

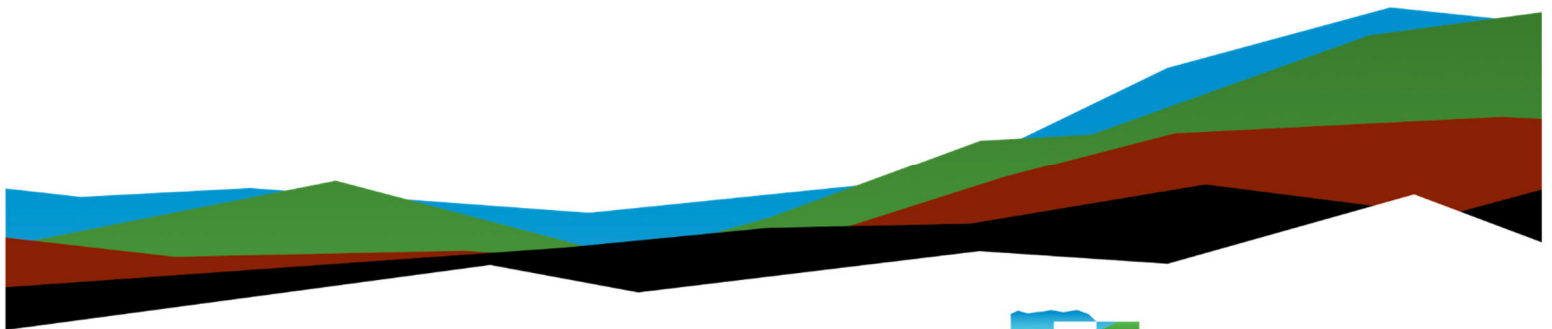
# Cortez Route-Alignment Alternatives

## Preliminary Geotechnical Engineering Report

October 18, 2022 | Terracon Project No. 61225159

Prepared for:

RailPros  
360 South Fort Lane, Suite 3A  
Layton, Utah 84041



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October 18, 2022

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Attn: Adam Halls  
P: (515) 321-9468  
E: [Adam.Halls@railpros.com](mailto:Adam.Halls@railpros.com)

Re: Preliminary Geotechnical Engineering Report  
Cortez Route-Alignment Alternatives  
101 Main Street  
Carlin, NV  
Terracon Project No. 61225159

Dear Mr. Halls:

We have completed the scope of Preliminary Geotechnical Engineering services for the above referenced project in general accordance with Terracon Proposal No. P61225159 dated July 13, 2022. This report presents the findings of the subsurface exploration and provides preliminary geotechnical recommendations concerning earthwork and the design and construction of ballasted rail section thickness for the referenced project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

**Terracon**

Charles V. Molthen, P.E (UT)

Senior Associate

Rick L. Chesnut, (P.E.)

Senior Principal

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## Introduction

This report presents the results of our subsurface exploration and Preliminary Geotechnical Engineering services performed for the proposed Cortez Route Alignments to be located west of Carlin, NV. The purpose of these services was to provide information and preliminary geotechnical engineering recommendations relative to:

- Subsurface soil (and rock) conditions
- Groundwater conditions
- Site preparation and earthwork
- Railroad ballast section thickness
- Track Support
- Slope stability considerations

The geotechnical engineering Scope of Services for this project included the advancement of 13 test borings to depths ranging from 6½ feet to 26½ feet below existing site grade, laboratory testing, engineering analysis, and preparation of this report.

Drawings showing the site and boring locations are included on the [Site Location](#) and [Exploration Plan](#), respectively. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs and as separate graphs in the [Exploration Results](#) section.

## Project Description

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

| Item                 | Description                                                                                                                                                                                                                                      |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Information Provided | <p>Information for this project was provided by RailRpos via email and phone conversations. The following documents were provided:</p> <ul style="list-style-type: none"><li>■ NGM RFP</li><li>■ Siding KMZs</li><li>■ Alignment Plans</li></ul> |

| Item                          | Description                                                                                                                                                                                                                                                                                                                                |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Description           | <p>The project consists of constructing three new rail connections in Eureka and Elko County, NV. Improvements are expected to consist of the following:</p> <ul style="list-style-type: none"> <li>■ Carlin Alignment (9 Miles)</li> <li>■ Crescent Valley Alignment (35 Miles)</li> <li>■ Boulder Valley Alignment (19 Miles)</li> </ul> |
| Anticipated Structures        | Various structures are anticipated as part of the project. However, our current scope of work does not include geotechnical exploration or analysis at structure locations. We understand that structures will be addressed in future design phases.                                                                                       |
| Grading / Slopes              | Fill heights up to 15 feet at rail loops and up to 25 feet at I-80 Bridge. Cuts up to 80 feet are planned to facilitate mass grading for the rail lines.                                                                                                                                                                                   |
| Below-Grade Structures        | None expected.                                                                                                                                                                                                                                                                                                                             |
| Free-Standing Retaining Walls | None expected.                                                                                                                                                                                                                                                                                                                             |
| Site development track        | Mass grading cuts and fills and track section consisting of ballast and sub-ballast.                                                                                                                                                                                                                                                       |
| Design Criteria               | <p>American Railway Engineering and Maintenance of Way Association (AREMA).</p> <p>Union Pacific Railroad (UPRR) design standards.</p>                                                                                                                                                                                                     |

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits, as modifications to our recommendations may be necessary.

## Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

| Item               | Description                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Parcel Information | <p>The project alignments are located north and south of I-80 near Carlin, NV.</p> <p>See <a href="#">Site Location</a></p> |

| Item                  | Description                                                                                                                                                                                                           |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Existing Improvements | Open undeveloped property near existing UPRR rail lines extending to existing mining operations.                                                                                                                      |
| Current Ground Cover  | Sparse natural vegetation and bare soil                                                                                                                                                                               |
| Existing Topography   | <ul style="list-style-type: none"> <li>■ Carlin Route: Localized mild to moderate slopes.</li> <li>■ Crescent Valley: Relatively flat to localized mild slopes.</li> <li>■ Boulder Valley: Relatively flat</li> </ul> |

## Geotechnical Characterization

### Subsurface Profile

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual logs. The individual logs can be found in the [Exploration Results](#) and the GeoModel can be found in the [Figures](#) attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

| Model Layer | Layer Name     | General Description                                        |
|-------------|----------------|------------------------------------------------------------|
| 1           | Fine Grained   | Clays and silts with varying amounts of sands and gravels. |
| 2           | Coarse Grained | Sands and gravels with varying amounts of clays and silts  |

Hard rock was not encountered at boring locations within the depths that were excavated. Hard rock may be present at greater depths or at higher elevations. Confirmation of the rock would require additional testing including borings at higher elevations or geophysical testing.

## Groundwater Conditions

Groundwater was observed at 6.5 to 13 feet in lower elevation borings. These observations represent groundwater conditions at the time of the field exploration and may not be indicative of other times, or at other locations. Groundwater conditions can change with varying seasonal and weather conditions, and other factors

## Geotechnical Overview

The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the test borings, provided that the recommendations provided in this report are implemented in the design and construction phases of this project.

The subsurface materials generally consisted of sand and clay mixtures in the upper 5 – 15 feet, underlain Sands and silts with varying amounts of gravel. Groundwater was encountered at depths of 6.5 to 13 during or at the completion of drilling. Ground water was encountered in borings at lower elevations.

The near surface, soft to very stiff medium plasticity lean clay located along portions of the alignments, most commonly in the lower elevations along the Crescent Valley alignment, could become unstable or slippery with typical earthwork and construction traffic, especially after precipitation events. The effective drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. If possible, the grading should be performed during the warmer and drier times of the year. If grading is performed during the winter months, an increased risk for possible undercutting and replacement of unstable subgrade will persist. Additional site preparation recommendations, including subgrade improvement and fill placement, are provided in the [Earthwork](#) section.

Soil conditions in the higher elevations in areas of planned cuts generally consist of medium dense to very dense granular soil and are expected to support typical cut slopes on the order of 2:1 to 1.5:1, horizontal to vertical. As indicated herein, additional analysis will be required to evaluate final slope geometry.

The recommendations contained in this report are based upon the results of widely spaced field and laboratory testing (presented in the [Exploration Results](#)), preliminary engineering analyses, and our current understanding of the proposed project. The [General Comments](#) section provides an understanding of the report limitations. We understand that additional geotechnical exploration and analysis will be completed at a later time to develop final geotechnical recommendations for the project.

## Earthwork

Earthwork operations should generally follow AREMA guidelines except where otherwise presented in this report. Where variations exist between this report and AREMA manual the stricter recommendation should be followed. Earthwork is anticipated to include clearing and grubbing, excavations, and placement of engineered fills. The following sections provide preliminary recommendations for use in the conceptual layout and evaluation of the proposed rail alignment alternatives. Final geotechnical recommendations for development of project specifications and final design will be provided at a later time after additional design-level explorations and analysis have been completed. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for ballasted track section thickness design, general site grading, and subgrade and roadbed preparation.

### Site Preparation

Preparation of subgrades and roadbed to support new embankments, track section, and structures should include the removal of topsoil, unsuitable fills, deleterious materials, vegetation, debris and any other unsuitable materials that may be present. The lateral extent, composition, and condition of unsuitable materials should be determined during the site preparation phase.

We recommend that exposed subgrades and roadbed be thoroughly evaluated by Terracon prior to the placement of new fill, track section, or other structures. Following removal of vegetation and unsuitable materials and rough grading, exposed subgrades and roadbed should be scarified a minimum of 8 inches moisture-conditioned as necessary, and recompacted per the requirements of this report. If unsuitable areas are observed during construction, soil stabilization will then be necessary to establish a suitable subgrade and stable roadbed for support of the planned improvements.

Based on our preliminary analysis and results of widely spaced exploration points areas of potential subgrade and roadbed improvements may be present along the Crescent Valley and Boulder Valley alignments. Additional explorations and analysis for final design may indicate more extensive requirements or a reduced risk.

Typical methods of subgrade stabilization are described in more detail in the following sections.

### Soil Stabilization

Methods of subgrade improvement, as described below, could include scarification, moisture conditioning and recompaction, removal of unstable materials and replacement

with granular fill (with or without geosynthetics), and chemical stabilization. The appropriate method of improvement, if required, would be dependent on factors such as schedule, weather, the size of area to be stabilized, and the nature of the instability. More detailed recommendations can be provided during construction as the need for subgrade stabilization occurs. Performing site grading operations during warm seasons and dry periods would help reduce the amount of subgrade stabilization required.

If the exposed subgrade is unstable during scarification and compaction operations, it could be stabilized using one of the methods outlined below.

- **Scarification and Recomaction** - It may be feasible to scarify, dry, and recompact the exposed soils. The success of this procedure would depend primarily upon favorable weather and sufficient time to dry the soils. Stable subgrades likely would not be achievable if the thickness of the unstable soil is greater than about 1 foot, if the unstable soil is at or near groundwater levels, or if construction is performed during a period of wet or cool weather when drying is difficult.
- **Crushed Stone** - The use of crushed stone or crushed gravel is a common procedure to improve subgrade stability. Typical undercut depths would be expected to range from about 12 to 24 inches below finished subgrade elevation. The use of high modulus geotextiles (i.e., engineering fabric or geogrid) could also be considered after underground work such as utility construction is completed. Prior to placing the fabric or geogrid, we recommend that all below grade construction, such as utility line installation, be completed to avoid damaging the fabric or geogrid. Equipment should not be operated above the fabric or geogrid until one full lift of crushed stone fill is placed above it. The maximum particle size of granular material placed over geotextile fabric or geogrid should not exceed 1-1/2 inches.
- **Chemical Modification** - Improvement of subgrades with portland cement or class C fly ash could be considered for improving unstable soils. Chemical modification should be performed by a pre-qualified contractor having experience with successfully stabilizing subgrades and railroad roadbeds in similar soil conditions. Results of chemical analysis of the additive materials should be provided to the geotechnical engineer prior to use. The hazards of chemicals blowing across the site or onto adjacent property should also be considered. Additional testing would be needed to develop specific recommendations to improve subgrade stability by blending chemicals with the site soils. Additional testing could include, but not be limited to, determining the most suitable stabilizing agent, the optimum amounts required, the presence of sulfates in the soil, and freeze-thaw durability of the subgrade.

Further evaluation of the need and recommendations for subgrade stabilization can be provided during construction as the geotechnical conditions are exposed.

## Fill Material Types

All fill materials should be inorganic soils free of vegetation, debris, and fragments larger than three inches in size. Pea gravel or other similar non-cementitious, gap-graded materials should not be used as fill or backfill without the prior approval of the geotechnical engineer. Fill material should meet the following requirements:

| Fill Type <sup>1</sup>          | Application                                                           | Requirements                                                                                                                                                                            |                         |                                               |
|---------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------|
|                                 |                                                                       | Gradation                                                                                                                                                                               |                         | Plasticity                                    |
|                                 |                                                                       | Size                                                                                                                                                                                    | Percent finer by weight |                                               |
| On-Site Soils                   | General Grading and Embankments                                       | Zone to place more granular soils at shallow depths and fine-grained soil deeper in fill sections. Remove particles over 12 inches and grade to prevent nesting of aggregate particles. |                         |                                               |
| Structural Fill                 | All locations and elevations, below foundations and concrete flatwork | 3 inch<br>No. 4 Sieve<br>No. 200 Sieve                                                                                                                                                  | 100<br>40-60<br>15 max  | Liquid Limit 30 max<br>Plasticity Index 6 max |
| Stabilization Fill <sup>2</sup> | Fill used to stabilize soft, potentially pumping subgrade             | 6 inch<br>No. 200 Sieve                                                                                                                                                                 | 100<br>5 max            | -                                             |

1. All fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the geotechnical engineer for evaluation.
2. Rock fragments should be coarse, angular particles (not rounded)

Materials proposed for use as engineered fill should be tested to verify conformance with the specifications above. Granular soils encountered in the northern section of Crescent Valley and Boulder Valley alignments as well as the Carlin alignment may be considered for re-use.

## Fill Placement and Compaction Requirements

Structural and general fill should meet the following compaction requirements.

| Material Type and Location                                                | Minimum Compaction Requirement (%) <sup>1</sup> | Proctor Method              | Range of Moisture Contents for Compaction (referenced from optimum moisture content) |         |
|---------------------------------------------------------------------------|-------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------|---------|
|                                                                           |                                                 |                             | Minimum                                                                              | Maximum |
| On-site soil:<br>Sand and Gravel with <15% fines:<br>Other on-site soils: | 95                                              | ASTM D1557<br><br>ASTM D698 | -2%                                                                                  | +2%     |
| Structural Fill:                                                          | 95                                              | ASTM D 1557                 | -2%                                                                                  | +2%     |
| Subballast                                                                | 95                                              | ASTM D1557                  | -2%                                                                                  | +2%     |
| Ballast                                                                   | 95                                              | -- <sup>2</sup>             |                                                                                      |         |

1. The moisture content and compaction should be measured for each lift of engineered fill during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.
2. Specifically, moisture levels for the ballast material should be maintained low enough to allow for satisfactory placement and densification in accordance with AREMA guidelines.

Fine-grained on-site soils may require additional time and effort to moisture condition, properly place, and achieve compaction. Elevated in-situ moisture content may require extensive drying time. If dry of optimum, adding water may require disk or special mixing to achieve uniform moisture content for compaction. Typically, a sheep-foot compactor is used for fine-grained soils. Pumping fill subgrades may require additional drying time or special treatment or stabilization.

Coarse-grained soils along the project may contain over-sized material and may require screening to produce acceptable gradation for engineered fill.

## Preliminary Cut and Fill Slopes

Preliminary design cut and fill slopes for onsite granular and stiff fine grained soils are summarized below.

| Grading Condition   | Recommended Design Slope <sup>1,2</sup> |
|---------------------|-----------------------------------------|
| Cut (granular)      | 2.5:1                                   |
| Cut (fine-grained)  | 3:1                                     |
| Fill (granular)     | 2:1                                     |
| Fill (Fine-grained) | 3:1                                     |

1. H:V – Horizontal to Vertical
2. The Geotechnical Engineer should be notified if clay layers greater than 5 feet in thickness, or soft clay layers are encountered in cut slopes. If seepage or raveling is encountered flatter slopes may be required.

Large cuts are planned at select locations along the alignments. Terracon should observe cut slopes during earthwork operations to confirm if cut slope changes are required. Additional geotechnical analysis will be required to confirm permanent cut slopes over 20 feet tall.

The face of all fill slopes should be compacted to the minimum specification for fill embankments. Alternately, fill slopes can be over-built and trimmed to compacted material.

Some sloughing or raveling of granular soils exposed on cut faces may occur, especially during or following rain or snow events. Drainage above and below cut slope should be designed to move surface runoff away from the slope face and from the toe of the slope. Some maintenance to remove raveled material should be anticipated. Revegetating the slope will reduce raveling of the slope face.

Additional exploration will be required for the final design of cut and fill slopes.

## Earthwork Construction Considerations

Proper drainage should be incorporated into design. Final grades should be properly sloped to divert surface away from track sections, cuts and fills, and structures to prevent ponding of water and wetting of supporting soils. Per Chapter 1 of AREMA guidelines, drainage surfaces should be sloped a minimum of 2 percent toward drainage outlet points. The completed roadbed should be graded to promote drainage of surface water away from the track section at a minimum slope of 2 percent away from the crown point toward adjacent drainage ditches as indicated in UPRR standard sections and design details.

In periods of dry weather, the surficial soils may be of sufficient strength to allow fill construction on the stripped and grubbed ground surface. However, unstable subgrade conditions could develop during general construction operations, particularly if the soils are wet or subjected to repetitive construction traffic. The use of low ground pressure construction equipment would aid in reducing subgrade and track roadbed disturbance. If unstable subgrade conditions are encountered, stabilization measures, as described in Soil Stabilization will need to be employed.

Where fill will be placed against existing slopes steeper than 5 horizontal to 1 vertical (5H:1V) benches should be cut into the existing slopes as fill is placed. The benches

should have a minimum vertical face height of 1 foot and a maximum vertical face height of 3 feet. Benches should be cut wide enough to accommodate the compaction equipment. Horizontal benches should be constructed as fills are placed. We understand final embankment slopes will be no steeper than 2H:1V. Proper compaction cannot be performed on a steeply sloped embankment; therefore, fill should be placed in lifts beyond the designed embankment surface and the sloped face should be cut out of the fills after compaction.

Temporary excavations may be required during grading operations. The grading contractor is responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, state and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards.

If clay subgrades become frozen, desiccated, saturated, or disturbed prior to placement of the subballast/ballast, the affected material should be removed, or these materials should be scarified, moisture conditioned, and recompacted prior to subballast/ballast placement.

During fill placement, freezing of fill lifts should not be allowed. If constructed in freezing weather special measures such as use of blankets, removal of the upper 3 inches of the previous lift, or continuous 24/7 construction from base of fill to top may be required to prevent freezing of subgrade materials.

Upon completion of filling and grading, care should be taken to maintain the subgrade moisture content prior to the placement of the subballast/ballast. Construction traffic over the completed subgrade should be avoided to the extent practical. The site should also be graded to prevent ponding of surface water on the prepared subgrade or in excavations. If the track bed should become frozen, desiccated, saturated, or disturbed, the affected material should be removed, or these materials should be scarified, moisture conditioned, and recompacted prior to construction.

## Railroad Track

### Track Roadbed

It is recommended that the roadbed be scarified to a depth of 8 inches and recompacted prior to placement of ballast or subballast. If soils that comprise the roadbed are wet and/or unstable, it will not be possible to achieve compaction of soils placed on top of unsuitable materials. Soft, unstable soils, where encountered, can be addressed as outlined in [Earthwork](#)

## Preliminary Track Sections

We understand a ballasted track section will be used for the new track addition. Railroad ballast section thickness design was developed in general accordance with the AREMA Chapter 1, Part 2.11.2, Ballast. Design parameters to compute the required track section ballast and subballast thickness are summarized in the following table. These design sections are based on the wheel diameters, wheel loads, and tie spacing shown. If these assumptions are different from the actual values to be used, a re-evaluation will be required.

| Description                                    | Description           |                |                 |
|------------------------------------------------|-----------------------|----------------|-----------------|
|                                                | Carlin                | Boulder Valley | Crescent Valley |
| Wheel Diameter                                 | 36 inches             |                |                 |
| Wheel Loading                                  | 40,000 lbs            |                |                 |
| Train Speed                                    | 25 mph                |                |                 |
| Tie Material                                   | Wood                  |                |                 |
| Tie Base Width                                 | 9 inches              |                |                 |
| Tie Base Length                                | 8½ feet               |                |                 |
| Tie Spacing                                    | 21 inches             |                |                 |
| Average Bearing Capacity (Psi)                 | 45                    | 17             | 14              |
| Factor of Safety for Bearing Capacity          | 2                     |                |                 |
| Distribution Factor                            | 47                    |                |                 |
| Impact Factor                                  | 0.23                  |                |                 |
| Ballast Pressure                               | 45 psi                |                |                 |
| Minimum Ballast Thickness (in)<br><sup>1</sup> | 8                     | 8              | 12              |
| Minimum Subballast Thickness                   | 6 inches <sup>2</sup> | 12             | 12              |

1. Thickness of ballast measured from bottom of tie.

2. AREMA indicates a minimum mainline ballast thickness of 12 inches for mainline service application. Our calculations came up with a lower value at Carlin and Boulder Valley. A minimum 12-inch thick value should be followed for a mainline category. A minimum thickness of 8 inches may be used for industrial track service application.

AREMA design guidelines for roadbed and drainage construction should be followed. At a minimum proper drainage should include the following.

- Drainage ditches extending at least 2 feet below bottom of subballast elevation on both sides of the rail line.
- Slope roadbed below subballast section 2 to 4 percent toward adjacent drainage ditches.

- Place culverts or other features frequently along the project to allow for rapid drainage of ditches.
- Slope subballast and ballast sections toward adjacent ditches to accommodate drainage and prevent wetting of roadbed soils.

## General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly effect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such

impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

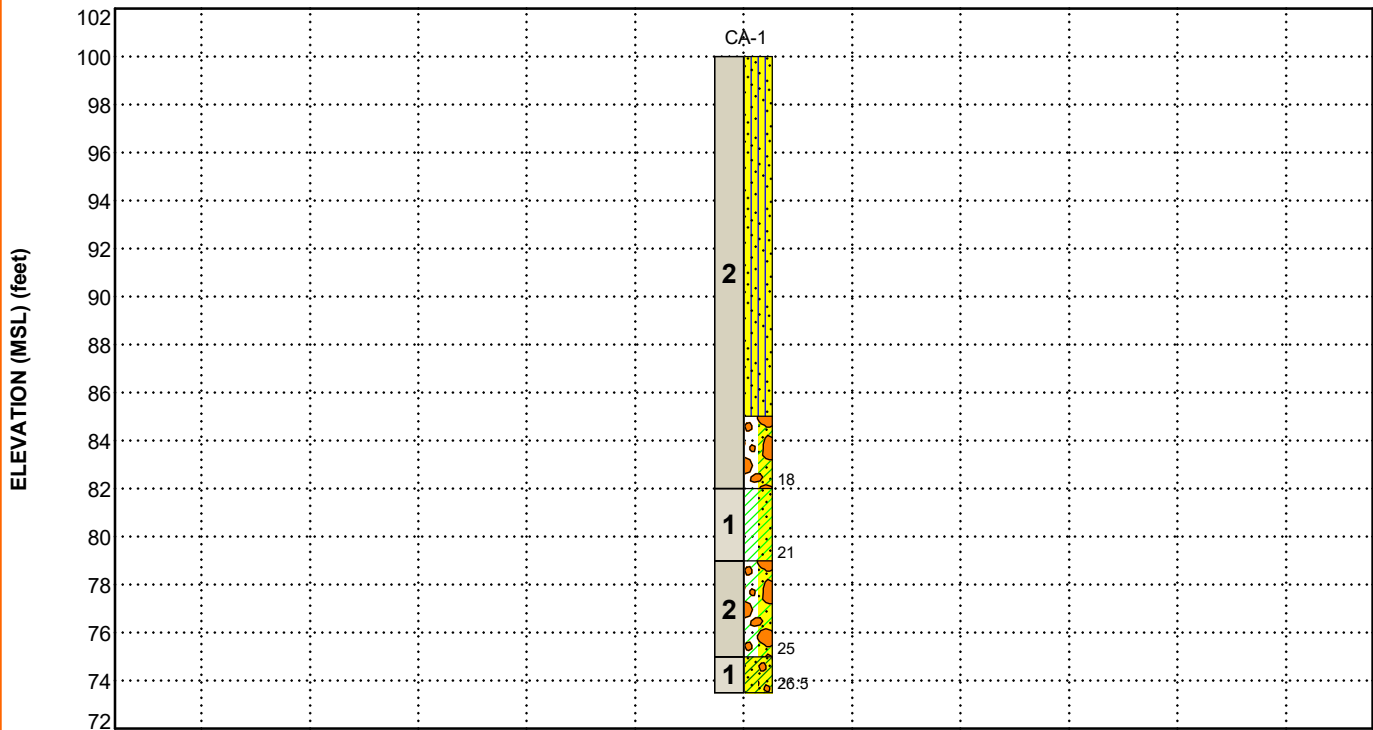
## Figures

Contents:

GeoModel (3 pages)

## GEOMODEL

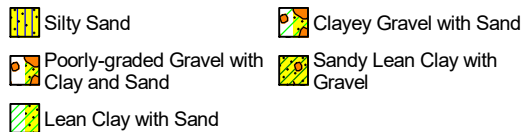
RailPros - Cortez Route - Alignment Alternatives ■ Carlin, NV  
Terracon Project No. 61225159



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

| Model Layer | Layer Name     | General Description                                        |
|-------------|----------------|------------------------------------------------------------|
| 1           | Fine Grained   | Clays and silts with varying amounts of sands and gravels. |
| 2           | Coarse Grained | Sands and gravels with varying amounts of clays and silts  |

### LEGEND



First Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

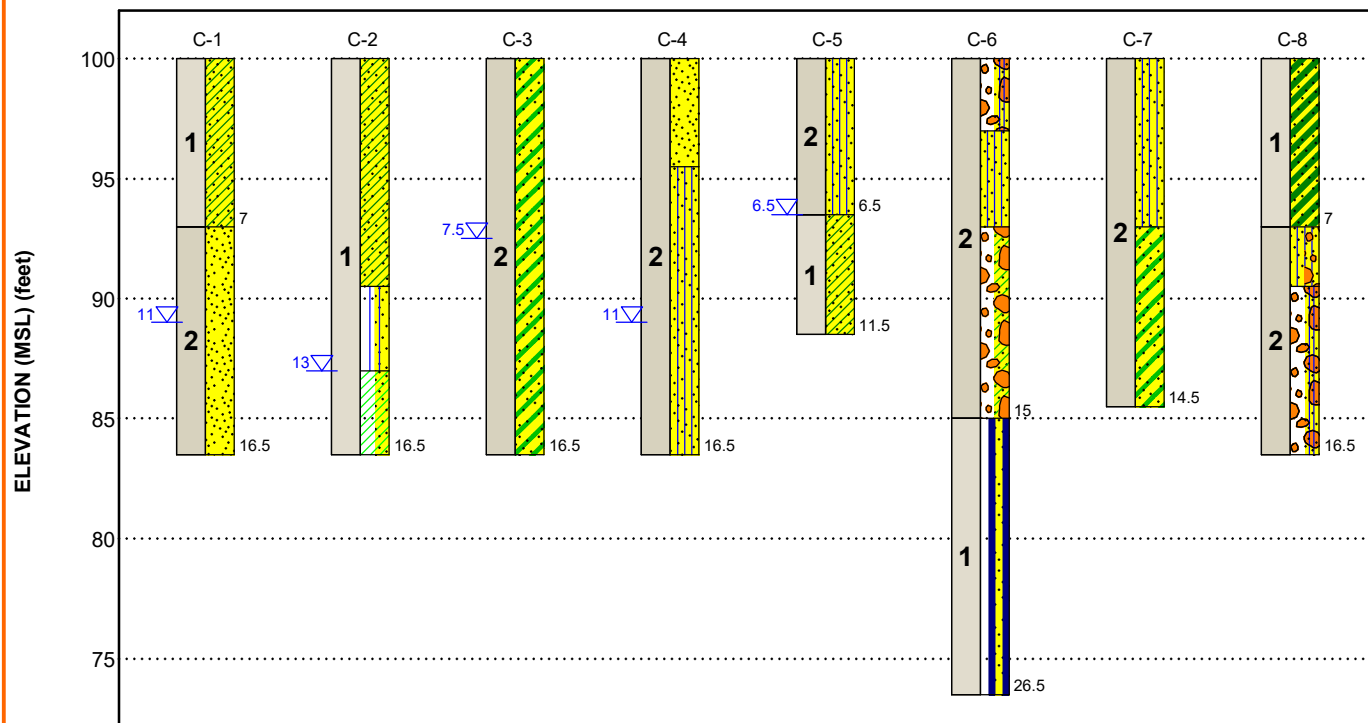
### NOTES:

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

## GEOMODEL

RailPros - Cortez Route - Alignment Alternatives ■ Carlin, NV  
Terracon Project No. 61225159

**Terracon**  
**GeoReport**



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### LEGEND

|                    |                     |                                         |                        |
|--------------------|---------------------|-----------------------------------------|------------------------|
| Sandy Lean Clay    | Lean Clay with Sand | Poorly-graded Gravel with Silt and Sand | Sandy Fat Clay         |
| Poorly-graded Sand | Clayey Sand         | Poorly-graded Gravel with Clay and Sand | Silty Sand with Gravel |
| Silt with Sand     | Silty Sand          | Elastic Silt with Sand                  |                        |

First Water Observation

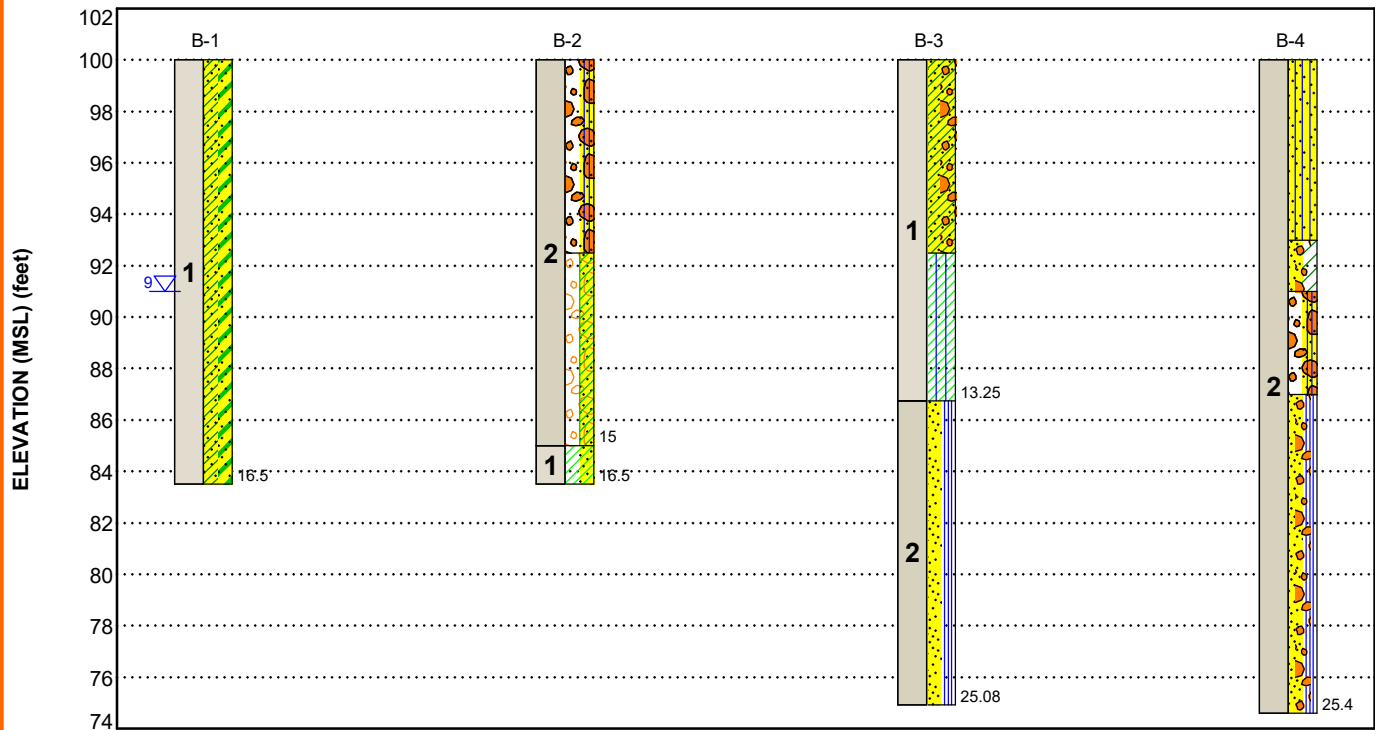
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Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

## GEOMODEL

RailPros - Cortez Route - Alignment Alternatives ■ Carlin, NV  
Terracon Project No. 61225159



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

| Model Layer | Layer Name     | General Description                                        |
|-------------|----------------|------------------------------------------------------------|
| 1           | Fine Grained   | Clays and silts with varying amounts of sands and gravels. |
| 2           | Coarse Grained | Sands and gravels with varying amounts of clays and silts  |

### LEGEND

|                                         |                             |                                         |                                         |
|-----------------------------------------|-----------------------------|-----------------------------------------|-----------------------------------------|
| Sandy Lean Clay/Clayey Sand             | Lean Clay with Sand         | Poorly-graded Sand with Silt            | Poorly-graded Sand with Silt and Gravel |
| Poorly-graded Gravel with Silt and Sand | Sandy Lean Clay with Gravel | Silty Sand                              |                                         |
| Well-graded Gravel with clay and sand   | Silty Clay                  | Poorly-graded Sand with Clay and Gravel |                                         |

First Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

### NOTES:

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

## Attachments

## Exploration and Testing Procedures

### Field Exploration

| Number of Borings | Approximate Boring Depth (feet) | Location                  |
|-------------------|---------------------------------|---------------------------|
| 1                 | 26½                             | Carlin Alignment          |
| 4                 | 11½ to 25                       | Boulder Valley Alignment  |
| 8                 | 6½ to 26½                       | Crescent Valley Alignment |

**Boring Layout and Elevations:** Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal accuracy of about  $\pm 10$  feet) and referencing existing site features. Approximate ground surface elevations were estimated using Google Earth. If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

**Subsurface Exploration Procedures:** We advanced the borings with a truck-mounted rotary drill rig using continuous flight solid stem augers. Four samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. A 3-inch O.D. split-barrel sampling spoon with 2.5-inch I.D. ring lined sampler was used for sampling. Ring-lined, split-barrel sampling procedures are similar to standard split spoon sampling procedure; however, blow counts are typically recorded for 6-inch intervals for a total of 12 inches of penetration. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with auger cuttings after their completion.

We also observed the boreholes while drilling and at the completion of drilling for the presence of groundwater. Groundwater was observed at 6 to 13 feet in the borings at lower elevations in both the Crescent and Boulder Valley Alignments.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials observed during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's

interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

## Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following types of tests:

- Moisture Content
- Dry Unit Weight
- Unconfined Compression
- Swell/ consolidation
- Atterberg Limits
- Classification/ grain size analysis

The laboratory testing program often included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in accordance with the Unified Soil Classification System.

## Site Location and Exploration Plans

### Contents:

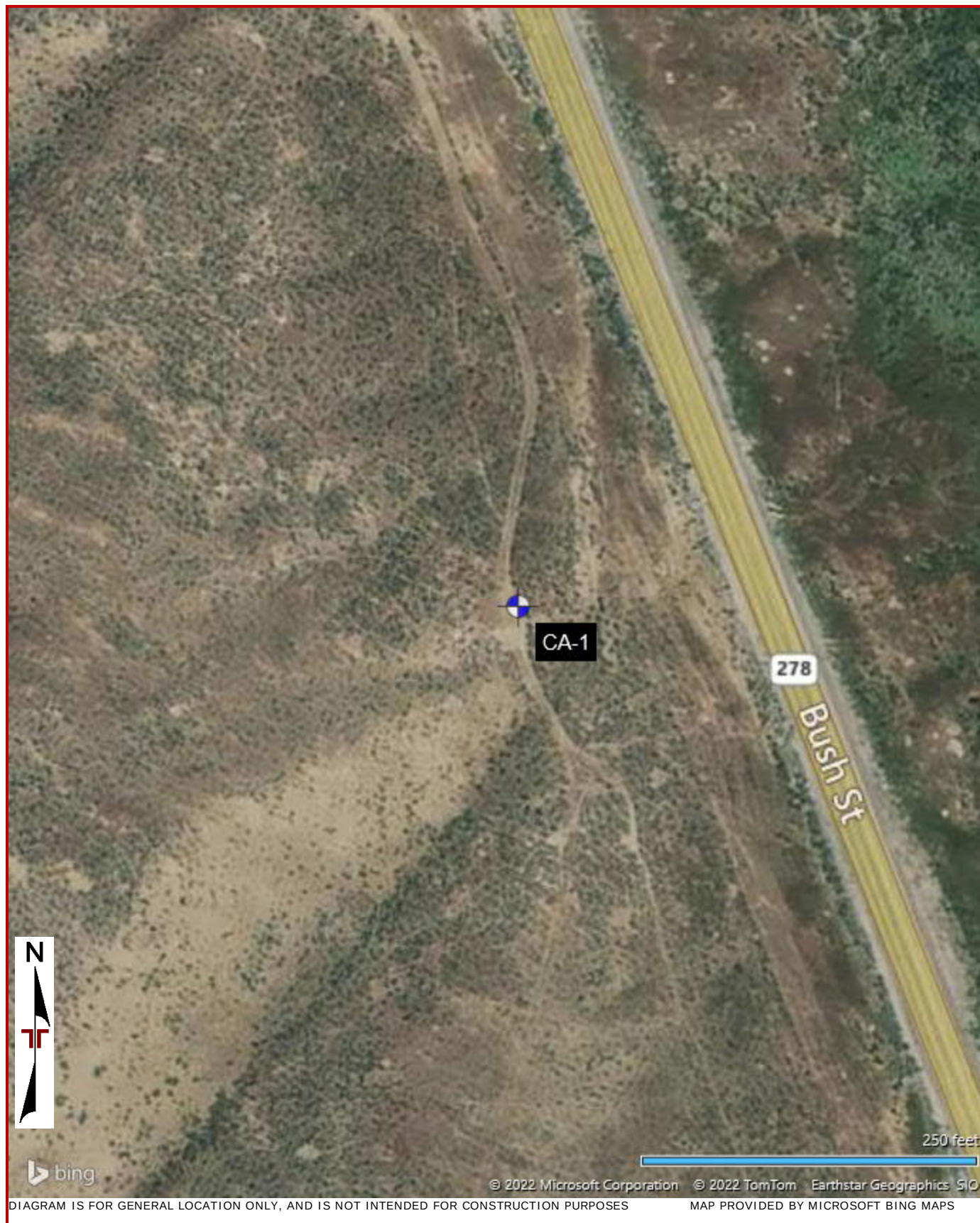
Site Location Plan  
Exploration Plan

Note: All attachments are one page unless noted above.

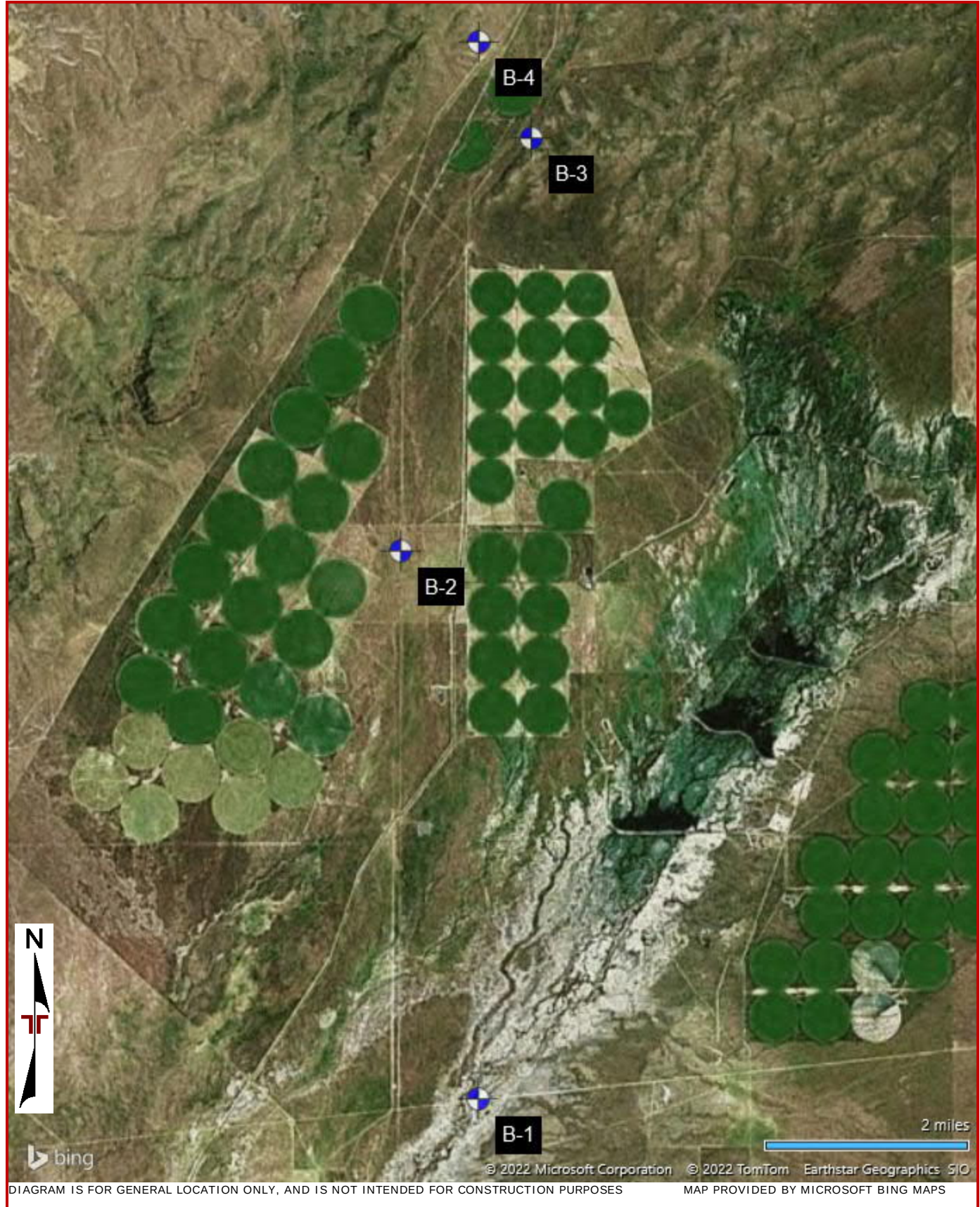
## Site Location



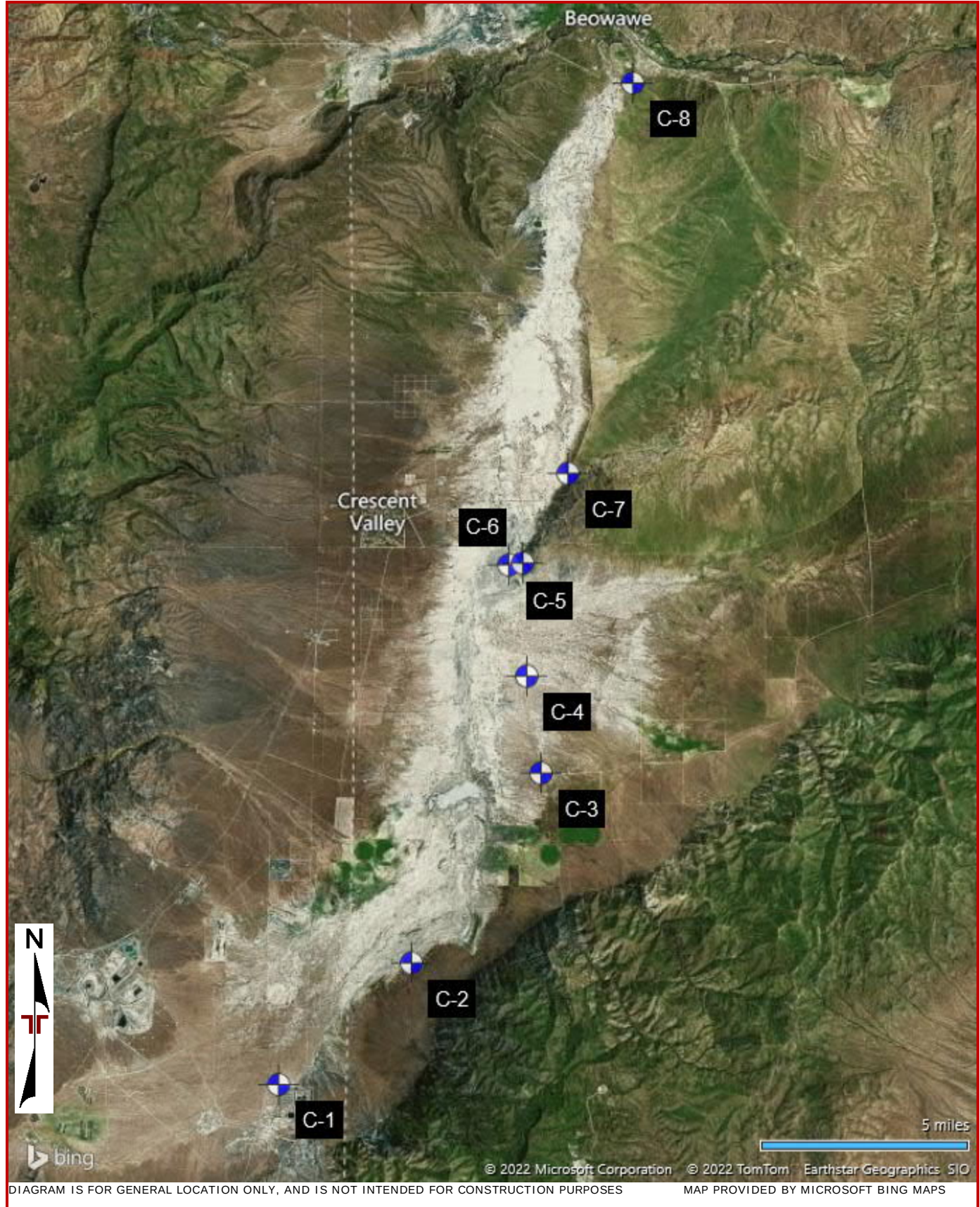
## Exploration Plan (Carlin)



## Exploration Plan (Boulder Valley)



## Exploration Plan (Crescent Valley)



## Exploration and Laboratory Results

### Contents:

Boring Logs (B-1 to B-4, Ca-1, and C-1 to C-8)

Grain Size Distribution (5pages)

Summary of Laboratory Results

Note: All attachments are one page unless noted above.

# BORING LOG NO. B-1

Page 1 of 1

**PROJECT:** RailPros - Cortez Route - Alignment Alternatives

**CLIENT:** RailPros Layton, UT

**SITE:**  
Carlin, NV

| MODEL LAYER | GRAPHIC LOG | LOCATION See <a href="#">Exploration Plan</a><br>Latitude: 40.7774° Longitude: -116.4849° | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | Recovery (In.) | FIELD TEST RESULTS | STRENGTH TEST |                            |            | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS<br>LL-PL-PI | PERCENT FINES |
|-------------|-------------|-------------------------------------------------------------------------------------------|-------------|--------------------------|-------------|----------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|---------------|
|             |             |                                                                                           |             |                          |             |                |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) |                   |                       |                              |               |
|             |             | DEPTH                                                                                     |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             | <b>SANDY LEAN CLAY (CL)</b> , tan, very stiff to hard                                     |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                           |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                           | 5           |                          |             | 22             | 4-11-19<br>N=30    |               |                            |            | 26.3              |                       |                              |               |
|             |             |                                                                                           |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                           |             |                          |             | 22             | 16-46-34<br>N=80   |               |                            |            | 18.5              |                       | 37-24-13                     | 61            |
|             |             | - medium dense                                                                            |             |                          |             | 20             | 5-8-5<br>N=13      |               |                            |            | 24.0              |                       |                              |               |
|             |             | -soft                                                                                     | 10          |                          |             | 19             | 2-1-2<br>N=3       |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                           |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             | - very stiff, increase in sand                                                            | 15          |                          |             | 8              | 10-14-10<br>N=24   |               |                            |            |                   |                       |                              |               |
|             |             | 16.5                                                                                      |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             | <b>Boring Terminated at 16.5 Feet</b>                                                     |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

While drilling

**Terracon**  
6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 08-31-2022

Boring Completed: 08-31-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 61225159 RAILPROS - CORTEZ.GPJ TERRACON\_DATATEMPLATE.GDT 10/18/22

# BORING LOG NO. B-2

Page 1 of 1

**PROJECT: RailPros - Cortez Route - Alignment Alternatives**

**CLIENT: RailPros Layton, UT**

**SITE: Carlin, NV**

| MODEL LAYER | GRAPHIC LOG | LOCATION    See <a href="#">Exploration Plan</a><br><br>Latitude: 40.8556° Longitude: -116.4995°<br><br>DEPTH | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | Recovery (In.) | FIELD TEST RESULTS | STRENGTH TEST |                            |            | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS | PERCENT FINES |
|-------------|-------------|---------------------------------------------------------------------------------------------------------------|-------------|--------------------------|-------------|----------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------|---------------|
|             |             |                                                                                                               |             |                          |             |                |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) |                   |                       | LL-PL-PI         |               |
| 2           |             | <b><u>POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)</u></b> , gray, dense to very dense<br><br>- trace clay | 5           |                          |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |             | <b><u>WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC)</u></b> , black, dense to very dense, oxidation stains    | 10          |                          |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |            |                   |                       |                  |               |
| 1           |             | <b><u>LEAN CLAY WITH SAND (CL)</u></b> , brown, medium stiff                                                  | 15          |                          |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |             | <b><i>Boring Terminated at 16.5 Feet</i></b>                                                                  |             |                          |             |                |                    |               |                            |            |                   |                       |                  |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

Groundwater not encountered while drilling

**Terracon**

6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 08-31-2022

Boring Completed: 08-31-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_61225159 RAILPROS - CORTEZ.GPJ TERRACON\_DATATEMPLATE.GDT 10/18/22

# BORING LOG NO. B-3

Page 1 of 2

**PROJECT:** RailPros - Cortez Route - Alignment Alternatives

**CLIENT:** RailPros Layton, UT

**SITE:**  
Carlin, NV

| MODEL LAYER | GRAPHIC LOG | LOCATION See <a href="#">Exploration Plan</a><br>Latitude: 40.9144° Longitude: -116.4749°                                         | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | Recovery (In.) | FIELD TEST RESULTS | STRENGTH TEST |                            |            | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS<br>LL-PL-PI | PERCENT FINES |
|-------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|-------------|----------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|---------------|
|             |             |                                                                                                                                   |             |                          |             |                |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) |                   |                       |                              |               |
| 1           |             | <b>SANDY LEAN CLAY WITH GRAVEL (CL)</b> , brown, stiff to very stiff, mineralization stains                                       | 5           |                          |             |                |                    |               |                            |            | 11.7              |                       |                              |               |
|             |             |                                                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
| 2           |             | <b>SILTY CLAY (CL-ML)</b> , trace sand, brown, stiff                                                                              | 10          |                          |             |                |                    |               |                            |            | 18.2              |                       | 27-21-6                      | 86            |
|             |             |                                                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             | <b>POORLY GRADED SAND WITH SILT (SP-SM)</b> , trace gravel, dark brown, dense to very dense, oxidation stains<br><br>- trace clay | 15          |                          |             |                |                    |               |                            |            | 12.4              |                       |                              |               |
|             |             |                                                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
ODEX

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

Groundwater not encountered while drilling

**Terracon**

6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 08-31-2022

Boring Completed: 08-31-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 61225159 RAILPROS - CORTEZ.GPJ TERRACON\_DATATEMPLATE.GDT 10/18/22

## BORING LOG NO. B-3

Page 2 of 2

PROJECT: RailPros - Cortez Route - Alignment  
AlternativesCLIENT: RailPros  
Layton, UTSITE:  
Carlin, NV

| MODEL LAYER | GRAPHIC LOG | LOCATION See <a href="#">Exploration Plan</a><br>Latitude: 40.9144° Longitude: -116.4749°<br>DEPTH | DEPTH (Ft.) | WATER LEVEL<br>OBSERVATIONS | SAMPLE TYPE | Recovery (In.) | FIELD TEST<br>RESULTS | STRENGTH TEST |                                  |            | WATER<br>CONTENT (%) | DRY UNIT<br>WEIGHT (pcf) | ATTERBERG<br>LIMITS | PERCENT FINES |
|-------------|-------------|----------------------------------------------------------------------------------------------------|-------------|-----------------------------|-------------|----------------|-----------------------|---------------|----------------------------------|------------|----------------------|--------------------------|---------------------|---------------|
|             |             |                                                                                                    |             |                             |             |                |                       | TEST TYPE     | COMPRESSIVE<br>STRENGTH<br>(tsf) | STRAIN (%) |                      |                          | LL-PL-PI            |               |
|             |             | <b>Boring Terminated at 25.08 Feet</b>                                                             |             |                             |             | 0              | 50/1"                 |               |                                  |            |                      |                          |                     |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
ODEXSee [Exploration and Testing Procedures](#) for a  
description of field and laboratory procedures used  
and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.See [Supporting Information](#) for explanation of  
symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

Groundwater not encountered while drilling



6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 08-31-2022

Boring Completed: 08-31-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

# BORING LOG NO. B-4

Page 1 of 2

**PROJECT:** RailPros - Cortez Route - Alignment Alternatives

**CLIENT:** RailPros  
Layton, UT

**SITE:**  
Carlin, NV

| MODEL LAYER | GRAPHIC LOG | LOCATION See <a href="#">Exploration Plan</a><br>Latitude: 40.9281° Longitude: -116.4848°         | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | Recovery (In.) | FIELD TEST RESULTS | STRENGTH TEST |                            |            | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS<br>LL-PL-PI | PERCENT FINES |
|-------------|-------------|---------------------------------------------------------------------------------------------------|-------------|--------------------------|-------------|----------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|---------------|
|             |             |                                                                                                   |             |                          |             |                |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) |                   |                       |                              |               |
|             |             | DEPTH                                                                                             |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             | <b>SILTY SAND (SC)</b> , brown, dense to very dense                                               |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                                   | 5           |                          |             | 16             | 12-16-16<br>N=32   |               |                            |            | 14.7              |                       | NP                           | 36            |
|             |             |                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                                   |             |                          |             | 14             | 39-32-23<br>N=55   |               |                            |            |                   |                       |                              |               |
|             |             | <b>POORLY GRADED SAND WITH CLAY AND GRAVEL (SP-SC)</b> , brown, very dense                        |             |                          |             | 16             | 14-46-50/3"        |               |                            |            | 10.6<br>23.8      |                       |                              |               |
|             |             | <b>POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)</b> , brown, very dense, mineralization stains | 10          |                          |             | 4              | 50/5"              |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             | <b>POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)</b> , brown, very dense                        | 15          |                          |             | 8              | 54-75/4"           |               |                            |            | 19.1              |                       |                              |               |
|             |             |                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                                   | 20          |                          |             | 8              | 37-75/3"           |               |                            |            | 16.9              |                       |                              |               |
|             |             |                                                                                                   |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |             |                                                                                                   | 25          |                          |             |                |                    |               |                            |            |                   |                       |                              |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
ODEX

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

Groundwater not encountered while drilling

**Terracon**

6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 08-31-2022

Boring Completed: 08-31-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_61225159 RAILPROS - CORTEZ.GPJ TERRACON\_DATATEMPLATE.GDT 10/18/22

# BORING LOG NO. B-4

Page 2 of 2

**PROJECT: RailPros - Cortez Route - Alignment Alternatives**

**CLIENT: RailPros Layton, UT**

**SITE: Carlin, NV**

| MODEL LAYER | GRAPHIC LOG | LOCATION See <a href="#">Exploration Plan</a><br>Latitude: 40.9281° Longitude: -116.4848° | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | Recovery (In.) | FIELD TEST RESULTS | STRENGTH TEST |                            |            | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS<br>LL-PL-PI | PERCENT FINES |
|-------------|-------------|-------------------------------------------------------------------------------------------|-------------|--------------------------|-------------|----------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|---------------|
|             |             |                                                                                           |             |                          |             |                |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) |                   |                       |                              |               |
| 2           |             | DEPTH<br>25.4                                                                             |             |                          |             | 6              | 75/5"              |               |                            |            |                   |                       |                              |               |
|             |             | <b>Boring Terminated at 25.4 Feet</b>                                                     |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
ODEX

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

Groundwater not encountered while drilling

**Terracon**  
6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 08-31-2022

Boring Completed: 08-31-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

# BORING LOG NO. C-1

Page 1 of 1

**PROJECT:** RailPros - Cortez Route - Alignment Alternatives

**CLIENT:** RailPros  
Layton, UT

**SITE:**  
Carlin, NV

| MODEL LAYER | GRAPHIC LOG                                                                        | LOCATION    See <a href="#">Exploration Plan</a><br><br>Latitude: 40.2183° Longitude: -116.6284°<br><br>DEPTH | DEPTH (Ft.) | WATER LEVEL<br>OBSERVATIONS                                                         | SAMPLE TYPE                                                                        | Recovery (In.) | FIELD TEST<br>RESULTS | STRENGTH TEST |                                  |            | WATER<br>CONTENT (%) | DRY UNIT<br>WEIGHT (pcf) | ATTERBERG<br>LIMITS | PERCENT FINES |      |
|-------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------|-----------------------|---------------|----------------------------------|------------|----------------------|--------------------------|---------------------|---------------|------|
|             |                                                                                    |                                                                                                               |             |                                                                                     |                                                                                    |                |                       | TEST TYPE     | COMPRESSIVE<br>STRENGTH<br>(tsf) | STRAIN (%) |                      |                          | LL-PL-PI            |               |      |
| 1           |   | <b>SANDY LEAN CLAY (CL)</b> , gray, very stiff                                                                | 5           |    |   | 14.5           | 7-14-16<br>N=30       |               |                                  |            | 14.5                 |                          | 29-19-10            | 58            |      |
|             |                                                                                    |                                                                                                               |             |                                                                                     |   | 10             |                       |               |                                  |            |                      |                          |                     |               |      |
|             |                                                                                    |                                                                                                               |             |                                                                                     |   | 12             |                       |               |                                  |            |                      |                          | 8-9-11<br>N=20      |               | 3.4  |
|             |                                                                                    |                                                                                                               |             |                                                                                     |  | 12             |                       |               |                                  |            |                      |                          | 5-8-6<br>N=14       |               | 10.0 |
| 2           |  | <b>POORLY GRADED SAND (SP)</b> , trace clay and gravel, brown, medium dense                                   | 15          |  | 14                                                                                 | 2-6-7<br>N=13  |                       |               |                                  |            |                      |                          |                     |               |      |
|             |                                                                                    |                                                                                                               |             |                                                                                     | <b>Boring Terminated at 16.5 Feet</b>                                              |                |                       |               |                                  |            |                      |                          |                     |               |      |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

 While drilling

**Terracon**

6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 08-30-2022

Boring Completed: 08-30-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_61225159 RAILPROS - CORTEZ.GPJ TERRACON\_DATATEMPLATE.GDT 10/18/22

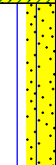
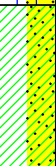
# BORING LOG NO. C-2

Page 1 of 1

**PROJECT:** RailPros - Cortez Route - Alignment Alternatives

**CLIENT:** RailPros  
Layton, UT

**SITE:**  
Carlin, NV

| MODEL LAYER                                                                         | GRAPHIC LOG                                                                        | LOCATION    See <a href="#">Exploration Plan</a><br><br>Latitude: 40.2608° Longitude: -116.5675°<br><br>DEPTH | DEPTH (Ft.)                                                                         | WATER LEVEL OBSERVATIONS                                                            | SAMPLE TYPE                                                                       | Recovery (In.) | FIELD TEST RESULTS | STRENGTH TEST |                            |                                                                                     | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS | PERCENT FINES                                                                       |                                                                                   |                                                                                     |                                                                                     |      |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------|--------------------|---------------|----------------------------|-------------------------------------------------------------------------------------|-------------------|-----------------------|------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|--|-----------------------------------------------------------------------------------|------|---------|----|-------------------------------------------------------------------------------------|------|--------------|------|----|----|--------------|
|                                                                                     |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%)                                                                          |                   |                       | LL-PL-PI         |                                                                                     |                                                                                   |                                                                                     |                                                                                     |      |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |
| 1                                                                                   |   | <b><u>SANDY LEAN CLAY (CL)</u></b> , brown, medium stiff, organics                                            | 5                                                                                   |    |  |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |                                                                                   |                                                                                     |                                                                                     |      |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |
|                                                                                     |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |  | 11                                                                                  | 1-2-2<br>N=4                                                                        | 24.2 |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |
|                                                                                     |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |                                                                                   |    | 12                                                                                  |      |  | 2-3-3<br>N=6                                                                      | 21.2 | 30-22-8 | 69 |                                                                                     |      |              |      |    |    |              |
|                                                                                     |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |                                                                                   |                                                                                     |    |      |  | 15                                                                                |      |         |    | 2-2-3<br>N=5                                                                        | 29.8 |              |      |    |    |              |
|                                                                                     |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |                                                                                   |                                                                                     |                                                                                     |      |  |  |      |         |    | 16                                                                                  |      | 3-4-3<br>N=7 | 41.0 | NP | 83 |              |
|                                                                                     |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |                                                                                   |                                                                                     |                                                                                     |      |  |                                                                                   |      |         |    |  |      | 10           |      |    |    | 6-2-1<br>N=3 |
|                                                                                     |  | <b><u>SILT WITH SAND (ML)</u></b> , light gray, medium stiff                                                  | 10                                                                                  |    |  |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |                                                                                   |                                                                                     |                                                                                     |      |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |
|                                                                                     |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    |               |                            |                                                                                     |                   |                       |                  |  |                                                                                   |                                                                                     |                                                                                     |      |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |
|                                                                                     |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |                                                                                   |  |                                                                                     |      |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |
|                                                                                     |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |                                                                                   |                                                                                     |  |      |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |
|  | <b><u>LEAN CLAY WITH SAND (CL)</u></b> , gray, soft                                | 15                                                                                                            |  |  |                                                                                   |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |                                                                                   |                                                                                     |                                                                                     |      |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |
|                                                                                     |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    |               |                            |  |                   |                       |                  |                                                                                     |                                                                                   |                                                                                     |                                                                                     |      |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |
|                                                                                     |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |                                                                                   |  |                                                                                     |      |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |
|                                                                                     |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |                                                                                   |                                                                                     |  |      |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |
| <b>Boring Terminated at 16.5 Feet</b>                                               |                                                                                    |                                                                                                               |                                                                                     |                                                                                     |                                                                                   |                |                    |               |                            |                                                                                     |                   |                       |                  |                                                                                     |                                                                                   |                                                                                     |                                                                                     |      |  |                                                                                   |      |         |    |                                                                                     |      |              |      |    |    |              |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

While drilling

**Terracon**

6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 08-30-2022

Boring Completed: 08-30-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159



# BORING LOG NO. C-4

Page 1 of 1

**PROJECT: RailPros - Cortez Route - Alignment Alternatives**

**CLIENT: RailPros Layton, UT**

**SITE: Carlin, NV**

| MODEL LAYER | GRAPHIC LOG                                                                       | LOCATION    See <a href="#">Exploration Plan</a><br><br>Latitude: 40.3610° Longitude: -116.5147°<br><br>DEPTH | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS                                                          | SAMPLE TYPE | Recovery (In.) | FIELD TEST RESULTS | STRENGTH TEST |                            |            | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS | PERCENT FINES |
|-------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------|-------------|----------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------|---------------|
|             |                                                                                   |                                                                                                               |             |                                                                                   |             |                |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) |                   |                       | LL-PL-PI         |               |
| 2           |  | <b>POORLY GRADED SAND (SP)</b> , trace clay, brown, loose                                                     | 5           |                                                                                   |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |                                                                                   | 4.5                                                                                                           |             |                                                                                   |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |                                                                                   | <b>SILTY SAND (SM)</b> , brown, loose to medium dense                                                         |             |                                                                                   |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |                                                                                   |                                                                                                               |             |                                                                                   |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |                                                                                   |                                                                                                               |             |                                                                                   |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |                                                                                   |                                                                                                               |             |                                                                                   |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |                                                                                   |                                                                                                               | 10          |  |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |                                                                                   |                                                                                                               |             |                                                                                   |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |                                                                                   |                                                                                                               | 15          |                                                                                   |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |                                                                                   |                                                                                                               |             |                                                                                   |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |                                                                                   |                                                                                                               |             |                                                                                   |             |                |                    |               |                            |            |                   |                       |                  |               |
|             |                                                                                   | <b>Boring Terminated at 16.5 Feet</b>                                                                         |             |                                                                                   |             |                |                    |               |                            |            |                   |                       |                  |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

 While drilling

**Terracon**

6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 08-30-2022

Boring Completed: 08-30-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 61225159 RAILPROS - CORTEZ.GPJ TERRACON\_DATATEMPLATE.GDT 10/18/22

# BORING LOG NO. C-5

Page 1 of 1

**PROJECT:** RailPros - Cortez Route - Alignment Alternatives

**CLIENT:** RailPros  
Layton, UT

**SITE:**  
Carlin, NV

| MODEL LAYER | GRAPHIC LOG | LOCATION See <a href="#">Exploration Plan</a><br>Latitude: 40.3998° Longitude: -116.5229°<br><br>DEPTH | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | Recovery (In.) | FIELD TEST RESULTS | STRENGTH TEST |                            |            | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS<br><br>LL-PL-PI | PERCENT FINES |
|-------------|-------------|--------------------------------------------------------------------------------------------------------|-------------|--------------------------|-------------|----------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|----------------------------------|---------------|
|             |             |                                                                                                        |             |                          |             |                |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) |                   |                       |                                  |               |
| 2           |             | <b>SILTY SAND (SM)</b> , brown, loose to medium dense                                                  | 5           |                          | X           | 20             | 5-8-5<br>N=13      |               |                            |            | 18.5              |                       | NP                               | 33            |
|             |             |                                                                                                        |             |                          |             |                |                    |               |                            |            |                   |                       |                                  |               |
| 1           |             | <b>SANDY LEAN CLAY (CL)</b> , brown, very soft to medium stiff                                         | 10          |                          | X           | 14             | 3-2-3<br>N=5       |               |                            |            | 20.6              |                       |                                  |               |
|             |             |                                                                                                        |             |                          |             |                |                    |               |                            |            |                   |                       |                                  |               |
|             |             |                                                                                                        |             |                          |             |                |                    |               |                            |            |                   |                       |                                  |               |
|             |             |                                                                                                        |             |                          | X           | 15             | 3-6-1<br>N=7       |               |                            |            |                   |                       |                                  |               |
|             |             |                                                                                                        |             |                          | X           | 20             | 2-0-1<br>N=1       |               |                            |            | 32.8              |                       |                                  |               |
|             |             | <b>Boring Terminated at 11.5 Feet</b>                                                                  |             |                          |             |                |                    |               |                            |            |                   |                       |                                  |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

While drilling

**Terracon**  
6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 08-30-2022

Boring Completed: 08-30-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 61225159 RAILPROS - CORTEZ.GPJ TERRACON\_DATATEMPLATE.GDT 10/18/22

# BORING LOG NO. C-6

Page 1 of 2

**PROJECT:** RailPros - Cortez Route - Alignment Alternatives

**CLIENT:** RailPros  
Layton, UT

**SITE:**  
Carlin, NV

| MODEL LAYER | GRAPHIC LOG | LOCATION    See <a href="#">Exploration Plan</a><br><br>Latitude: 40.4004° Longitude: -116.5165°<br><br>DEPTH | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | Recovery (In.)  | FIELD TEST RESULTS | STRENGTH TEST |                            |            | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTEBERG LIMITS |  | PERCENT FINES |
|-------------|-------------|---------------------------------------------------------------------------------------------------------------|-------------|--------------------------|-------------|-----------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|-----------------|--|---------------|
|             |             |                                                                                                               |             |                          |             |                 |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) |                   |                       | LL-PL-PI        |  |               |
| 2           |             | <b>POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)</b> , tan, medium dense                                    | 5           |                          |             |                 |                    |               |                            |            |                   |                       |                 |  |               |
|             |             | <b>SILTY SAND (SM)</b> , trace gravel, tan, medium dense                                                      |             | X                        | 2           | 9-11-10<br>N=21 |                    |               |                            |            |                   |                       |                 |  |               |
|             |             |                                                                                                               |             | X                        | 10          | 3-8-10<br>N=18  |                    |               | 22.8                       |            | NP                | 41                    |                 |  |               |
|             |             |                                                                                                               |             | X                        | 7           | 9-8-9<br>N=17   |                    |               |                            |            |                   |                       |                 |  |               |
| 1           |             | <b>POORLY GRADED GRAVEL WITH CLAY AND SAND (GP-GC)</b> , tan, loose to medium dense                           | 10          |                          | X           | 1               | 8-4-3<br>N=7       |               |                            |            |                   |                       |                 |  |               |
|             |             |                                                                                                               |             |                          |             |                 |                    |               |                            |            |                   |                       |                 |  |               |
|             |             | <b>ELASTIC SILT WITH SAND (MH)</b> , brown, stiff to hard, mineralization stains                              | 15          | X                        | 14          | 5-9-8           |                    |               | 35.4                       |            |                   |                       |                 |  |               |
|             |             |                                                                                                               | X           | 15                       | 17-20-23    |                 |                    | 30.0          |                            | 80-39-41   | 84                |                       |                 |  |               |
|             |             |                                                                                                               | 25          |                          |             |                 |                    |               |                            |            |                   |                       |                 |  |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
ODEX

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

Groundwater not encountered while drilling

**Terracon**

6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 09-01-2022

Boring Completed: 09-01-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 61225159 RAILPROS - CORTEZ.GPJ TERRACON\_DATATEMPLATE.GDT 10/18/22

# BORING LOG NO. C-6

Page 2 of 2

**PROJECT: RailPros - Cortez Route - Alignment Alternatives**

**CLIENT: RailPros Layton, UT**

**SITE: Carlin, NV**

| MODEL LAYER | GRAPHIC LOG                                                                       | LOCATION See <a href="#">Exploration Plan</a><br>Latitude: 40.4004° Longitude: -116.5165°                              | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | Recovery (In.) | FIELD TEST RESULTS | STRENGTH TEST |                            |            | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS<br>LL-PL-PI | PERCENT FINES |
|-------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|-------------|----------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|---------------|
|             |                                                                                   |                                                                                                                        |             |                          |             |                |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) |                   |                       |                              |               |
| 1           |  | DEPTH<br><b>ELASTIC SILT WITH SAND (MH)</b> , brown, stiff to hard, mineralization stains ( <i>continued</i> )<br>26.5 |             |                          |             | 18             | 6-7-8              |               |                            |            |                   |                       |                              |               |
|             |                                                                                   | <b>Boring Terminated at 26.5 Feet</b>                                                                                  |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
ODEX

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

Groundwater not encountered while drilling

**Terracon**  
6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 09-01-2022

Boring Completed: 09-01-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

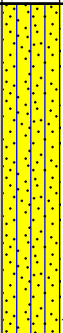
# BORING LOG NO. C-7

Page 1 of 1

**PROJECT:** RailPros - Cortez Route - Alignment Alternatives

**CLIENT:** RailPros  
Layton, UT

**SITE:**  
Carlin, NV

| MODEL LAYER | GRAPHIC LOG                                                                        | LOCATION See <a href="#">Exploration Plan</a><br>Latitude: 40.4317° Longitude: -116.4958° | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | Recovery (In.) | FIELD TEST RESULTS | STRENGTH TEST |                            |            | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS<br>LL-PL-PI | PERCENT FINES |
|-------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------|--------------------------|-------------|----------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|---------------|
|             |                                                                                    |                                                                                           |             |                          |             |                |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) |                   |                       |                              |               |
| 2           |   | <b>SILTY SAND (SM)</b> , brown, medium stiff                                              | 5           |                          |             | 6              | 1-2-3<br>N=5       | UU            |                            |            | 9.1               |                       | NP                           | 25            |
|             |                                                                                    |                                                                                           |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |                                                                                    |                                                                                           |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |                                                                                    |                                                                                           |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |                                                                                    |                                                                                           |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |  | <b>CLAYEY SAND (SC)</b> , trace gravel, light tan, medium dense to dense                  | 10          |                          |             | 14             | 31-47-30<br>N=77   |               |                            |            | 7.7               |                       |                              |               |
|             |                                                                                    |                                                                                           |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |                                                                                    |                                                                                           |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |                                                                                    |                                                                                           |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |
|             |                                                                                    | <b>Auger Refusal at 14.5 Feet</b>                                                         |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

Groundwater not encountered while drilling

**Terracon**  
6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 08-30-2022

Boring Completed: 08-30-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 61225159 RAILPROS - CORTEZ.GPJ TERRACON\_DATATEMPLATE.GDT 10/18/22

# BORING LOG NO. C-8

Page 1 of 1

**PROJECT:** RailPros - Cortez Route - Alignment Alternatives

**CLIENT:** RailPros  
Layton, UT

**SITE:**  
Carlin, NV

| MODEL LAYER | GRAPHIC LOG                                                                        | LOCATION    See <a href="#">Exploration Plan</a><br><br>Latitude: 40.5677° Longitude: -116.4661°<br><br>DEPTH | DEPTH (Ft.) | WATER LEVEL<br>OBSERVATIONS | SAMPLE TYPE                                                                       | Recovery (In.)   | FIELD TEST<br>RESULTS | STRENGTH TEST |                                  |            | WATER<br>CONTENT (%) | DRY UNIT<br>WEIGHT (pcf) | ATTERBERG<br>LIMITS | PERCENT FINES |
|-------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------|-----------------------------|-----------------------------------------------------------------------------------|------------------|-----------------------|---------------|----------------------------------|------------|----------------------|--------------------------|---------------------|---------------|
|             |                                                                                    |                                                                                                               |             |                             |                                                                                   |                  |                       | TEST TYPE     | COMPRESSIVE<br>STRENGTH<br>(tsf) | STRAIN (%) |                      |                          | LL-PL-PI            |               |
| 1           |   | <b><u>SANDY FAT CLAY (CH)</u></b> , tan, soft                                                                 | 5           |                             |  | 22               |                       | 0-2-1<br>N=3  |                                  |            |                      |                          | 53-25-28            | 70            |
|             |                                                                                    |                              |             |                             | 8                                                                                 |                  |                       |               |                                  |            |                      |                          |                     |               |
| 2           |  | <b><u>SILTY SAND WITH GRAVEL (SM)</u></b> , tan, medium dense                                                 | 10          |                             |  | 14               | 11-15-14<br>N=29      |               |                                  |            |                      |                          |                     |               |
|             |                                                                                    |                              |             |                             | 10                                                                                | 7-11-11<br>N=22  |                       |               |                                  |            |                      |                          |                     |               |
|             |                                                                                    |                            |             |                             |                                                                                   |                  |                       |               |                                  |            |                      |                          |                     |               |
|             |                                                                                    |                            |             |                             | 13                                                                                | 12-12-15<br>N=27 |                       |               |                                  |            |                      |                          |                     |               |
|             |                                                                                    | <b><i>Boring Terminated at 16.5 Feet</i></b>                                                                  |             |                             |                                                                                   |                  |                       |               |                                  |            |                      |                          |                     |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
Auger

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

Groundwater not encountered while drilling

**Terracon**

6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 08-30-2022

Boring Completed: 08-30-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 61225159 RAILPROS - CORTEZ.GPJ TERRACON\_DATATEMPLATE.GDT 10/18/22

# BORING LOG NO. CA-1

Page 1 of 2

**PROJECT:** RailPros - Cortez Route - Alignment Alternatives

**CLIENT:** RailPros Layton, UT

**SITE:**  
Carlin, NV

| MODEL LAYER | GRAPHIC LOG | LOCATION See <a href="#">Exploration Plan</a><br><br>Latitude: 40.7119° Longitude: -116.1322°<br><br>DEPTH    | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | Recovery (In.) | FIELD TEST RESULTS | STRENGTH TEST |                            |             | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS | PERCENT FINES |
|-------------|-------------|---------------------------------------------------------------------------------------------------------------|-------------|--------------------------|-------------|----------------|--------------------|---------------|----------------------------|-------------|-------------------|-----------------------|------------------|---------------|
|             |             |                                                                                                               |             |                          |             |                |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%)  |                   |                       | LL-PL-PI         |               |
| 2           |             | <b>SILTY SAND (SM)</b> , brown, loose to medium dense, contains pinholes, mineralization and oxidation stains | 5           |                          |             | 12             | 4-6-7<br>N=13      |               |                            |             | 20.7              |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |             |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |             |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |             |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |             |                   |                       |                  |               |
| 1           |             | <b>LEAN CLAY WITH SAND (CL)</b> , brown, hard, oxidation stains                                               | 20          |                          |             | 16             | 19-40-40           |               |                            | 6.2<br>33.5 |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |             |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |             |                   |                       |                  |               |
| 2           |             | <b>CLAYEY GRAVEL WITH SAND (GC)</b> , brown, dense, oxidation stains                                          | 25          |                          |             |                |                    |               |                            |             |                   |                       |                  |               |
|             |             |                                                                                                               |             |                          |             |                |                    |               |                            |             |                   |                       |                  |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
ODEX

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

Groundwater not encountered while drilling

**Terracon**  
6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 09-01-2022

Boring Completed: 09-01-2022

Drill Rig: 7822DT

Driller: DPS

Project No.: 61225159

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_61225159 RAILPROS - CORTEZ.GPJ TERRACON\_DATATEMPLATE.GDT 10/18/22

# BORING LOG NO. CA-1

Page 2 of 2

**PROJECT:** RailPros - Cortez Route - Alignment Alternatives

**CLIENT:** RailPros  
Layton, UT

**SITE:**  
Carlin, NV

| MODEL LAYER | GRAPHIC LOG | LOCATION See <a href="#">Exploration Plan</a><br>Latitude: 40.7119° Longitude: -116.1322°<br><br>DEPTH | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | Recovery (In.) | FIELD TEST RESULTS | STRENGTH TEST |                            |            | WATER CONTENT (%) | DRY UNIT WEIGHT (pcf) | ATTERBERG LIMITS<br>LL-PL-PI | PERCENT FINES |
|-------------|-------------|--------------------------------------------------------------------------------------------------------|-------------|--------------------------|-------------|----------------|--------------------|---------------|----------------------------|------------|-------------------|-----------------------|------------------------------|---------------|
|             |             |                                                                                                        |             |                          |             |                |                    | TEST TYPE     | COMPRESSIVE STRENGTH (tsf) | STRAIN (%) |                   |                       |                              |               |
| 1           |             | <b>SANDY LEAN CLAY WITH GRAVEL (CL)</b> , brown, hard, oxidation stains<br>26.5                        |             |                          |             | 21             | 18-58-73           |               |                            |            | 8.4               |                       |                              |               |
|             |             | <b>Boring Terminated at 26.5 Feet</b>                                                                  |             |                          |             |                |                    |               |                            |            |                   |                       |                              |               |

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
ODEX

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (If any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See [Supporting Information](#) for explanation of symbols and abbreviations.

## WATER LEVEL OBSERVATIONS

Groundwater not encountered while drilling

**Terracon**  
6949 S High Tech Dr Ste 100  
Midvale, UT

Boring Started: 09-01-2022

Boring Completed: 09-01-2022

Drill Rig: 7822DT

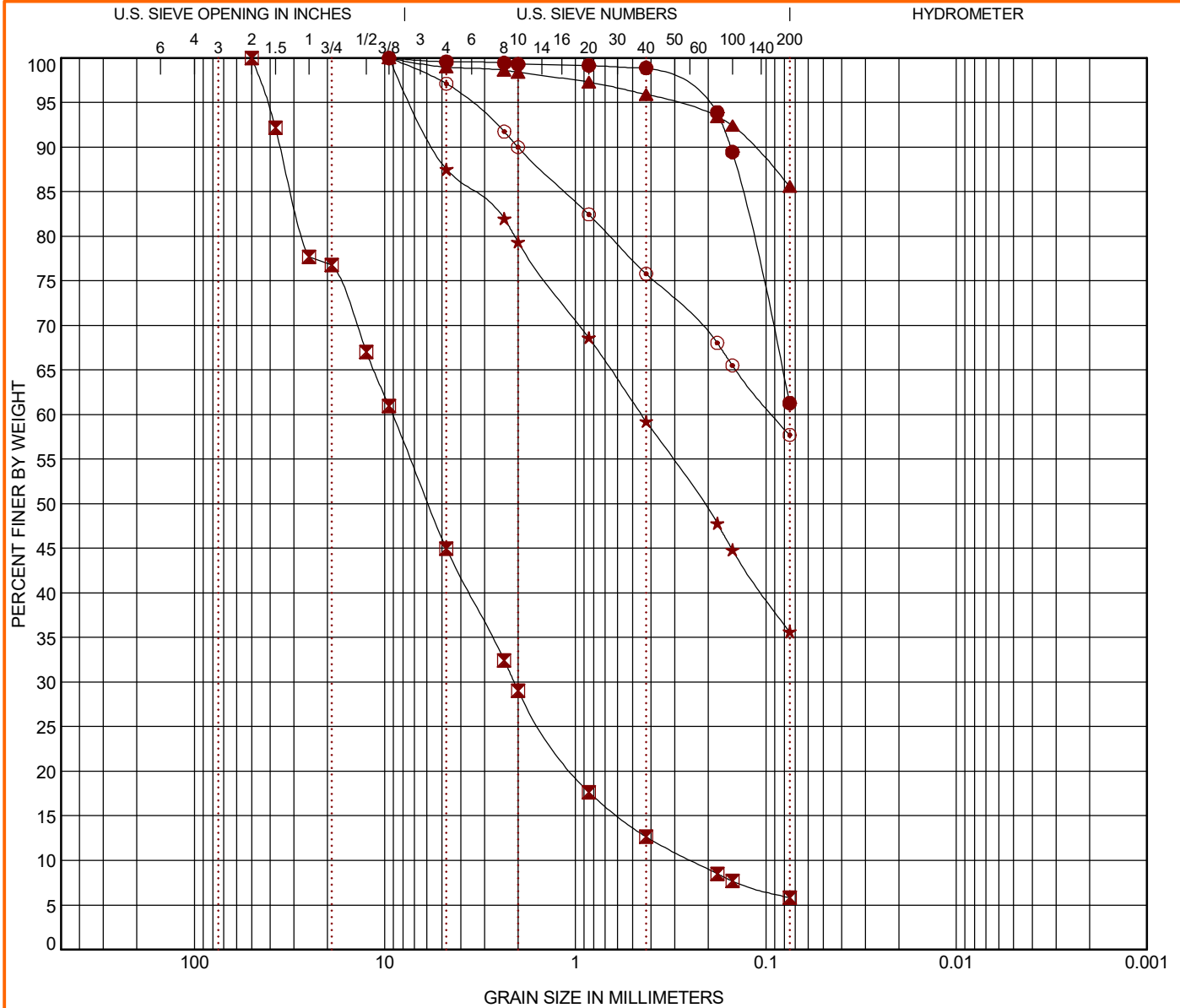
Driller: DPS

Project No.: 61225159

# GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 61225159 RAILPROS - CORTEZ GPJ TERRACON DATATEMPLATE.GDT 10/18/22



| COBBLES | GRAVEL |      | SAND   |        |      | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
|         | coarse | fine | coarse | medium | fine |              |

| Boring ID | Depth (Ft) | USCS Classification                           |                 |                 |                 | WC (%)   | LL      | PL    | PI    | Cc     | Cu    |
|-----------|------------|-----------------------------------------------|-----------------|-----------------|-----------------|----------|---------|-------|-------|--------|-------|
| ● B-1     | 5 - 6.5    | SANDY LEAN CLAY (CL)                          |                 |                 |                 |          | 37      | 24    | 13    |        |       |
| ⊠ B-2     | 7.5 - 9    | WELL-GRADED GRAVEL with CLAY and SAND (GW-GC) |                 |                 |                 |          | 26      | 15    | 11    | 1.96   | 37.06 |
| ▲ B-3     | 10 - 11.5  | SILTY CLAY (CL-ML)                            |                 |                 |                 |          | 27      | 21    | 6     |        |       |
| ★ B-4     | 2.5 - 4    | SILTY SAND (SM)                               |                 |                 |                 |          | NP      | NP    | NP    |        |       |
| ⊙ C-1     | 2.5 - 4.5  | SANDY LEAN CLAY (CL)                          |                 |                 |                 |          | 29      | 19    | 10    |        |       |
| Boring ID | Depth (Ft) | D <sub>100</sub>                              | D <sub>60</sub> | D <sub>30</sub> | D <sub>10</sub> | %Cobbles | %Gravel | %Sand | %Silt | %Fines | %Clay |
| ● B-1     | 5 - 6.5    | 9.5                                           |                 |                 |                 | 0.0      | 0.4     | 38.3  |       | 61.3   |       |
| ⊠ B-2     | 7.5 - 9    | 50                                            | 9.1             | 2.095           | 0.246           | 0.0      | 55.0    | 39.1  |       | 5.8    |       |
| ▲ B-3     | 10 - 11.5  | 9.5                                           |                 |                 |                 | 0.0      | 1.0     | 13.4  |       | 85.6   |       |
| ★ B-4     | 2.5 - 4    | 9.5                                           | 0.45            |                 |                 | 0.0      | 12.5    | 51.9  |       | 35.7   |       |
| ⊙ C-1     | 2.5 - 4.5  | 9.5                                           | 0.092           |                 |                 | 0.0      | 2.9     | 39.4  |       | 57.7   |       |

PROJECT: RailPros - Cortez Route - Alignment Alternatives

SITE: Carlin, NV

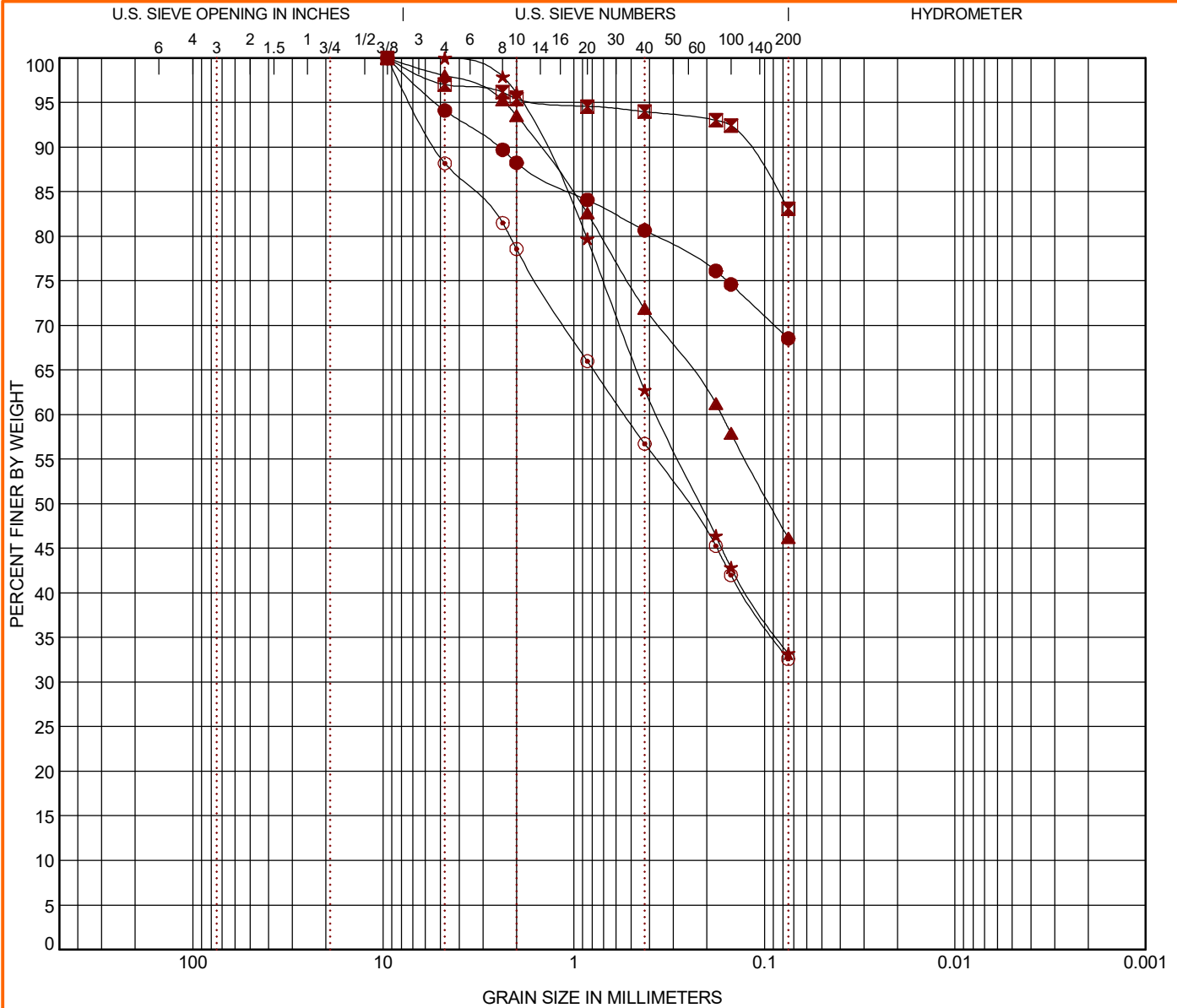
**Terracon**  
6949 S High Tech Dr Ste 100  
Midvale, UT

PROJECT NUMBER: 61225159

CLIENT: RailPros  
Layton, UT

# GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



| COBBLES | GRAVEL |      | SAND   |        |      | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
|         | coarse | fine | coarse | medium | fine |              |

| Boring ID |            | Depth (Ft)       | USCS Classification  |                 |                 |          |         | WC (%) | LL    | PL     | PI    | Cc | Cu |
|-----------|------------|------------------|----------------------|-----------------|-----------------|----------|---------|--------|-------|--------|-------|----|----|
| ●         | C-2        | 5 - 6.5          | SANDY LEAN CLAY (CL) |                 |                 |          |         |        | 30    | 22     | 8     |    |    |
| ☒         | C-2        | 10 - 11.5        | SILT with SAND (ML)  |                 |                 |          |         |        | NP    | NP     | NP    |    |    |
| ▲         | C-3        | 2.5 - 4          | CLAYEY SAND (SC)     |                 |                 |          |         |        | 30    | 20     | 10    |    |    |
| ★         | C-4        | 5 - 6.5          | SILTY SAND (SM)      |                 |                 |          |         | 29.7   | 37    | 29     | 8     |    |    |
| ⊙         | C-5        | 2.5 - 4          | SILTY SAND (SM)      |                 |                 |          |         |        | NP    | NP     | NP    |    |    |
| Boring ID | Depth (Ft) | D <sub>100</sub> | D <sub>60</sub>      | D <sub>30</sub> | D <sub>10</sub> | %Cobbles | %Gravel | %Sand  | %Silt | %Fines | %Clay |    |    |
| ●         | C-2        | 5 - 6.5          | 9.5                  |                 |                 | 0.0      | 5.9     | 25.6   |       | 68.5   |       |    |    |
| ☒         | C-2        | 10 - 11.5        | 9.5                  |                 |                 | 0.0      | 3.0     | 13.9   |       | 83.1   |       |    |    |
| ▲         | C-3        | 2.5 - 4          | 9.5                  | 0.168           |                 | 0.0      | 2.0     | 51.9   |       | 46.2   |       |    |    |
| ★         | C-4        | 5 - 6.5          | 4.75                 | 0.368           |                 | 0.0      | 0.0     | 66.8   |       | 33.2   |       |    |    |
| ⊙         | C-5        | 2.5 - 4          | 9.5                  | 0.543           |                 | 0.0      | 11.8    | 55.6   |       | 32.6   |       |    |    |

PROJECT: RailPros - Cortez Route - Alignment Alternatives

SITE: Carlin, NV

**Terracon**  
6949 S High Tech Dr Ste 100  
Midvale, UT

PROJECT NUMBER: 61225159

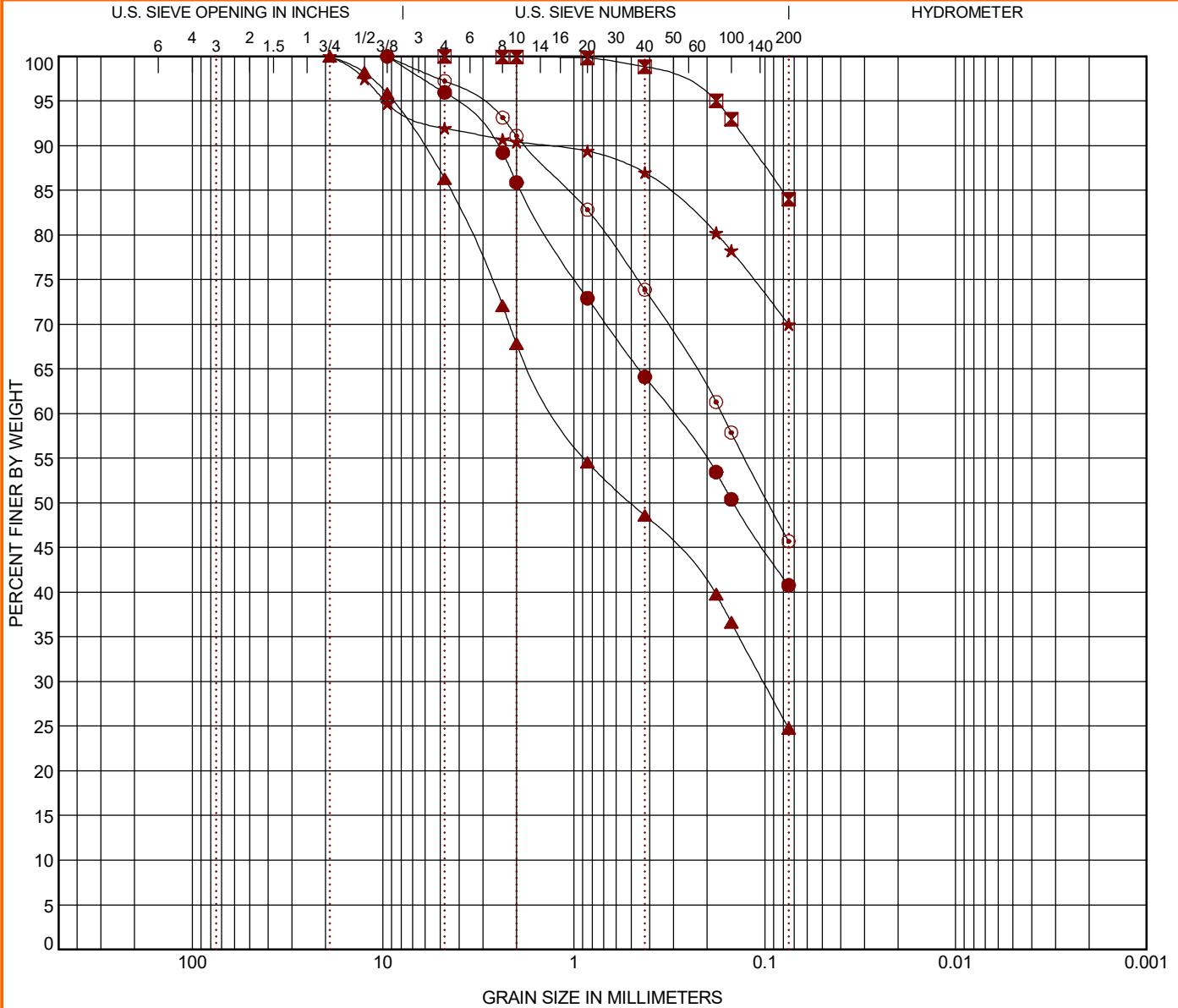
CLIENT: RailPros  
Layton, UT

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 61225159 RAILPROS - CORTEZ.GPJ TERRACON\_DATATEMPLATE.GDT 10/18/22

# GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 61225159 RAILPROS - CORTEZ GPJ TERRACON DATATEMPLATE.GDT 10/18/22



| COBBLES | GRAVEL |      | SAND   |        |      | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
|         | coarse | fine | coarse | medium | fine |              |

| Boring ID | Depth (Ft) | USCS Classification         |                 |                 |                 | WC (%)   | LL      | PL    | PI    | Cc     | Cu    |
|-----------|------------|-----------------------------|-----------------|-----------------|-----------------|----------|---------|-------|-------|--------|-------|
| ● C-6     | 5 - 6.5    | SILTY SAND (SM)             |                 |                 |                 |          | NP      | NP    | NP    |        |       |
| ☒ C-6     | 20 - 21.5  | ELASTIC SILT with SAND (MH) |                 |                 |                 |          | 80      | 39    | 41    |        |       |
| ▲ C-7     | 5 - 7      | SILTY SAND (SM)             |                 |                 |                 |          | NP      | NP    | NP    |        |       |
| ★ C-8     | 2.5 - 4.5  | SANDY FAT CLAY (CH)         |                 |                 |                 |          | 53      | 25    | 28    |        |       |
| ⊙ CA-1    | 5 - 6.5    | SILTY SAND (SM)             |                 |                 |                 |          | NP      | NP    | NP    |        |       |
| Boring ID | Depth (Ft) | D <sub>100</sub>            | D <sub>60</sub> | D <sub>30</sub> | D <sub>10</sub> | %Cobbles | %Gravel | %Sand | %Silt | %Fines | %Clay |
| ● C-6     | 5 - 6.5    | 9.5                         | 0.305           |                 |                 | 0.0      | 4.0     | 55.2  |       | 40.8   |       |
| ☒ C-6     | 20 - 21.5  | 4.75                        |                 |                 |                 | 0.0      | 0.0     | 16.0  |       | 84.0   |       |
| ▲ C-7     | 5 - 7      | 19                          | 1.208           | 0.102           |                 | 0.0      | 13.7    | 61.5  |       | 24.8   |       |
| ★ C-8     | 2.5 - 4.5  | 19                          |                 |                 |                 | 0.0      | 8.0     | 22.0  |       | 70.0   |       |
| ⊙ CA-1    | 5 - 6.5    | 9.5                         | 0.168           |                 |                 | 0.0      | 2.8     | 51.5  |       | 45.7   |       |

PROJECT: RailPros - Cortez Route - Alignment Alternatives

SITE: Carlin, NV

**Terracon**  
6949 S High Tech Dr Ste 100  
Midvale, UT

PROJECT NUMBER: 61225159

CLIENT: RailPros  
Layton, UT

# SUMMARY OF LABORATORY RESULTS

| Borehole No. | Depth (ft.) | USCS Soil Class. | In-Situ Properties |                   | Classification         |                  |    | Expansion Testing |                   |                   |                 |               | Corrosivity                      |    |                      | Remarks |                |
|--------------|-------------|------------------|--------------------|-------------------|------------------------|------------------|----|-------------------|-------------------|-------------------|-----------------|---------------|----------------------------------|----|----------------------|---------|----------------|
|              |             |                  | Dry Density (pcf)  | Water Content (%) | Passing #200 Sieve (%) | Atterberg Limits |    |                   | Dry Density (pcf) | Water Content (%) | Surcharge (psf) | Expansion (%) | Expansion Index EI <sub>50</sub> | pH | Resistivity (ohm-cm) |         | Sulfates (ppm) |
|              |             |                  |                    |                   |                        | LL               | PL | PI                |                   |                   |                 |               |                                  |    |                      |         |                |
| B-1          | 2.5         | CL               |                    | 26                |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| B-1          | 5           |                  |                    |                   | 61                     | 37               | 24 | 13                |                   |                   |                 |               |                                  |    |                      |         |                |
| B-1          | 7.5         |                  |                    |                   | 24                     |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| B-2          | 2.5         | GW-GC            |                    | 1                 |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| B-2          | 5           |                  |                    |                   | 2                      |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| B-2          | 7.5         |                  |                    |                   |                        | 6                | 26 | 15                | 11                |                   |                 |               |                                  |    |                      |         |                |
| B-3          | 5           | CL-ML            |                    | 12                |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| B-3          | 10          |                  |                    |                   | 86                     | 27               | 21 | 6                 |                   |                   |                 |               |                                  |    |                      |         |                |
| B-3          | 20          |                  |                    |                   | 12                     |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| B-4          | 2.5         | SM               |                    |                   | 36                     | NP               | NP | NP                |                   |                   |                 |               |                                  |    |                      |         |                |
| B-4          | 7.5         |                  |                    |                   | 24                     |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| B-4          | 7.5         |                  |                    |                   | 11                     |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| B-4          | 15          |                  |                    | 19                |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| B-4          | 20          |                  |                    |                   | 17                     |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| C-1          | 2.5         |                  | CL                 |                   |                        | 58               | 29 | 19                | 10                |                   |                 |               |                                  |    |                      |         |                |
| C-1          | 7.5         |                  |                    |                   | 3                      |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| C-1          | 10          |                  |                    |                   | 10                     |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| C-2          | 2.5         | CL               |                    | 24                |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| C-2          | 5           |                  |                    |                   |                        | 69               | 30 | 22                | 8                 |                   |                 |               |                                  |    |                      |         |                |
| C-2          | 7.5         |                  |                    |                   | 30                     |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| C-2          | 10          | ML               |                    |                   | 83                     | NP               | NP | NP                |                   |                   |                 |               |                                  |    |                      |         |                |
| C-3          | 2.5         |                  | SC                 |                   |                        | 46               | 30 | 20                | 10                |                   |                 |               |                                  |    |                      |         |                |
| C-3          | 5           |                  |                    |                   |                        | 21               |    |                   |                   |                   |                 |               |                                  |    |                      |         |                |
| C-3          | 7.5         |                  |                    |                   | 17                     |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| C-3          | 10          |                  |                    | 21                |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |

## REMARKS

1. Dry Density and/or moisture determined from one or more rings of a multi-ring sample.
2. Visual Classification.
3. Submerged to approximate saturation.
4. Expansion Index in accordance with ASTM D4829-95.
5. Air-Dried Sample

|                                                           |                                                                                                                                                                          |                                |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| PROJECT: RailPros - Cortez Route - Alignment Alternatives | <br>6949 S High Tech Dr Ste 100<br>Midvale, UT<br>PH. 801-545-8500 FAX. 801-545-8600 | PROJECT NUMBER: 61225159       |
| SITE:<br>Carlin, NV                                       |                                                                                                                                                                          | CLIENT: RailPros<br>Layton, UT |
|                                                           |                                                                                                                                                                          | EXHIBIT: B-1                   |

## SUMMARY OF LABORATORY RESULTS

| Borehole No. | Depth (ft.) | USCS Soil Class. | In-Situ Properties |                   | Classification         |                  |    | Expansion Testing |                   |                   |                 |               | Corrosivity                      |    |                      | Remarks |                |
|--------------|-------------|------------------|--------------------|-------------------|------------------------|------------------|----|-------------------|-------------------|-------------------|-----------------|---------------|----------------------------------|----|----------------------|---------|----------------|
|              |             |                  | Dry Density (pcf)  | Water Content (%) | Passing #200 Sieve (%) | Atterberg Limits |    |                   | Dry Density (pcf) | Water Content (%) | Surcharge (psf) | Expansion (%) | Expansion Index EI <sub>50</sub> | pH | Resistivity (ohm-cm) |         | Sulfates (ppm) |
| C-4          | 2.5         |                  |                    | 8                 |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| C-4          | 5           | SM               |                    | 30                | 33                     | 37               | 29 | 8                 |                   |                   |                 |               |                                  |    |                      |         |                |
| C-5          | 2.5         | SM               |                    |                   | 33                     | NP               | NP | NP                |                   |                   |                 |               |                                  |    |                      |         |                |
| C-5          | 5           |                  |                    | 21                |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| C-5          | 10          |                  |                    | 33                |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| C-6          | 5           | SM               |                    |                   | 41                     | NP               | NP | NP                |                   |                   |                 |               |                                  |    |                      |         |                |
| C-6          | 15          | MH               |                    | 35                |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| C-6          | 20          | MH               |                    |                   | 84                     | 80               | 39 | 41                |                   |                   |                 |               |                                  |    |                      |         |                |
| C-7          | 5           | SM               |                    |                   | 25                     | NP               | NP | NP                |                   |                   |                 |               |                                  |    |                      |         |                |
| C-7          | 7.5         |                  |                    | 8                 |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| C-7          | 10          |                  |                    | 7                 |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| C-8          | 2.5         | CH               |                    |                   | 70                     | 53               | 25 | 28                |                   |                   |                 |               |                                  |    |                      |         |                |
| C-8          | 10          |                  |                    | 2                 |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| CA-1         | 2.5         |                  |                    | 21                |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| CA-1         | 5           | SM               |                    |                   | 46                     | NP               | NP | NP                |                   |                   |                 |               |                                  |    |                      |         |                |
| CA-1         | 10          |                  |                    | 14                |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| CA-1         | 20          |                  |                    | 33                |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| CA-1         | 20.5        |                  |                    | 6                 |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |
| CA-1         | 25          | CL               |                    | 8                 |                        |                  |    |                   |                   |                   |                 |               |                                  |    |                      |         | 2              |

### REMARKS

1. Dry Density and/or moisture determined from one or more rings of a multi-ring sample.
2. Visual Classification.
3. Submerged to approximate saturation.
4. Expansion Index in accordance with ASTM D4829-95.
5. Air-Dried Sample

PROJECT: RailPros - Cortez Route - Alignment Alternatives

SITE:  
Carlin, NV

**Terracon**  
6949 S High Tech Dr Ste 100  
Midvale, UT

PH. 801-545-8500

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PROJECT NUMBER: 61225159

CLIENT: RailPros  
Layton, UT

EXHIBIT: B-2

## Supporting Information

Contents:

General Notes

Unified Soil Classification System

Note: All attachments are one page unless noted above.

# GENERAL NOTES

## DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

RailPros - Cortez Route - Alignment Alternatives ■ Carlin, NV  
Terracon Project No. 61225159

| SAMPLING                                                                                                                                                                                                                                                                                                                              | WATER LEVEL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | FIELD TESTS                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  Modified Dames & Moore Ring Sampler<br> Shelby Tube<br> Standard Penetration Test |  Water Initially Encountered<br> Water Level After a Specified Period of Time<br> Water Level After a Specified Period of Time<br> Cave In Encountered<br><p>Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.</p> | <b>N</b> Standard Penetration Test Resistance (Blows/Ft.)<br><b>(HP)</b> Hand Penetrometer<br><b>(T)</b> Torvane<br><b>(DCP)</b> Dynamic Cone Penetrometer<br><b>UC</b> Unconfined Compressive Strength<br><b>(PID)</b> Photo-Ionization Detector<br><b>(OVA)</b> Organic Vapor Analyzer |

## DESCRIPTIVE SOIL CLASSIFICATION

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

## LOCATION AND ELEVATION NOTES

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See [Exploration and Testing Procedures](#) in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

## RELEVANCE OF SOIL BORING LOG

The soil boring logs contained within this document are intended for application to the project as described in this document. Use of these soil boring logs for any other purpose may not be appropriate.

## Unified Soil Classification System

| Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests <sup>A</sup> |                                                                   |                                                                                 |                                                 | Soil Classification |                                                                          |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------|---------------------|--------------------------------------------------------------------------|
|                                                                                          |                                                                   |                                                                                 |                                                 | Group Symbol        | Group Name <sup>B</sup>                                                  |
| Coarse-Grained Soils: More than 50% retained on No. 200 sieve                            | Gravels: More than 50% of coarse fraction retained on No. 4 sieve | Clean Gravels: Less than 5% fines <sup>C</sup>                                  | Cu≥4 and 1≤Cc≤3 <sup>E</sup>                    | GW                  | Well-graded gravel <sup>F</sup>                                          |
|                                                                                          |                                                                   |                                                                                 | Cu<4 and/or [Cc<1 or Cc>3.0] <sup>E</sup>       | GP                  | Poorly graded gravel <sup>F</sup>                                        |
|                                                                                          |                                                                   | Gravels with Fines: More than 12% fines <sup>C</sup>                            | Fines classify as ML or MH                      | GM                  | Silty gravel <sup>F, G, H</sup>                                          |
|                                                                                          |                                                                   |                                                                                 | Fines classify as CL or CH                      | GC                  | Clayey gravel <sup>F, G, H</sup>                                         |
|                                                                                          | Sands: 50% or more of coarse fraction passes No. 4 sieve          | Clean Sands: Less than 5% fines <sup>D</sup>                                    | Cu≥6 and 1≤Cc≤3 <sup>E</sup>                    | SW                  | Well-graded sand <sup>I</sup>                                            |
|                                                                                          |                                                                   |                                                                                 | Cu<6 and/or [Cc<1 or Cc>3.0] <sup>E</sup>       | SP                  | Poorly graded sand <sup>I</sup>                                          |
|                                                                                          |                                                                   | Sands with Fines: More than 12% fines <sup>D</sup>                              | Fines classify as ML or MH                      | SM                  | Silty sand <sup>G, H, I</sup>                                            |
|                                                                                          |                                                                   |                                                                                 | Fines classify as CL or CH                      | SC                  | Clayey sand <sup>G, H, I</sup>                                           |
| Fine-Grained Soils: 50% or more passes the No. 200 sieve                                 | Silts and Clays: Liquid limit less than 50                        | Inorganic:                                                                      | PI > 7 and plots above “A” line <sup>J</sup>    | CL                  | Lean clay <sup>K, L, M</sup>                                             |
|                                                                                          |                                                                   |                                                                                 | PI < 4 or plots below “A” line <sup>J</sup>     | ML                  | Silt <sup>K, L, M</sup>                                                  |
|                                                                                          |                                                                   | Organic:                                                                        | $\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$ | OL                  | Organic clay <sup>K, L, M, N</sup><br>Organic silt <sup>K, L, M, O</sup> |
|                                                                                          |                                                                   |                                                                                 | Silts and Clays: Liquid limit 50 or more        | Inorganic:          | PI plots on or above “A” line                                            |
|                                                                                          | PI plots below “A” line                                           | MH                                                                              |                                                 |                     | Elastic silt <sup>K, L, M</sup>                                          |
|                                                                                          | Organic:                                                          | $\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$                                 |                                                 | OH                  | Organic clay <sup>K, L, M, P</sup><br>Organic silt <sup>K, L, M, Q</sup> |
|                                                                                          |                                                                   | Highly organic soils: Primarily organic matter, dark in color, and organic odor |                                                 | PT                  | Peat                                                                     |

<sup>A</sup> Based on the material passing the 3-inch (75-mm) sieve.

<sup>B</sup> If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

<sup>C</sup> Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

<sup>D</sup> Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

$$E \quad Cu = D_{60}/D_{10} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

<sup>F</sup> If soil contains  $\geq 15\%$  sand, add "with sand" to group name.

<sup>G</sup> If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

<sup>H</sup> If fines are organic, add "with organic fines" to group name.

<sup>I</sup> If soil contains  $\geq 15\%$  gravel, add "with gravel" to group name.

<sup>J</sup> If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

<sup>K</sup> If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

<sup>L</sup> If soil contains  $\geq 30\%$  plus No. 200 predominantly sand, add "sandy" to group name.

<sup>M</sup> If soil contains  $\geq 30\%$  plus No. 200, predominantly gravel, add "gravelly" to group name.

<sup>N</sup>  $PI \geq 4$  and plots on or above "A" line.

<sup>O</sup>  $PI < 4$  or plots below "A" line.

<sup>P</sup>  $PI$  plots on or above "A" line.

<sup>Q</sup>  $PI$  plots below "A" line.

