted to 91.0 percent at Maximum Theoretical Unit Weight (Rice Gravity) of AASHTO T-209.

7.3. Portland Cement Concrete Pavement

If portland Cement Concrete (PCC) pavement is used, we recommend that the PCC thickness for standard and heavy-duty pavement areas be 6 inches and 7 inches, respectively. The aggregate base layer underneath the PCC section should be at least 9 inches thick. These PCC pavement sections assume a concrete flexural strength of 600 pounds per square inch (psi). These design values meet the minimum thickness requirements in the Fred Meyer/Kroger Specifications.

8.0 STRUCTURAL DESIGN RECOMMENDATIONS

8.1. Foundation Support Recommendations

It is our understanding that shallow drilled pier foundations are the preferred foundation type to support the proposed canopy structure, while the kiosk is typically supported by a concrete slab with turned-down edges. It is also our understanding that typical design axial downward loads for the canopy structure are approximately 25 kips per column but uplift forces generally control design. Drilled pier foundations are typically 4 to 5 feet in diameter and generally 5 to 8 feet deep, depending upon soil conditions and design loads.

Design recommendations for both shallow and pier foundations are provided below. We recommend footings have a minimum width of 24 inches and the bottom of the exterior footings be founded at least 18 inches below the lowest adjacent grade, or as needed to meet the design loads. The recommended minimum footing depth is greater than the anticipated frost depth. Concrete piers should be constructed per the most current version of the American Concrete Institute (ACI) Standard Specifications for Construction of Drilled Piers—336.1, or comparable specifications.

8.1.1. Foundation Subgrade Preparation

The site should be prepared as described in the "Site Preparation" section of this report.

We recommend loose or disturbed soils be removed before placing reinforcing steel and concrete. Foundation bearing surfaces should not be exposed to standing water. If water infiltrates and pools in the excavation, the water, along with any disturbed soil, should be removed before placing reinforcing steel. A thin layer of crushed rock can be used to provide protection to the subgrade from weather and light foot traffic. Compaction should be performed as described in the "Fill Placement and Compaction" section.

We recommend GeoEngineers observe all foundation excavations before placing concrete forms and reinforcing steel in order to determine that bearing surfaces have been adequately prepared and the soil conditions are consistent with those observed during our explorations.

8.1.2. Bearing Capacity – Spread Footings

We recommend conventional thickened edge footings be proportioned using a maximum allowable bearing pressure of 2,000 pounds per square foot (psf) if supported on medium stiff or stiffer native silt or structural fill bearing on these materials. This bearing pressure applies to the total of dead and long-term live loads and may be increased by one-third when considering earthquake or wind loads. This is a net bearing pressure. The weight of the footing and overlying backfill can be ignored in calculating footing sizes.

8.1.3. Bearing Capacity – Piers

The axial downward capacity for shallow pier foundations will be achieved primarily by end-bearing on medium stiff or stiffer native silt, medium dense or denser silty sand or gravel, or structural fill bearing on these materials. If loose to very loose silty sand is encountered at the base of proposed piers, the material should be compacted to a medium dense or denser condition or removed and replaced with structural fill. We recommend a maximum allowable bearing pressure of 2,500 psf for piers bearing on these materials. As above, this bearing pressure applies to the total of dead and long-term live loads and may be increased by one-third when considering earthquake or wind loads. This is a net bearing pressure.

Pile capacity reduction factors due to downdrag or group effects are not expected to be a concern, based on the anticipated pier configuration.

8.1.4. Foundation Settlement

Foundations designed and constructed as recommended are expected to experience settlements of less than 1 inch. Differential settlements of up to one-half of the total settlement magnitude can be expected between adjacent footings supporting comparable loads.

8.1.5. Uplift Capacity

Uplift forces can be resisted by the weight of the piers. The full weight of the pier can be used in uplift calculations without application of a safety factor.

8.1.6. Lateral Resistance

Lateral loads on footings can be resisted by passive earth pressures on the sides of footings and by friction on the bearing surface. We recommend that passive earth pressures be calculated using an equivalent fluid unit weight of 270 pounds per cubic foot (pcf) for foundations confined by native medium stiff or stiffer silt and 350 pcf if confined by a minimum of 2 feet of imported granular fill.

We recommend using a friction coefficient of 0.35 for foundations placed on the native medium stiff or stiffer silt and medium dense or denser silty sand or 0.50 for foundations placed on medium dense or denser gravel or a minimum 2-foot thickness of compacted crushed rock. The passive earth pressure and friction components may be combined, provided the passive component does not exceed two-thirds of the total.

The passive earth pressure value is based on the assumptions that the adjacent grade is level and static groundwater remains below the base of the footing throughout the year. The top 1 foot of soil should be neglected when calculating passive lateral earth pressures unless the adjacent area is covered with pavement. The lateral resistance values do not include safety factors.

8.2. Floor Slabs

Subgrade support for concrete slabs supporting up to 125 psf areal loading can be obtained from the medium stiff or stiffer silt or on new structural fill placed on these materials, when prepared in accordance with the recommendations presented in this report. A minimum 6-inch-thick layer of crushed rock aggregate base material should be placed over the prepared subgrade as a capillary break. Aggregate base material placed directly below the slab should be ¾-inch maximum or less. We recommend using a subgrade modulus value of 150 pounds per cubic inch (pci) to design slabs on grade, provided the site is prepared as recommended. Concrete slabs constructed as recommended will likely settle less than ½ inch.

8.3. Seismic Design

Parameters provided in Table 4 are based on the conditions encountered during our subsurface exploration program and the procedure outlined in the 2018 International Building Code (IBC), which references the 2016 Minimum Design Loads for Buildings and Other Structures (American Society of Civil Engineers [ASCE] 7-16). Per ASCE 7-16 Section 11.4.8, a ground motion hazard analysis or site-specific response analysis is required to determine the design ground motions for structures on Site Class D sites with S_1 greater than or equal to 0.2g.

For this project, the site is classified as Site Class D with an S_1 value of 0.414g; therefore, the provision of 11.4.8 applies. The parameters listed in Table 4 below may be used to determine the design ground motions if Exception 2 of Section 11.4.8 of ASCE 7-16 is used. Using this exception, the seismic response coefficient (C_s) is determined by Equation (Eq.) (12.8-2) for values of $T \leq 1.5T_S$, and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for $T_L \geq T > 1.5T_s$ or Eq. (12.8-4) for $T > T_L$, where T represents the fundamental period of the structure and T_S=0.809 sec. If requested, we can complete a site-specific seismic response analysis, which might provide somewhat reduced seismic demands from the parameters in Table 4 and the requirements for using Exception 2 of Section 11.4.8 in ASCE 7-16. The construction cost savings are unlikely to warrant the additional engineering costs.

TABLE 4. SEISMIC DESIGN PARAMETERS

Parameter	Value
Site Class	D
Spectral Response Acceleration, S_s	0.83 g
Spectral Response Acceleration, S_1	0.41 g
Site Coefficient, F_a	1.17
Site Coefficient, F_v	1.89
Spectral Response Acceleration (Short Period), S_{DS}	0.65 g
Spectral Response Acceleration (1-Second Period) S_{D1}	0.52 g
Seismic Design Category	D

9.0 OTHER CONSIDERATIONS

9.1. Frost Penetration

The near-surface soils are slightly too moderately susceptible to frost heave. However, foundation and floor slab elements are expected to bear on compacted granular fill. We anticipate that the depth of frost penetration in this region is approximately 12 to 18 inches. The recommended exterior and interior footing embedment depths provided above should allow adequate frost protection. Frost susceptibility in pavement areas is also expected to be low if they are constructed and supported as recommended.

9.2. Corrosivity

We completed one resistivity test, one pH test, and one Oxidation Reduction Potential (ORP) test on a composite soil sample of the soil obtained from borings B-1 and B-2 (collected from the drill cuttings and sample excess during drilling) as an indicator of corrosion potential. The sample had a measured resistivity of 5,400 ohms per centimeter, a pH of 6.6 and an ORP of 237 mV. Based on the test results, we conclude that there is a low to moderate risk of corrosion to steel and iron pipes in this material. The results of the laboratory tests are provided in Table A-2 in Appendix A.

9.3. Expansive Soils

Based on our laboratory test results and experience with similar soils in the area, we do not consider the soils encountered in our borings to be expansive.

10.0 DESIGN REVIEW AND CONSTRUCTION SERVICES

Recommendations provided in this report are based on the assumptions and preliminary design information stated herein. We welcome the opportunity to review and discuss construction plans and specifications for this project as they are being developed. In addition, GeoEngineers should be retained to review the geotechnical-related portions of the plans and specifications to evaluate whether they are in conformance with the recommendations provided in this report.

Satisfactory foundation and earthwork performance depends to a large degree on quality of construction. Sufficient monitoring of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated.

We recommend that GeoEngineers be retained to observe construction at the site to confirm that subsurface conditions are consistent with the site explorations, and to confirm that the intent of project plans and specifications relating to earthwork, pavement, and foundation construction are being met.

11.0 LIMITATIONS

We have prepared this report for the exclusive use of MJC Investment Property XII, LLC, Fred Meyer Stores, Inc. and their authorized agents and/or regulatory agencies for the proposed Fred Meyer Fuel Center project at 2980 River Road North in Salem, Oregon.

This report is not intended for use by others, and the information contained herein is not applicable to other sites. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in the area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix B, Report Limitations and Guidelines for Use, for additional information pertaining to use of this report.

12.0 REFERENCES

Bela, J.L. 1981 Geologic Map of the Rickreall and Salem West Quadrangles, Oregon: *Oregon Department of Geology and Mineral Industries,* Geological Map Series GMS-18b, 1 plate, 1:24,000scale

City of Salem Department of Public Works Administrative Rules Chapter 109, Division 004, Appendix C, dated January 2014.

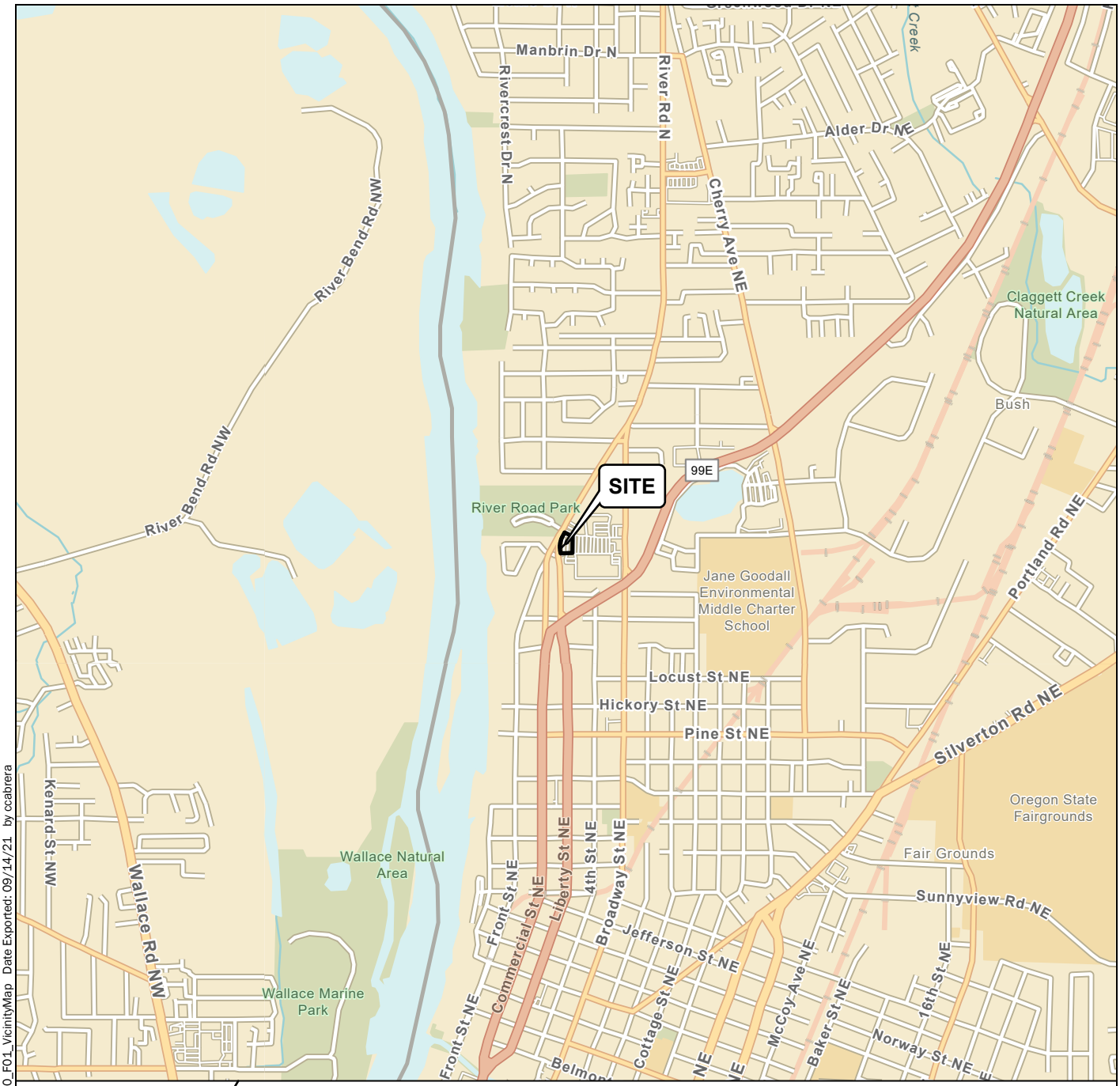
International Code Council. 2018. International Building Code.

International Code Council. 2019. Oregon Structural Specialty Code.

Occupational Safety and Health Administration (OSHA) Technical Manual Section V: Chapter 2, Excavations: Hazard Recognition in Trenching and Shoring: http://www.osha.gov/dts/osta/otm/otm_v/otm_v_2.html.

FIGURES

GeoEngineers



N
W E
S

2,000 0 2,000

Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: ESRI

Projection: NAD 1983 UTM Zone 10N

Vicinity Map

2980 River Road N
Salem, Oregon

GeoEngineers

Figure 1

P:\2_2831110\GIS\2831110_Project\2831110_Project.aprx\283111000tsk200_F01_VicinityMap Date Exported: 09/14/21 by ccabrera

Boring Number and Approximate Location

Infiltration Test Number and Approximate Location

Data Source: Base from Barghausen Consulting Engineers, Inc.

N
W E
S

50 0 50

Feet

Site Plan

2980 River Road N
Salem, Oregon

GeoEngineers

Figure 2

P:\2\2831110\GIS\2831110_Project\2831110_Project.aprx\283111001_F02_SitePlan Date Exported: 12/14/21 by ccabrera

NOTES:

Legend

APPENDICES

GeoEngineers

APPENDIX A
Field Explorations and Laboratory Testing

APPENDIX A
FIELD EXPLORATIONS AND LABORATORY TESTING

Field Explorations

Soil and groundwater conditions at the proposed Fred Meyer Fuel center were explored on December 13, 2021 by completing two geotechnical borings (B-1 and B-2) to depths of approximately 21 ½ feet bgs, and five infiltration test borings (IT-1 through IT-5) to depths of approximately 5 feet bgs at the approximate locations shown in Figure 2. The infiltration test borings were advanced using a hollow-stem auger and the geotechnical borings using mud rotary techniques by a truck-mounted drill rig owned and operated by Western States Soil Conservation.

The drilling was continuously monitored by an engineering geologist from our office who maintained a detailed log of subsurface explorations, visually classified the soil encountered, and obtained representative soil samples from the borings. Representative soil samples were obtained from each boring at approximate 2½- to 5-foot-depth intervals using either: (1) a 1-inch, inside-diameter, standard split spoon (SPT) sampler; or (2) a 2.4-inch, inside-diameter, split-barrel ring sampler (Dames & Moore [D&M]). The samplers were driven into the soil using a hydraulic-drive 140-pound hammer, free-falling 30 inches on each blow. The number of blows required to drive the sampler each of three, 6-inch increments of penetration were recorded in the field. The sum of the blow counts for the last two, 6-inch increments of penetration is reported on the boring logs as the ASTM D 1556 Standard Penetration Test (SPT) N-value. The N-value for D&M samples have been reduced using the Lacroix Horn conversions to correlate with SPT N-values.

Recovered soil samples were visually classified in the field in general accordance with ASTM D 2488 and the classification chart listed in Key to Exploration Logs, Figure A-1. Logs of the borings are presented in Figures A-2 through A-8. The logs are based on interpretation of the field and laboratory data and indicate the depth at which subsurface materials or their characteristics change, although these changes might actually be gradual.

Photoionization Detector Test Results

Photoionization Detector (PID) readings were completed on soil samples collected during the boring explorations as required in the Fred Meyer/Kroger Specifications. The readings were measured by placing the PID sensor in the plastic bag with the soil sample, sealing the bag around the sensor, and allowing the reading to stabilize. The results of the tests are shown in Table A-1. Environmental sampling was conducted on Sample Number 2, as described below, and came back as non-detect.

TABLE A-1. PID TEST RESULTS

Sample No.	Depth (ft.)	Readings (ppm)
		Boring B-1 (Tank Loc'n)
	2.5	0.0
2	5.0	3.1
3	7.5	0.0
4	10	0.0
5	15	0.0
6	20	0.0

Laboratory Testing

Soil samples obtained from the explorations were visually classified in the field and in our laboratory using the Unified Soil Classification System (USCS) and ASTM classification methods. ASTM Test Method D 2488 was used to visually classify the soil samples, while ASTM D 2487 was used to classify the soils based on laboratory tests results. Seven percent fines (silt- and clay-sized particles passing the U.S. No. 200 sieve) tests (ASTM C 117) were complete along with five moisture density tests (ASTM D 2216), and one moisture content test (ASTM D 2216-04) on representative soil samples. Results of the laboratory testing are presented in the appropriate exploration logs at the respective sample depths.

Corrosion Tests

We retained ACS Testing, Inc. of Tigard, Oregon, to complete one pH test in general accordance with the AASHTO Test Method T 289, one resistivity test in general accordance with AASHTO Test Method T 288, and one ORP test in general accordance with AASHTO Test Method M 2580. These tests were intended to serve as indicators of the corrosion potential of the on-site soils. The sample tested was a composite sample of soil cuttings collected in the upper 20 feet in borings B-1 and B-2. Test results are summarized in Table A-2.

TABLE A-2. CORROSION TEST RESULTS

Exploration Point	Depth (feet)	Soil Classification	pH	ORP mV	Resistivity Ohm-cm
B-2 (composite)	0 to 20	See boring logs	6.2	237	5,400

Environmental Soil and Groundwater Test Results

Environmental laboratory testing was completed on Sample Number 2 (highest PID reading) from boring B-1 at the proposed tank location, as required in the Fred Meyer/Kroger Specifications. Tests performed on these samples by Apex Labs of Tigard, Oregon, included the following:

- Hydrocarbon identification screen by NWTPH-HCID (soil only);
- Diesel and oil hydrocarbons by NWTPH-Dx (soil only);
- Gasoline-range hydrocarbons (benzene to napthalene) by NWTPH-Gx (soil only); and
- Risk-Based Corrective Action (RBCA) compounds (benzene, toluene, ethylbenzene, xylenes [BTEX+]) by U.S. Environmental Protection Agency (EPA) 8260B (soil and water).

The results of testing indicated non-detect results. The Apex laboratory test report is attached to this appendix.

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
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	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% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	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, ROCK FLOUR, 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% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel / Dames & Moore (D&M)

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PL	Point lead test
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
UU	Unconsolidated undrained triaxial compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

Key to Exploration Logs

GeoEngineers

Figure A-1

Drilled Start 12/13/2021 End 12/13/2021	Total Depth (ft) 21.25	Logged By JLL Checked By GAL	Driller Western States Drilling	Drilling Method Mud Rotary	
Surface Elevation (ft) 141 Vertical Datum NAVD88		Hammer Data Autohammer 140 (lbs) / 30 (in) Drop		Drilling Equipment CME 85	
Latitude 44.968822 Longitude -123.031648		System Datum Decimal Degrees WGS84		Groundwater not observed at time of exploration	

Notes: D&M N values reduced using Lacroix-Horn Equation to approximate SPT N values

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
140	0						AC	Approximately 2 inches asphalt concrete pavement			
							GM	Approximately 6 inches aggregate base course			
							ML	Brown silt with sand, low plasticity (stiff, moist) (Lower Terrace Deposits)			
		3	9		1 MD				46		
135	5						SM	Brown silty fine sand (loose, moist)			
		12	7		2 %F;MD				27	31	DD = 92.8 pcf
		16	5		3						
130	10										
		13	3		4 %F;MD			Becomes very loose	33	34	DD=72.1 pcf
							SP-SM	Grayish brown poorly graded fine to medium sand with silt (loose to medium dense, moist)			
125	15										
		12	10		5						
	20										
120		14	50/9"		6 %F;MD		GP	Gray-brown poorly graded gravel with trace silt and sand (very dense, wet)			DD=101.3 pcf

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Boring B-1

GeoEngineers

Project: Fred Meyer - Salem Fuel Center
Project Location: 2980 River Road North, Salem, Oregon
Project Number: 2831-110-01

Figure A-2
Sheet 1 of 1

Drilled Start 12/13/2021 End 12/13/2021	Total Depth (ft) 21.5	Logged By JLL Checked By GAL	Driller Western States Drilling	Drilling Method Mud Rotary	
Surface Elevation (ft) 141 Vertical Datum NAVD88		Hammer Data Autohammer 140 (lbs) / 30 (in) Drop		Drilling Equipment CME 85	
Latitude 44.969086 Longitude -123.031558		System Datum Decimal Degrees WGS84		Groundwater not observed at time of exploration	

Notes: D&M N values reduced using Lacroix-Horn Equation to approximate SPT N values

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample / Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
140	0					AC	Approximately 2 inches asphalt concrete pavement			
						GM	Approximately 6 inches aggregate base course			
						ML	Brown silt with trace sand, low to moderate plasticity (medium stiff, moist) (Lower Terrace Deposits)			
		16	7	1 MD				35		DD = 86 pcf
135	5					SM	Brown silty fine sand (loose, moist)			
		12	9	2 %F				27	42	
		12	15	3 %F; MD			Becomes medium dense with occasional rounded gravel	18	16	DD = 70.3 pcf
130	10					GP-GM	Gray-brown poorly graded rounded to subangular gravel with silt and sand (dense, moist)			
		10	39	4 %F				15	4	
125	15	3	28	5			Becomes medium dense			
120	20	8	71	6 %F			Becomes very dense	11	9	

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Boring B-2

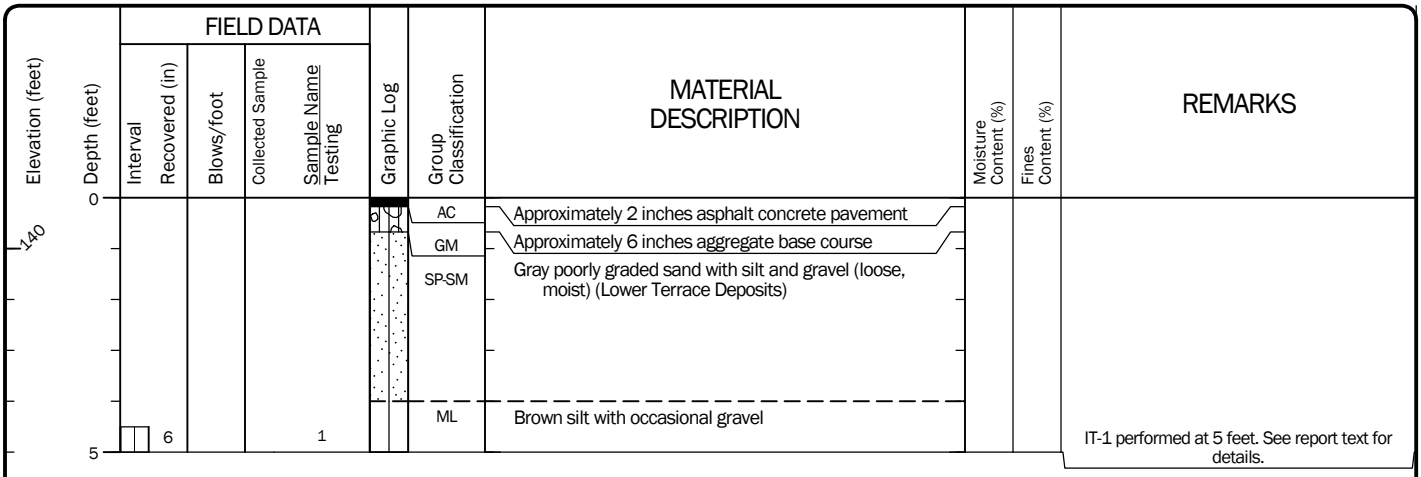
GeoEngineers

Project: Fred Meyer - Salem Fuel Center
Project Location: 2980 River Road North, Salem, Oregon
Project Number: 2831-110-01

Figure A-3
Sheet 1 of 1

Drilled Start 12/13/2021 End 12/13/2021	Total Depth (ft) 5	Logged By JLL Checked By GAL	Driller Western States Drilling	Drilling Method Hollow-stem Auger	
Surface Elevation (ft) 141 Vertical Datum NAVD88	Hammer Data Autohammer 140 (lbs) / 30 (in) Drop	Drilling Equipment CME 85			
Latitude 44.968848 Longitude -123.031236	System Datum Decimal Degrees WGS84	Groundwater not observed at time of exploration			

Notes:



Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Boring IT-1

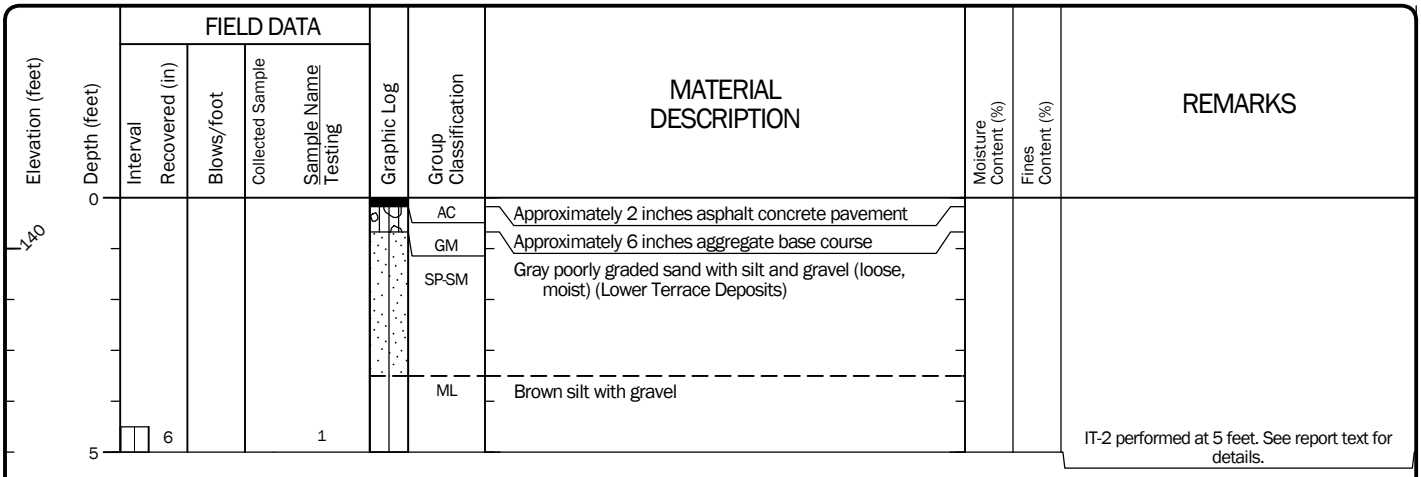
GeoEngineers

Project: Fred Meyer - Salem Fuel Center
Project Location: 2980 River Road North, Salem, Oregon
Project Number: 2831-110-01

Figure A-4
Sheet 1 of 1

Drilled Start 12/13/2021 End 12/13/2021	Total Depth (ft) 5	Logged By JLL Checked By GAL	Driller Western States Drilling	Drilling Method Hollow-stem Auger	
Surface Elevation (ft) 141 Vertical Datum NAVD88	Hammer Data Autohammer 140 (lbs) / 30 (in) Drop	Drilling Equipment CME 85			
Latitude 44.969304 Longitude -123.031222	System Datum Decimal Degrees WGS84	Groundwater not observed at time of exploration			

Notes:



Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Boring IT-2

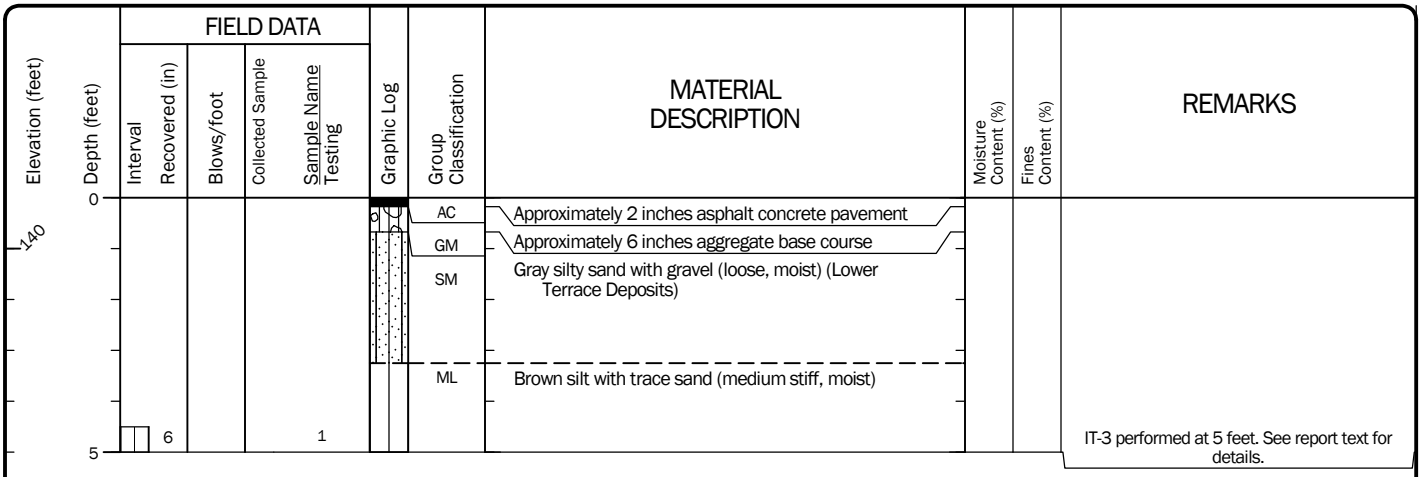
GeoEngineers

Project: Fred Meyer - Salem Fuel Center
Project Location: 2980 River Road North, Salem, Oregon
Project Number: 2831-110-01

Figure A-5
Sheet 1 of 1

Drilled Start 12/13/2021 End 12/13/2021	Total Depth (ft) 5	Logged By JLL Checked By GAL	Driller Western States Drilling	Drilling Method Hollow-stem Auger	
Surface Elevation (ft) 141 Vertical Datum NAVD88		Hammer Data Autohammer 140 (lbs) / 30 (in) Drop		Drilling Equipment CME 85	
Latitude 44.969411 Longitude -123.031415		System Datum Decimal Degrees WGS84		Groundwater not observed at time of exploration	

Notes:



Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Boring IT-3

GeoEngineers

Project: Fred Meyer - Salem Fuel Center
Project Location: 2980 River Road North, Salem, Oregon
Project Number: 2831-110-01

Figure A-6
Sheet 1 of 1

Drilled	Start 12/13/2021	End 12/13/2021	Total Depth (ft) 5	Logged By JLL / Checked By GAL	Driller Western States Drilling	Drilling Method Hollow-stem Auger
Surface Elevation (ft) / Vertical Datum	141 / NAVD88		Hammer Data	Autohammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	CME 85
Latitude / Longitude	44.969296 / -123.03176		System Datum	Decimal Degrees WGS84	Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	FIELD DATA: Blows/foot	FIELD DATA: Collected Sample / Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
140	0					ML	Dark brown silt with trace sand, low to moderate plasticity (soft, moist) (Lower Terrace Deposits)			
							Becomes brown, medium stiff			
	5	6		1						IT-4 performed at 5 feet. See report text for details.

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Boring IT-4

GeoEngineers

Project: Fred Meyer - Salem Fuel Center
Project Location: 2980 River Road North, Salem, Oregon
Project Number: 2831-110-01

Figure A-7
Sheet 1 of 1

Drilled	Start 12/13/2021	End 12/13/2021	Total Depth (ft) 5	Logged By JLL / Checked By GAL	Driller Western States Drilling	Drilling Method Hollow-stem Auger
Surface Elevation (ft) / Vertical Datum	141 NAVD88		Hammer Data	Autohammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	CME 85
Latitude / Longitude	44.968952 -123.031782		System Datum	Decimal Degrees WGS84	Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	FIELD DATA: Blows/foot	FIELD DATA: Collected Sample / Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
140	0					ML	Dark brown silt with sand and occasional gravel (soft, moist) (Lower Terrace Deposits)			
							Grades to brown			
	5	6		1						IT-5 performed at 5 feet. See report text for details.

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

Log of Boring IT-5

GeoEngineers

Project: Fred Meyer - Salem Fuel Center
Project Location: 2980 River Road North, Salem, Oregon
Project Number: 2831-110-01

Figure A-8
Sheet 1 of 1

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

Tuesday, January 11, 2022

John Lawes
GeoEngineers
4000 Kruse Way Place, Bldg 3 Suite 200
Lake Oswego, OR 97035

RE: A1L0943 - FM River Road N. - 3831-110-01

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A1L0943, which was received by the laboratory on 12/23/2021 at 10:30:00AM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1	1.7 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.
All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers
4000 Kruse Way Place, Bldg 3 Suite 200
Lake Oswego, OR 97035

Project: **FM River Road N.**
Project Number: **3831-110-01**
Project Manager: **John Lawes**

Report ID:
A1L0943 - 01 11 22 1504

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-1-2@5 ft	A1L0943-01	Soil	12/13/21 11:30	12/23/21 10:30

Apex Laboratories

Darrell Auvil, Client Services Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

ANALYTICAL CASE NARRATIVE

Work Order: A1L0943

Amended Report Revision 1:

Sample Identification (ID) Change-

This report supersedes all previous reports.

The following sample ID has been changed at client request:

Sample; B-1-2 @ 10ft. is now reported as; B-1-2 @ 5ft (Apex ID: A1L0943-01).

Darrell Auvil
Client Services Manager
1/11/2022

Apex Laboratories

Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B-1-2@5 ft (A1L0943-01)				**Matrix: Soil**		**Batch: 21L0946**		
Diesel	ND	---	25.6	mg/kg dry	1	12/27/21 20:55	NWTPH-Dx	
Oil	ND	---	51.2	mg/kg dry	1	12/27/21 20:55	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 86 %*		*Limits: 50-150 %*	*1*	*12/27/21 20:55*	*NWTPH-Dx*	

Apex Laboratories

Darrell Auvil, Client Services Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B-1-2@5 ft (A1L0943-01)				**Matrix: Soil**		**Batch: 21L1037**		**H-01**
Gasoline Range Organics	ND	---	10.0	mg/kg dry	50	12/30/21 13:46	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery:*	*110 %*	*Limits: 50-150 %*	*1*	*12/30/21 13:46*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*101 %*	*50-150 %*	*1*	*12/30/21 13:46*	*NWTPH-Gx (MS)*	

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B-1-2@5 ft (A1L0943-01)				**Matrix: Soil**		**Batch: 21L1037**		**H-01**
Acetone	ND	---	2000	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Acrylonitrile	ND	---	200	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Benzene	ND	---	20.0	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Bromobenzene	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Bromochloromethane	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Bromodichloromethane	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Bromoform	ND	---	200	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Bromomethane	ND	---	1000	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
2-Butanone (MEK)	ND	---	1000	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
n-Butylbenzene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
sec-Butylbenzene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
tert-Butylbenzene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Carbon disulfide	ND	---	1000	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Carbon tetrachloride	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Chlorobenzene	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Chloroethane	ND	---	1000	ug/kg dry	50	12/30/21 13:46	5035A/8260D	Q-30
Chloroform	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Chloromethane	ND	---	501	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
2-Chlorotoluene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
4-Chlorotoluene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Dibromochloromethane	ND	---	200	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,2-Dibromo-3-chloropropane	ND	---	501	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,2-Dibromoethane (EDB)	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Dibromomethane	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,2-Dichlorobenzene	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,3-Dichlorobenzene	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,4-Dichlorobenzene	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Dichlorodifluoromethane	ND	---	200	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,1-Dichloroethane	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,2-Dichloroethane (EDC)	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,1-Dichloroethene	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
cis-1,2-Dichloroethene	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
trans-1,2-Dichloroethene	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	

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6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B-1-2@5 ft (A1L0943-01)				**Matrix: Soil**		**Batch: 21L1037**		**H-01**
1,2-Dichloropropane	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,3-Dichloropropane	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
2,2-Dichloropropane	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,1-Dichloropropene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
cis-1,3-Dichloropropene	ND	---	200	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
trans-1,3-Dichloropropene	ND	---	200	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Ethylbenzene	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Hexachlorobutadiene	ND	---	200	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
2-Hexanone	ND	---	1000	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Isopropylbenzene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
4-Isopropyltoluene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Methylene chloride	ND	---	1000	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
4-Methyl-2-pentanone (MiBK)	ND	---	1000	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Methyl tert-butyl ether (MTBE)	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Naphthalene	ND	---	200	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
n-Propylbenzene	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Styrene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,1,1,2-Tetrachloroethane	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,1,2,2-Tetrachloroethane	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Toluene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,2,3-Trichlorobenzene	ND	---	501	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,2,4-Trichlorobenzene	ND	---	501	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,1,1-Trichloroethane	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,1,2-Trichloroethane	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Trichloroethene (TCE)	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Trichlorofluoromethane	ND	---	200	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,2,3-Trichloropropane	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,2,4-Trimethylbenzene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
1,3,5-Trimethylbenzene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
Vinyl chloride	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
m,p-Xylene	ND	---	100	ug/kg dry	50	12/30/21 13:46	5035A/8260D	
o-Xylene	ND	---	50.1	ug/kg dry	50	12/30/21 13:46	5035A/8260D	

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503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B-1-2@5 ft (A1L0943-01)				**Matrix: Soil**		**Batch: 21L1037**		**H-01**
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*102 %*	*Limits: 80-120 %*	*1*	*12/30/21 13:46*	*5035A/8260D*	
Toluene-d8 (Surr)			*101 %*	*80-120 %*	*1*	*12/30/21 13:46*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*100 %*	*79-120 %*	*1*	*12/30/21 13:46*	*5035A/8260D*	

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ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B-1-2@5 ft (A1L0943-01)				**Matrix: Soil**		**Batch: 21L0949**		
% Solids	**76.8**	---	1.00	%	1	12/28/21 07:59	EPA 8000D	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 21L0946 - EPA 3546 (Fuels)							**Soil**					
Blank (21L0946-BLK1)			Prepared: 12/27/21 11:03		Analyzed: 12/27/21 17:33							
NWTPH-Dx												
Diesel	ND	---	25.0	mg/kg wet	1	---	---	---	---	---	---	
Oil	ND	---	50.0	mg/kg wet	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		*Recovery: 95 %*	*Limits: 50-150 %*		*Dilution: 1x*							
LCS (21L0946-BS1)			Prepared: 12/27/21 11:03		Analyzed: 12/27/21 17:55							
NWTPH-Dx												
Diesel	118	---	25.0	mg/kg wet	1	125	---	94	38-132%	---	---	
Surr: o-Terphenyl (Surr)		*Recovery: 97 %*	*Limits: 50-150 %*		*Dilution: 1x*							
Duplicate (21L0946-DUP1)			Prepared: 12/27/21 11:03		Analyzed: 12/27/21 20:08							
QC Source Sample: Non-SDG (A1L0679-02)												
Diesel	ND	---	130	mg/kg dry	5	---	ND	---	---	---	30%	
Oil	**2550**	---	260	mg/kg dry	5	---	3050	---	---	18	30%	
Surr: o-Terphenyl (Surr)		*Recovery: 77 %*	*Limits: 50-150 %*		*Dilution: 5x*							S-05
Duplicate (21L0946-DUP2)			Prepared: 12/27/21 11:08		Analyzed: 12/27/21 21:15							
QC Source Sample: B-1-2@5 ft (A1L0943-01)												
NWTPH-Dx												
Diesel	ND	---	25.5	mg/kg dry	1	---	ND	---	---	---	30%	
Oil	ND	---	51.0	mg/kg dry	1	---	ND	---	---	---	30%	
Surr: o-Terphenyl (Surr)		*Recovery: 85 %*	*Limits: 50-150 %*		*Dilution: 1x*							

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GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 21L1037 - EPA 5035A								**Soil**				
Blank (21L1037-BLK1)			Prepared: 12/30/21 08:30 Analyzed: 12/30/21 11:04									
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	5.00	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery:*	*108 %*	*Limits:*	*50-150 %*		*Dilution:*	*1x*				
1,4-Difluorobenzene (Sur)			*99 %*		*50-150 %*			*"*				
LCS (21L1037-BS2)			Prepared: 12/30/21 08:30 Analyzed: 12/30/21 10:09									
NWTPH-Gx (MS)												
Gasoline Range Organics	27.2	---	5.00	mg/kg wet	50	25.0	---	109	80-120%	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery:*	*110 %*	*Limits:*	*50-150 %*		*Dilution:*	*1x*				
1,4-Difluorobenzene (Sur)			*102 %*		*50-150 %*			*"*				
Duplicate (21L1037-DUP1)			Prepared: 12/21/21 13:00 Analyzed: 12/30/21 11:58									
QC Source Sample: Non-SDG (A1L0864-01)												
Gasoline Range Organics	ND	---	5.52	mg/kg dry	50	---	ND	---	---	---	30%	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery:*	*109 %*	*Limits:*	*50-150 %*		*Dilution:*	*1x*				
1,4-Difluorobenzene (Sur)			*100 %*		*50-150 %*			*"*				

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ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 21L1037 - EPA 5035A							**Soil**					
Blank (21L1037-BLK1)			Prepared: 12/30/21 08:30 Analyzed: 12/30/21 11:04									
5035A/8260D												
Acetone	ND	---	1000	ug/kg wet	50	---	---	---	---	---	---	
Acrylonitrile	ND	---	100	ug/kg wet	50	---	---	---	---	---	---	
Benzene	ND	---	10.0	ug/kg wet	50	---	---	---	---	---	---	
Bromobenzene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
Bromochloromethane	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Bromodichloromethane	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Bromoform	ND	---	100	ug/kg wet	50	---	---	---	---	---	---	
Bromomethane	ND	---	500	ug/kg wet	50	---	---	---	---	---	---	
2-Butanone (MEK)	ND	---	500	ug/kg wet	50	---	---	---	---	---	---	
n-Butylbenzene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
sec-Butylbenzene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
tert-Butylbenzene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Carbon disulfide	ND	---	500	ug/kg wet	50	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Chlorobenzene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
Chloroethane	ND	---	500	ug/kg wet	50	---	---	---	---	---	---	Q-30
Chloroform	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Chloromethane	ND	---	250	ug/kg wet	50	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Dibromochloromethane	ND	---	100	ug/kg wet	50	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	250	ug/kg wet	50	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Dibromomethane	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	100	ug/kg wet	50	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	

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ORELAP ID: OR100062

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 21L1037 - EPA 5035A							**Soil**					
Blank (21L1037-BLK1)			Prepared: 12/30/21 08:30 Analyzed: 12/30/21 11:04									
1,2-Dichloropropane	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	100	ug/kg wet	50	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	100	ug/kg wet	50	---	---	---	---	---	---	
Ethylbenzene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	100	ug/kg wet	50	---	---	---	---	---	---	
2-Hexanone	ND	---	500	ug/kg wet	50	---	---	---	---	---	---	
Isopropylbenzene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
4-Isopropyltoluene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Methylene chloride	ND	---	500	ug/kg wet	50	---	---	---	---	---	---	
4-Methyl-2-pentanone (MiBK)	ND	---	500	ug/kg wet	50	---	---	---	---	---	---	
Methyl tert-butyl ether (MTBE)	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Naphthalene	ND	---	100	ug/kg wet	50	---	---	---	---	---	---	
n-Propylbenzene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
Styrene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
1,1,1,2-Tetrachloroethane	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
Toluene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	250	ug/kg wet	50	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	250	ug/kg wet	50	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	100	ug/kg wet	50	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
1,2,4-Trimethylbenzene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
1,3,5-Trimethylbenzene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
Vinyl chloride	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	
m,p-Xylene	ND	---	50.0	ug/kg wet	50	---	---	---	---	---	---	
o-Xylene	ND	---	25.0	ug/kg wet	50	---	---	---	---	---	---	

Surr: 1,4-Difluorobenzene (Surr) *Recovery: 101 %* *Limits: 80-120 %* *Dilution: 1x*

Apex Laboratories

Darrell Auvil, Client Services Manager

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers
4000 Kruse Way Place, Bldg 3 Suite 200
Lake Oswego, OR 97035

Project: **FM River Road N.**
Project Number: **3831-110-01**
Project Manager: **John Lawes**

Report ID:
A1L0943 - 01 11 22 1504

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 21L1037 - EPA 5035A							**Soil**					
Blank (21L1037-BLK1)			Prepared: 12/30/21 08:30 Analyzed: 12/30/21 11:04									
Surr: Toluene-d8 (Surr)			*Recovery: 101 %*	*Limits: 80-120 %*			*Dilution: 1x*					
4-Bromofluorobenzene (Surr)			*101 %*	*79-120 %*			*"*					
LCS (21L1037-BS1)			Prepared: 12/30/21 08:30 Analyzed: 12/30/21 09:42									
5035A/8260D												
Acetone	2080	---	1000	ug/kg wet	50	2000	---	104	80-120%	---	---	
Acrylonitrile	1090	---	100	ug/kg wet	50	1000	---	109	80-120%	---	---	
Benzene	1080	---	10.0	ug/kg wet	50	1000	---	108	80-120%	---	---	
Bromobenzene	1020	---	25.0	ug/kg wet	50	1000	---	102	80-120%	---	---	
Bromochloromethane	1090	---	50.0	ug/kg wet	50	1000	---	109	80-120%	---	---	
Bromodichloromethane	976	---	50.0	ug/kg wet	50	1000	---	98	80-120%	---	---	
Bromoform	859	---	100	ug/kg wet	50	1000	---	86	80-120%	---	---	
Bromomethane	1130	---	500	ug/kg wet	50	1000	---	113	80-120%	---	---	
2-Butanone (MEK)	2170	---	500	ug/kg wet	50	2000	---	108	80-120%	---	---	
n-Butylbenzene	1240	---	50.0	ug/kg wet	50	1000	---	**124**	**80-120%**	---	---	Q-56
sec-Butylbenzene	1220	---	50.0	ug/kg wet	50	1000	---	**122**	**80-120%**	---	---	Q-56
tert-Butylbenzene	1180	---	50.0	ug/kg wet	50	1000	---	118	80-120%	---	---	
Carbon disulfide	1010	---	500	ug/kg wet	50	1000	---	101	80-120%	---	---	
Carbon tetrachloride	1080	---	50.0	ug/kg wet	50	1000	---	108	80-120%	---	---	
Chlorobenzene	987	---	25.0	ug/kg wet	50	1000	---	99	80-120%	---	---	
Chloroethane	691	---	500	ug/kg wet	50	1000	---	**69**	**80-120%**	---	---	Q-30
Chloroform	1130	---	50.0	ug/kg wet	50	1000	---	113	80-120%	---	---	
Chloromethane	1030	---	250	ug/kg wet	50	1000	---	103	80-120%	---	---	
2-Chlorotoluene	1130	---	50.0	ug/kg wet	50	1000	---	113	80-120%	---	---	
4-Chlorotoluene	1120	---	50.0	ug/kg wet	50	1000	---	112	80-120%	---	---	
Dibromochloromethane	914	---	100	ug/kg wet	50	1000	---	91	80-120%	---	---	
1,2-Dibromo-3-chloropropane	929	---	250	ug/kg wet	50	1000	---	93	80-120%	---	---	
1,2-Dibromoethane (EDB)	1130	---	50.0	ug/kg wet	50	1000	---	113	80-120%	---	---	
Dibromomethane	1060	---	50.0	ug/kg wet	50	1000	---	106	80-120%	---	---	
1,2-Dichlorobenzene	1080	---	25.0	ug/kg wet	50	1000	---	108	80-120%	---	---	
1,3-Dichlorobenzene	1090	---	25.0	ug/kg wet	50	1000	---	109	80-120%	---	---	
1,4-Dichlorobenzene	1010	---	25.0	ug/kg wet	50	1000	---	101	80-120%	---	---	
Dichlorodifluoromethane	1190	---	100	ug/kg wet	50	1000	---	119	80-120%	---	---	
1,1-Dichloroethane	1100	---	25.0	ug/kg wet	50	1000	---	110	80-120%	---	---	

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers
4000 Kruse Way Place, Bldg 3 Suite 200
Lake Oswego, OR 97035

Project: **FM River Road N.**
Project Number: **3831-110-01**
Project Manager: **John Lawes**

Report ID:
A1L0943 - 01 11 22 1504

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 21L1037 - EPA 5035A							**Soil**					
LCS (21L1037-BS1)			Prepared: 12/30/21 08:30 Analyzed: 12/30/21 09:42									
1,2-Dichloroethane (EDC)	1040	---	25.0	ug/kg wet	50	1000	---	104	80-120%	---	---	
1,1-Dichloroethene	1100	---	25.0	ug/kg wet	50	1000	---	110	80-120%	---	---	
cis-1,2-Dichloroethene	1130	---	25.0	ug/kg wet	50	1000	---	113	80-120%	---	---	
trans-1,2-Dichloroethene	1130	---	25.0	ug/kg wet	50	1000	---	113	80-120%	---	---	
1,2-Dichloropropane	1090	---	25.0	ug/kg wet	50	1000	---	109	80-120%	---	---	
1,3-Dichloropropane	1090	---	50.0	ug/kg wet	50	1000	---	109	80-120%	---	---	
2,2-Dichloropropane	1280	---	50.0	ug/kg wet	50	1000	---	**128**	**80-120%**	---	---	Q-56
1,1-Dichloropropene	1220	---	50.0	ug/kg wet	50	1000	---	**122**	**80-120%**	---	---	Q-56
cis-1,3-Dichloropropene	1100	---	100	ug/kg wet	50	1000	---	110	80-120%	---	---	
trans-1,3-Dichloropropene	1010	---	100	ug/kg wet	50	1000	---	101	80-120%	---	---	
Ethylbenzene	1060	---	25.0	ug/kg wet	50	1000	---	106	80-120%	---	---	
Hexachlorobutadiene	1170	---	100	ug/kg wet	50	1000	---	117	80-120%	---	---	
2-Hexanone	2080	---	500	ug/kg wet	50	2000	---	104	80-120%	---	---	
Isopropylbenzene	1230	---	50.0	ug/kg wet	50	1000	---	**123**	**80-120%**	---	---	Q-56
4-Isopropyltoluene	1270	---	50.0	ug/kg wet	50	1000	---	**127**	**80-120%**	---	---	Q-56
Methylene chloride	971	---	500	ug/kg wet	50	1000	---	97	80-120%	---	---	
4-Methyl-2-pentanone (MiBK)	2130	---	500	ug/kg wet	50	2000	---	106	80-120%	---	---	
Methyl tert-butyl ether (MTBE)	1120	---	50.0	ug/kg wet	50	1000	---	112	80-120%	---	---	
Naphthalene	1110	---	100	ug/kg wet	50	1000	---	111	80-120%	---	---	
n-Propylbenzene	1140	---	25.0	ug/kg wet	50	1000	---	114	80-120%	---	---	
Styrene	1020	---	50.0	ug/kg wet	50	1000	---	102	80-120%	---	---	
1,1,1,2-Tetrachloroethane	995	---	25.0	ug/kg wet	50	1000	---	99	80-120%	---	---	
1,1,2,2-Tetrachloroethane	1100	---	50.0	ug/kg wet	50	1000	---	110	80-120%	---	---	
Tetrachloroethene (PCE)	1160	---	25.0	ug/kg wet	50	1000	---	116	80-120%	---	---	
Toluene	1070	---	50.0	ug/kg wet	50	1000	---	107	80-120%	---	---	
1,2,3-Trichlorobenzene	1150	---	250	ug/kg wet	50	1000	---	115	80-120%	---	---	
1,2,4-Trichlorobenzene	1170	---	250	ug/kg wet	50	1000	---	117	80-120%	---	---	
1,1,1-Trichloroethane	1140	---	25.0	ug/kg wet	50	1000	---	114	80-120%	---	---	
1,1,2-Trichloroethane	1100	---	25.0	ug/kg wet	50	1000	---	110	80-120%	---	---	
Trichloroethene (TCE)	1140	---	25.0	ug/kg wet	50	1000	---	114	80-120%	---	---	
Trichlorofluoromethane	980	---	100	ug/kg wet	50	1000	---	98	80-120%	---	---	
1,2,3-Trichloropropane	1100	---	50.0	ug/kg wet	50	1000	---	110	80-120%	---	---	
1,2,4-Trimethylbenzene	1190	---	50.0	ug/kg wet	50	1000	---	119	80-120%	---	---	
1,3,5-Trimethylbenzene	1140	---	50.0	ug/kg wet	50	1000	---	114	80-120%	---	---	

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers
4000 Kruse Way Place, Bldg 3 Suite 200
Lake Oswego, OR 97035

Project: **FM River Road N.**
Project Number: **3831-110-01**
Project Manager: **John Lawes**

Report ID:
A1L0943 - 01 11 22 1504

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 21L1037 - EPA 5035A							**Soil**					
LCS (21L1037-BS1)			Prepared: 12/30/21 08:30 Analyzed: 12/30/21 09:42									
Vinyl chloride	1040	---	25.0	ug/kg wet	50	1000	---	104	80-120%	---	---	
m,p-Xylene	2180	---	50.0	ug/kg wet	50	2000	---	109	80-120%	---	---	
o-Xylene	1130	---	25.0	ug/kg wet	50	1000	---	113	80-120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery:*	*100 %*	*Limits:*	*80-120 %*		*Dilution:*	*1x*				
Toluene-d8 (Surr)			*103 %*		*80-120 %*			*"*				
4-Bromofluorobenzene (Surr)			*100 %*		*79-120 %*			*"*				
Duplicate (21L1037-DUP1)			Prepared: 12/21/21 13:00 Analyzed: 12/30/21 11:58									
QC Source Sample: Non-SDG (A1L0864-01)												
Acetone	ND	---	1100	ug/kg dry	50	---	ND	---	---	---	30%	
Acrylonitrile	ND	---	110	ug/kg dry	50	---	ND	---	---	---	30%	
Benzene	ND	---	11.0	ug/kg dry	50	---	ND	---	---	---	30%	
Bromobenzene	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
Bromochloromethane	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
Bromodichloromethane	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
Bromoform	ND	---	110	ug/kg dry	50	---	ND	---	---	---	30%	
Bromomethane	ND	---	552	ug/kg dry	50	---	ND	---	---	---	30%	
2-Butanone (MEK)	ND	---	552	ug/kg dry	50	---	ND	---	---	---	30%	
n-Butylbenzene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
sec-Butylbenzene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
tert-Butylbenzene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
Carbon disulfide	ND	---	552	ug/kg dry	50	---	ND	---	---	---	30%	
Carbon tetrachloride	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
Chlorobenzene	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
Chloroethane	ND	---	552	ug/kg dry	50	---	ND	---	---	---	30%	Q-30
Chloroform	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
Chloromethane	ND	---	276	ug/kg dry	50	---	ND	---	---	---	30%	
2-Chlorotoluene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
4-Chlorotoluene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
Dibromochloromethane	ND	---	110	ug/kg dry	50	---	ND	---	---	---	30%	
1,2-Dibromo-3-chloropropane	ND	---	276	ug/kg dry	50	---	ND	---	---	---	30%	
1,2-Dibromoethane (EDB)	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
Dibromomethane	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
1,2-Dichlorobenzene	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 21L1037 - EPA 5035A							**Soil**					
Duplicate (21L1037-DUP1)			Prepared: 12/21/21 13:00 Analyzed: 12/30/21 11:58									
QC Source Sample: Non-SDG (A1L0864-01)												
1,3-Dichlorobenzene	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
1,4-Dichlorobenzene	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
Dichlorodifluoromethane	ND	---	110	ug/kg dry	50	---	ND	---	---	---	30%	
1,1-Dichloroethane	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
1,2-Dichloroethane (EDC)	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
1,1-Dichloroethene	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
cis-1,2-Dichloroethene	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
trans-1,2-Dichloroethene	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
1,2-Dichloropropane	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
1,3-Dichloropropane	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
2,2-Dichloropropane	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
1,1-Dichloropropene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
cis-1,3-Dichloropropene	ND	---	110	ug/kg dry	50	---	ND	---	---	---	30%	
trans-1,3-Dichloropropene	ND	---	110	ug/kg dry	50	---	ND	---	---	---	30%	
Ethylbenzene	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
Hexachlorobutadiene	ND	---	110	ug/kg dry	50	---	ND	---	---	---	30%	
2-Hexanone	ND	---	552	ug/kg dry	50	---	ND	---	---	---	30%	
Isopropylbenzene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
4-Isopropyltoluene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
Methylene chloride	ND	---	552	ug/kg dry	50	---	ND	---	---	---	30%	
4-Methyl-2-pentanone (MiBK)	ND	---	552	ug/kg dry	50	---	ND	---	---	---	30%	
Methyl tert-butyl ether (MTBE)	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
Naphthalene	ND	---	110	ug/kg dry	50	---	ND	---	---	---	30%	
n-Propylbenzene	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
Styrene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
1,1,1,2-Tetrachloroethane	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
1,1,2,2-Tetrachloroethane	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	ND	---	27.6	ug/kg dry	50	---	19.3	---	---	***	30%	
Toluene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
1,2,3-Trichlorobenzene	ND	---	276	ug/kg dry	50	---	ND	---	---	---	30%	
1,2,4-Trichlorobenzene	ND	---	276	ug/kg dry	50	---	ND	---	---	---	30%	
1,1,1-Trichloroethane	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
1,1,2-Trichloroethane	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	

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Darrell Auvil, Client Services Manager

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Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 21L1037 - EPA 5035A							**Soil**					
Duplicate (21L1037-DUP1)			Prepared: 12/21/21 13:00 Analyzed: 12/30/21 11:58									
QC Source Sample: Non-SDG (A1L0864-01)												
Trichloroethene (TCE)	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
Trichlorofluoromethane	ND	---	110	ug/kg dry	50	---	ND	---	---	---	30%	
1,2,3-Trichloropropane	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
1,2,4-Trimethylbenzene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
1,3,5-Trimethylbenzene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
Vinyl chloride	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
m,p-Xylene	ND	---	55.2	ug/kg dry	50	---	ND	---	---	---	30%	
o-Xylene	ND	---	27.6	ug/kg dry	50	---	ND	---	---	---	30%	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery:*	*101 %*	*Limits:*	*80-120 %*		*Dilution:*	*1x*				
Toluene-d8 (Surr)			*101 %*		*80-120 %*			*"*				
4-Bromofluorobenzene (Surr)			*101 %*		*79-120 %*			*"*				
Matrix Spike (21L1037-MS1)			Prepared: 12/28/21 10:46 Analyzed: 12/30/21 21:24									**V-16**
QC Source Sample: Non-SDG (A1L0968-09)												
5035A/8260D												
Acetone	4320	---	1430	ug/kg dry	50	2850	1920	84	36-164%	---	---	
Acrylonitrile	1570	---	143	ug/kg dry	50	1430	ND	110	65-134%	---	---	
Benzene	1480	---	14.3	ug/kg dry	50	1430	ND	104	77-121%	---	---	
Bromobenzene	1390	---	35.7	ug/kg dry	50	1430	ND	98	78-121%	---	---	
Bromochloromethane	1540	---	71.3	ug/kg dry	50	1430	ND	108	78-125%	---	---	
Bromodichloromethane	1320	---	71.3	ug/kg dry	50	1430	ND	93	75-127%	---	---	
Bromoform	1190	---	143	ug/kg dry	50	1430	ND	83	67-132%	---	---	
Bromomethane	1640	---	713	ug/kg dry	50	1430	ND	115	53-143%	---	---	
2-Butanone (MEK)	2930	---	713	ug/kg dry	50	2850	ND	103	51-148%	---	---	
n-Butylbenzene	1550	---	71.3	ug/kg dry	50	1430	ND	109	70-128%	---	---	Q-54b
sec-Butylbenzene	1550	---	71.3	ug/kg dry	50	1430	ND	109	73-126%	---	---	Q-54
tert-Butylbenzene	1540	---	71.3	ug/kg dry	50	1430	ND	108	73-125%	---	---	
Carbon disulfide	1290	---	713	ug/kg dry	50	1430	ND	91	63-132%	---	---	
Carbon tetrachloride	1380	---	71.3	ug/kg dry	50	1430	ND	97	70-135%	---	---	
Chlorobenzene	1320	---	35.7	ug/kg dry	50	1430	ND	92	79-120%	---	---	
Chloroethane	1530	---	713	ug/kg dry	50	1430	ND	107	59-139%	---	---	Q-30
Chloroform	1560	---	71.3	ug/kg dry	50	1430	ND	110	78-123%	---	---	
Chloromethane	1380	---	357	ug/kg dry	50	1430	ND	97	50-136%	---	---	

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

GeoEngineers
4000 Kruse Way Place, Bldg 3 Suite 200
Lake Oswego, OR 97035

Project: **FM River Road N.**
Project Number: **3831-110-01**
Project Manager: **John Lawes**

Report ID:
A1L0943 - 01 11 22 1504

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 21L1037 - EPA 5035A							**Soil**					
Matrix Spike (21L1037-MS1)			Prepared: 12/28/21 10:46		Analyzed: 12/30/21 21:24							**V-16**
QC Source Sample: Non-SDG (A1L0968-09)												
2-Chlorotoluene	1500	---	71.3	ug/kg dry	50	1430	ND	105	75-122%	---	---	
4-Chlorotoluene	1510	---	71.3	ug/kg dry	50	1430	ND	106	72-124%	---	---	
Dibromochloromethane	1250	---	143	ug/kg dry	50	1430	ND	88	74-126%	---	---	
1,2-Dibromo-3-chloropropane	1280	---	357	ug/kg dry	50	1430	ND	90	61-132%	---	---	
1,2-Dibromoethane (EDB)	1550	---	71.3	ug/kg dry	50	1430	ND	109	78-122%	---	---	
Dibromomethane	1480	---	71.3	ug/kg dry	50	1430	ND	104	78-125%	---	---	
1,2-Dichlorobenzene	1430	---	35.7	ug/kg dry	50	1430	ND	101	78-121%	---	---	
1,3-Dichlorobenzene	1450	---	35.7	ug/kg dry	50	1430	ND	101	77-121%	---	---	
1,4-Dichlorobenzene	1370	---	35.7	ug/kg dry	50	1430	ND	96	75-120%	---	---	
Dichlorodifluoromethane	1570	---	143	ug/kg dry	50	1430	ND	110	29-149%	---	---	
1,1-Dichloroethane	1510	---	35.7	ug/kg dry	50	1430	ND	106	76-125%	---	---	
1,2-Dichloroethane (EDC)	1440	---	35.7	ug/kg dry	50	1430	ND	101	73-128%	---	---	
1,1-Dichloroethene	1440	---	35.7	ug/kg dry	50	1430	ND	101	70-131%	---	---	
cis-1,2-Dichloroethene	1540	---	35.7	ug/kg dry	50	1430	ND	108	77-123%	---	---	
trans-1,2-Dichloroethene	1510	---	35.7	ug/kg dry	50	1430	ND	106	74-125%	---	---	
1,2-Dichloropropane	1480	---	35.7	ug/kg dry	50	1430	ND	104	76-123%	---	---	
1,3-Dichloropropane	1470	---	71.3	ug/kg dry	50	1430	ND	103	77-121%	---	---	
2,2-Dichloropropane	1390	---	71.3	ug/kg dry	50	1430	ND	97	67-133%	---	---	Q-54d
1,1-Dichloropropene	1620	---	71.3	ug/kg dry	50	1430	ND	114	76-125%	---	---	Q-54
cis-1,3-Dichloropropene	1360	---	143	ug/kg dry	50	1430	ND	95	74-126%	---	---	
trans-1,3-Dichloropropene	1310	---	143	ug/kg dry	50	1430	ND	92	71-130%	---	---	
Ethylbenzene	1390	---	35.7	ug/kg dry	50	1430	ND	98	76-122%	---	---	
Hexachlorobutadiene	1520	---	143	ug/kg dry	50	1430	ND	107	61-135%	---	---	
2-Hexanone	2810	---	713	ug/kg dry	50	2850	ND	98	53-145%	---	---	
Isopropylbenzene	1600	---	71.3	ug/kg dry	50	1430	ND	112	68-134%	---	---	Q-54a
4-Isopropyltoluene	1620	---	71.3	ug/kg dry	50	1430	ND	114	73-127%	---	---	Q-54c
Methylene chloride	1370	---	713	ug/kg dry	50	1430	ND	96	70-128%	---	---	
4-Methyl-2-pentanone (MiBK)	3050	---	713	ug/kg dry	50	2850	ND	107	65-135%	---	---	
Methyl tert-butyl ether (MTBE)	1530	---	71.3	ug/kg dry	50	1430	ND	107	73-125%	---	---	
Naphthalene	1460	---	143	ug/kg dry	50	1430	ND	102	62-129%	---	---	
n-Propylbenzene	1460	---	35.7	ug/kg dry	50	1430	ND	103	73-125%	---	---	
Styrene	1420	---	71.3	ug/kg dry	50	1430	ND	100	76-124%	---	---	
1,1,1,2-Tetrachloroethane	1350	---	35.7	ug/kg dry	50	1430	ND	95	78-125%	---	---	

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Darrell Auvil, Client Services Manager

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 21L1037 - EPA 5035A							**Soil**					
Matrix Spike (21L1037-MS1)			Prepared: 12/28/21 10:46		Analyzed: 12/30/21 21:24							**V-16**
QC Source Sample: Non-SDG (A1L0968-09)												
1,1,2,2-Tetrachloroethane	1480	---	71.3	ug/kg dry	50	1430	ND	104	70-124%	---	---	
Tetrachloroethene (PCE)	1440	---	35.7	ug/kg dry	50	1430	ND	101	73-128%	---	---	
Toluene	2410	---	71.3	ug/kg dry	50	1430	1030	97	77-121%	---	---	
1,2,3-Trichlorobenzene	1520	---	357	ug/kg dry	50	1430	ND	107	66-130%	---	---	
1,2,4-Trichlorobenzene	1500	---	357	ug/kg dry	50	1430	ND	105	67-129%	---	---	
1,1,1-Trichloroethane	1510	---	35.7	ug/kg dry	50	1430	ND	106	73-130%	---	---	
1,1,2-Trichloroethane	1490	---	35.7	ug/kg dry	50	1430	ND	104	78-121%	---	---	
Trichloroethene (TCE)	1530	---	35.7	ug/kg dry	50	1430	ND	107	77-123%	---	---	
Trichlorofluoromethane	1650	---	143	ug/kg dry	50	1430	ND	116	62-140%	---	---	
1,2,3-Trichloropropane	1480	---	71.3	ug/kg dry	50	1430	ND	104	73-125%	---	---	
1,2,4-Trimethylbenzene	1560	---	71.3	ug/kg dry	50	1430	ND	109	75-123%	---	---	
1,3,5-Trimethylbenzene	1470	---	71.3	ug/kg dry	50	1430	ND	103	73-124%	---	---	
Vinyl chloride	1500	---	35.7	ug/kg dry	50	1430	ND	105	56-135%	---	---	
m,p-Xylene	2900	---	71.3	ug/kg dry	50	2850	49.5	100	77-124%	---	---	
o-Xylene	1510	---	35.7	ug/kg dry	50	1430	20.2	105	77-123%	---	---	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 101 %*		*Limits: 80-120 %*				*Dilution: 1x*			
Toluene-d8 (Surr)			*100 %*		*80-120 %*				*"*			
4-Bromofluorobenzene (Surr)			*101 %*		*79-120 %*				*"*			

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Darrell Auvil, Client Services Manager

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Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers
4000 Kruse Way Place, Bldg 3 Suite 200
Lake Oswego, OR 97035

Project: **FM River Road N.**
Project Number: **3831-110-01**
Project Manager: **John Lawes**

Report ID:
A1L0943 - 01 11 22 1504

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 21L0949 - Total Solids (Dry Weight)							**Soil**					
Duplicate (21L0949-DUP1)			Prepared: 12/27/21 11:40		Analyzed: 12/28/21 07:59							
QC Source Sample: Non-SDG (A1L0919-01)												
% Solids	**76.8**	---	1.00	%	1	---	80.7	---	---	5	10%	
Duplicate (21L0949-DUP2)			Prepared: 12/27/21 11:40		Analyzed: 12/28/21 07:59							
QC Source Sample: Non-SDG (A1L0928-10)												
% Solids	**77.1**	---	1.00	%	1	---	77.0	---	---	0.1	10%	
Duplicate (21L0949-DUP3)			Prepared: 12/27/21 11:40		Analyzed: 12/28/21 07:59							
QC Source Sample: Non-SDG (A1L0948-04)												
% Solids	**70.2**	---	1.00	%	1	---	71.9	---	---	2	10%	

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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ANALYTICAL REPORT

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GeoEngineers
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Project: **FM River Road N.**
Project Number: **3831-110-01**
Project Manager: **John Lawes**

Report ID:
A1L0943 - 01 11 22 1504

SAMPLE PREPARATION INFORMATION

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Prep: EPA 3546 (Fuels)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 21L0946							
A1L0943-01	Soil	NWTPH-Dx	12/13/21 11:30	12/27/21 11:03	10.18g/5mL	10g/5mL	0.98

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Prep: EPA 5035A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 21L1037							
A1L0943-01	Soil	NWTPH-Gx (MS)	12/13/21 11:30	12/13/21 11:30	3.83g/5mL	5g/5mL	1.31

Volatile Organic Compounds by EPA 8260D

Prep: EPA 5035A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 21L1037							
A1L0943-01	Soil	5035A/8260D	12/13/21 11:30	12/13/21 11:30	3.83g/5mL	5g/5mL	1.31

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 21L0949							
A1L0943-01	Soil	EPA 8000D	12/13/21 11:30	12/27/21 11:40			NA

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ANALYTICAL REPORT

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GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

H-01	This sample was analyzed outside the recommended holding time.
Q-30	Recovery for Lab Control Spike (LCS) is below the lower control limit. Data may be biased low.
Q-54	Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +2%. The results are reported as Estimated Values.
Q-54a	Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +3%. The results are reported as Estimated Values.
Q-54b	Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +4%. The results are reported as Estimated Values.
Q-54c	Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +7%. The results are reported as Estimated Values.
Q-54d	Daily Continuing Calibration Verification recovery for this analyte failed the +/-20% criteria listed in EPA method 8260/8270 by +8%. The results are reported as Estimated Values.
Q-56	Daily CCV/LCS recovery for this analyte was above the +/-20% criteria listed in EPA 8260
S-05	Surrogate recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.
V-16	Sample aliquot was subsampled from the sample container in the laboratory. The subsampled aliquot was not preserved within 48 hours of sampling.

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ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

Apex Laboratories

Darrell Auvil, Client Services Manager

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503-718-2323
ORELAP ID: **OR100062**

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories, LLC
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ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) -
EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

Darrell Auvil, Client Services Manager

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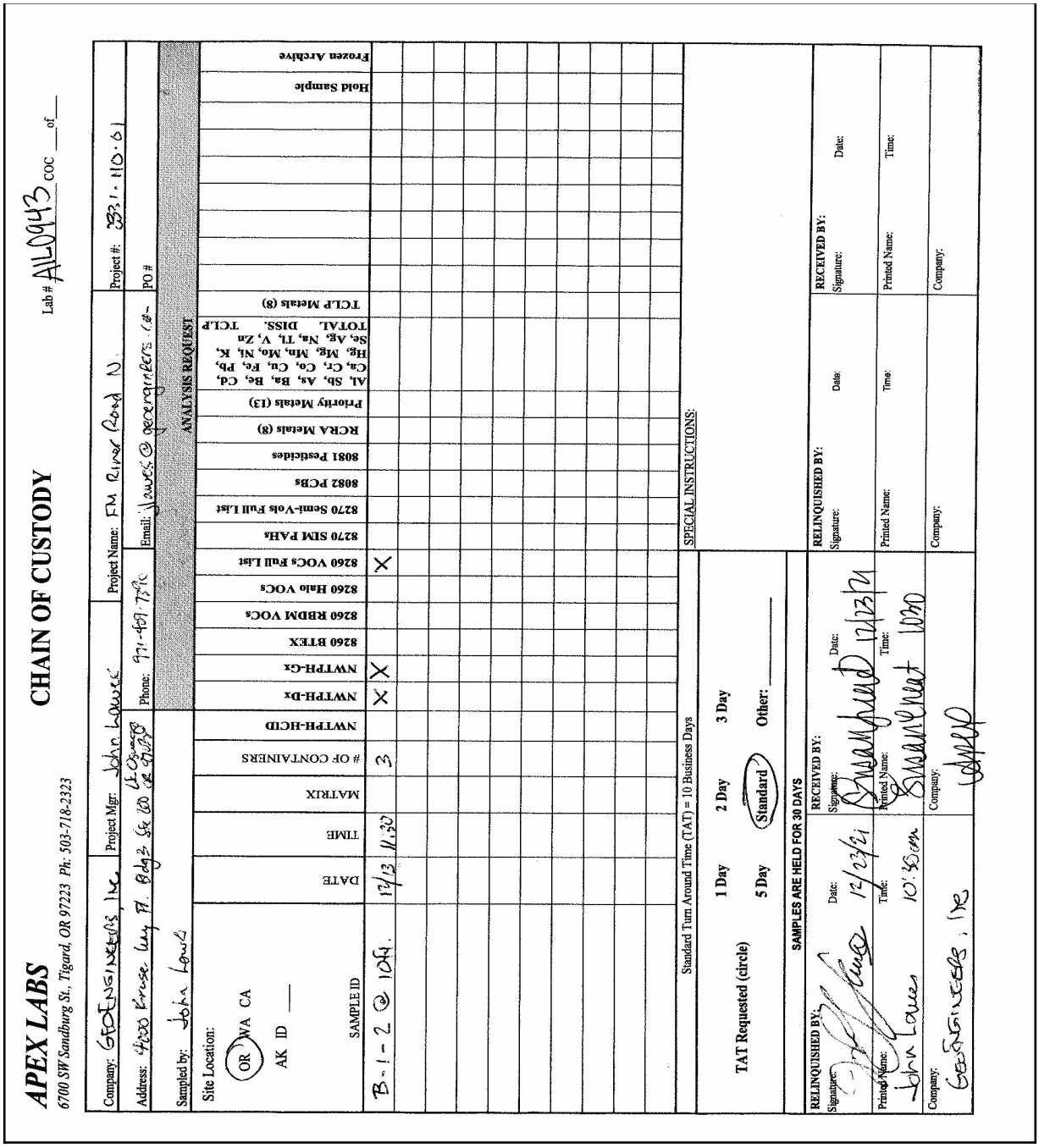
ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers
4000 Kruse Way Place, Bldg 3 Suite 200
Lake Oswego, OR 97035

Project: **FM River Road N.**
Project Number: **3831-110-01**
Project Manager: **John Lawes**

Report ID:
A1L0943 - 01 11 22 1504



APEX LABS
6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

CHAIN OF CUSTODY

Lab # A1L0943 COC ___ of ___

Company: GeoEngineers, Inc | Project Mgr: John Lawes | Project Name: FM River Road N | Project #: 3831-110.01
Address: 4000 Kruse Way Pl. Bldg 2 Ste 200 Lake Oswego, OR 97035 | Phone: 971-409-7710 | Email: jlawes@geoengineers.com | PO #
Sampled by: John Lawes

Site Location: (OR) WA CA AK ID ___

SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 BTEX	8260 RBDM VOCs	8260 Halo VOCs	8260 VOCs Full List	8270 SIM PAHs	8270 Semi-Vols Full List	8082 PCBs	8081 Pesticides	RCRA Metals (8)	Priority Metals (13)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS. TCLP	TCLP Metals (8)	Hold Sample	Frozen Archive
B-1-2 @ 10ft.	12/13	11:30		3		X	X				X										

ANALYSIS REQUEST

Standard Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day | 2 Day | 3 Day | 5 Day | (Standard) | Other: ___

SPECIAL INSTRUCTIONS:

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY:	Date:	Time:	RECEIVED BY:	Date:	Time:
Signature:	12/23/21		Signature:	12/23/21	
Printed Name: John Lawes		10:45am	Printed Name: Susan Hurd		1030
Company: GeoEngineers, Inc			Company:		

RELINQUISHED BY:	Date:	Time:	RECEIVED BY:	Date:	Time:
Signature:			Signature:		
Printed Name:			Printed Name:		
Company:			Company:		

RELINQUISHED BY:	Date:	Time:	RECEIVED BY:	Date:	Time:
Signature:			Signature:		
Printed Name:			Printed Name:		
Company:			Company:		

Apex Laboratories

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ORELAP ID: **OR100062**

ANALYTICAL REPORT

AMENDED REPORT

GeoEngineers	Project: **FM River Road N.**	
4000 Kruse Way Place, Bldg 3 Suite 200	Project Number: **3831-110-01**	**Report ID:**
Lake Oswego, OR 97035	Project Manager: **John Lawes**	**A1L0943 - 01 11 22 1504**

APEX LABS COOLER RECEIPT FORM

Client: GeoEngineers Element WO#: A1 L0943

Project/Project #: FM River Road N / 3831-110-01

Delivery Info:

Date/time received: 12/23/21 @ 1030 By: SO

Delivered by: Apex____Client_x__ESS____FedEx____UPS____Swift___Senvoy ___SDS___Other_____

Cooler Inspection Date/time inspected: 12/23/21 @ 1030 By: SO

Chain of Custody included? Yes _x_ No _____ Custody seals? Yes_____ No_X_____

Signed/dated by client? Yes _X_ No _____

Signed/dated by Apex? Yes _Y_ No _____

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	1.7						
Received on ice? (Y/N)	Y						
Temp. blanks? (Y/N)	N						
Ice type: (Gel/Real/Other)	gel						
Condition:	good						

Cooler out of temp? (Y/(N)) Possible reason why:_____

Green dots applied to out of temperature samples? Yes/(No)

Out of temperature samples form initiated? Yes/(No)

Sample Inspection: Date/time inspected: 12/23/21 @ 1635 By: HAS

All samples intact? Yes X No ___ Comments:_____

Bottle labels/COCs agree? Yes X No ___ Comments: _____

COC/container discrepancies form initiated? Yes ___ No X

Containers/volumes received appropriate for analysis? Yes X No ___ Comments: _____

Do VOA vials have visible headspace? Yes ___ No ___ NA X

Comments_____

Water samples: pH checked: Yes___No___NA_X_ pH appropriate? Yes___No___NA_X_

Comments: _____

Additional information: _____

Labeled by: HAS Witness: [illegible] Cooler Inspected by: HAS

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darrell Auvil, Client Services Manager

APPENDIX B
Report Limitations and Guidelines for Use

APPENDIX B
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory "limitations" provisions in its reports. Please confer with GeoEngineers if you need to know more how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for MJC Investment Property XII, LLC and The Kroger Company for the proposed Fred Meyer Fuel Center project specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with MJC Investment Property XII, LLC dated December 6, 2021 and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

A Geotechnical Engineering or Geologic Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the proposed Fred Meyer Fuel Center on 2980 River Road N in Salem, Oregon. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

- elevation, configuration, location, orientation or weight of the proposed structure;

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Environmental Concerns Are Not Covered

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

Geotechnical Engineering Report Recommendations Are Not Final

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance

with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable, but separating logs from the report can create a risk of misinterpretation.

Give Contractors a Complete Report and Guidance

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- encourages contractors to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer.

Contractors Are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

GeoEngineers