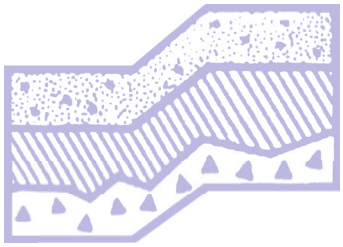
GEOTECHNICAL REPORT

City Heights
Cle Elum, Washington

Project No. T-6504-1



Terra Associates, Inc.

Prepared for:

Trailside Homes
Seattle, Washington

June 9, 2020

TERRA ASSOCIATES, Inc.
Consultants in Geotechnical Engineering, Geology
and
Environmental Earth Sciences

June 9, 2020
Project No. T-6504-1

Mr. Sean Northrop
Trailside Homes
116 ½ South Washington Street
Seattle, Washington 98104

Subject: Geotechnical Report
City Heights
Cle Elum, Washington

References:

1. Preliminary Geology and Geotechnical Evaluation, Proposed City Heights Development, Cle Elum, Washington, prepared by Aspect Consulting, dated July 30, 2009
2. Mine Hazards Subsurface Exploration Data Report, City Heights, Cle Elum, Washington, prepared by Aspect Consulting, dated July 14, 2009
3. Coal Mine Hazards Risk Assessment, Final Report, Cle Elum, Washington, prepared by Sub-Terra Inc., dated October 1, 2009
4. Phase I Environmental Site Assessment, City Heights Development, Cle Elum, Washington, prepared by Aspect Consulting, dated August 18, 2009
5. Memorandum, Coal Waste Rock Sampling and Analysis, City Heights Development, prepared by Aspect Consulting, dated November 23, 2009

Dear Mr. Northrop:

As requested, we have conducted a geotechnical engineering study for the subject project. The attached report presents our findings and recommendations for the geotechnical aspects of project design and construction.

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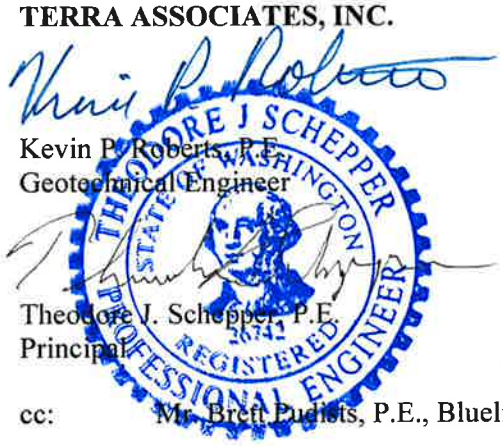
In general, the site is underlain by up to 16 inches of topsoil. Beneath the topsoil, the central and eastern area soils consist of sandstone and siltstone, the upper portion of which has weathered completely to silty sand and silt soil. Glacial outwash and alluvium consisting of sands and gravels with varying amounts of silt. Undocumented fills were observed at the eastern and south-central portions of the site. Loose coal waste fills were identified in our western test pits.

We trust the information presented is sufficient for your current needs. If you have any questions or require additional information, please call.

Sincerely yours,
TERRA ASSOCIATES, INC.

Kevin P. Roberts, P.E.
Geotechnical Engineer



6-9-2020

Theodore J. Schepper, P.E.
Principal

cc: Mr. Brett Pudists, P.E., Blueline

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1.0 PROJECT DESCRIPTION

Blueline prepared and provided us with conceptual site plans for the project's west, central, and east areas dated, respectively, April 2, 2020, March 31, 2020, and March 11, 2020. The proposed project consists of developing the 380-acre property primarily with residential lots in clustered neighborhoods across the site. Associated with these lots will be new roadways and utility infrastructure. Tracts located at the site's south-central and north-central portions are designated for future amenity and commercial use. A trail and park system will also be established throughout the property. Stormwater will be managed using infiltration where feasible with facilities consisting of retention and detention ponds, bio-swales, galleries, and open trenches. Based on the preliminary plans and discussions with the project team, grading to establish roadway and building lot elevations is expected to involve maximum cuts and fills of up to 15 feet. Grade transitions will be accommodated with benching and terracing, sloped embankments, and retaining walls.

Single-family structures are typically one to two stories in height with main floor levels framed over a crawlspace. For structures of this nature, loads would be light, in the range of 2 to 3 kips per foot for bearing walls and 25 to 50 kips for isolated columns. Multi-family structures are typically three or more stories in height with their main floor levels constructed as slabs on grade. Similarly, we anticipate that commercial structures would vary from one to three stories in height with their main floor levels constructed as slab-on grade. Foundation loads for multi-family and commercial structures should be light to moderate, in the range of 3 to 5 kips per foot for bearing walls and 50 to 100 kips for isolated columns

The recommendations contained in the following sections of this report are based on our understanding of these preliminary design features. If actual features vary or changes are made, we should review them in order to modify our recommendations, as required. We should review final design drawings and specifications to verify that our recommendations have been properly interpreted and incorporated into project design.

2.0 SCOPE OF WORK

On November 2 through 5, 2010, we explored subsurface conditions at the site by excavating 75 test pits to a maximum depth of 20 feet. On November 10 and 11, 2010, a geophysical services firm subcontracted to Terra Associates, Inc. performed seismic refraction surveys in specific areas of the site to determine the approximate depth to and density of bedrock. On May 14, 15, and 18, 2020, we returned to the site and excavated 18 additional test pits at planned stormwater pond and road cut locations. Using the information obtained from our subsurface explorations, seismic refraction analyses, and laboratory test results, we performed analyses to develop geotechnical engineering recommendations for project design and construction.

Specifically, this report addresses the following:

- Soil and groundwater conditions.
- Geologically hazardous areas.
- Seismic Site Class per 2018 International Building Code (IBC).
- Site preparation and grading.
- Excavations
- Slopes and embankments.
- Retaining wall alternatives.
- Lateral earth pressures.
- Building foundation support.
- Floor slab-on-grade support.
- Stormwater infiltration.
- Subsurface drainage.
- Utilities
- Pavement design.

It should be noted that the recommendations outlined in this report regarding drainage are associated with soil strength, design earth pressures, erosion, and stability. Design and performance issues with respect to moisture as it relates to the structure environment (i.e., humidity, mildew, mold) are beyond Terra Associates' purview. A building envelope specialist or contractor should be consulted to address these issues, as needed.

3.0 SITE CONDITIONS

3.1 Surface

The site is an irregular shaped 380-acre land parcel located within the northern portion of Cle Elum, Washington. The approximate location of the site is shown on Figure 1.

Topography varies significantly across the site. Two paved roadways, Summit View Road, and Deer Creek Road divide the site into approximate western, central, and eastern areas. Two additional gravel surfaced roads, Sun Ridge Road and Creekside Road, are located at the eastern portion of the site on either side of a relatively steeply sloping, moderately incised ravine identified as Balmers Canyon on National Resource Conservation Service (NRSC) maps. The steeply sloping, deeply incised Deer Creek ravine, extends northwest and southeast through the site. We observed some scouring and erosion within the western bank of the ravine. At the time of our site visits, we observed flow in Deer Creek near the central portion of the site.

A power line utility easement extends westward along the northern property line to Summit View Road then turns to the southeast corner of the site. Unimproved roadways provide access along the easement and are located at portions of the property.

Vegetation in the western two thirds of the site consists of second growth coniferous trees with occasional deciduous trees and a relatively moderate undergrowth of grasses, creeping vines, and brush. Vegetation in the eastern third is predominantly grasses and mid-height brush along with scattered of conifers and deciduous trees.

3.2 Soils

In general, we observed that the site is underlain by up to 16 inches of topsoil or forest duff. Beneath the topsoil/duff layer, test pits east of Summit View Road generally found residual soil consisting of completely weathered siltstone and sandstone grading to highly to slightly weathered siltstone and sandstone. Test pits nearest the southern property boundary and side slopes of existing streams or seasonal streams, found gravel and sand with varying amounts of silt. Test Pits TP-37 and TP-38 found soft, undocumented fill to depths of 11 and 6 feet below existing surface grades, respectively. The fill consists of a 7- to 4.5-foot thick layer of silt with sand and occasional siltstone fragments overlying organics with silt. Fill soils were also observed to depths ranging from five feet to 14 feet during excavation of Test Pits TP-113 through TP-116. These fills consist of coal tailings/waste, silty sand and silty gravel that vary in relative density from very loose to dense.

West of Summit View Road, test pits generally found silty sand with gravel overlying gravel with sand and varying amounts silt. Test pits nearest Summit View Road and the northern property line encountered weak, highly weathered to medium strong, moderately to slightly weathered siltstone and sandstone. Uncontrolled fill was observed in Test Pits TP-61 through TP-64, and TP-68 overlying outwash deposits. The fill in this area consists of coal waste. Test Pit TP-61 excavated within an existing berm surrounding a graded area known as a coal waste pile, found the coal to be blocky, having numerous void spaces. Test pits excavated within the graded area below the berm found the coal to be highly degraded, resembling a fine grained sandy soil. The coal is in a loose unconsolidated condition and was observed to depths ranging from 6 to 16 feet.

The siltstone and sandstone bedrock are generally weak and highly weathered becoming medium strong and slightly weathered with depth. Several of the test pits were terminated due to excavator refusal in massive rock. Rock outcrops are visible on the slopes in the central portion of the property along the southern boundary known as “Slick Rock” and along Creekside toward the Forest Ridge Development above the northeast corner of the project site.

Detailed descriptions of the subsurface conditions encountered at the test pits are summarized on the Test Pit Logs in Appendix A. The approximate test pit and boring locations are shown on Figures 2a, 2b, and 2c.

The Geologic Map of the Wenatchee 1:100,000 Quadrangle, Central Washington, by R.W. Tabor, R.B. Waitt Jr., V.A. Fizzell Jr., D.A. Swanson, G.R Byerly, and R.D. Bentley (1982), maps the soils at the site as the Roslyn Formation (Tru). The Roslyn Formation is said to consist of medium to fine grained weathered sandstone cemented with calcite in areas, siltstone, and thin bedded to laminated. Well jointed bands of bituminous coal. The native weathered to unweathered rock conditions observed east of the roadway Summit View is consistent with this mapped description. West of Summit View Road, our test pits generally found soils that would more accurately be described or mapped as Manmade Fill and Modified Land (mf), Alluvium of the Yakima Valley, or Ronald Subdrift (Qy to Qlrm). Our explorations also found granular, boulder to pebble size deposits nearest existing streams, Crystal Creek and Deer Creek, best described as Sidestream Alluvium (Qs). A site specific generalized geologic map has been prepared for this report and is included as Figure 3.

3.3 Groundwater

Light to moderate groundwater seepage was observed at depths of 10 feet and 12 feet during excavation of Test Pits TP-107 and TP-108, respectively. No groundwater was observed in any of the other test pits during our 2010 and 2020 field efforts. We noted, reddish colored soils and completely weathered stone indicating the presence of seasonally fluctuating groundwater levels at some site locations.

Fluctuations in groundwater seepage levels will occur and should be expected on a seasonal and annual basis. Typically, groundwater seepage reaches maximum levels during and shortly following the winter season.

4.0 GEOLOGICALLY HAZARDOUS AREAS

Chapter 18.01.030 of the City of Cle Elum Municipal Code (CEMC) defines Geologically hazardous areas that include erosion hazard areas, landslide hazard areas, seismic hazard areas, mine collapse hazard areas and volcanic hazard areas.

4.1 Erosion

Chapter 18.01.030 B. 4. a. of the CEMC defines Erosion Hazard Areas as "… those areas identified by the U.S. Department of Agriculture's Natural Resources Conservation Service as having a "moderate to severe," "severe," or "very severe" rill and inter-rill erosion hazard. Erosion hazard areas are also those areas impacted by shore land and/or stream bank erosion and those areas within a river's channel migration zone."

Review of the NRCS maps indicates that the site is underlain by Mine tailings (137), Nard ashy loam (164), 25 to 45 percent slopes, Roslyn sandy loam (201), 0 to 5 percent slopes, Ampad ashy sandy loam, 5 to 30 percent slopes (166) and Teanaway ashy loam, 0 to 3 percent slopes (1441). Nard ashy loam, 25 to 45 percent slopes which underlies the eastern portion of the site, is listed in the NRCS as having a severe erosion hazard. Accordingly, portions of eastern site locations, as well as ravines having steeply incised slopes are classified as "erosion hazard areas" per CEMC.

In our opinion, the erosion hazard in the development area can be adequately mitigated with proper implementation and maintenance of Best Management Practices (BMPs) for erosion and sedimentation control. BMPs conforming to City of Cle Elum standards should be in place prior to, during, and immediately following clearing and grading activities at the site.

4.2 Landslide

Chapter 18.01.030 B. 4. b. of the CEMC defines Landslide Hazard Areas as "…areas potentially subject to landslides based on a combination of geologic, topographic, and hydrologic factors. They include areas susceptible because of any combination of bedrock, soil, slope (gradient), slope aspect, structure, hydrology, or other factors."

Slopes of 25 percent and greater exist throughout the site. Slopes along the deeply incised ravine and banks of Deer Creek are inclined at up to approximately 70 percent. Shallow landsliding was observed and is documented in the referenced Preliminary Geology and Geotechnical Evaluation prepared by Aspect Consulting.

In our opinion, multiple areas within the site would classify as a Landslide Hazard Area as defined by the CEMC. In general, however, areas planned for development are located at portions of the site having relatively gentle to moderate slope inclinations (less than 30 percent) or a low erosion/landslide hazard.

Appendix G of the City Heights Annexation and Development Agreement (Earth, Soils and Critical Areas) requires a minimum set back of 25 feet from the top of 35 percent and greater slopes. No clearing or grading can occur in this setback. Based on the results of our study, in our opinion, a minimum 15-foot setback from the crest or toe of site slopes inclined at 35 percent or greater would be adequate for protection of the slopes and new structures.

4.3 Seismic

Chapter 18.01.030 B. 4. c. of the CEMC defines Seismic Hazard Areas as "…areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, settlement, soil liquefaction, lateral spreading, or surface faulting. Settlement and soil liquefaction conditions occur in areas underlain by cohesionless, loose, or soft-saturated soils of low density, typically in association with a shallow groundwater table.".

The site is located approximately 12 miles northwest of the Kittitas Valley Faults designated as Class B, reverse faults and approximately 28 miles northeast of the Straight Creek Fault designated as a Class B, dextral, reverse, normal fault (USGS Quaternary fault and fold database). Each fault is inferred to have been active during the Quaternary Period less than 1.6 million years ago. No historic earthquakes (within the last 150 years) have been caused by or associated with deformation or surface rupture along a fault or fold in Washington State.

The site is underlain by fine grained residual soil, highly to slightly weathered siltstone and sandstone, and dense to very dense gravel with varying amounts of silt. Due to the cohesive nature of the fine grained soils and weathered rock, in addition to the density and composition of the granular soils and lack of groundwater in our site explorations, it is our opinion that the hazard for seismically induced liquefaction at the site is negligible.

Locally exposed steeply inclined rock faces were observed in the portion of the slope designated as "Slick Rock". There is a potential for rock fall at the site during a seismic event; however, it is our opinion that slope stability in this area would not be affected.

Based on our on-site observations, exploration, and document review, it is our opinion, the site does not meet the criteria of a seismic hazard area as defined by the CEMC.

Seismic Site Class

Based on the soil conditions encountered and the local geology, per the 2018 International Building Code (IBC) Site Class "D" should be used in structural design for areas generally underlain by medium dense to dense silty sands and silty gravels. Where bedrock is shallow (areas designated as Roslyn Formation), on Figure 3, Site Class "B" should be used in structural design.

4.4 Mine

Chapter 18.01.030 B. 4. d. of the CEMC defines Mine Hazard Areas as "…those areas underlain by or affected by mine workings such as adits, gangways, tunnels, drifts, or airshafts, and those areas of probable sink holes, gas releases, or subsidence due to mine workings."

The site is known to be underlain almost entirely by mine workings. Site specific analysis and exploration has been completed in relation to the potential mine hazards at the site. The referenced Coal Mine Hazards Risk Assessment by SubTerra, Inc., and the Mine Hazards Subsurface Exploration Data Report by Aspect Consulting specifically address this potential hazard. All recommendations and mitigation procedures should adhere to those outlined in the Sub Terra, Inc. report.

4.5 Volcanic

Chapter 18.01.030 B. 4. e. of the CEMC defines Volcanic Hazard Areas as "…areas subject to pyroclastic flows, lava flows, debris avalanche, and inundation by debris flows, lahars, mudflows, or related flooding resulting from volcanic activity."

Mount Rainer is considered to be the most dangerous volcano in the Cascade Range because of its tendency to generate mud flows coupled with the density of the population in the river valleys around the volcano. According to *Plate II, Open-File Report (OFR 98-428) Map A: Total Cascades Tephra Hazards* contained in the *Volcano Hazards from Mount Rainier, Washington, Revised 1998* by Hoblitt et al., the site is within an area that is estimated to have an "annual probability of the deposition of 1 centimeter or more of tephra from any of the major Cascade volcano's" of 0.1 to 0.2 percent.

Based on our document review, and due to the unknown and unpredictable nature of a volcanic eruption and the relatively minor secondary effects posed to the site, it is our opinion that the volcanic hazard at the site is low.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 General

Based on our study, over the majority of the project site, there are no geotechnical conditions that preclude the planned development. Residential and commercial structures can be supported on conventional spread footings bearing on competent native soil or rock subgrades or on structural fill placed above competent native subgrade. Floor slabs can be similarly supported.

Our study indicates that coal waste has been stockpiled at the west end of the site. The coal waste is loose and would not be suitable for support of buildings or new infrastructure. Additionally, analytical testing indicates the waste has a high organic content and as such would be subject to long-term subsidence due to decay and degradation of the organic material. To establish suitable structural support, it will be necessary to remove this material and replace to finish grade elevations with suitable granular structural fill. Alternatively, light to moderately loaded structures along with main utility pipes could be supported on piles.

Excavations east of Summit View Road extending to a depth of 3 to 15 feet below existing site grades will encounter sedimentary bedrock. Difficult excavation requiring hard rock excavation techniques should be expected. Based on conditions observed at the test pits and the results of the seismic refraction survey, the weathered bedrock generally found in the upper 10 to 15 feet of the surface should be readily excavated using conventional modern excavating machinery. Shear wave velocities in this upper weathered material designated as O1 and O2 in the Seismic Refraction Survey report attached as Appendix B, were generally less than 3,400 feet per second (fps). More competent rock, designated as Bx in the report, exhibited velocities in the range of 5500 to 7,800 fps. Based on published data, this rock should be rippable, depending on fracture orientation, using a Caterpillar D8L multi or single No. 8 ripper. The grading contractor should be prepared to implement methods to fracture deeper bedrock using blasting or mechanical breakers in the event existing fracture patterns or absence of fractures (massive rock) preclude using a ripper during excavation.

We anticipate the on-site silty residuum, silt, and silty sand soils will require moisture conditioning to facilitate proper compaction as structural fill. The soils contain a significant percentage of fines such that they will be difficult to compact during earthwork activities. Soil moisture contents during our study were generally dry to moist and we anticipate the grading contractor will need to add moisture to the soils during grading to achieve proper compaction.

Excavated siltstone and sandstone will likely be removed as large rock fragments. We recommend that siltstone and sandstone fragments be reduced to approximately three inches in size when placed as fill during mass grading. This typically can be accomplished by placing the material in thin loose lifts not exceeding six inches and compacting with a heavy-duty sheep's foot compactor.

In our opinion, management of stormwater using infiltration will be feasible in areas underlain by sufficient thicknesses of sand with silt and gravel with silt soils. Silty sand and silty gravel soils that exhibit relatively low silt contents within their classification ranges may be suitable for construction of LID facilities such as rain gardens or bio-swales. Due to variations in silt content of the site's soils, infiltration rates will vary widely across the site.

Detailed recommendations regarding these issues and other geotechnical design considerations are provided in the following sections of this report. These recommendations should be incorporated into the final design drawings and construction specifications.

5.2 Site Preparation and Grading

To prepare the site for construction, all vegetation, organic surface soils, and debris should be stripped from the proposed building and pavement areas. Soils containing organic material will not be suitable for use as structural fill but may be used for limited depths in nonstructural areas or for landscaping purposes. Over the majority of the site, surfacing stripping depths required to remove the organic surface layer will range from 6 to 16 inches.

Once clearing and stripping operations are complete, cuts and fills can be made to establish finished building grades. Prior to placing fill and preparing building subgrades, all exposed surfaces should be observed by a representative of Terra Associates to verify that exposed subgrades are suitable for placement of structural fill or building elements. If excessively yielding or soft soils are observed during grading that cannot be stabilized in place by compaction, they should be cut to firm bearing and filled to grade with structural fill. If the depth of excavation to remove unstable soils is excessive, using a Geotextile fabric, such as Mirafi 500X or equivalent, in conjunction with structural fill should be considered. In general, a minimum of 18 inches of clean granular structural fill over the Geotextile fabric should establish a stable bearing surface.

As discussed earlier, fill soils were observed at Test Pits TP-37 and TP-38 excavated in the far eastern portion of the site. This area is shown on Figure 3 as modified land (mf). The fill is not suitable for support of new fill, buildings, or infrastructure as unacceptable levels of settlement would occur under project loads. Removal and replacement of this material with new structural fill should be planned during mass grading. Similarly, the coal waste area in the western portion of the site is not suitable for support of buildings or infrastructure. This material should be excavated and replaced with new structural fill to establish suitable support for buildings or infrastructure improvements. Analytical testing of the coal waste indicated it contains contaminants in excess of regulated levels and will required special handling procedures during construction. Analytical test results along with discussion regarding handling of this material are summarized in attached Appendix C.

Boulders from cut areas that are larger than 12 inches should be segregated and not placed in shallow fill areas. Boulder placement can be considered in mass fill areas provided the fill depth is three times the thickness of the boulder. We recommend isolating boulders at the base of the fill to prevent "nesting" and creation of voids, and allow adequate compaction of the soil adjacent to the boulder.

As noted earlier, siltstone and sandstone will most likely be excavated as rock fragments measuring three inches and greater. We recommend reducing the size of excavated rock fragments to approximately 3 inches when placed as fill during mass grading. This can be accomplished by placing the material in thin loose lifts not exceeding six inches and compacting with a heavy-duty sheep's foot compactor.

Most of the site soils contain relatively high percentages of fines (silt and clay size particles) and will be difficult to compact as structural fill when wet or dry of their optimum moisture contents. The ability to use the site soils as structural fill will depend on their moisture content and the prevailing weather conditions at the time of construction. Based on the results of laboratory moisture testing, most of the soils observed at our test pits were dry of their optimum moisture range needed for compaction. The grading contractor should be prepared to add water to the soils during mass grading/utility backfilling to facilitate proper compaction as structural fill.

If it becomes necessary to import soil for use as fill or backfill, we recommend importing a granular soil that meets the following grading requirements:

U.S. Sieve Size	Percent Passing
3 inches	100
No. 4	75 maximum
No. 200	5 maximum*

*Based on the 3/4-inch fraction.

Structural fill should be placed in uniform loose layers not exceeding 12 inches and then compacted to a minimum of 95 percent of the soil's maximum dry density, as determined by American Society for Testing and Materials (ASTM) Test Designation D-698 (Standard Proctor). The soil's moisture content at the time of compaction should be kept in the range of approximately two percent of its optimum moisture, as determined by this ASTM standard. In nonstructural areas, the degree of compaction can be reduced to 90 percent.

Where uneven bedrock surfaces are exposed at the foundation or slab-on-grade elevation, we recommend overexcavating the rock to allow for the placement of at least four inches of compacted gravel borrow to provide subgrade uniformity beneath the foundation and floor slab. As a minimum, the gravel borrow should meet the grading requirements recommended for import structural fill above.

5.3 Excavations

All excavations at the site associated with confined spaces, such as utility trenches, retaining walls or lower-level basement walls, must be completed in accordance with local, state, or federal requirements. Based on current Washington Industrial Safety and Health Act (WISHA) regulations, the loose/soft to medium dense residual soils and medium dense silty sand and outwash deposits would be classified as Type C soils. The very dense silty sand soils would be classified as Type A soil. Slightly weathered, medium strong siltstone and sandstone when exposed would generally be classified as stable rock. Due to inconsistencies in rock fracturing, strength and degree of weathering across the site, excavation slopes made in bedrock should be evaluated based on field observations made by the geotechnical engineer during site excavation.

Temporary excavations in Type C soils should have their slopes laid back at an inclination of 1.5:1 (Horizontal:Vertical) or flatter, from the toe to the crest of the slope. Side slopes in Type A soils can be laid back at a slope inclination of 0.75:1 or flatter. For temporary excavation slopes less than eight feet in height in Type A soils, the lower 3.5 feet can be cut vertically, with a 0.75:1 slope graded above. For temporary excavation slopes greater than 8 feet but less than 12 feet in height, the slope above the 3.5-foot vertical portion will need to be laid back at a minimum slope inclination of 1:1. All temporary exposed slopes on excavations that will remain open for an extended time period should be covered with a durable reinforced plastic membrane during construction to prevent slope raveling and rutting during periods of precipitation.

This information is provided solely for the benefit of the owner and other design consultants and should not be construed to imply that Terra Associates, Inc. assumes responsibility for job site safety. It is understood that job site safety is the sole responsibility of the project contractor.

5.4 Slopes and Embankments

All permanent cut and fill slopes should be graded with a finished inclination of no steeper than 2:1 (Horizontal:Vertical). Steeper inclinations may be possible where permanent slopes are cut into bedrock. We should evaluate long-term stability of slope cuts in rock on a case-by-case basis.

Upon completion of grading, the slope face should be appropriately vegetated or provided with other physical means to guard against erosion. Final grades at the top of the slope must promote surface drainage away from the slope crest. Water must not be allowed to flow uncontrolled over the slope face. If surface runoff must be directed towards the slope, the runoff should be controlled at the top of the slope, piped in a closed conduit installed on the slope face, and taken to an appropriate point of discharge beyond the toe.

All fill placed for embankment construction should meet the structural fill requirements in Section 5.2 of this report. In addition, if the new fills will be placed over existing slopes inclined at 20 percent or greater, the structural fill should be keyed and benched into competent native slope soils. Figure 4 presents a typical slope key and bench configuration. At minimum, a toe drain should be installed in the key cut as shown on Figure 4. Depending on seepage conditions, drains may also be required along individual benches excavated on the slope face. The need for drains along the upper benches will be best determined in the field at the time of construction.

If ravines that have been identified as seasonal streams or have the potential for becoming a water course in its post development condition will be filled for road and lot grading, drainage should be installed as shown on Figure 5.

The conceptual plans indicate some of the stormwater ponds will be constructed with fill berms. For pond berm construction, we recommend stripping topsoil, duff, and soils containing organic material prior to the placement of fill. The fill berms should be constructed by placing structural fill in layers no more than 12 inches thick, compacting each layer as structural fill to a minimum of 95 percent of the soil's maximum dry density, as determined by American Society for Testing and Materials (ASTM) Test Designation D-1557 (Modified Proctor). Material used to construct pond berms should consist of predominately granular soils with a maximum size of 3 inches and a minimum of 20 percent fines. Terra Associates, Inc. should examine and test on-site soils, or imported materials proposed for use as berm fill prior to their use.

Because of exposure to fluctuating stored water levels, soils exposed on the interior side slopes of the ponds may be subject to some risk of periodic shallow instability or sloughing. Establishing interior slopes at a 3:1 gradient will significantly reduce or eliminate this potential. Exterior berm slopes and interior slopes above the maximum water surface should be graded to a finished inclination no steeper than 2:1. Finished slope faces should be thoroughly compacted and vegetated to guard against erosion.

5.5 Foundation Support

In general, native soil conditions throughout the site will be suitable for support of conventional spread footing foundations. Allowable design bearing capacities will be dependent on design elevations with higher bearing capacities typically available in the lower dense to very dense granular soils or moderately to slightly weathered bedrock. For foundations bearing at or near-surface on competent native soils or structural fill placed above competent native soils, we recommend designing foundations for a net allowable bearing capacity of 2,500 pounds per square foot (psf). Foundations bearing on native, dense to very dense granular soils or bedrock can be designed for an allowable soil bearing capacity of 5,000 psf. A one-third increase in these bearing values can be used when considering short-term transitory loading.

Perimeter foundations exposed to the weather should bear at a minimum depth of 30 inches below final exterior grades for frost protection. Interior foundations can be constructed at any convenient depth below the floor slab. For short-term loads, such as wind and seismic, a one-third increase in this allowable capacity can be used.

For designing foundations to resist lateral loads, a base friction coefficient of 0.35 can be used. Passive earth pressures acting on the sides of the footings can also be considered. We recommend calculating this lateral resistance using an equivalent fluid weight of 300 pounds per cubic foot (pcf). We recommend not including the upper 12 inches of soil in this computation because it can be affected by weather or disturbed by future grading activity. This value assumes the foundations will be backfilled with structural fill, as described in Section 5.2 of this report. The values recommended include a safety factor of 1.5.

5.6 Floor Slab-on-Grade Support

Slab-on-grade may be supported on the subgrade prepared as recommended in Section 5.2 of this report. Immediately below the floor slab, we recommend placing a four-inch thick capillary break layer of clean free-draining sand or gravel that has less than three percent passing the No. 200 sieve. This material will reduce the potential for upward capillary movement of water through the underlying soil and subsequent wetting of the floor slab.

The capillary break layer will not prevent moisture intrusion through the slab caused by water vapor transmission. Where moisture by vapor transmission is undesirable, such as covered floor areas, a common practice is to place a durable plastic membrane on the capillary break layer and then cover the membrane with a layer of clean sand or fine gravel to protect it from damage during construction, and aid in uniform curing of the concrete slab. It should be noted that if the sand or gravel layer overlying the membrane is saturated prior to pouring the slab, it will be ineffective in assisting uniform curing of the slab, and can actually serve as a water supply for moisture seeping through the slab with the potential for adverse impacts to floor coverings. Therefore, in our opinion, covering the membrane with a layer of sand or gravel should be avoided if floor slab construction occurs during the wet winter months and the layer cannot be effectively drained. We recommend floor designers and contractors refer to the latest American Concrete Institute (ACI) Manual of Concrete Practice for further information regarding vapor barrier installation below slab-on-grade floors.

5.7 Lateral Earth Pressures for Retaining Walls

The magnitude of earth pressures developing on retaining walls will depend on the quality and compaction of the wall backfill. We recommend placing and compacting wall backfill as structural fill. Below improved areas, such as pavements or floor slabs, the backfill should be compacted to a minimum of 95 percent of its maximum dry unit weight, as determined by ASTM Test Designation D-698 (Standard Proctor). In unimproved areas, the relative compaction can be reduced to 90 percent. To prevent overstressing the walls during backfilling, heavy construction machinery should not be operated within five feet of the wall. Wall backfill in this zone should be compacted with hand-operated equipment.

To prevent hydrostatic pressure development, wall drainage must also be installed. A typical wall drainage detail is shown on Figure 5. All drains should be routed to the storm sewer system or other approved point of controlled discharge.

With wall backfill placed and compacted as recommended and drainage properly installed, we recommend designing unrestrained walls for an active earth pressure equivalent to a fluid weighing 35 pcf. For restrained walls, an additional uniform lateral pressure of 100 psf should be included. An additional loading equivalent to 8H psf, where H is the height of the wall below-grade in feet, can be used to evaluate the wall under seismic loading. These values assume a horizontal backfill condition and that no other surcharge loading, such as traffic, sloping embankments, or adjacent buildings, will act on the wall. If such conditions will exist, then the imposed loading must be included in the wall design.

Friction at the base of foundations and passive earth pressure will provide resistance to these lateral loads. Values for these parameters are provided in Section 5.5 of this report.

5.8 Retaining Wall Alternatives

Retaining walls may be constructed at vertical grade transitions for lots and roadways. Based on our test pits, in our opinion, the site soils will support rockery construction in cuts up to a maximum of four feet in net height. Four-foot rockeries can also be built against structural fill provided the fill is over-built, then cut back prior to rockery placement. A recommended rockery detail is attached as Figure 6.

It should be noted that rockeries are not engineered structures that are designed to retain earth in a manner similar to a cast-in-place concrete wall, gravity block wall or Mechanically Stabilized Earth (MSE) with facing wall systems. Rocks used to construct the wall will by virtue of their mass enhance stability and provide cut face protection; however, the soil against which the rockery is constructed must be inherently stable and able to stand unsupported in a near-vertical condition. Rock size, shape, and quality must meet all Associated Rockery Contractors (ARC) guidelines.

An engineered retaining wall system should be used where wall heights are greater than four feet. Wrap-faced reinforced earth walls faced with rockeries (ten feet in height maximum) or MSE segmental block walls can be considered as well as cast-in-place concrete or gravity block (Ultrablock of Lock Block) walls. Wall backfill must be placed and compacted structurally as recommended in Section 5.2 of this report. Wall drainage must also be provided to prevent hydrostatic loading. With wall backfill composed of suitable on-site granular outwash soils compacted structurally, we recommend using the following soil parameters in wall design:

- Reinforced Earth Wall Systems Facing Granular Soils
    - Soil Unit Weight – 125 pounds per cubic foot (pcf)
    - Soil Friction Angle – 34 degrees
- Gravity Block Wall Systems
    - Equivalent Fluid Pressure – 35 pcf plus uniform seismic loading equal to 8H psf, where H is the height of the wall in feet. This assumes a level backslope and that no other surcharge loading is imposed on the wall.

Wall foundations can be designed for allowable bearing and lateral resistance values recommended in Section 5.5 "Foundation Support".

We can provide retaining wall designs for reinforced rockeries, MSE segmental block walls and gravity block walls, if desired. It should be noted that soils having fines contents of over 30 percent or aggregate in excess of three inches in diameter cannot be used in the reinforced wall backfill zones. Therefore, native silt, sandy silt, or residual bedrock will not be suitable for use in the reinforced zone. The owner should be prepared to borrow suitable materials from other portions of the site or import soil for use in the reinforced backfill zone.

5.9 Stormwater Infiltration

Our evaluation of the feasibility of using infiltration as a means for development stormwater disposal is based on our review of the Test Pit Logs and grain size distribution analyses determined in our laboratory. Barrier soils and bedrock were found throughout the eastern and central portions of the site which, depending on design base-of-facility elevations, will impact or impede stormwater infiltration. We should review the stormwater drainage plans to evaluate infiltration feasibility and provide infiltration rates for each facility. In addition, field Pilot Infiltration Tests will be required to determine final design infiltration rates based on field conditions.

We used Option 3, Soil Grain Size Analysis Method as outlined in Chapter 5.44, Volume V of the Washington State Department of Ecology *2019 Stormwater Management Manual for Western Washington*, to determine preliminary long-term design infiltration rates at areas indicating infiltration feasibility. Based on the sieve analysis results, for preliminary sizing of the infiltration facilities, long-term design infiltration rates vary from 0.8 inches per hour in the vicinity of Test Pits TP-72, 2 in/hr below a depth of 8 feet near Test TP-74, 3.5 in/hr at Test Pit TP-51, and 9 in/hr in the vicinity of Test Pits TP-27 and TP-33.

The permeability of the site's soils will be significantly impacted by the intrusion of soil fines (silt- and clay-sized particles). Even a relatively minor amount of soil fines can reduce the permeability of the formation by a factor of ten. The greatest exposure to soil fines contamination will occur during mass grading and construction. Therefore, we recommend that the Temporary Erosion and Sedimentation Control (TESC) plans route construction stormwater to a location other than the permanent infiltration sites. If this is not possible, the TESC pond bottom elevations should be kept two feet above the final infiltration elevations with final grade established after site areas have been substantially stabilized.

Ponds B1 to H2

On May 14, 15, and 18, 2020, we excavated 2 test pits at each of planned pond locations B-1, B7-B, C, D1, F3, F4, and H2 to assess feasibility for stormwater infiltration. The ponds and associated test pit locations are shown on Figures 2A, 2B, and 2C. For reference during our investigation, each pond's center was surveyed and staked in the field.

The results of our field investigation indicate infiltration as a primary means of stormwater flow control and management will not be feasible at these locations. This is due to the presence of silty gravel and silty sand soils, undocumented fills in Test Pits TP-113 through TP-116 and relatively shallow depths to sandstone/siltstone barrier layers in some of the test pits.

Our field observations indicated some of the above ponds are located on or adjacent to the crests of slopes. In general, we recommend designing ponds on or near the crests of slopes as conventional detention facilities due to the potential for seepage-related slope instability at and downgradient from the pond. Impermeable pond liners may also be required to minimize seepage-related impacts to slopes. As stormwater drainage plans are developed, we should evaluate each pond location for slope stability impacts resulting from pond storage and seepage.

5.10 Drainage

Surface

Final exterior grades should promote free and positive drainage away from the site at all times. Water must not be allowed to pond or collect adjacent to foundations or within the immediate building areas. We recommend providing a gradient of at least three percent for a minimum distance of ten feet from the building perimeters. If this gradient cannot be provided, surface water should be collected adjacent to the structures and disposed to appropriate storm facilities.

Surface water must not be allowed to flow uncontrolled over the crest of the site slopes and embankments. Surface water should be directed away from the slope crests to a point of collection and controlled discharge. If site grades do not allow for directing surface water away from slopes, then water should be collected and tightlined down the slope face in a controlled manner.

Subsurface

We recommend installing perimeter foundation drains adjacent to the shallow foundations. The drains can be laid to grade at an invert elevation equivalent to the bottom of footing grade. The drains can consist of four-inch diameter perforated PVC pipe that is enveloped in washed pea gravel-sized drainage aggregate. The aggregate should extend six inches above and to the sides of the pipe. Roof and foundation drains should be tightlined separately to the storm drains. All drains should be provided with cleanouts at easily accessible locations.

5.11 Utilities

Utility pipes should be bedded and backfilled in accordance with American Public Works Association (APWA) or the applicable jurisdiction's specifications. As a minimum, trench backfill should be placed and compacted as structural fill, as described in Section 5.2 of this report. As noted, most native soils excavated on the site should be suitable for use as backfill material during most weather conditions. However, if importing structural fill is necessary, we recommend using a suitable wet weather fill for utility trench backfilling.

If deep utility construction is planned areas of bedrock at the site, special construction techniques as discussed in Section 5.1 of this report may be required for trench excavation in the bedrock.

5.12 Pavements

Pavement subgrades should be prepared as described in the Section 5.2 of this report. Regardless of the degree of relative compaction achieved, the subgrade must be firm and relatively unyielding before paving. The subgrade should be proofrolled with heavy construction equipment such as a loaded ten-yard dump truck to verify this condition.

The thickness of the various components of the pavement depends not only on the subgrade soils, but also the traffic loading conditions to which the pavement will be subjected. For design, we have assumed the traffic loading can be represented by design 18-kip equivalent single axle loads (ESALs) of 50,000 for light traffic and 500,000 for heavy traffic areas. These ESALs represent traffic loading equivalent to 3 and 30, loaded (80,000 pound gross vehicle weight) tractor-trailer rigs, respectively, traversing the pavement per day over a 20-year design life. If heavier traffic loading or volumes are expected, we should reevaluate the following recommended pavement sections:

With a stable subgrades prepared as recommended, we recommend the following options for pavement sections:

Light Traffic and Parking:

- Two inches of hot mix asphalt (HMA) over four inches of crushed rock base (CRB)
- Full depth HMA – 3 ½ inches

Heavy Traffic:

- Three inches of HMA over 6 inches of CRB
- Full depth HMA – 5 inches

The paving materials used should conform to the current Washington State Department of Transportation (WSDOT) specifications for ½-inch hot mix asphalt (HMA) surfacing and CRB.

Long-term pavement performance will depend on surface drainage. A poorly-drained pavement section will be subject to premature failure as a result of surface water infiltrating into the subgrade soils and reducing their supporting capability. To improve pavement performance, we recommend surface drainage gradients of at least two percent. Some longitudinal and transverse cracking of the pavement surface should be expected over time. Regular maintenance should be planned to seal cracks when they occur.

6.0 ADDITIONAL SERVICES

Terra Associates, Inc. should review the final design and specifications in order to verify that our earthwork and foundation recommendations have been properly interpreted and implemented in project design. We should also provide geotechnical services during construction to observe compliance with our design concepts, specifications, and recommendations. This will allow for design changes if subsurface conditions differ from those anticipated prior to the start of construction.

7.0 LIMITATIONS

This report is the copyrighted property of Terra Associates, Inc. and was prepared in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made. This report is intended for specific application to the City Heights project in Cle Elum, Washington and for the exclusive use of Trailside Homes and their authorized representatives. The conclusions reached in this report should not be extrapolated to other properties in the site vicinity.

The analyses and recommendations presented in this report are based on data obtained from the test pits excavated on-site, seismic analysis performed on-site, and our laboratory testing. Variations in soil conditions can occur, the nature and extent of which may not become evident until construction. If variations appear evident, Terra Associates, Inc. should be requested to reevaluate the recommendations in this report prior to proceeding with construction. Terra Associates, Inc. should be retained to reevaluate the recommendations in this report prior as project grading plans change as well as prior to proceeding with construction.

REFERENCE:MSN MAPS ON-LINE AT WWW.BING.COM/MAPS

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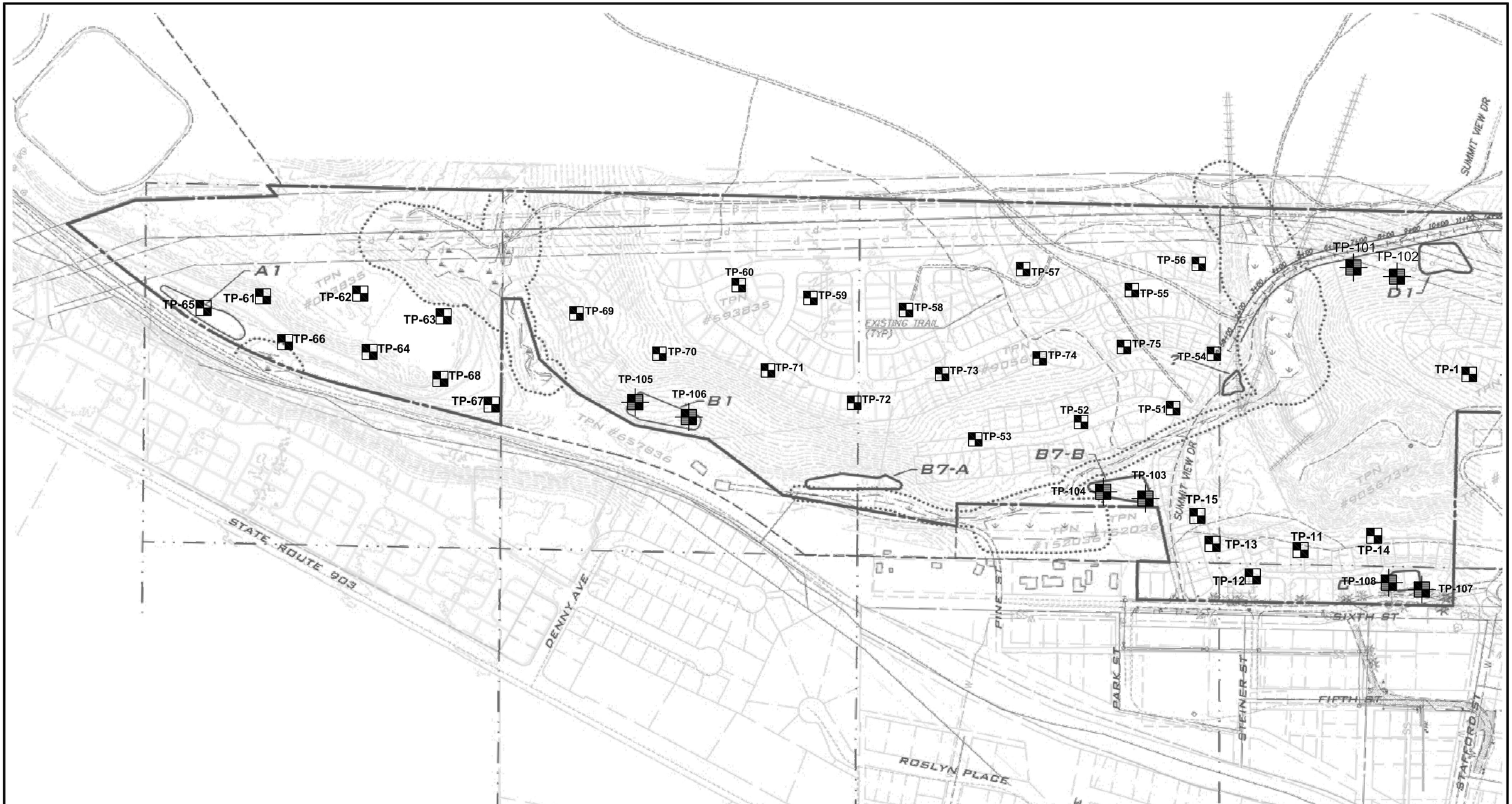
Geology and
Environmental Earth Sciences

VICINITY MAP
CITY HEIGHTS
CLE ELUM, WASHINGTON

Proj.No.T-6504-1	Date:JUNE 2020	Figure 1



NOTE:

THIS SITE PLAN IS SCHEMATIC. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. IT IS INTENDED FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUCTION PURPOSES.

REFERENCE: SITE PLAN PROVIDED BY BLUELINE.

LEGEND:

APPROXIMATE TEST PIT LOCATION NOVEMBER 2010

APPROXIMATE TEST PIT LOCATION MAY 2020

0 350 700

APPROXIMATE SCALE IN FEET

N

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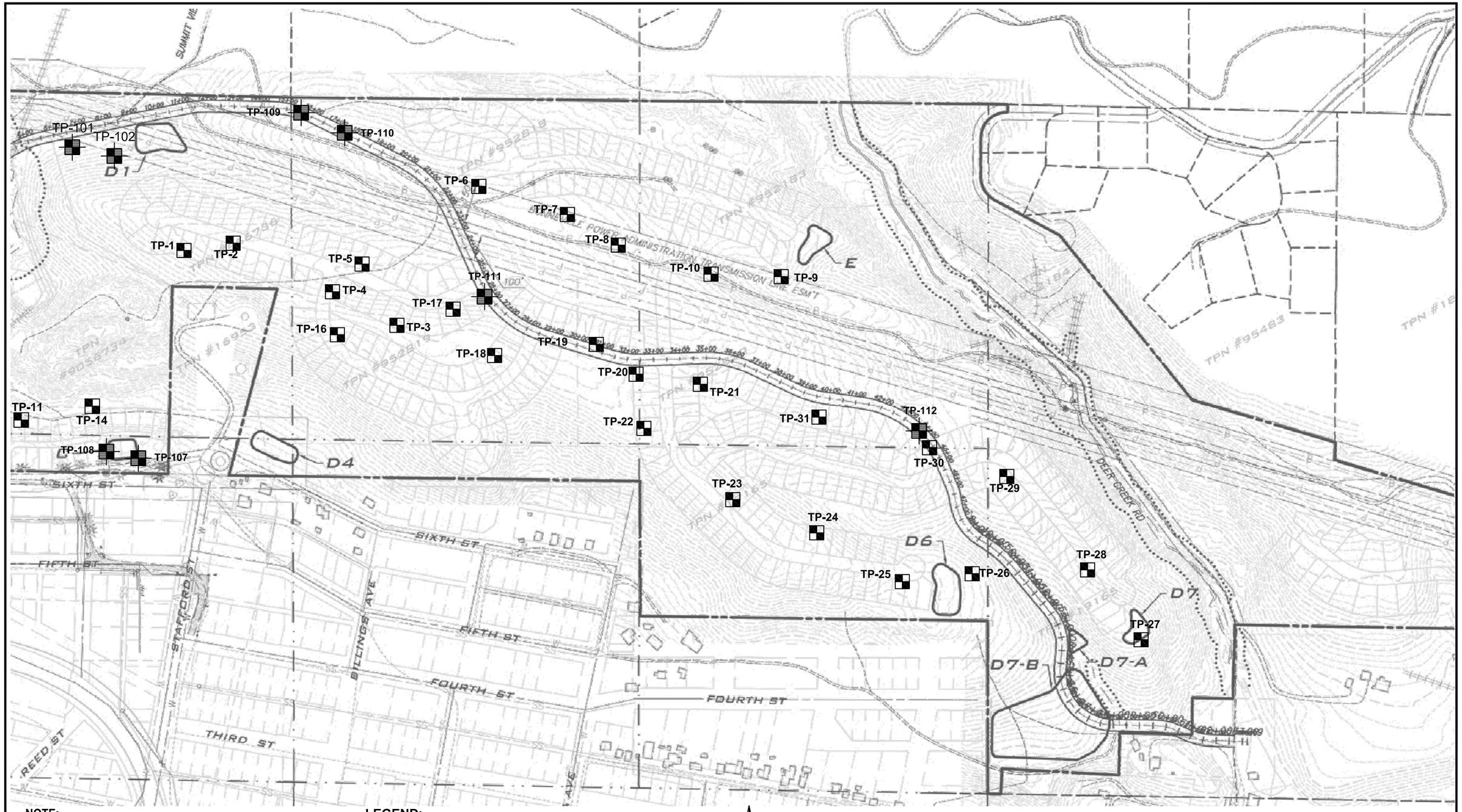
EXPLORATION LOCATION PLAN
CITY HEIGHTS (WESTERN 1/3)
CLE ELUM, WASHINGTON

Proj. No.T-6504-1	Date JUNE 2020	Figure 2A



NOTE:

THIS SITE PLAN IS SCHEMATIC. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. IT IS INTENDED FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUCTION PURPOSES.

REFERENCE: SITE PLAN PROVIDED BY BLUELINE.

LEGEND:

APPROXIMATE TEST PIT LOCATION NOVEMBER 2010

APPROXIMATE TEST PIT LOCATION MAY 2020

0 350 700

APPROXIMATE SCALE IN FEET

N

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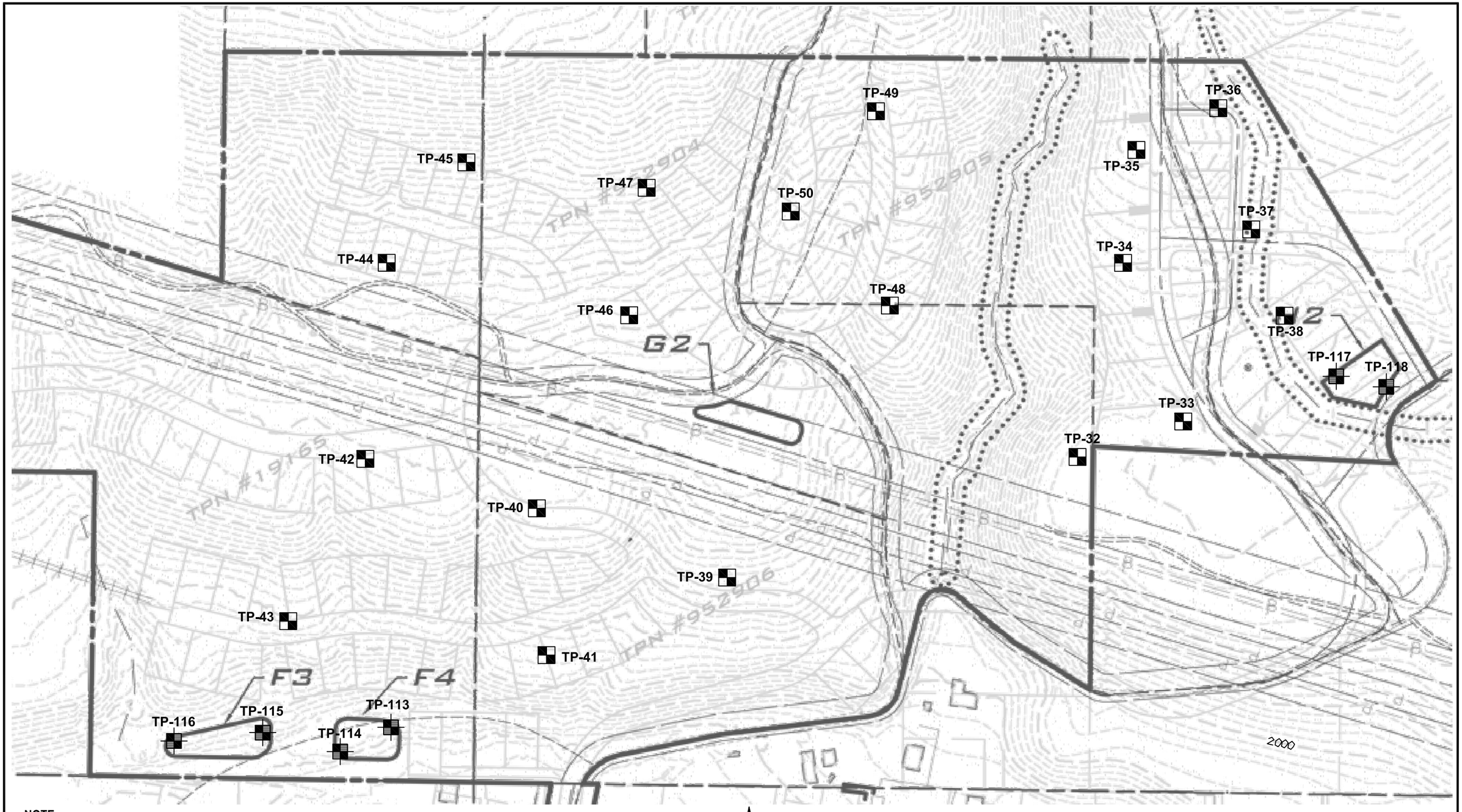
EXPLORATION LOCATION PLAN
CITY HEIGHTS (CENTRAL 1/3)
CLE ELUM, WASHINGTON

Proj. No.T-6504-1	Date JUNE 2020	Figure 2B



NOTE:

THIS SITE PLAN IS SCHEMATIC. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. IT IS INTENDED FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUCTION PURPOSES.

REFERENCE: SITE PLAN PROVIDED BY BLUELINE.

APPROXIMATE TEST PIT LOCATION NOVEMBER 2010

APPROXIMATE TEST PIT LOCATION MAY 2020

0 350 700

APPROXIMATE SCALE IN FEET

N

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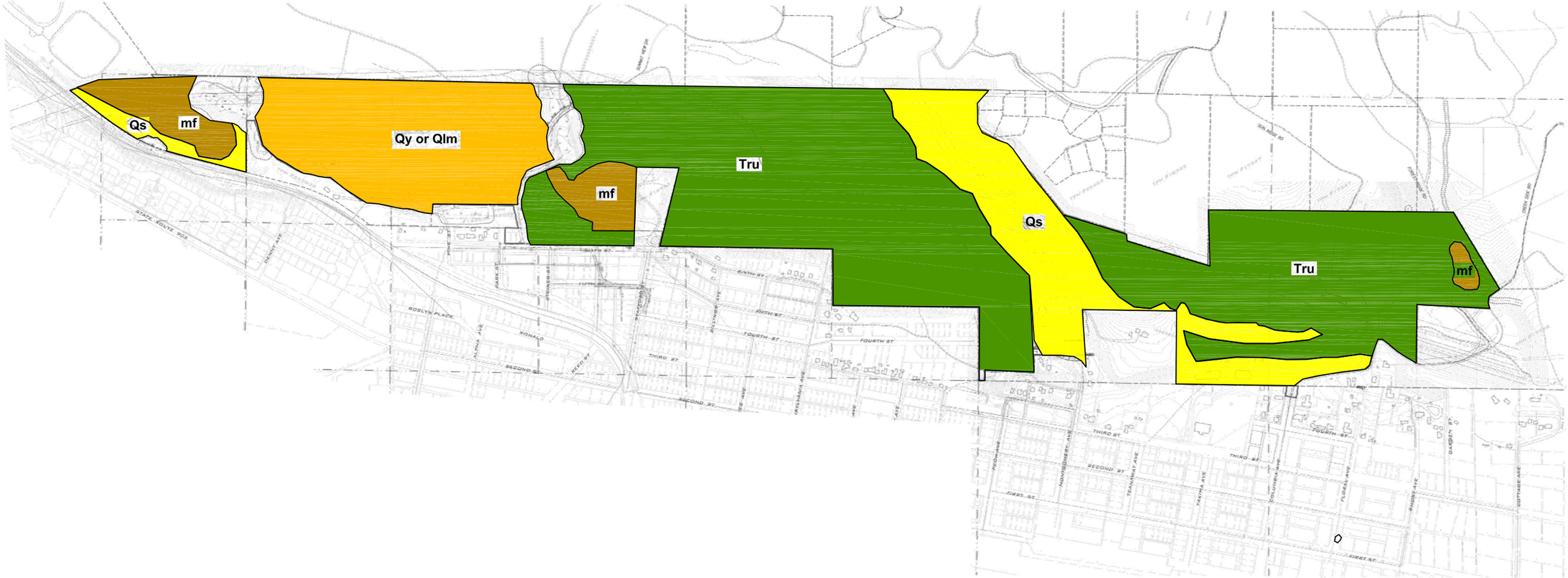
EXPLORATION LOCATION PLAN
CITY HEIGHTS (EAST 1/3)
CLE ELUM, WASHINGTON

Proj. No.T-6504-1	Date JUNE' 2020	Figure 2C



NOTE:

THIS SITE PLAN IS SCHEMATIC. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. IT IS INTENDED FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUCTION PURPOSES.

REFERENCE: SITE PLAN PROVIDED BY BLUELINE.

LEGEND:

mf : MODIFIED LAND, FILL
Qs: SIDESTREAM ALLUVIUM
Qy or Qlrm : ALUVIUM OF THE YAKIMA RIVER OR RONALD SUBDRIFT
Tru : ROSLYN FORMATION

N

NOT TO SCALE

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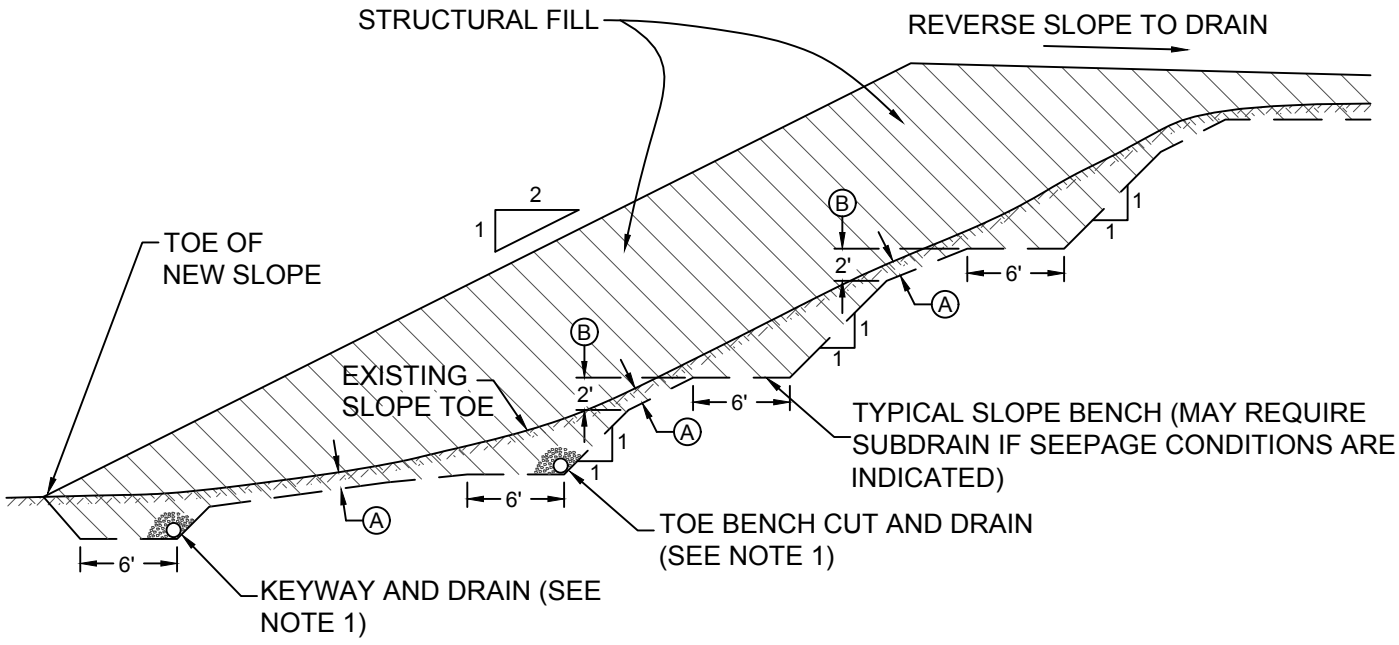
GENERALISED GEOLOGIC MAP
CITY HEIGHTS
CLE ELUM, WASHINGTON

Proj. No.T-6504-1	Date JUNE 2020	Figure 3



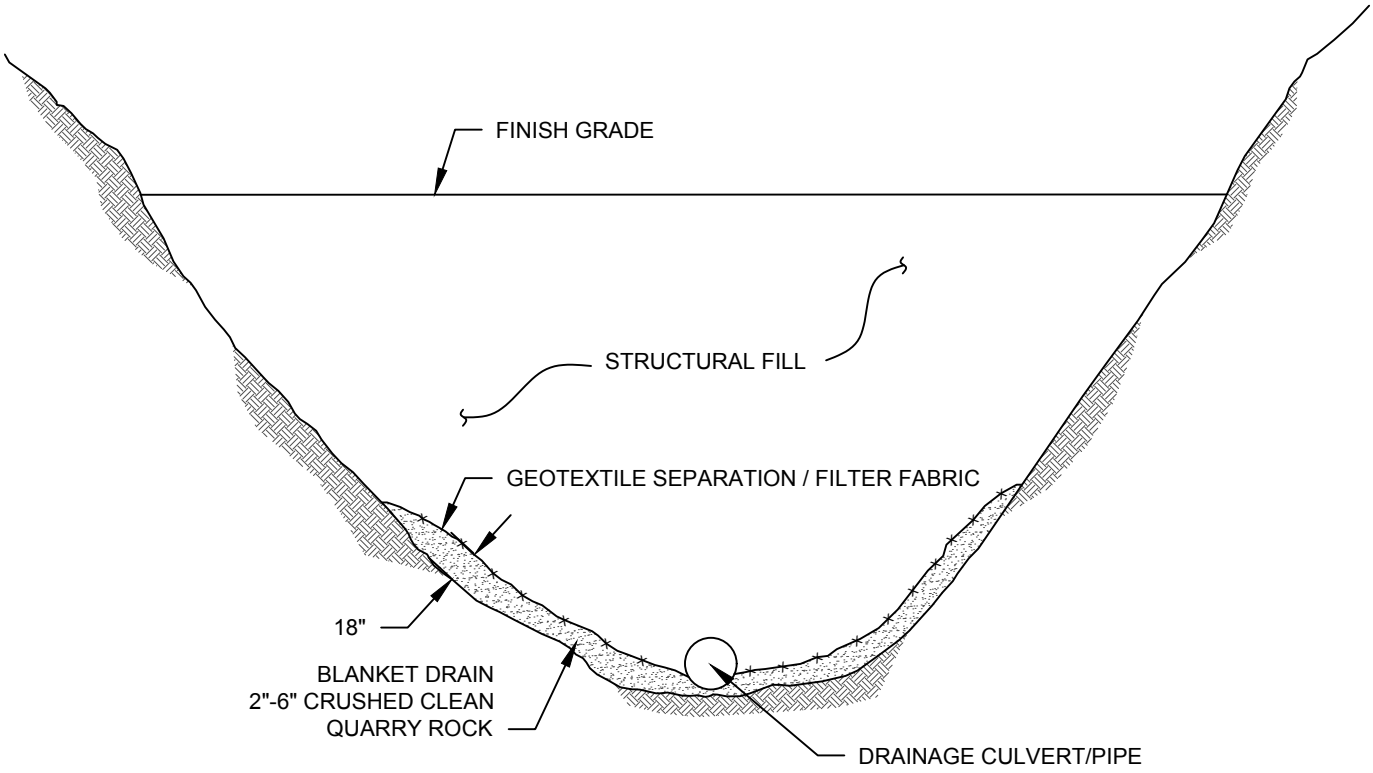
NOT TO SCALE

NOTES:

1) DRAINS SHALL CONSIST OF 6" DIAMETER PERFORATED PVC PIPE ENVELOPED IN 1 cu. ft. OF WASHED 3/4" MINUS DRAINAGE GRAVEL.

2) (A) – TOPSOIL REMOVAL THICKNESS BETWEEN KEYWAY AND BENCHES.

(B) – VERTICAL ELEVATION DIFFERENCE BETWEEN TOP OF LOWER BENCH BACKCUT AND UPPER BENCH ELEVATION.



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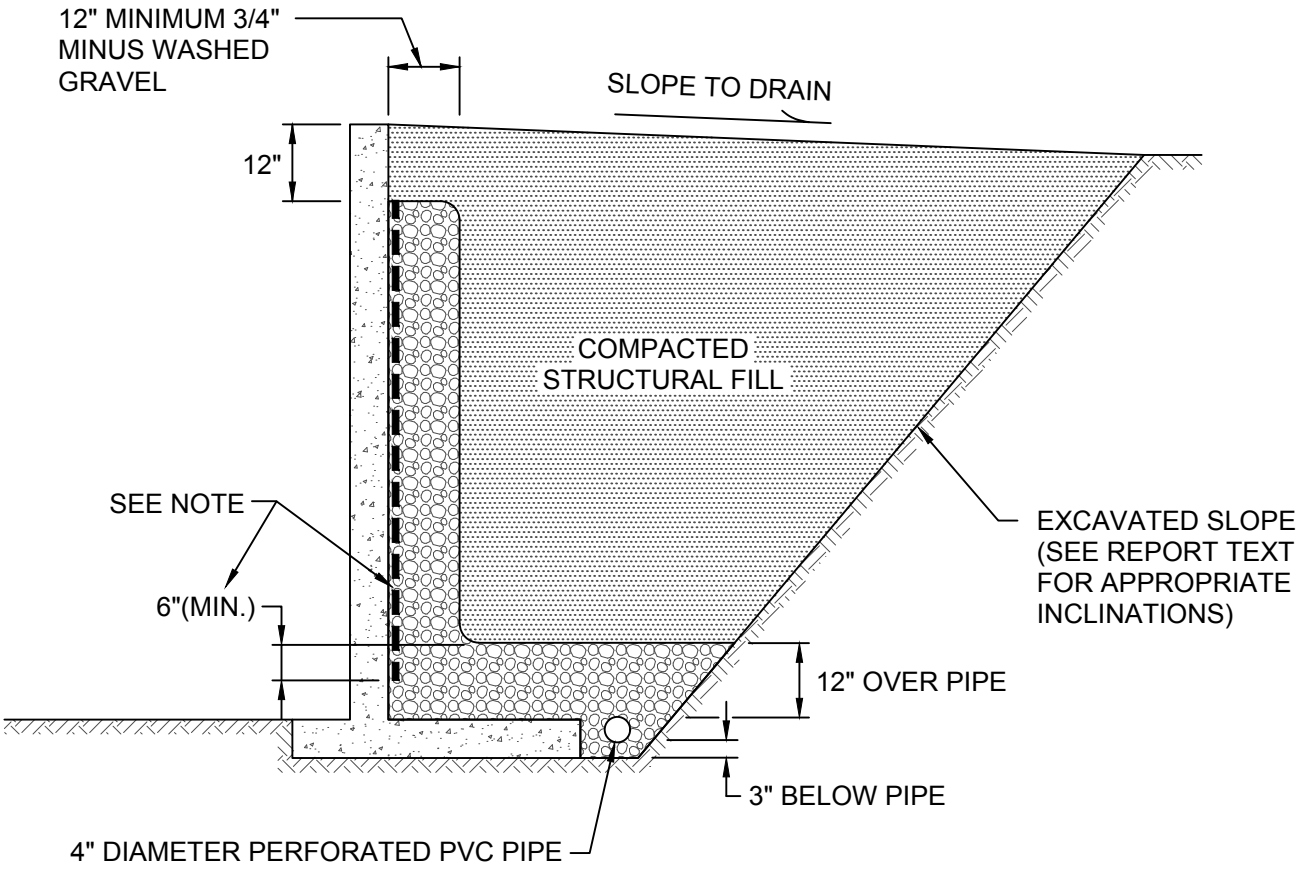
RAVINE FILL BLANKET DRAIN DETAIL
CITY HEIGHTS
CLE ELUM, WASHINGTON

Proj. No.T-6504-1	Date JUNE 2020	Figure 5



NOT TO SCALE

NOTE:

MIRADRAIN G100N PREFABRICATED DRAINAGE PANELS OR SIMILAR PRODUCT CAN BE SUBSTITUTED FOR THE 12-INCH WIDE GRAVEL DRAIN BEHIND WALL. DRAINAGE PANELS SHOULD EXTEND A MINIMUM OF SIX INCHES INTO 12-INCH THICK DRAINAGE GRAVEL LAYER OVER PERFORATED DRAIN PIPE.

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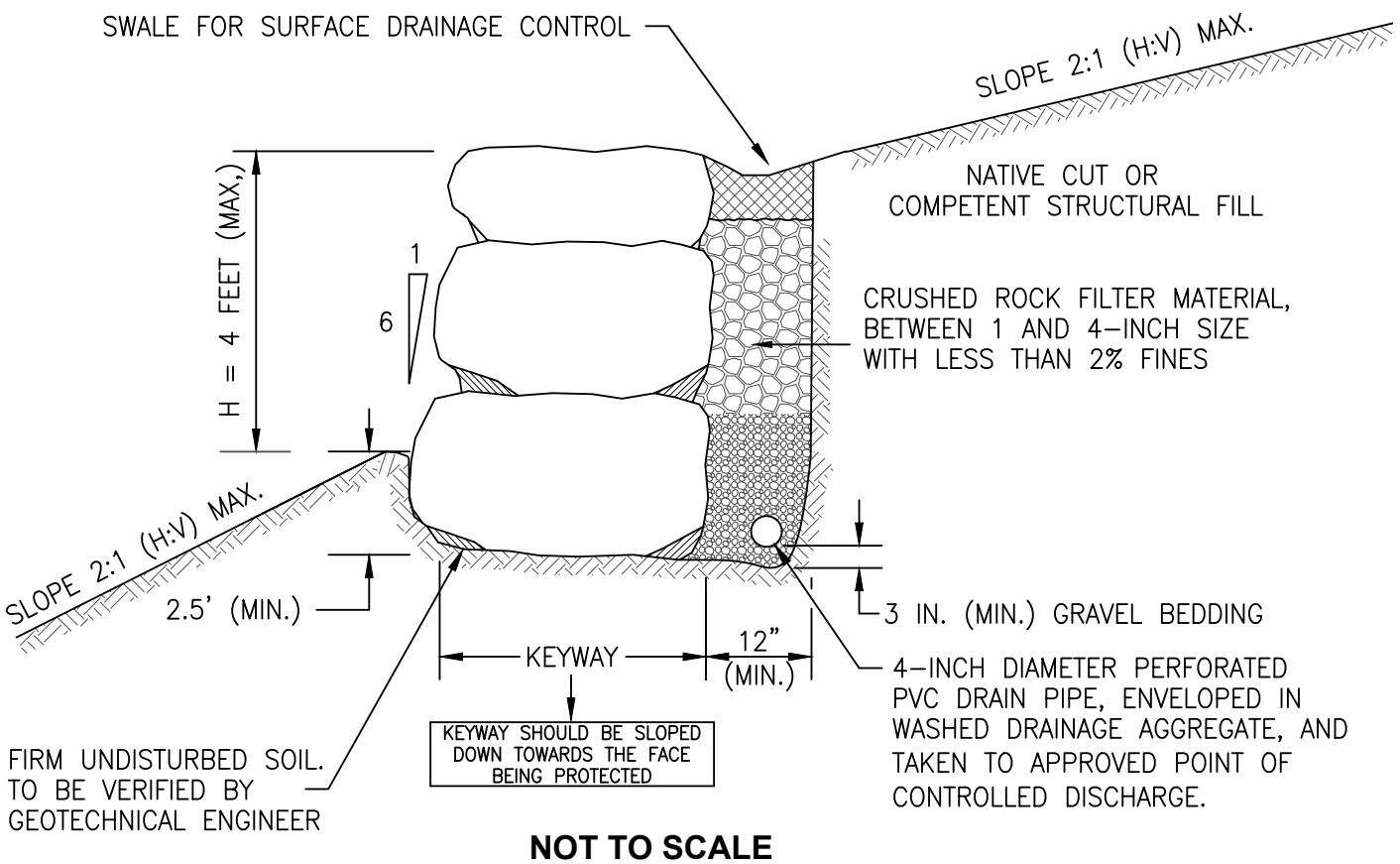
TYPICAL WALL DRAINAGE DETAIL
CITY HEIGHTS
CLE ELUM, WASHINGTON

Proj. No. T-6504-1	Date JUNE 2020	Figure 6



NOT TO SCALE

NOTES:

1) ROCKERY CONSTRUCTION SHALL BE COMPLETED IN ACCORDANCE WITH THE ASSOCIATION OF ROCKERY CONTRACTORS (ARC) GUIDELINES

2) ROCK USED MUST MEET THE REQUIREMENTS FOR ROCK QUALITY SPECIFIED IN SECTION 9-13.7(1) OF WSDOT STANDARDS SPECIFICATIONS (2010)

3) ALL CAP ROCKS MUST BE SECURE AND NOT ABLE TO BE DISLODGED BY HAND

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TYPICAL UNREINFORCED ROCKERY
CITY HEIGHTS
CLE ELUM, WASHINGTON

Proj.No.T-6504-1	Date:JUNE 2020	Figure 7

APPENDIX A
FIELD EXPLORATION AND LABORATORY TESTING

City Heights
Cle Elum, Washington

On November 2 through 5, 2010, we explored subsurface soil conditions at the site by excavating 75 test pits to a maximum depth of 20 feet below existing surface grades. These test pits were excavated using a Deere 350D excavator. We returned to the site on May 14, 15, and 18, 2020 and, using a Deere 160G excavator, logged 18 additional test pits at planned stormwater pond locations to a maximum depth of 14 feet. The test pit locations were approximately determined in the field by using a hand-held GPS and, at road locations, surveyed station staking. The test pit locations are shown on Figure 2. The Test Pit Logs are presented on Figures A-2 through A-94.

A geotechnical engineer from our office conducted the site explorations, classified the soils and bedrock encountered, maintained a log of each test pit, obtained representative soil samples, and observed pertinent site features. All soil samples were visually classified in accordance with the Unified Soil Classification System (USCS) described on Figure A-1.

Representative soil samples obtained from the test pits were placed in sealed plastic bags and taken to our laboratory for further examination and testing. The moisture content of each soil sample was measured and is reported on the corresponding Test Pit Log. Grain size analyses were performed on 24 of the soil samples. The results are shown on Figures A-95 through A-104.

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTION
COARSE GRAINED SOILS More than 50% material larger than No. 200 sieve size	**GRAVELS** More than 50% of coarse fraction is larger than No. 4 sieve	Clean Gravels (less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.
		Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS More than 50% of coarse fraction is smaller than No. 4 sieve	Clean Sands (less than 5% fines)	SW	Well-graded sands, sands with gravel, little or no fines.
			SP	Poorly-graded sands, sands with gravel, little or no fines.
		Sands with fines	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS More than 50% material smaller than No. 200 sieve size	**SILTS AND CLAYS** Liquid Limit is less than 50%		ML	Inorganic silts, rock flour, clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity. (Lean clay)
			OL	Organic silts and organic clays of low plasticity.
	SILTS AND CLAYS Liquid Limit is greater than 50%		MH	Inorganic silts, elastic.
			CH	Inorganic clays of high plasticity. (Fat clay)
			OH	Organic clays of high plasticity.
HIGHLY ORGANIC SOILS			PT	Peat.

DEFINITION OF TERMS AND SYMBOLS

COHESIONLESS

Density	Standard Penetration Resistance in Blows/Foot
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	>50

COHESIVE

Consistancy	Standard Penetration Resistance in Blows/Foot
Very Soft	0-2
Soft	2-4
Medium Stiff	4-8
Stiff	8-16
Very Stiff	16-32
Hard	>32

I	2" OUTSIDE DIAMETER SPILT SPOON SAMPLER
II	2.4" INSIDE DIAMETER RING SAMPLER OR SHELBY TUBE SAMPLER
▼	WATER LEVEL (Date)
Tr	TORVANE READINGS, tsf
Pp	PENETROMETER READING, tsf
DD	DRY DENSITY, pounds per cubic foot
LL	LIQUID LIMIT, percent
PI	PLASTIC INDEX
N	STANDARD PENETRATION, blows per foot

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UNIFIED SOIL CLASSIFICATION SYSTEM
CITY HEIGHTS
CLE ELUM, WASHINGTON

Proj.No.T-6504-1 | Date:JUNE 2020 | Figure A-1

LOG OF TEST PIT NO. TP-1

FIGURE A-2

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,190

DATE LOGGED: November 2, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		(FOREST DUFF and brown organics silty sand)	Loose			
1		Tan silty SAND becoming SAND with silt, fine grained sand, dry. (SM to SP-SM) Slightly to strongly cemented (Completely weathered SANDSTONE)	Loose Becoming Medium Dense			
2						
3		Becomes highly weathered SANDSTONE.				
4	1			5.2		
		Becomes medium weathered SANDSTONE.	Dense/ Soft Rock			
5						
6						
7	2		Very Dense/ Medium Hard Rock	6.6		
8						
9						
10		Terminated at 9.5 feet due to density. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-2

FIGURE A-3

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,200

DATE LOGGED: November 2, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		(FOREST DUFF and brown organic silty sand)	Loose			
1–2	1	Tan silty SAND, fine grained, dry. (SM) Slightly to moderately cemented. (Completely weathered SANDSTONE)	Loose Becoming Dense	7.3		
5–6	2	Reddish-tan silty SAND to SAND with silt, fine grained, moist. (SM to SP-SM) Moderately to strongly cemented (Highly becoming becoming medium weathered SANDSTONE)	Very Dense/ Soft to Medium Rock	7.7		
9		Terminated at 9 feet due to density. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-3

FIGURE A-4

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,205

DATE LOGGED: November 2, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		(FOREST DUFF and brown organic silty sand)				
1–2	1	Reddish-tan silty SAND, fine grained, dry. (SM) Slightly cemented (Completely weathered SANDSTONE)	Loose to Medium Dense	9.0		
3–4		Gray slightly weathered sedimentry rock.	Hard			
5–7	2	Reddish-tan silty SAND to sandy SILT, some areas with black coal partings, moist. (SM to ML) Moderately to strongly cemented (Highly to medium weathered SILTSTONE)	Dense to Very Dense/ Medium Hard Rock	9.8		
8	3			8.2		
9		Terminated at 9 feet due to density. No groundwater seepage observed.				
10–15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-4

FIGURE A-5

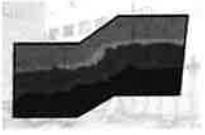
PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,215

DATE LOGGED: November 2, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1–2		(6 inches FOREST DUFF and brown organic silty sand) Tan silty SAND, fine grained, dry. (SM) Slightly to moderately cemented (Completely weathered SANDSTONE)				
3	1		Loose to Medium Dense to Dense	6.9		
4–8		Becomes reddish-brown in color and less weathered.		7.9		
9	2	Brown silty SAND with areas of black coal, moist. (SM) (Highly weathered SANDSTONE)	Dense			
10–13	3	Tan silty SAND to SAND with silt, fine grained, moist. (SM) Moderately to strongly cemented (Highly to medium weathered SANDSTONE)	Very Dense/ Soft to Medium Hard	6.6		
14–15						
16	4			6.4		
17–20		Terminated at 16 feet due to density. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-5

FIGURE A-6

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,210

DATE LOGGED: November 2, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		(FOREST DUFF and brown organic silty sand)	Loose			
1–2		Reddish-tan silty SAND, fine grained, dry. (SM)	Loose Becoming Medium Dense			
3	1	Tan SAND with silt, fine grained, dry to moist. (SP-SM) Slightly becoming strongly cemented (Completely to highly weathered SANDSTONE)	Medium Dense Becoming Very Dense/ Soft to Medium Hard Rock	10.5		
4–5						
6	2	Becomes medium weathered SANDSTONE.		7.4		
7		Terminated at 7 feet. No groundwater seepage observed.				
8–15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-6

FIGURE A-7

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,200

DATE LOGGED: November 2, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		(FOREST DUFF and brown organic silty sand)	Loose			
1–2	1	Tan SILT, blocky, dry. (ML) (Completely weathered SILTSTONE)	Stiff to Very Stiff	14.5		
3–4		Brown SILT, blocky, dry. (ML) (Completely weathered SILTSTONE)	Very Stiff to Hard			
5–8		Reddish-tan SILT, moist. (ML) (Completely weathered SILTSTONE)	Very Stiff			
9–10	2	Becomes highly weathered SILTSTONE.	Soft to Medium Hard Rock	15.7		
11–13		Reddish-tan SILTSTONE, completely to highly weathered. (SILTSTONE) Below 9 feet includes trace coal.	Medium Hard to Hard			
14	3	Becomes medium weathered SILTSTONE.		10.4		
15–20		Terminated at 15 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-7

FIGURE A-8

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,220

DATE LOGGED: November 2, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		(FOREST DUFF and brown organic silty sand)	Loose			
1–2	1	Reddish-brown SILT, moist. (ML)	Soft to Medium Stiff	11.1		
3–5		Reddish-tan silty SAND to sandy SILT, fine grained, moist. (SM to ML) (Completely weathered SILTSTONE)	Stiff to Hard			
6–9	2	Becomes highly to medium weathered SILTSTONE with stained and filled fractures, areas of SANDSTONE. (SILTSTONE and SANDSTONE)	Soft to Medium Hard	22.2		
10–11	3	Becomes medium to slightly weathered SANDSTONE. (SANDSTONE)	Hard	11.2		
12–15		Terminated at 12 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-8

FIGURE A-9

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,215

DATE LOGGED: November 2, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		(Dark brown organics with silty sand)				
1–6		Tan SILT, dry. (ML) (Completely weathered SILTSTONE)	Soft to Very Stiff			
7	1	Reddish-tan SILT, blocky, moist to wet in places. (ML) (Highly weathered SILTSTONE)	Soft	15.3		
8–11		Becomes medim to slightly weathered SILTSTONE, filled and stained fractures.	Medium Hard to Hard			
12	2			14.4		
12		Terminated at 12 feet. No groundwater seepage observed.				
13–15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-9

FIGURE A-10

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,165

DATE LOGGED: November 2, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		(Dark brown organics with silty sand. (TOPSOIL)	Loose			
1–4		Tan SILT, dry. (ML)	Soft to Stiff			
4	1			17.0		
5–8		Reddish-tan SILT, blocky, moist. (ML) (Completely weathered SILTSTONE)	Very Stiff			
9	2	Becomes highly to medium weathered SILTSTONE.	Soft to Medium Hard	13.2		
10		Terminated at 10 feet. No groundwater seepage observed.				
11–15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-10

FIGURE A-11

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,192

DATE LOGGED: November 2, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(4 inches FOREST DUFF)		18.5		
	1	Tan silty SAND to sandy SILT, fine grained, dry. (SM to ML)	Loose to Medium Dense			
5		Reddish-tan SILT, blocky, moist. (ML) (Completely to highly weathered SILTSTONE)	Soft to Medium Hard			
11	2			12.1		
12		Becomes highly to medium weathered SANDSTONE, fine grained, moist. (SANDSTONE)	Medium Hard to Hard			
13		Terminated at 13 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-11

FIGURE A-12

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Short Grass **APPROX. ELEV:** 2,030

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** 0 to 10 Feet

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1						
2	1	FILL: gray siltstone and black coal pieces, dry. (SILTSTONE & COAL)	Loose	7.5		
3						
4						
5						
6						
7						
8	2			12.1		
9						
10						
11		Reddish-tan silty SAND with gravel, scattered cobbles, moist. (SM)	Medium Dense to Dense			
12	3			14.6		
13		Terminated at 13 feet. No groundwater seepage observed. Significant sidewall caving 0 to 10 feet.				
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-12

FIGURE A-13

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,015

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		Dark brown organics with silt sand. (TOPSOIL)	Loose			
1						
2			Loose Becoming			
		Tan silty SAND, fine grained, dry. (SM)	Medium Dense	6.9		
3	1					
4						
5						
6			Dense			
7						
8				10.6		
	2					
9						
		Brown silty SAND with gravel and scattered cobbles, moist. (SM)	Dense	8.5		
	3					
10						
		Terminated at 10 feet. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-13

FIGURE A-14

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,020

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		8 inches FOREST DUFF and brown organic silty sand. (TOPSOIL)	Loose			
1	1	Tan silty SAND with gravel, dry. (SM)	Loose to Medium Dense	10.2		
4	2	Reddish-tan silty SAND with scattered gravel, moist with wet areas. (SM)	Medium Dense to Dense	11.7		
11	3			16.9		
12		Terminated at 12 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-14

FIGURE A-15

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,033

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** 0 to 15 Feet

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		8 inches dark brown organic silty sand. (TOPSOIL)	Loose			
2	1	FILL: gray chip rock, organics and metal debris, dry. (UNCONTROLLED FILL)	Loose	10.3		
5	2	FILL: red siltstone chips. (UNCONTROLLED Fill)	Loose	7.0		
15		Terminated at 15 feet due to caving. No groundwater seepage observed. Significant sidewall caving the entire depth.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-15

FIGURE A-16

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,023

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
0		10 inches FOREST DUFF and brown organics with silty sand. (TOPSOIL)	Loose			
1–2	1	Reddish-brown sandy SILT with occasional gravel, moist. (ML)	Stiff to Hard	9.5		
3–9						
9	2			17.2		
10		Terminated at 10 feet. No groundwater seepage observed.				
11–15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-16

FIGURE A-17

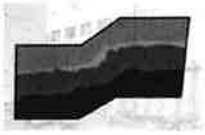
PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,185

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(4 inches FOREST DUFF) Reddish-tan SILT, dry to moist. (ML) (Completely weathered SILTSTONE)				
2	1		Soft	10.0		
3						
4						
5						
6						
7		Reddish-tan SILTSTONE, highly to medium weathered. (SILTSTONE)	Medium Hard			
8	2			10.9		
9						
10		Terminated at 10 feet. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-17

FIGURE A-18

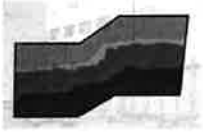
PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,235

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		(FOREST DUFF and silty SAND)	Loose			
1–5		Tan SILT, dry. (ML) (Completely weathered SILTSTONE)	Stiff to Very Stiff			
5–9		Reddish-tan silty SAND, fine grained, moist. (SM) (Highly weathered SILTSTONE)	Dense to Soft Rock			
10	1			10.4		
10–15		Reddish-tan SILTSTONE, medium to slightly weathered, moist. (SILTSTONE)	Medium Hard to Hard			
15		Terminated at 15 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-18

FIGURE A-19

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,203

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		FOREST DUFF and brown organics silty sand. (TOPSOIL)	Loose			
2	1	Tan silty SAND to sandy SILT, fine grained, dry. (SM to ML)	Loose to Medium Dense	5.8		
5	2	Reddish-tan SAND, fine grained, moist. (SM) (Completely weathered SANDSTONE)	Medium Dense to Soft Rock	16.5		
11	3	Reddish-tan SANDSTONE, highly to medium weathered, moist. (SANDSTONE)	Medium Hard	12.2		
12		Terminated at 12 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-19

FIGURE A-20

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,227

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		FOREST DUFF and brown organic silty sand.	Loose			
1–4		Tan SILT, dry. (ML)	Medium Stiff to Very Stiff			
5	1	Reddish-tan SILT, moist. (ML) (Completely weathered SILTSTONE)	Very Stiff	11.0		
7–10		Reddish-tan SILTSTONE, highly to medium weathered, moist. (SILTSTONE)	Medium Hard			
11	2			16.1		
12			Hard			
13		Becomes slightly weathered SILTSTONE.				
		Terminated at 13 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-20

FIGURE A-21

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,215

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(4 inches FOREST DUFF) Tan SILT, dry. (ML)	Medium Stiff to Very Stiff			
6		Reddish-tan SILT, moist. (ML) (Completely to lightly weathered SILTSTONE)	Soft to Medium Hard			
10		Terminated at 10 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-21

FIGURE A-22

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,220

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(3 inches FOREST DUFF)				
		Tan SILT, dry. (ML)				
2						
			Medium Stiff			
3			to Very Stiff			
	1			12.9		
4						
5						
6				31.4		
	2	Reddish-tan SILT, moist.	Very Stiff			
		(ML) (Completely weathered SILTSTONE)	to Hard			
7						
		Becomes medium to slightly weathered SILTSTONE.				
8			Medium Hard			
9				13.3		
	3	Black coal, wet voids. (COAL)	Soft			
10						
		Gray slightly weathered SILTSTONE. (SILTSTONE)	Hard			
11						
	4					
12						
		Terminated at 12 feet due to density.				
		No groundwater seepage observed.				
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-22

FIGURE A-23

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,193

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		(8 inches FOREST DUFF)	Loose			
1–2	1	Tan silty SAND to SAND with silt, fine grained, dry. (SM to SP-SM) (Completely weathered SANDSTONE)	Loose to Medium Dense	5.1		
3–4		Tan SAND with silt, fine grained, dry. (SP-SM) (Highly weathered SANDSTONE)	Soft			
5–8	2	Tan medium to slightly weathered SANDSTONE. (SANDSTONE)	Medium Hard to Hard	9.3		
9		Terminated at 9 feet due to refusal. No groundwater seepage observed.				
10–15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-23

FIGURE A-24

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,160

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(3 inches FOREST DUFF) Tan SAND, dry. (SP) (Completely to highly weathered SANDSTONE)				
2	1		Loose Becoming Dense	4.2		
3						
4						
5						
6	2			14.9		
7		Reddish-brown sandy SILT, moist. (ML) (Completely to highly weathered SILTSTONE)	Medium Dense Becoming Soft Rock			
8						
9	3	Reddish-brown medium weathered SILTSTONE. (SILTSTONE)	Medium Hard	9.4		
10		Terminated at 10 feet due to density. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-24

FIGURE A-25

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,150

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(2 inches FOREST DUFF)				
2		Reddish-tan SILT with sand, blocky, dry. (ML) (Completely weathered SILTSTONE)	Stiff to Hard			
3						
4						
5		Reddish-tan SILTSTONE, highly to medium weathered, moist. (SILTSTONE)	Soft to Medium Hard			
6	1			7.8		
7		Becomes slightly weathered SILTSTONE.	Hard			
8		Terminated at 8 feet due to density. No groundwater seepage observed.				
9						
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-25

FIGURE A-26

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,125

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(1-inch FOREST DUFF) Brown silty SAND with organics, dry. (SM)	Loose			
2		Tan SAND, fine grained, dry. (SP) (Completely weathered SANDSTONE)	Medium Dense to Dense			
3		Tan SANDSTONE, medium to slightly weathered. (SANDSTONE)	Medium Hard to Hard			
4	1			2.6		
		Terminated at 4 feet due to refusal. No groundwater seepage observed.				
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-26

FIGURE A-27

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,100

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		(FOREST DUFF)	Loose			
1–2		Tan silty SAND, fine grained, dry. (SM)	Loose to	7.7		
3	1		Medium Dense			
4–5						
6	2			15.4		
7–8		Reddish-tan sandy SILT with gravel, fine grained, moist. (ML) (Completely weathered SANDSTONE)	Medium Dense			
9–10			Dense			
11	3			14.7		
12		Becoming orange and less silty. (Medium weathered SANDSTONE)	Very Dense			
13		Terminated at 13 feet. No groundwater seepage observed.				
14–15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-27

FIGURE A-28

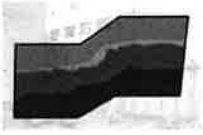
PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,073

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(3 inches FOREST DUFF) Tan sandy SILT, fine grained, dry. (ML)	Loose			
3		Reddish-tan SILT with sand, fiine grained, moist. (ML)	Very Stiff			
6	1	Reddish-brown GRAVEL with sand and silt, fine to coarse grained, moist. (GP-GM)	Dense to Very Dense	5.1		
10	2			5.1		
16	3			6.8		
19	4			6.2		
20		Terminated at 20 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-28

FIGURE A-29

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,077

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(4 inches DUFF and ROOTS) Tan SILT with sand, fine grained, dry. (ML)	Soft to Stiff			
3		Reddish-brown SILT, moist. (ML) (Completely to highly weathered SILTSTONE)	Very Stiff to Soft Rock			
8		Reddish-brown SILTSTONE, medium to slightly weathered. (SILTSTONE)	Hard			
10		Terminated at 10 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-29

FIGURE A-30

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,125

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(2 inches FOREST DUFF)				
		Tan SILT, chunky, dry. (ML) (Completely weathered SILTSTONE)				
2	1		Medium Stiff to Hard	15.5		
3						
4						
5	2			13.1		
6		Reddish-tan SILTSTONE, highly to medium weathered. (SILTSTONE)	Soft to Medium Hard			
7						
8						
9						
10	3	Orange-tan SANDSTONE, medium weathered. (SANDSTONE)	Hard	14.9		
11		Terminated at 10.5 feet due to density. No groundwater seepage observed.				
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-30

FIGURE A-31

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Forest Duff **APPROX. ELEV:** 2,145

DATE LOGGED: November 3, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		10 inches FOREST DUFF and brown silty SAND with organics, moist. (SM)	Loose			
1–2–3	1	Tan SILT, dry. (ML)	Soft to Very Stiff	15.7		
4–5		Reddish-tan sandy SILT to silty SAND, fine grained, moist. (ML to SM) (Completely weathered SILTSTONE and SANDSTONE)	Very Stiff to Hard			
6–7–8	2	Reddish-tan SANDSTONE/SILTSTONE, highly to medium weathered. (SANDSTONE/SILTSTONE)	Medium Hard	10.2		
9		Terminated at 9 feet due to density. No groundwater seepage observed.				
10–11–12–13–14–15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-31

FIGURE A-32

PROJECT NAME: City Heights PROJ. NO: T-6504 LOGGED BY: JMC

LOCATION: Kittatas County, Washington SURFACE CONDS: Underbrush APPROX. ELEV: 2,183

DATE LOGGED: November 3, 2010 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(4 inches FOREST DUFF) Tan SILT, dry. (ML)	Soft to Very Stiff			
4		Reddish-tan SILT and silty SAND, moist. (ML & SM) (Completely weathered SILTSTONE/SANDSTONE)	Medium Dense			
7		Reddish-tan SILTSTONE/SANDSTONE, highly to medium weathered. (SILTSTONE/SANDSTONE) Becomes medium to slightly weathered.	Soft to Medium Hard Hard			
13		Terminated at 12.5 feet due to density. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-32

FIGURE A-33

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,072

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		Brown silty SAND with organics, moist. (SM)	Loose			
2	1	Tan SILT, dry. (ML)	Medium Stiff	20.9		
3						
4		Reddish-tan SILT, moist. (ML)	Stiff			
5						
6	2			8.8		
7						
8			Dense to Very Dense			
9		Reddish-brown silty GRAVEL with sand, fine to coarse grained sand, moist. (GM) Slightly cemented in places				
10						
11						
12						
13						
14						
15		Reddish-brown silty SAND with gravel, fine to medium grained sand, moist. (SM)	Very Dense			
16						
17						
18	3			10.4		
19		Terminated at 18 feet. No groundwater seepage observed.				
20						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-33

FIGURE A-34

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,075

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(2 inches SOD) Brown SILT with sand, scattered organics, dry. (ML)	Medium Stiff			
2	1	Tan SILT, occasional organics, moist. (ML)	Stiff to Very Stiff	10.8		
5		Reddish-tan SILT with sand, moist. (ML) (Completely weathered SILTSTONE)	Hard			
8	2	Reddish-tan silty SAND, fine grained, moist. (SM) (Completely weathered SANDSTONE)	Dense	13.1		
11	3	Brown GRAVEL with sand and silt, fine to coarse grained sand, moist. (GP-GM)	Very Dense	5.5		
15	4	Terminated at 15 feet. No groundwater seepage observed.		6.4		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-34

FIGURE A-35

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,103

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		8 inches brown silty SAND with organics, moist. (SM)	Loose			
2	1	Tan SILT, trace organics, moist. (ML)	Very Stiff	18.0		
5	2	Orange-tan SANDSTONE, completely to highly weathered. (SANDSTONE)	Soft to Medium Hard	11.9		
9		Terminated at 9 feet due to density. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-35

FIGURE A-36

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,133

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
0	1	(3-inch ROOT MAT) Brown silty SAND with organics, moist. (SM)	Loose	11.8		
1						
2		Light tan SANDSTONE, completely to slightly weathered. (SANDSTONE)	Soft to Hard			
3	2			3.5		
4		Terminated at 4 feet due to refusal. No groundwater seepage observed.				
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-36

FIGURE A-37

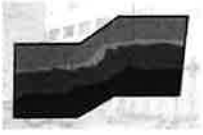
PROJECT NAME: City Heights PROJ. NO: T-6504 LOGGED BY: JMC

LOCATION: Kittatas County, Washington SURFACE CONDS: Field Grass APPROX. ELEV: 2,130

DATE LOGGED: November 4, 2010 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(2-inch ROOT MAT) Brown silty SAND with scattered organics, moist. (SM)	Loose			
2–6		Tan SILT, dry. (ML)	Stiff to Very Stiff			
6	1	Reddish-tan SILT, moist. (ML) (Completely weathered SILTSTONE)	Hard	17.7		
11		Reddish-tan SILTSTONE, medium weathered. (SILTSTONE)	Medium Hard to Hard	14.6		
12	2					
13		Terminated at 13 feet due to density. No groundwater seepage observed.				
14–15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-37

FIGURE A-38

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Weeds & Grasses **APPROX. ELEV:** 2,095

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1–3	1	FILL: reddish-brown silt with sand, occasional siltstone clasts, wet. (ML) (UNDOCUMENTED Fill)	Soft	19.9		
7–9	2	FILL: black and gray organics and silt, wet. (ORGANICS and ML) (UNDOCUMENTED Fill)	Soft	18.8		
11–12	3	DISTURBED: reddish-brown siltstone, completely to highly weathered. (SILTSTONE)	Soft	19.6		
13–14	4	Reddish-brown SILTSTONE, medium weathered. (SILTSTONE)	Medium Hard	13.3		
15		Terminated at 15 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-38

FIGURE A-39

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Weeds & Grasses **APPROX. ELEV:** 2,087

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1–4		FILL: tan silt and silty sand, scattered wood debris and siltstone clasts, moist. (ML & SM) (UNDOCUMENTED Fill)	Soft			
5		FILL: black and reddish-brown organics and silt, wet. (ORGANICS and ML) (UNDOCUMENTED Fill)	Soft			
6–7		DISTURBED: reddish-brown silt, moist. (ML)	Stiff			
8		Reddish-brown SILT, moist. (ML) (Highly weathered SILTSTONE)	Hard			
9		Terminated at 9 feet. No groundwater seepage observed.				
10–15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-39

FIGURE A-40

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Moss & Brush **APPROX. ELEV:** 2,030

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(2 inches DUFF) Tan silty GRAVEL with sand, fine to medium grained sand, dry. (GM)	Medium Dense to Dense	6.2		
2	1					
3						
4	2			6.0		
5						
6						
7		Reddish-brown SILT, moist. (ML) (Completely weathered SILTSTONE)	Stiff			
8	3			28.7		
9						
10						
11		Becomes highly weathered SILTSTONE.				
12						
13		Terminated at 13 feet. No groundwater seepage observed.				
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-40

FIGURE A-41

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,067

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(10 inches ROOTS and DUFF) Tan SILT with scattered gravel sand sand, dry. (ML)	Stiff			
2	1			6.1		
3						
4						
5		Tan silty GRAVEL with sand, fine to coarse grained sand, dry. (GM)	Medium Dense			
6	2			7.1		
7						
8						
9	3			8.2		
10		Reddish silty GRAVEL with sand, fine to coarse grained sand, moist. (GM)	Dense to Very Dense			
11						
12						
13						
14		Silt grading out with depth.				
15	4			7.8		
16		Terminated at 15 feet. No groundwater seepage observed.				
17						
18						
19						
20						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-41

FIGURE A-42

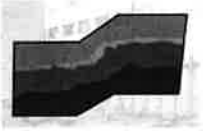
PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 1,990

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(10 inches FOREST DUFF and organics)	Loose			
2	1	Tan silty SAND, fine grained, dry. (SM)	Medium Dense	5.3		
5						
6	2	Reddish-tan SILT with scattered sand, chunky, moist. (ML) (Completely to highly weathered SILTSTONE)	Very Stiff to Hard	19.8		
9						
10	3	Reddish-brown silty GRAVEL with sand, fine to coarse sand, moist. (GM) Areas slightly to moderately cemented.	Very Dense	9.4		
12		Terminated at 12 feet. No groundwater seepage observed.				
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-42

FIGURE A-43

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,075

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		8 inches DUFF and brown silty SAND. (SM)	Loose			
1–2–3–		Tan sandy SILT, blocky, dry. (ML)	Stiff to Very Stiff			
4–5–6–7–8–9–		Reddish-brown silty GRAVEL with sand, fine to medium grained sand, moist. (GM) Areas moderately cemented.	Very Dense			
10–11–12–13–14–15–		Terminated at 10 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-43

FIGURE A-44

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 1,995

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		FOREST DUFF and brown organic silty sand. (TOPSOIL)	Loose			
1		Tan SILT with occasional sand and organics, dry. (ML) (Completely weathered SILTSTONE)	Soft to Very Stiff	5.7		
2	1					
3						
4	2	Reddish-tan SILTSTONE/SANDSTONE, highly to medium weathered. (SILTSTONE/SANDSTONE)	Soft to Medium Hard	12.1		
5						
6						
7						
8	3			11.4		
9		Terminated at 9 feet due to density. No groundwater seepage observed.				
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-44

FIGURE A-45

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,130

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		8-inch ROOT MAT and brown silty SAND. (SM)	Loose			
1		Tan to reddish-tan silty SAND to sandy SILT, fine grained, dry. (SM to ML) (Completely weathered SILTSTONE/SANDSTONE)	Soft			
2						
3						
4						
5						
6	1			11.3		
7		Becomes highly weathered SILTSTONE/SANDSTONE.				
8						
9	2	Becomes medium weathered SANDSTONE.	Medium Hard	13.0		
10		Terminated at 10 feet due to density. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-45

FIGURE A-46

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,190

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		8-inch ROOT MAT and brown organic silty SAND. (TOPSOIL)	Loose			
1		Light tan SANDSTONE, completely to highly weathered. (SANDSTONE)	Soft to Medium Hard to Hard			
2		Becomes medium weathered.				
3		Becomes slightly weathered.				
4		Terminated at 4 feet due to refusal. No groundwater seepage observed.				
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-46

FIGURE A-47

PROJECT NAME: City Heights PROJ. NO: T-6504 LOGGED BY: JMC

LOCATION: Kittatas County, Washington SURFACE CONDS: Field Grass APPROX. ELEV: 2,105

DATE LOGGED: November 4, 2010 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		ROOT MAT and brown organics with silty sand. (TOPSOIL)	Loose			
2		Tan SILT with scattered sand, dry. (ML)	Soft to Very Stiff			
3	1			6.2		
4		Sedimentary rock boulders from 4 to 5 feet.				
5						
6	2	Reddish-brown silty SAND, fine grained, moist. (SM) (Completely weathered SANDSTONE)		19.2		
7			Medium Dense to Medium Hard Rock			
8						
9						
10		Becomes highly to medium weathered.				
11	3			11.9		
12		Terminated at 11.5 feet. No groundwater seepage observed.				
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-47

FIGURE A-48

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,163

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		ROOT MAT and brown organics with silty sand. (TOPSOIL)	Loose			
2		Tan silty SAND to sandy SILT, fine grained, dry. (SM to ML) (Completely weathered SANDSTONE)	Medium Dense/ Soft Rock			
4		Becomes highly weathered SANDSTONE.	Medium Hard			
7		Becomes medium to slightly weathered SANDSTONE.	Hard			
9		Terminated at 9 feet due to refusal. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-48

FIGURE A-49

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Field Grass **APPROX. ELEV:** 2,085

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
0		ROOT MAT and brown organics with silty SAND, moist. (TOPSOIL)	Loose			
1–2		Reddish-tan silty SAND, fine grained, dry. (SM)	Loose to Medium Dense			
3	1			11.0		
4		Gray sedimentary rock boulders, 1.5 to 3 feet in diameter, rounded, voids filled with reddish-brown silty SAND, blocky, moist. (SM)	Hard			
5		Reddish-tan silty SAND, fine grained, moist. (SM) (Highly weathered SANDSTONE)	Dense			
6		Terminated at 6 feet. No groundwater seepage observed.				
7–15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-49

FIGURE A-50

PROJECT NAME: City Heights PROJ. NO: T-6504 LOGGED BY: JMC

LOCATION: Kittatas County, Washington SURFACE CONDS: Underbrush APPROX. ELEV: 2,135

DATE LOGGED: November 4, 2010 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		FOREST DUFF and brown organics with silty SAND, dry. (TOPSOIL)	Loose			
1		Tan SANDSTONE, completely weathered. (SANDSTONE)	Soft			
2						
3		Becomes highly weathered.	Medium Hard			
4						
5		Becomes medium weathered.	Hard			
6						
7		Becomes slightly weathered.				
		Terminated at 7 feet due to refusal. No groundwater seepage observed.				
8						
9						
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-50

FIGURE A-51

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,120

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		FOREST DUFF and brown organics with silty SAND. (TOPSOIL)	Loose			
1		Reddish-brown silty SAND with gravel, scattered cobbles, dry. (SM)	Medium Dense			
2						
3	1			12.4		
4		Becomes moist.				
5						
6	2	Gravels grade out.		12.6		
7						
8		Becomes completely weathered sandstone.	Dense			
9						
10	3			5.4		
11		Reddish-brown SANDSTONE, highly to medium weathered. (SANDSTONE)	Medium Hard			
12		Terminated at 12 feet. No groundwater seepage observed.				
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-51

FIGURE A-52

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Brush **APPROX. ELEV:** 2,057

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		FOREST DUFF and brown organics with silty SAND. (TOPSOIL)	Loose			
3	1	Tan silty SAND with scattered gravel, fine to medium grained sand, moist. (SM)	Medium Dense to Dense	7.0		
6	2			6.2		
9		Reddish-brown GRAVEL with sand and silt, fine to coarse grained sand, moist becoming wet. (GP-GM)	Dense to Very Dense			
12	3			13.3		
14		Terminated at 14 feet. No groundwater seepage observed.				
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-52

FIGURE A-53

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,070

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		3-inch ROOT MAT over brown silty SAND, moist. (SM)	Loose			
2–4		Reddish-tan silty SAND, fine grained, moist. (SM)	Dense to Very Dense			
5	1	Areas moderately cemented below 4 feet.		13.2		
6–9						
10–14		Reddish-brown GRAVEL with sand and silt, occasional sedimentary rock boulder, moist. (GP-GM)	Very Dense			
15	2			8.2		
16		Terminated at 16 feet. No groundwater seepage observed.				
17–20						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-53

FIGURE A-54

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,060

DATE LOGGED: November 4, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		FOREST DUFF, roots and brown organics with silty sand. (TOPSOIL)	Loose			
2		Reddish-brown silty SAND, occasional gravel, fine grained sand, dry becoming moist. (SM)	Medium Dense			
5			Dense			
10		Areas moderately to strongly cemented.	Very Dense			
12		Terminated at 12 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-54

FIGURE A-55

PROJECT NAME: City Heights PROJ. NO: T-6504 LOGGED BY: JMC

LOCATION: Kittatas County, Washington SURFACE CONDS: APPROX. ELEV: 2,097

DATE LOGGED: November 5, 2010 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(10 inches FOREST DUFF)				
2		Reddish-brown silty SAND and SILT, fine grained, dry. (SM & ML)				
3	1		Medium Dense	10.9		
4						
5						
6						
7	2			14.1		
8						
9						
10						
11			Medium Dense			
12		Reddish-brown SAND with silt and gravel, fine to coarse grained, moist. (SP-SM)	to Dense			
13						
14						
15						
16	3			14.7		
17						
18						
19						
20						
21		Terminated at 20 feet. No groundwater seepage observed.				
22						
23						
24						
25						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-55

FIGURE A-56

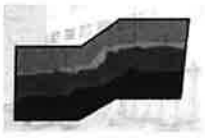
PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** _____ **APPROX. ELEV:** 2,115

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(10 inches FOREST DUFF)				
1–4		Tan silty SAND with gravel, fine grained sand, dry. (SM)	Medium Dense			
5–8			Dense			
9	1	Reddish-brown silty GRAVEL with sand, fine to coarse grained sand, moist. (GM)		12.4		
10–15			Very Dense			
16	2			37.0		
17–18		Orange-tan SILTSTONE with sand seams, medium weathered. (SILTSTONE)	Medium Hard			
19		Terminated at 19 feet due to density. No groundwater seepage observed.				
20–25						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-56

FIGURE A-57

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,125

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		FOREST DUFF and brown silty SAND. (SM)	Loose			
2–3		Reddish-tan silty SAND to sandy SILT, fine grained, dry. (SM to ML)	Medium Dense			
4–14	1	Reddish-brown silty SAND with gravel, fine to coarse grained sand, moist. (SM)	Medium Dense to Dense	11.7		
15–16	2	Tan SANDSTONE, highly to medium weathered, stained fractures. (SANDSTONE)	Medium Hard	14.9		
17–18	3			9.4		
18–19		Terminated at 18 feet due to density. No groundwater seepage observed.				
20						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-57

FIGURE A-58

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Charred Wood **APPROX. ELEV:** 2,117

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		Reddish-brown silty SAND, scattered roots, moist. (SM)	Medium Dense			
2	1	Reddish-brown silty SAND with scattered gravel, moist. (SM)	Medium Dense	9.3		
4		Reddish-brown silty GRAVEL with sand and cobbles, fine to coarse grained sand, moist. (GM)	Dense to Very Dense			
10	2			12.3		
13		Becomes wet below 13 feet.				
15	3			16.2		
18		Terminated at 18 feet. No groundwater seepage observed.				
20						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-58

FIGURE A-59

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,120

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(2 inches DUFF)				
2		Reddish-brown silty GRAVEL with sand, numerous cobbles, fine to coarse grained, moist. (GM)	Medium Dense			
3						
4			to Dense			
5						
6						
7						
8			Very Dense			
9	1			9.2		
10		Reddish-brown GRAVEL with sand and silt, moist. (GP-GM)				
11						
12						
13						
14						
15						
16						
17						
18						
19		Terminated at 18 feet. No groundwater seepage observed.				
20						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-59

FIGURE A-60

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,125

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		8 inches FOREST DUFF and brown silty sand. (TOPSOIL)	Loose			
1–5	1	Reddish-brown silty SAND, fine grained sand, dry. (SM)	Medium Dense to Dense	8.9		
6–14	2	Reddish-brown silty GRAVEL with sand, fine to coarse grained sand, moist. (GM) Silt grading out below 10 feet.	Dense to Very Dense	8.4		
15		Terminated at 14 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-60

FIGURE A-61

PROJECT NAME: City Heights PROJ. NO: T-6504 LOGGED BY: JMC

LOCATION: Kittatas County, Washington SURFACE CONDS: Underbrush APPROX. ELEV: 2,133

DATE LOGGED: November 5, 2010 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(10 inches DUFF and ROOTS)				
2		Reddish-brown SILT with sand, fine grained, dry becoming moist. (ML)				
3	1		Very Dense to Hard			
4						
5						
6	2			21.4		
7						
8						
9						
10						
11						
12	3			11.8		
13						
14		Reddish-brown silty SAND with gravel, fine to coarse grained, moist. (SM)	Dense			
15						
16						
17						
18						
19		Terminated at 18 feet. No groundwater seepage observed.				
20						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-61

FIGURE A-62

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Grasses **APPROX. ELEV:** 2,095

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** 0 to 12 Feet

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1–10		FILL: coal tailings, blocky, numerous small voids, moist. (COAL) (UNCONTROLLED Fill)	Soft			
11	1	Reddish-brown sandy SILT, scattered gravel, occasional coal pieces, fine to coarse grained, moist. (ML)	Dense to Very Dense	10.5		
14	2			8.3		
15		Terminated at 15 feet. No groundwater seepage observed. Caves easily 0 to 10 feet, minor caving 10 to 12 feet.				
16–20						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-62

FIGURE A-63

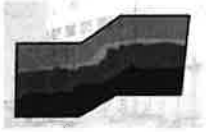
PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Grasses **APPROX. ELEV:** 2,090

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** 0 to 8 Feet

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1–6		FILL: coal tailings, highly degraded, fine particles, soil-like, moist. (COAL) (UNCONTROLLED Fill)	Soft	7.7		
6–7	1	Reddish-brown GRAVEL with silt and sand, fine to coarse grained, moist. (GP-GM)	Very Dense			
8–15		Terminated at 8 feet. No groundwater seepage observed. Moderate caving 0 to 6 feet, minor caving 6 to 8 feet.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-63

FIGURE A-64

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Grasses **APPROX. ELEV:** 2,090

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** 0 to 9 Feet

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1–4	1	FILL: coal tailings, highly degraded, fine particles, soil-like, moist. (COAL) (UNCONTROLLED Fill)		31.6		
9	2	Reddish-brown SAND with gravel and silt, fine to coarse grained, moist. (GM)	Very Dense	8.2		
10		Terminated at 10 feet. No groundwater seepage observed. Moderate caving 0 to 9 feet.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-64

FIGURE A-65

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Grasses **APPROX. ELEV:** 2,090

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** 0 to 18 Feet

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1–2	1	FILL: coal tailings, highly degraded, fine particles, soil-like, moist. (COAL) (UNCONTROLLED Fill)		36.7		
3–7		Becomes wet below 5 feet.	Soft			
8	2			70.5		
9–11						
12	3					
13–16						
16–18		Reddish-brown GRAVEL with sand and silt, fine to coarse grained, moist. (GP-GM)	Medium Dense	11.6		
18–20		Terminated at 18 feet. No groundwater seepage observed. Significant caving 0 to 16 feet. Moderate caving 16 to 18 feet.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-65

FIGURE A-66

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Short Grass **APPROX. ELEV:** 2,050

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** 0 to 8 Feet

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		FILL: coal tailings and gravel.	Loose			
1			Medium Dense			
2						
3			to Dense to			
4		Reddish-brown GRAVEL with sand and silt, fine to coarse grained, moist becoming wet. (GP-GM)				
5	1		Very Dense	6.0		
6						
7						
8						
9						
10						
	2			5.5		
11		Terminated at 11 feet. No groundwater seepage observed. Minor caving 0 to 8 feet.				
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-66

FIGURE A-67

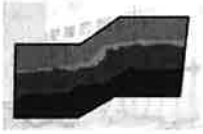
PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Short Grass **APPROX. ELEV:** 2,055

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** 0 to 7 Feet

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		FILL: coal tailings, gravels, brown bricks, moist. (FILL)	Loose			
4	1	Reddish-brown GRAVEL with sand and silt, fine to coarse grained, moist becoming wet. (GP-GM)	Medium Dense to Dense to Very Dense	6.3		
9	2			3.7		
10		Terminated at 10 feet. No groundwater seepage observed. Minor caving 0 to 7 feet.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-67

FIGURE A-68

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,077

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** 0 to 3 Feet

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
0		FOREST DUFF and brown organics with silty sand, dry. (TOPSOIL)	Loose			
1–2		Reddish-brown silty SAND with gravel, fine to medium grained sand, dry to moist. (SM)	Medium Dense			
2–3	1			7.8		
3–6		Grades to reddish-brown GRAVEL with sand and silt, fine to coarse grained, moist. (GP-GM)	Dense to Very Dense			
6–7	2			6.2		
8		Terminated at 8 feet. No groundwater seepage observed. Minor caving 0 to 3 feet.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-68

FIGURE A-69

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Grasses **APPROX. ELEV:** 2,090

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** 0 to 8 Feet

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1–8	1	FILL: coal tailings, highly degraded, fine particles, soil-like, moist. (COAL) (UNCONTROLLED Fill)	Soft	25.9		
8–10	2	Reddish-brown silty GRAVEL with sand, fine to coarse grained, wet. (GM)	Dense	12.5		
10		Terminated at 10 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-69

FIGURE A-70

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,057

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
0		(FOREST DUFF)	Loose			
2	1	Reddish-tan silty SAND, fine grained, dry. (SM)	Medium Dense	8.5		
7	2	Reddish-tan silty SAND with gravel, fine grained, moist. (SM)	Medium Dense to Dense	8.4		
13	3	Gray and tan SILT, moist. (ML)	Stiff to Very Stiff	41.4		
20		Terminated at 20 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-70

FIGURE A-71

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,103

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(3 inches FOREST DUFF)				
2		Reddish-brown silty SAND, fine grained, dry to moist. (SM)	Medium Dense to Dense			
10						
12	1			11.7		
13		Reddish-brown SAND, trace silt, fine grained, moist. (SP)	Dense			
18		Terminated at 18 feet. No groundwater seepage observed.				
20						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-71

FIGURE A-72

PROJECT NAME: City Heights PROJ. NO: T-6504 LOGGED BY: JMC

LOCATION: Kittatas County, Washington SURFACE CONDS: Underbrush APPROX. ELEV: 2,127

DATE LOGGED: November 5, 2010 DEPTH TO GROUNDWATER: N/A DEPTH TO CAVING: N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(2 inches FOREST DUFF)				
2		Reddish-brown silty SAND to sandy SILT, fine grained, dry. (SM to ML)	Medium Dense			
5		Becomes moist.	Dense			
10			Very Dense			
14		Reddish-brown silty GRAVEL with sand, moist. (GM)	Very Dense			
15		Terminated at 15 feet. No groundwater seepage observed.				
20						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-72

FIGURE A-73

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,117

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
0		FOREST DUFF and brown silty SAND. (TOPSOIL)	Loose			
1–2	1	Reddish-tan silty SAND, fine grained, dry. (SM)	Medium Dense	9.5		
3–6	2	Reddish-brown GRAVEL with sand, silt, and cobbles, fine to coarse grained sand, moist. (GM)	Dense to Very Dense	6.2		
10–11	3	Reddish-brown GRAVEL with silt and sand, fine to coarse grained sand, scattered small boulders, moist. (GP-GM)	Very Dense	5.3		
13–14	4	Reddish-brown SAND with gravel and silt, fine to medium grained, moist. (SP-SM)	Very Dense	9.5		
15		Terminated at 15 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-73

FIGURE A-74

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,113

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		(3 inches FOREST DUFF, ROOTS to 2 feet)				
2		Reddish-brown silty GRAVEL with sand, scattered cobbles, fine to coarse grained sand, moist. (GM)	Medium Dense			
3						
4						
5	1		Dense	5.8		
6						
7						
8			Very Dense			
9						
10		Silt grades out and back in between 9 and 12 feet.				
11	2			5.7		
12						
13						
14	3			16.7		
15						
16		Terminated at 15 feet. No groundwater seepage observed.				
17						
18						
19						
20						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-74

FIGURE A-75

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,110

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		10 inches FOREST DUFF and brown silty SAND with organics. (TOPSOIL)	Loose			
2	1	Tan silty GRAVEL with sand, fine grained sand, dry. (SM)	Medium Dense	5.0		
3						
4		Reddish-brown silty GRAVEL with sand, scattered cobbles, fine to coarse grained sand, moist. (GM)	Dense			
5						
6						
7						
8	2	Reddish-brown GRAVEL with silt and sand, fine to medium grained sand, moist. (GP-GM)	Very Dense	10.7		
9						
10						
11						
12						
13		Reddish-brown SAND, occasional gravels, fine to medium grained, moist. (SP)	Very Dense			
14	3			12.6		
15						
16		Terminated at 15 feet. No groundwater seepage observed.				
17						
18						
19						
20						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-75

FIGURE A-76

PROJECT NAME: City Heights **PROJ. NO:** T-6504 **LOGGED BY:** JMC

LOCATION: Kittatas County, Washington **SURFACE CONDS:** Underbrush **APPROX. ELEV:** 2,090

DATE LOGGED: November 5, 2010 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
0		10 inches FOREST DUFF and brown silty sand, scattered organics. (SM)	Loose			
1–6		Tan silty SAND with gravel, fine grained sand, moist. (SM)	Medium Dense to Dense			
6–10		Orange-tan SAND, fine grained, moist. (SP) (Completely weathered SANDSTONE)	Very Dense			
10–15		Terminated at 10 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-101

FIGURE A-77

PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,096 Feet

DATE LOGGED: May 14, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(12 inches TOPSOIL)		
1		Brown silty SAND, fine to medium grained, moist. (SM) (Completely weathered sandstone)		
2				
3				15.7
4			Medium Dense	
5				
6				
7				
8		Tan mottled SILT with fine sand, fractured, slight plasticity, moist. (ML) (Completely weathered sandstone)		
9				
10			Very Stiff	23.8
11				
12		Yellowish-gray SANDSTONE, medium grained, fractured, highly weathered, weak. (Roslyn Formation)		
13		Test pit terminated at approximately 13 feet. No groundwater. No caving.		
14				
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-102

FIGURE A-78

PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,100 Feet

DATE LOGGED: May 14, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(8 inches TOPSOIL)		
1		Brown silty SAND, fine to medium grained, moist. (SM) (Completely weathered sandstone)		
2			Medium Dense	
3				
4		Brown SILT with clay and fine sand, slight plasticity, moist. (ML) (Completely weathered sandstone)		
5				
6				
7			Very Stiff	
8				21.2
9				
10				
11		Yellowish-gray SANDSTONE, medium grained, fractured, highly weathered, weak. (Roslyn Formation)		
12				
13		Test pit terminated at approximately 13 feet. No groundwater. No caving.		
14				
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-103

FIGURE A-79

PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,030 Feet

DATE LOGGED: May 14, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6 inches DUFF)		
1		Brown silty SAND with sandstone clasts, fine sand, moist. (SM) (Possible glacial outwash)		
2				
3				
4				
5			Medium Dense	7.5
6				
7				
8				
9				
10				16.4
11		Light brown SANDSTONE, fine grained, fractured, highly weathered, weak. (Roslyn formation)		
12		Test pit terminated at approximately 12 feet. No groundwater. No caving.		
13				
14				
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-104

FIGURE A-80

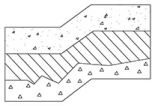
PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,025 Feet

DATE LOGGED: May 14, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(4 inches DUFF)	Medium Dense	
1		Brown silty SAND with gravel and rounded cobbles, fine to medium sand, moist. (SM) (Possible glacial outwash)		
2				
3				
4				
5			Dense to Very Dense	
6				12.7
7				
8				
9				
10				
11				
12				
13				
14				
15				13.9
16		Test pit terminated at approximately 15 feet. No groundwater. No caving.		
17				
18				
19				
20				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-105

FIGURE A-81

PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,035 Feet

DATE LOGGED: May 14, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(8 inches DUFF)		
1		Brown silty SAND with trace gravel, fine sand, moist. (SM) (Possible glacial outwash)		
2				
3				
4				
5			Medium Dense	
6				
7				10.5
8				
9				
10		Light brown SAND with silt and fine gravel, coarse sand, moist. (SP-SM)		
11				10.8
12			Dense	
13		Test pit terminated at approximately 13 feet. No groundwater. No caving.		
14				
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-106

FIGURE A-82

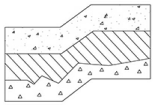
PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,025 Feet

DATE LOGGED: May 14, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(10 inches TOPSOIL)		
1		Brown silty SAND, fine grained, moist. (SM)		
2				
3			Medium Dense	
4				11.8
5				
6		Light gray mottled silty SAND with gravel, sandstone clasts, trace cobbles, moist. (SM)		
7				
8			Dense	11.4
9				
10		Gray CLAY, fractured, medium plasticity, moist. (CL)		
11			Very Stiff to Hard	38.6
12		Test pit terminated at approximately 12 feet. No groundwater. No caving.		
13				
14				
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-107

FIGURE A-83

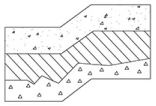
PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,006 Feet

DATE LOGGED: May 15, 2020 **DEPTH TO GROUNDWATER:** 10 Feet **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(16 inches TOPSOIL)		
1		Light brown mottled clayey SILT with fine sand, slightly plastic, moist. (ML)		
2				
3			Very Stiff	
4				20.2
5				
6		Light brown mottled silty SAND with gravel and cobbles, fine to medium sand, moist to wet. (SM)		
7				
8				
9				20.0
▼10			Medium Dense	
11		Brown SAND with silt, medium grained, wet. (SP-SM)		22.5
12				
13		Test pit terminated at approximately 13 feet. Light groundwater seepage at 10 feet. No caving.		
14				
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-108

FIGURE A-84

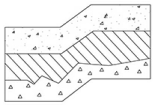
PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,004 Feet

DATE LOGGED: May 15, 2020 **DEPTH TO GROUNDWATER:** 12 Feet **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(16 inches TOPSOIL)		
1		Light brown mottled silty fine SAND/SILT with gravel, moist. (SM/ML)		
2			Medium Dense	
3				
4				
5				23.7
		Light brown mottled silty GRAVEL with cobbles, trace boulders, fine to coarse gravel, moist to wet. (GM)		
6				
7				
8				15.1
9			Dense	
10				
11				
12 ▼				
		Brown mottled SAND with silt, medium grained, wet. (SP-SM)	Medium Dense	
13		Test pit terminated at approximately 13 feet. Moderate groundwater seepage at 12 feet. No caving.		
14				
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-109

FIGURE A-85

PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,190 Feet

DATE LOGGED: May 15, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(9 inches TOPSOIL)		
1		Light brown-gray mottled SILT, non-plastic, moist. (ML) (Completely weathered sandstone)		
2				
3			Medium Dense	
4				
5				20.7
6				
7		Yellowish-tan SANDSTONE, thin coal seams, fine grained, fractured, moderately weathered, weak,. (Roslyn formation)		
8				
9				
10		*Massive, slightly weathered, medium strong.		
11		Test pit terminated at 11 feet due to excavator refusal. No groundwater. No caving.		
12				
13				
14				
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-110

FIGURE A-86

PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,214 Feet

DATE LOGGED: May 15, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(8 inches TOPSOIL)		
1		Light brown-gray mottled SILT, non-plastic, moist. (ML) (Completely weathered siltstone)	Medium Dense	
2				
3		Tan SILTSTONE, fractured, hightly weathered, weak. (Roslyn formation)		13.6
4				
5				
6		*Moderately weathered.		
7				
8				
9				
10		*Massive, slightly weathered, medium strong.		
11		Test pit terminated at 11 feet due to excavator refusal. No groundwater. No caving.		
12				
13				
14				
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-111

FIGURE A-87

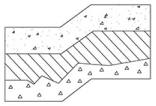
PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,236 Feet

DATE LOGGED: May 15, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(12 inches TOPSOIL)		
1		Brown silty SAND, fine to medium grained, moist. (SM) (Completely weathered sandstone)	Medium Dense	
2		Yellow-tan SANDSTONE, medium grained, fractured, highly weathered, weak. (Roslyn formation)		
3				
4				
5				
6				
7		*Massive, slightly weathered, medium strong.		
8		Test pit terminated at 8 feet due to excavator refusal. No groundwater. No caving.		
9				
10				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-112

FIGURE A-88

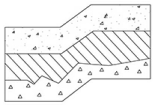
PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,152 Feet

DATE LOGGED: May 14, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(5 inches TOPSOIL)	Medium Dense	
1		Brown silty SAND, fine grained, moist. (SM) (Completely weathered siltstone)		14.3
2		Yellow-tan SILTSTONE, fractured, highly weathered, weak. (Roslyn formation)		
3				
4				
5				
6		*Slightly weathered.		
7				
8		*Medium strong.		
9		Test pit terminated at 9 feet due to excavator refusal.		
10		No groundwater. No caving.		
11				
12				
13				
14				
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.



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LOG OF TEST PIT NO. TP-113

FIGURE A-89

PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Sparse Grass **APPROX. ELEV:** 1,930 Feet

DATE LOGGED: May 18, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0–2		(10 inches TOPSOIL/FILL) FILL: Black coal tailings, moist.	Loose	
2–9		FILL: Brown silty GRAVEL with sand and scattered cobbles, fine to coarse gravel, moist. (GM)	Dense	6.2
9–14		Brown GRAVEL with silt and scattered cobbles, fine to coarse gravel, moist to wet. (GW-GM)	Dense	6.6
14–20		Test pit terminated at approximately 14 feet. No groundwater. No caving.		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-114

FIGURE A-90

PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 1,930 Feet

DATE LOGGED: May 18, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0–1		(8 inches TOPSOIL/FILL) FILL: Brown silty SAND with gravel, abundant brick fragments, moist to wet. (SM)	Loose	
1–12		FILL: Brown silty GRAVEL, coal fragments, scattered cobbles, fine to coarse gravel, moist. (GM) *12-inch layer of coal tailings.	Medium Dense	11.5
12–14		FILL: Gray to brown clayey GRAVEL with fine sand, disturbed texture, medium plastic, clay in matrix, fine to coarse gravel, moist. (GC)	Dense	19.0
14–20		Test pit terminated at approximately 14 feet. No groundwater. No caving.		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-115

FIGURE A-91

PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Sparse Grass **APPROX. ELEV:** 1,940 Feet

DATE LOGGED: May 18, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		FILL: Black coal fragments and dust, moist.	Very Loose	
2		FILL: Brown silty SAND with gravel, scattered cobbles, trace boulders, fine to medium sand, moist. (SM)	Dense	10.2
8		Brown clayey SILT, fractured medium plasticity, moist. (ML) (Completely weathered siltstone)	Hard	
9		Brown SILTSTONE, fractured moderately weathered, medium strong. (Roslyn formation) *Massive		
11		Test pit terminated at 11 feet due to excavator refusal. No groundwater. No caving.		
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-116

FIGURE A-92

PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Sparse Weeds **APPROX. ELEV:** 1,935 Feet

DATE LOGGED: May 18, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0–5		FILL: Brown-gray silty SAND with gravel and coal fragments, medium sand, moist. (SM)	Very Loose	
5–12		FILL: Brown silty GRAVEL with sand fine to medium sand, scattered cobbles, trace boulders, fine to coarse gravel, moist. (GM)	Dense	7.5
12–13		Gray-brown silty CLAY with pockets of coal and trace cobbles, disturbed texture, medium plastic, moist. (CL) (Completely weathered siltstone)	Very Stiff	
13–14		Brown SILTSTONE, fractured, moderately weathered, medium strong. (Roslyn formation)		
14–20		Test pit terminated at approximately 14 feet. No groundwater. No caving.		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-117

FIGURE A-93

PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,075 Feet

DATE LOGGED: May 18, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(5 inches DUFF)		
1		Brown mottled silty SAND, fine to medium grained, moist. (SM)		
2			Medium Dense	
3				
4				15.4
5		Tan SILT, fractured non-plastic, moist. (ML) (Completely weathered siltstone)		
6			Very Dense	
7		Tan SILTSTONE, fractured, moderately weathered, medium strong. (Roslyn formation)		
8				
9		Test pit terminated at 9 feet due to excavator refusal.		
10		No groundwater. No caving.		
11				
12				
13				
14				
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-118

FIGURE A-94

PROJECT NAME: City Heights **PROJ. NO:** T-6504-1 **LOGGED BY:** KPR

LOCATION: Cle Elum, Washington **SURFACE CONDITIONS:** Brush **APPROX. ELEV:** 2,065 Feet

DATE LOGGED: May 18, 2020 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7 inches DUFF)		
1		Dark brown to brown-gray silty SAND, fine grained, moist. (SM)		
2			Medium Dense	
3				
4		Light brown mottled silty CLAY with coarse gravel, fractured, low to medium plasticity, moist. (CL) (Completely weathered siltstone)		
5			Hard	
6				14.5
7		Tan SILTSTONE, fractured, moderately weathered, medium strong. (Roslyn formation)		
8				
9		Test pit terminated at 9 feet due to excavator refusal.		
10		No groundwater. No caving.		
11				
12				
13				
14				
15				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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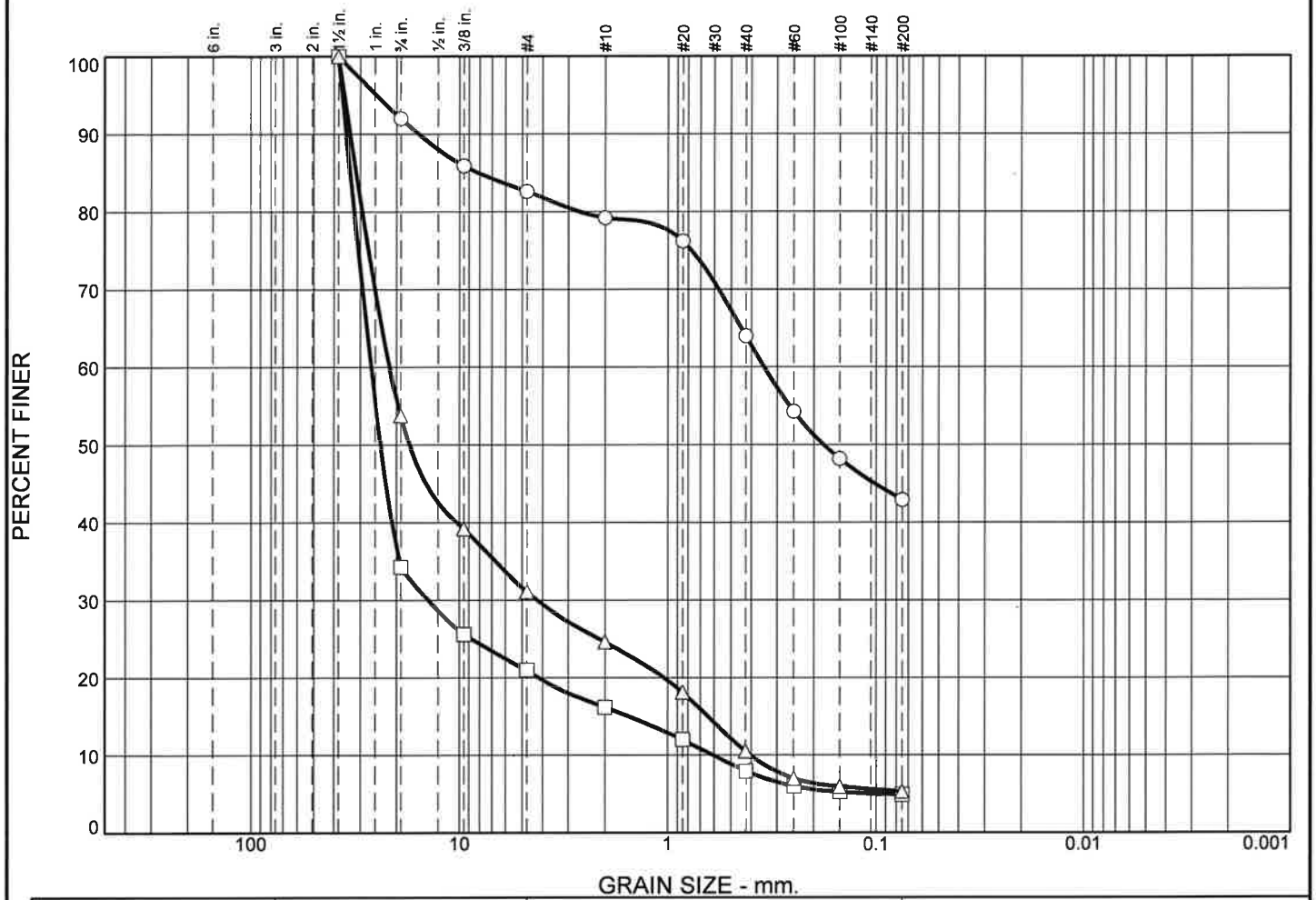
Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	8.0	9.4	3.4	15.2	21.1	42.9	
□	0.0	65.7	13.3	4.8	8.2	3.1	4.9	
△	0.0	46.2	22.7	6.5	14.1	5.2	5.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			8.1546	0.3472	0.1793					
□			33.4650	26.5288	23.8226	14.0797	1.5274	0.6070	12.31	43.70
△			31.3835	21.5989	17.2716	4.2416	0.6420	0.4024	2.07	53.67

Material Description	USCS	AASHTO
○ sandy SILT with gravel	(ML)	
□ GRAVEL with sand and silt	(GP-GM)	
△ GRAVEL with sand and silt	(GP-GM)	

Project No. T-6504-1 **Client:** Trailside Homes

Project: City Heights

Cle Elum, Washington

○ **Location:** Test Pit TP-26 **Depth:** -6 ft **Sample Number:** 2

□ **Location:** Test Pit TP-27 **Depth:** -6 ft **Sample Number:** 1

△ **Location:** Test Pit TP-27 **Depth:** -16 ft **Sample Number:** 3

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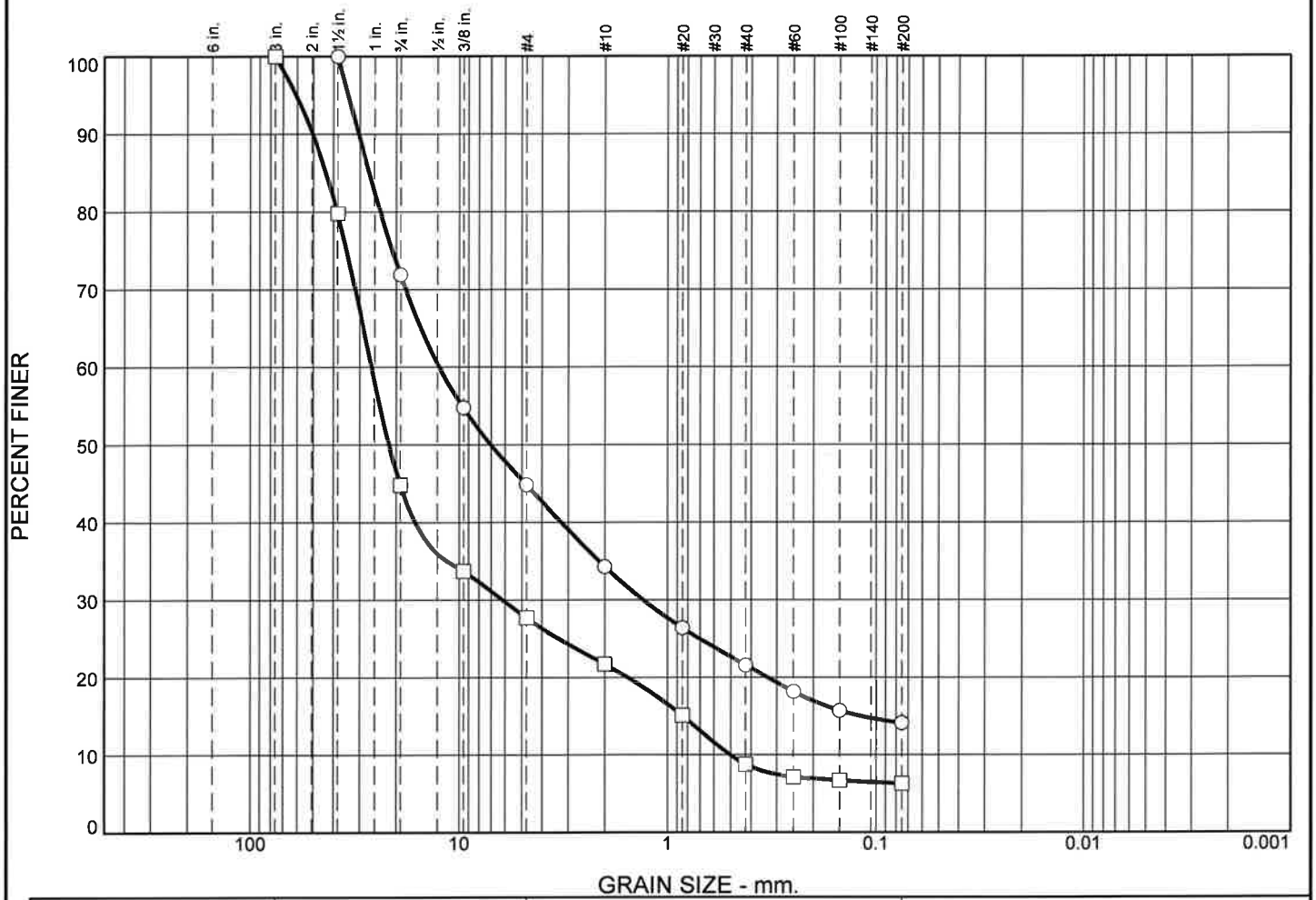
Remarks:

Figure A-95

Tested By: BS **Checked By:** JMC

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	28.1	27.0	10.6	12.7	7.5	14.1	
□	0.0	55.2	17.1	6.0	12.9	2.5	6.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			26.9197	12.3734	7.0134	1.3057	0.1193			
□			43.2358	26.1860	21.5608	6.1585	0.8412	0.5018	2.89	52.19

Material Description	USCS	AASHTO
○ sitly GRAVEL with sand	(GM)	
□ GRAVEL with sand and silt	(GP-GM)	

Project No. T-6504-1 **Client:** Trailside Homes

Project: City Heights

Cle Elum, Washington

○ **Location:** Test Pit TP-32 **Depth:** -6 ft **Sample Number:** 2

□ **Location:** Test Pit TP-33 **Depth:** -11 ft **Sample Number:** 3

Remarks:

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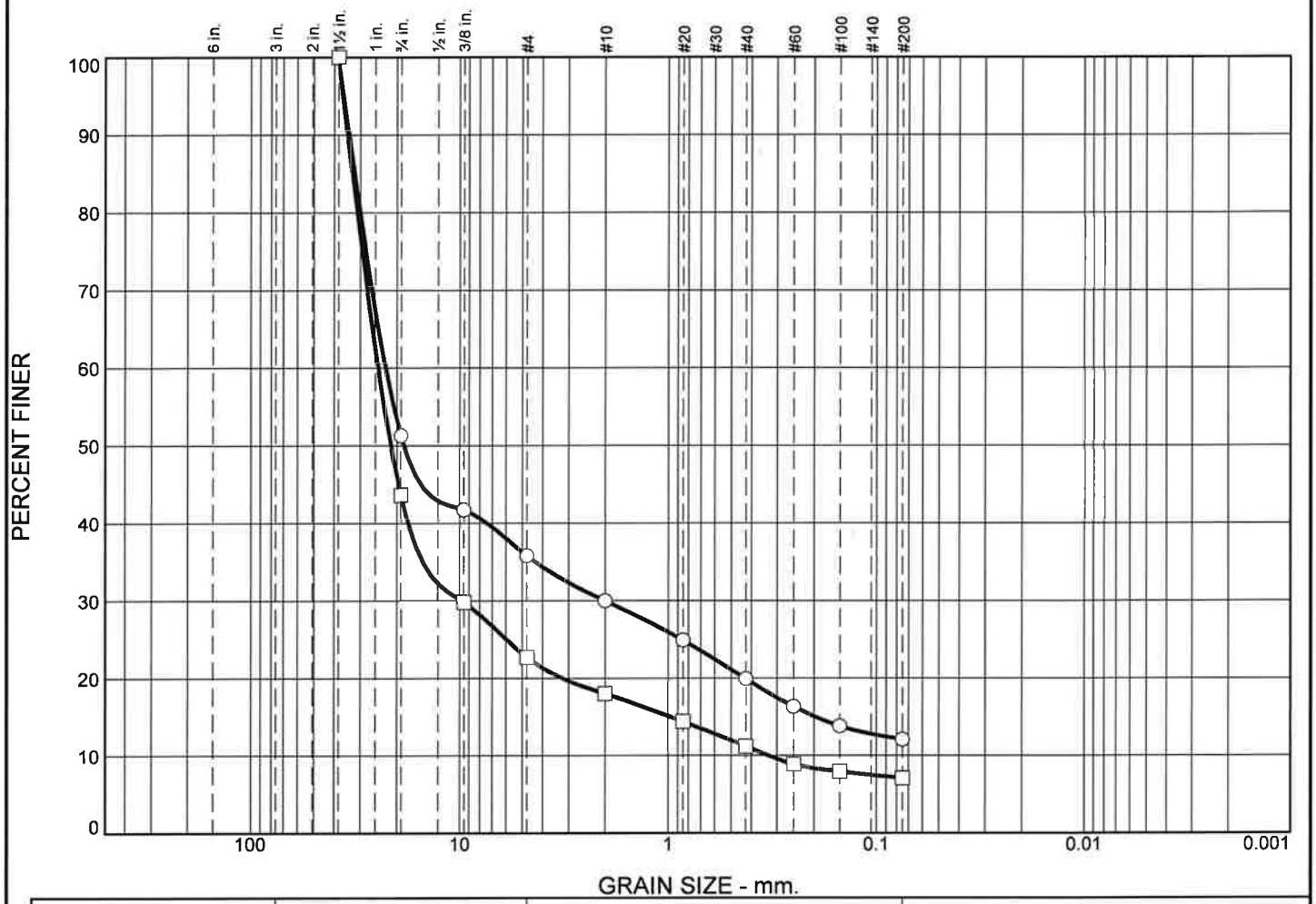
Kirkland, WA

Figure A-96

Tested By: BS **Checked By:** JMC

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	48.7	15.5	5.8	10.1	7.8	12.1	
□	0.0	56.4	20.9	4.7	6.8	4.1	7.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			31.8713	22.6089	18.4200	2.0000	0.1976			
□			32.6105	24.5264	21.3149	9.7756	0.9732	0.3302	11.80	74.27

Material Description	USCS	AASHTO
○ silty GRAVEL with sand	(GM)	
□ GRAVEL with sand and silt	(GP-GM)	

Project No. T-6504-1 **Client:** Trailside Homes

Project: City Heights

Cle Elum, Washington

○ **Location:** Test Pit TP-52 **Depth:** -15 ft **Sample Number:** 2

□ **Location:** Test Pit TP-51 **Depth:** -6 ft **Sample Number:** 2

Remarks:

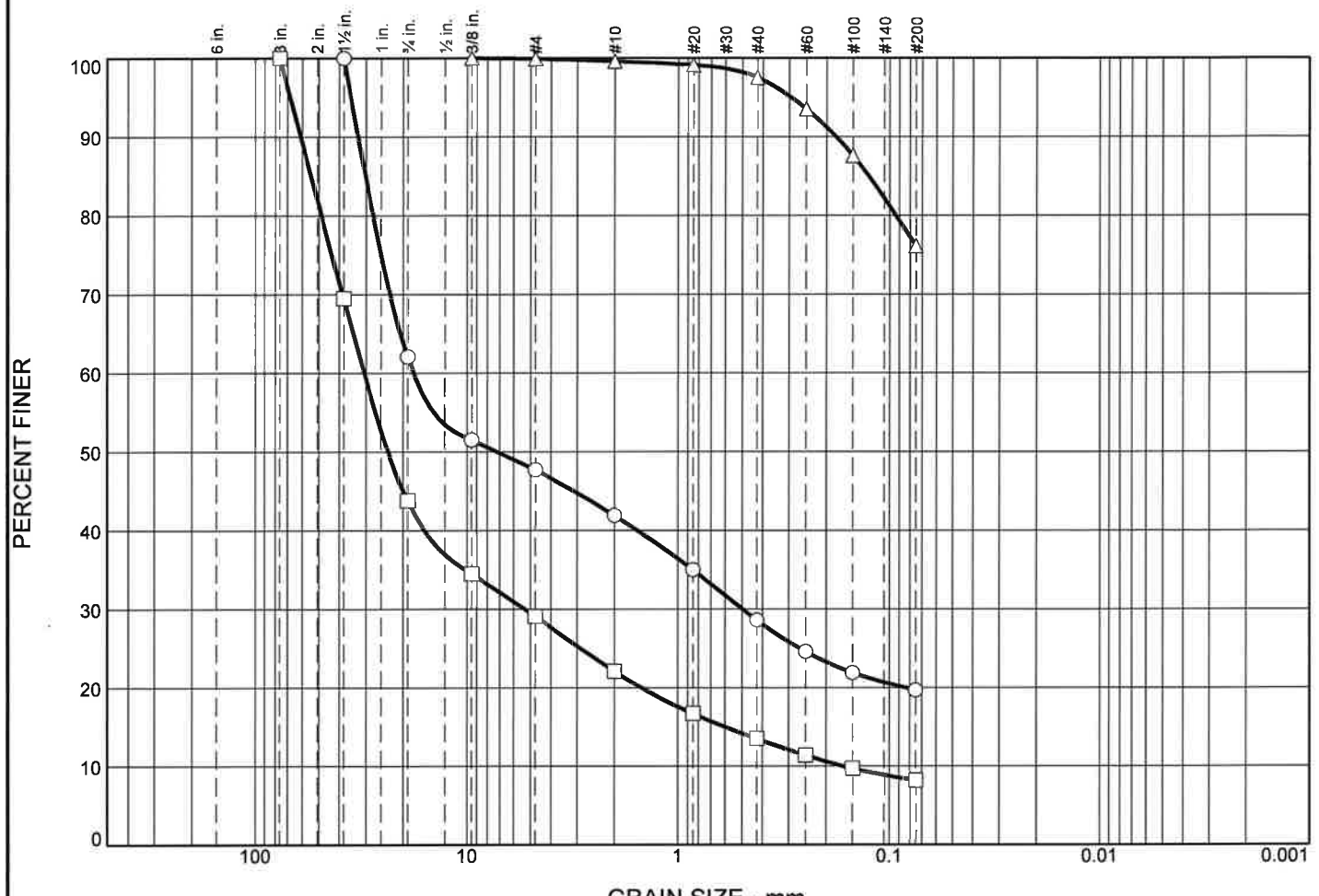
Terra Associates, Inc.

Kirkland, WA

Figure A-97

Tested By: BS **Checked By:** JMC

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	37.9	14.4	5.8	13.3	8.9	19.7	
□	0.0	56.2	14.7	7.0	8.6	5.3	8.2	
△	0.0	0.0	0.1	0.3	2.1	21.4	76.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			30.0685	17.8523	7.1804	0.4973				
□			54.2740	30.4888	23.4453	5.3139	0.6000	0.1662	5.57	183.41
△			0.1260							

Material Description	USCS	AASHTO
○ silty GRAVEL with sand	(GM)	
□ GRAVEL with sand and silt	(GP-GM)	
△ SILT with sand	(ML)	

Project No. T-6504-1 **Client:** Trailside Homes

Project: City Heights

Cle Elum, Washington

○ **Location:** Test Pit TP-57 **Depth:** -10 ft **Sample Number:** 2

□ **Location:** Test Pit TP-58 **Depth:** -9 ft **Sample Number:** 1

△ **Location:** Test Pit TP-60 **Depth:** -3 ft **Sample Number:** 1

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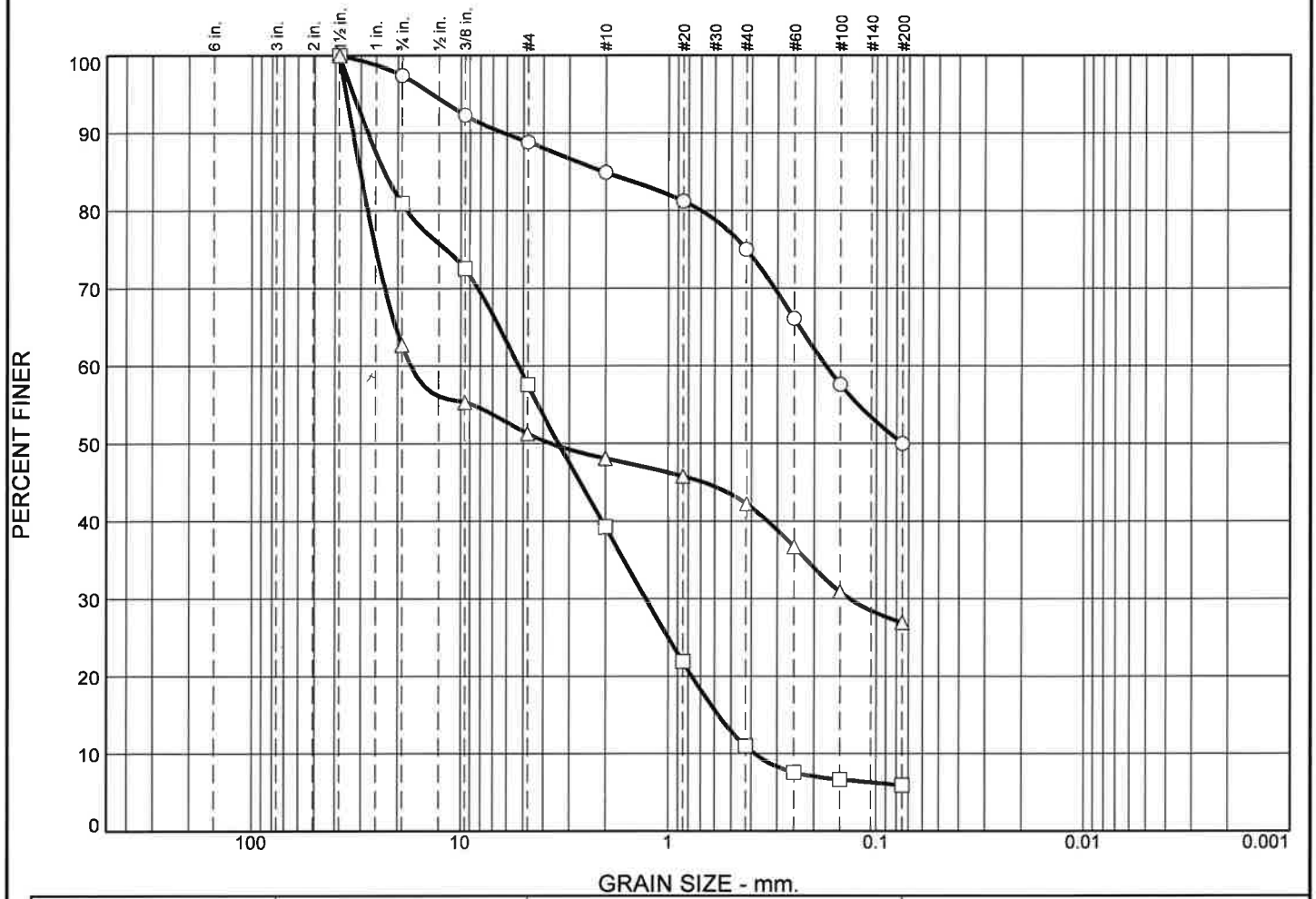
Remarks:

Figure A-98

Tested By: BS **Checked By:** JMC

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	2.6	8.6	3.9	9.9	25.0	50.0	
□	0.0	19.1	23.3	18.3	28.3	5.1	5.9	
△	0.0	37.3	11.4	3.2	5.8	15.4	26.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.0489	0.1758	0.0750					
□			23.0424	5.2588	3.3665	1.2753	0.5747	0.3831	0.81	13.73
△			30.1117	17.2189	3.6622	0.1347				

Material Description	USCS	AASHTO
○ sandy SILT	(ML)	
□ SAND with gravel and silt	(SP-SM)	
△ silty GRAVEL with sand	(GM)	

Project No. T-6504-1 **Client:** Trailside Homes

Project: City Heights

Cle Elum, Washington

○ **Location:** Test Pit TP-61 **Depth:** -11 ft **Sample Number:** 1

□ **Location:** Test Pit TP-63 **Depth:** -9.5 ft **Sample Number:** 2

△ **Location:** Test Pit TP-68 **Depth:** -9 ft **Sample Number:** 2

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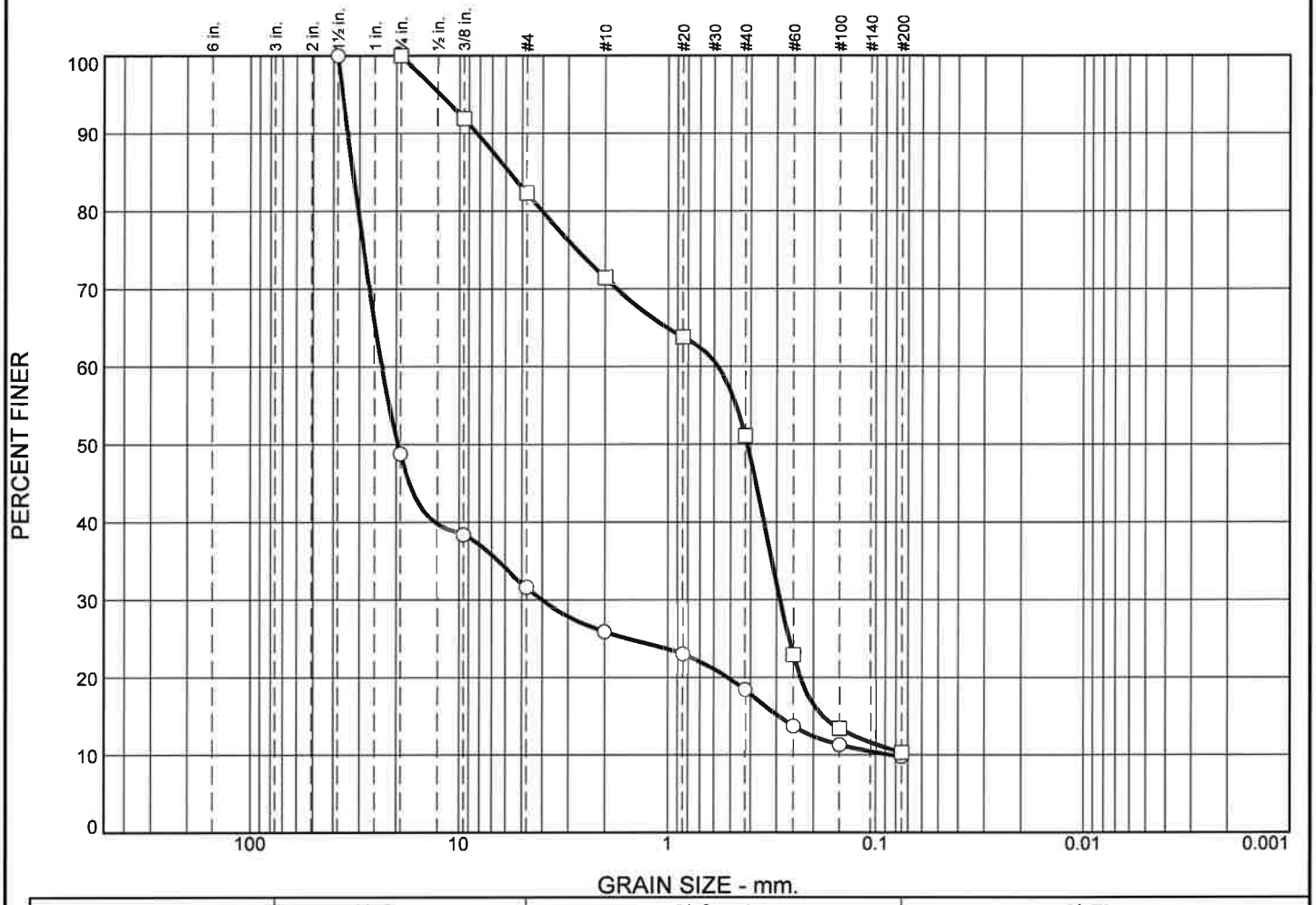
Remarks:

Figure A-99

Tested By: BS **Checked By:** JMC

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	51.2	17.2	5.7	7.5	8.6	9.8	
□	0.0	0.0	17.7	10.9	20.3	40.8	10.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			32.1518	23.3325	19.5674	4.0046	0.2938	0.0840	8.18	277.65
□			5.7584	0.5752	0.4148	0.2894	0.1809			

Material Description	USCS	AASHTO
○ GRAVEL with sand and silt	(GP-GM)	
□ SAND with gravel and silt	(SP-SM)	

Project No. T-6504-1 **Client:** Trailside Homes

Project: City Heights

Cle Elum, Washington

○ **Location:** Test Pit TP-72 **Depth:** -6 ft **Sample Number:** 2

□ **Location:** Test Pit TP-72 **Depth:** -13 ft **Sample Number:** 4

Remarks:

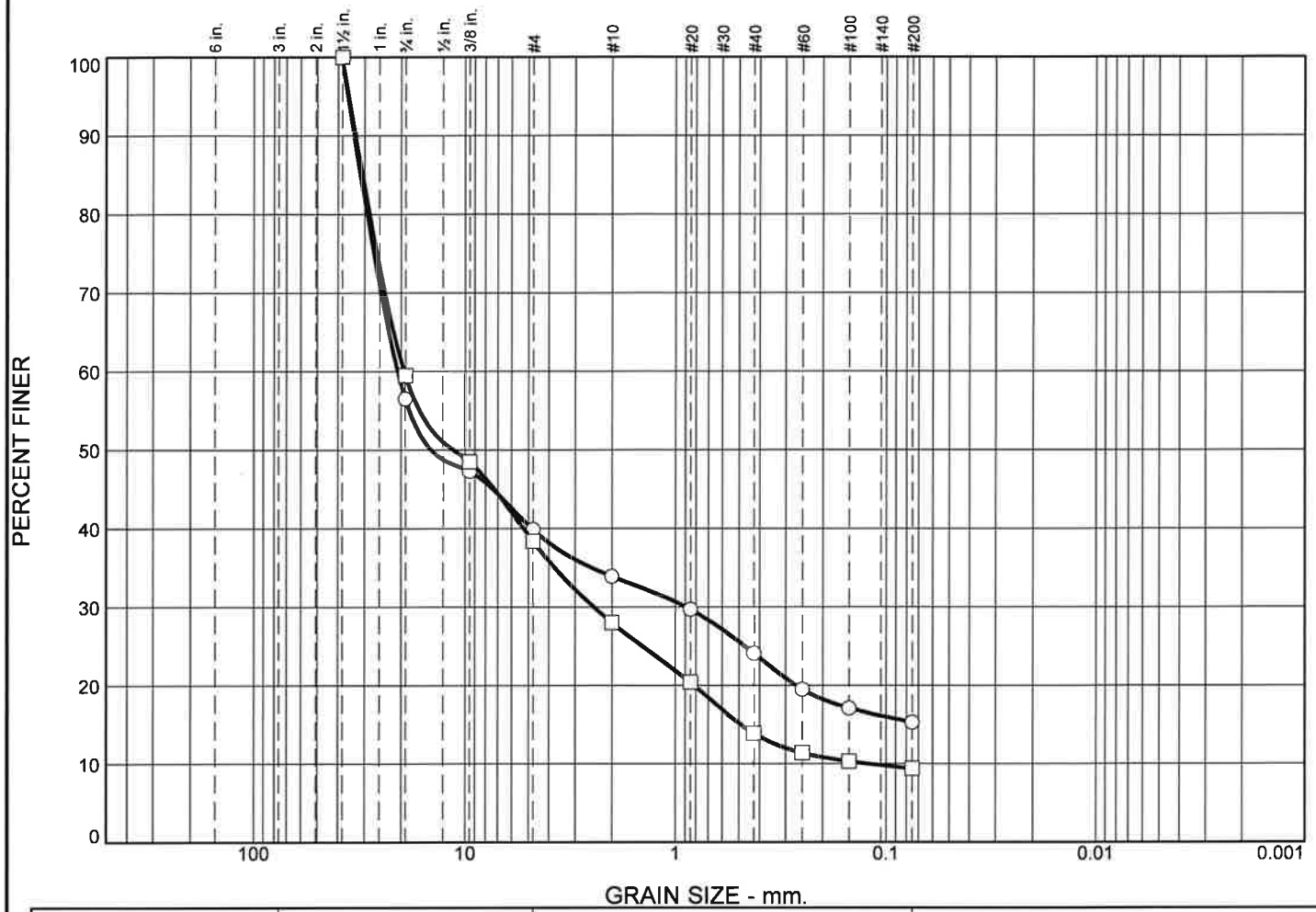
Terra Associates, Inc.

Kirkland, WA

Figure A-100

Tested By: BS **Checked By:** JMC

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	43.5	16.6	6.0	9.8	8.8	15.3	
□	0.0	40.5	21.1	10.4	14.1	4.5	9.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			31.1747	20.7408	14.4131	0.8918				
□			30.6198	19.3132	11.2819	2.4456	0.4882	0.1224	2.53	157.76

	Material Description	USCS	AASHTO
○	silty GRAVEL with sand	(GM)	
□	GRAVEL with sand and silt	(GP-GM)	

Project No. T-6504-1 **Client:** Trailside Homes

Project: City Heights

Cle Elum, Washington

○ **Location:** Test Pit TP-74 **Depth:** -2 ft **Sample Number:** 1

□ **Location:** Test Pit TP-74 **Depth:** -8 ft **Sample Number:** 2

Remarks:

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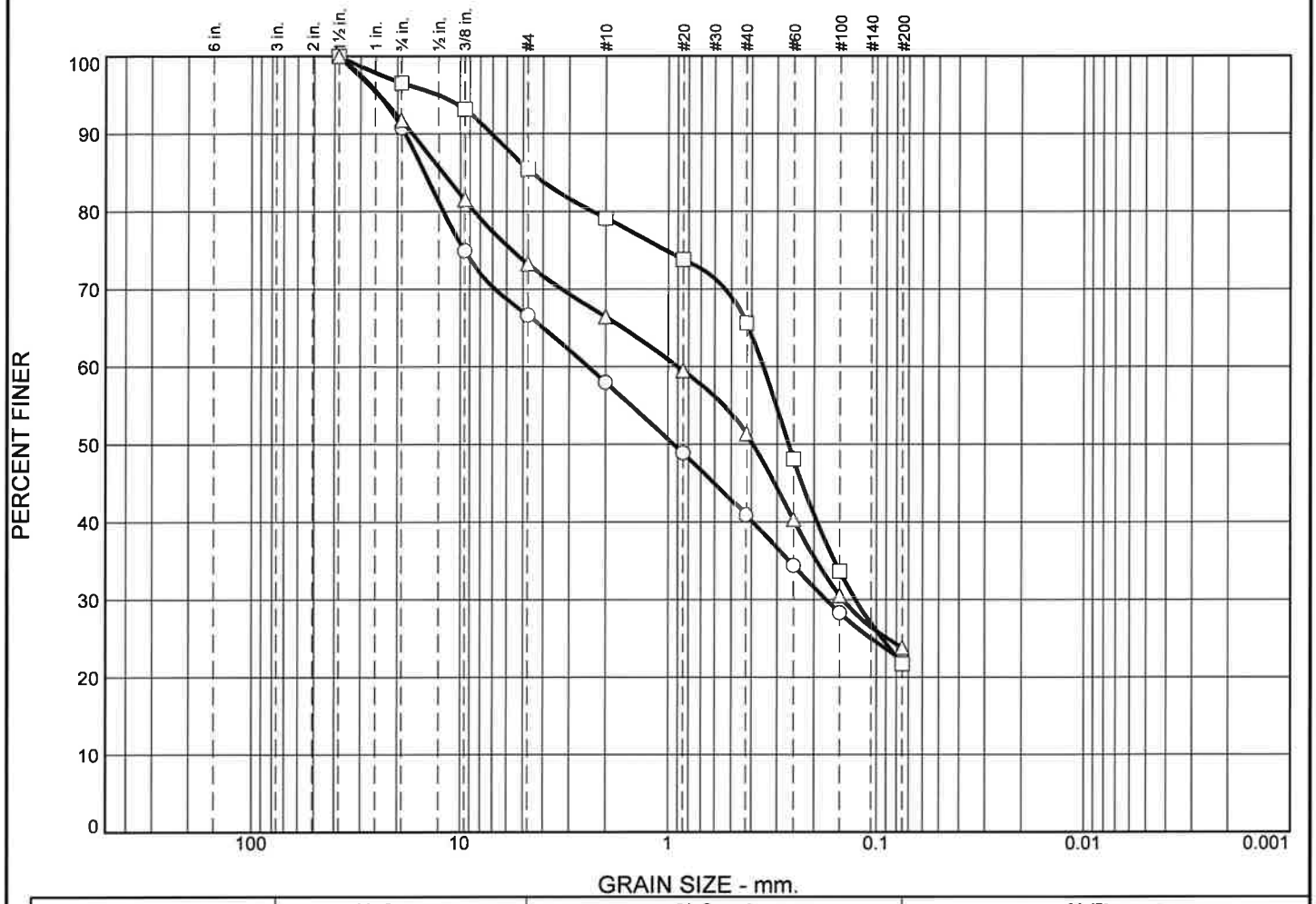
Kirkland, WA

Figure A-101

Tested By: BS **Checked By:** JMC

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	9.2	24.2	8.6	17.1	18.7	22.2	
□	0.0	3.5	11.1	6.3	13.5	43.9	21.7	
△	0.0	8.3	18.5	6.8	15.0	27.6	23.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			14.7514	2.4244	0.9395	0.1746				
□			4.5668	0.3512	0.2641	0.1260				
△			12.0847	0.9006	0.3934	0.1449				

	Material Description	USCS	AASHTO
○	Silty SAND	SM	
□	Silty SAND	SM	
△	Silty SAND	SM	

Project No. T-6504-1 **Client:** Trailside Homes

Project: City Heights

○ **Location:** TP-103 **Depth:** -5 ft

□ **Location:** TP-103 **Depth:** -10 ft

△ **Location:** TP-104 **Depth:** -6 ft

Remarks:

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Figure A-102

Tested By: FQ

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	1.8	4.5	6.9	28.3	42.8	15.7	
□	0.0	0.0	33.6	22.4	18.3	16.3	9.4	
△	0.0	18.2	20.0	8.8	17.8	19.1	16.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.6753	0.4423	0.3479	0.2125				
□			7.6560	3.9333	2.7038	0.6247	0.1863	0.0840	1.18	46.84
△			21.9237	4.0419	1.4400	0.3118				

	Material Description	USCS	AASHTO
○	Silty SAND	SM	
□	SAND with silt	SP-SM	
△	Silty SAND	SM	

Project No. T-6504-1 **Client:** Trailside Homes

Project: City Heights

○ **Location:** TP-105 **Depth:** -7 ft

□ **Location:** TP-105 **Depth:** -11 ft

△ **Location:** TP-106 **Depth:** -8 ft

Remarks:

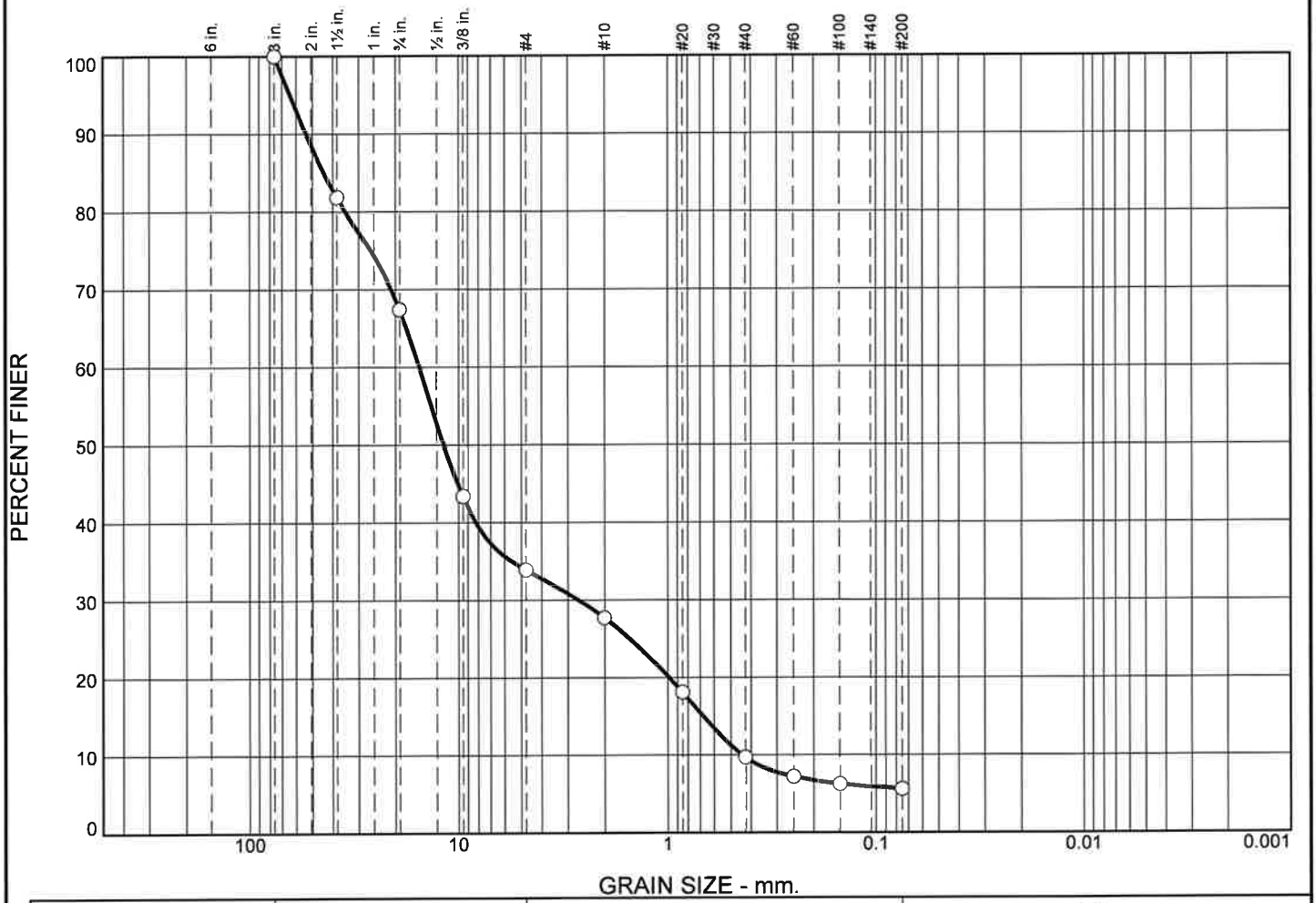
Terra Associates, Inc.

Kirkland, WA

Figure A-103

Tested By: FQ

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	32.6	33.5	6.2	18.0	4.1	5.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			43.9961	15.3124	11.7074	2.6649	0.6756	0.4400	1.05	34.80

	Material Description	USCS	AASHTO
○	GRAVEL with silt	GW-GM	

Project No. T-6504-1 **Client:** Trailside Homes

Project: City Heights

○ **Location:** TP-113 **Depth:** -14 ft

Remarks:

Terra Associates, Inc.

Kirkland, WA

Figure A-104

Tested By: FQ

APPENDIX B

SEISMIC REFRACTION SURVEY

SEISMIC REFRACTION SURVEY

CITY HEIGHTS DEVELOPMENT PROJECT
CLE ELUM, WASHINGTON

FOR

TERRA ASSOCIATES, INC.
KIRKLAND, WASHINGTON

DECEMBER 2010

PHILIP H. DUOOS
GEOPHYSICAL CONSULTANT

PHILIP H. DUOOS **GEOPHYSICAL CONSULTANT**

December 8, 2010 Our Ref: 938-10

Mr. Ted Schepper
Terra Associates, Inc.
12525 Willows Rd., Suite 101
Kirkland, WA 98034

REPORT: Seismic Refraction Survey
Proposed Roadway Sites
City Heights Development Project
Cle Elum, Washington

Dear Mr. Schepper:

This letter report contains the results of the seismic refraction survey that we performed at the site on November 10 - 11, 2010. The purpose of the investigation was to determine the depth and seismic wave velocity of shallow bedrock in the vicinity of selected proposed roadways and utility corridors. The seismic wave velocity in bedrock is often a good indicator of the rippability of the rock. A brief description of the seismic refraction method is given in Attachment A. Rippability charts for various Caterpillar rippers are provided in Attachment B.

Field Methodology

The general locations of the seismic lines are shown on the two Site Maps (Maps 1 and 2). The locations were selected by Terra Associates, and rough GPS coordinates were obtained by Jessica Charlton (Terra), who also assisted us during the field survey.

We used a tape measure and wire pin flags to mark the locations of the geophones along each line. Line SL-1 (460 feet long) used a spacing of 20 feet between geophones. The remaining lines (SL2, 3 and 4) were 230 feet long and used a spacing of 10 feet between geophones.

Relative elevation changes for each geophone were obtained using a hand-level. Approximate ground elevations were obtained from the contour maps you provided (Maps 1 and 2). The reference flags at each geophone location, along with several wood stakes along each seismic line were left in the field for future surveying if necessary.

The field investigation was performed using a digital seismograph to record the data, and an array of 24 geophones was used. A heavy slide-hammer was used to provide the seismic source energy. The source locations were spaced at 80 to 120 foot intervals along each seismic spread and off the ends of each line.

The seismic data quality was very good. The nearby large power lines did not affect the data to any large degree because we used grounded geophones. The shallow depth to rock was also a factor in obtaining good data.

Philip H. Duoos
PH/FAX: (425) 882-2634
13503 NE 78th Place, Redmond, Washington, 98052
Email: geopyg@aol.com

Interpretation Results

The results of the seismic survey are shown on the interpretation profiles for each seismic line. The profiles show the geophone locations along the ground surface, the calculated depth points below each geophone, and the interpreted interfaces (dashed lines). Results from nearby test pits or visual observations of rock are also noted on each profile. Please note that the horizontal scale is at 1 inch = 60 feet for SL-1, and 1 inch = 30 feet for the other lines. The vertical scale is 1 inch = 20 feet for all of the lines.

The basic geologic units were identified based on the interpreted compressional wave velocities (in feet/second), the limited site-specific information (borings), and results from other seismic surveys I have performed in the region. Their probable classification is indicated on the following table.

TABLE 1

Seismic Velocity Classification

SYMBOL	SEISMIC VELOCITY (feet per second)	PROBABLE CLASSIFICATION
O1	1,000 - 1,600	Unconsolidated residual soils; dry, loose overburden (sand & gravel)
O2	2,200 - 3,400	Highly weathered rock; more consolidated overburden; may include some moisture.
O3	5,500 – 7,800	Moderately weathered to competent Bedrock (siltstone and sandstone).

While the test pit information is fairly limited along the seismic lines (with the exception of SL-1 and TP 48 which were very close), they do provide good general information. It seems that the seismic "bedrock layer" (BX) is a bit deeper than what was observed in the test pits. The gradational nature of a weathered bedrock surface makes precise interpretation of the seismic data difficult. However, the bedrock "layer" indicated by the seismic survey probably indicates sounder rock than where the trackhoe met refusal at a shallower depth.

The seismic data is interpreted using discrete layer models. The test pit logs indicate that at this site the seismic velocities probably are gradational, rather than discrete layers. The amount of data obtained and the limitations of this seismic refraction method due to the basic physics involved does not allow for a complete and precise model of the gradational aspect of the geology.

The maximum observed seismic velocity of 7,800 feet per second below lines SL-1 and SL-4 is presumed to indicate sandstone. Based on the Caterpillar charts, this velocity should still be rippable with a D9 ripper. However, the rippability of the rock will depend on site-specific characteristics such as the orientation and amount of joints or fractures. Additional information on the rippability of the rock may also be gained from your test pit results, nearby rock outcrops, and perhaps excavation results from nearby developments.

Summary

General estimates of the accuracy of interpreted depths for the seismic refraction method is typically assumed to be about +/- 10 % under good conditions. As with any geophysical technique, these results are interpretive in nature and represent the best estimate of subsurface conditions considering the limitations of the geophysical method employed. Only direct observations using borings or other means can ultimately characterize subsurface conditions, using the geophysical results as a guide. Review of this information by someone familiar with the geology of the area may also provide additional insight into the seismic results.

Please feel free to contact me if you have any questions or comments regarding this information, or if you require further assistance. I appreciated the opportunity to work with you on this project and look forward to providing you with geophysical services in the future.

Sincerely,

Philip H. Duoos
Geophysical Consultant

Attachments

Attachment A: Seismic Refraction Methodology
Attachment B: Caterpillar Rippability Charts
Maps 1 & 2: Seismic Line Layout
Profiles: Seismic Interpretation Profiles (SL-1 through SL-4)

ATTACHMENT A

SEISMIC REFRACTION METHODOLOGY

Overview

The seismic refraction method is used to evaluate numerous subsurface conditions; including depth to and strength (rippability) of rock, depth to water, and general subsurface stratigraphy.

The seismic refraction method uses an induced shock wave. As the shock wave propagates through the earth, it is affected by the materials through which it passes. Geophones placed on the ground surface record the ground motion caused by the resultant wave. A seismograph measures the time required for the resultant wave to arrive at each geophone. These geophones are located at selected distances from the wave source. Analysis of the data (travel times and distances) provides seismic velocities of subsurface material and depths to significant velocity interfaces.

Geologic conditions yielding higher seismic velocities include increased amounts of water, clay, cobbles, and rock fragments, greater compaction of overburden materials, and greater competency of rock. Several factors can affect the effectiveness of the seismic method including the proximity of cultural interferences (such as powerlines and traffic noise), surface conditions (such as loose soil), the size and depth of the target, and the seismic wave velocity contrast between stratigraphic units. Seismic velocities must increase with depth for a reliable interpretation of the data.

Calculations

The description of the travel of seismic refraction waves through the earth uses the same equation that describes the refraction of light: Snell's Law. The following is a brief summary of the basic theory for a simple two-layer geologic model as discussed by Redpath (Redpath, 1973).

Snell's Law is stated as:

$$\frac{SIN\alpha}{SIN\beta} = \frac{V_1}{V_2}$$

and at the critical angle of incidence for a refracted seismic wave (β=90°), it becomes:

$$SIN\alpha = \frac{V_1}{V_2}$$

where V_1 and V_2 are the seismic wave velocities for the upper and lower layers, respectively.

The seismic refraction method measures the amount of time it takes the seismic energy to travel from the energy source to the geophones placed along the ground surface. The arrival time for the seismic wave at each geophone is plotted corresponding to the distance of the geophone from the energy source, creating a time-distance graph (Figure 1).

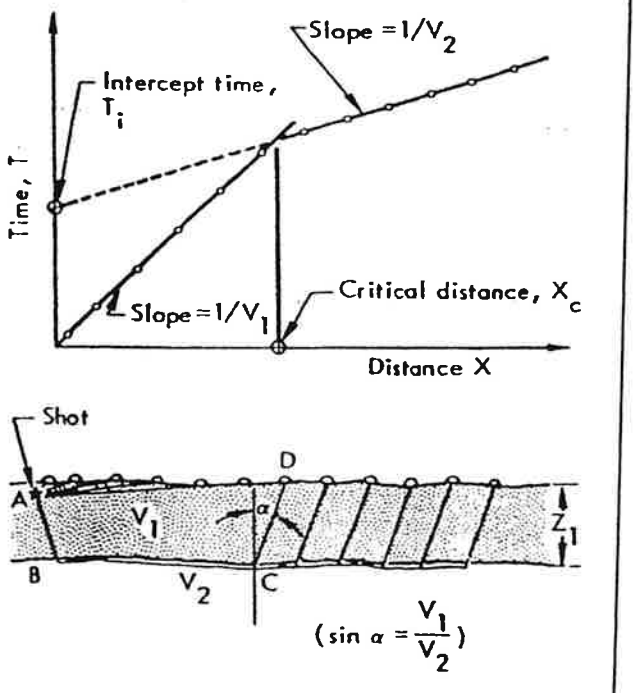


Figure 1: Two-layer geologic model and associated time-distance graph (Redpath, 1973).

The time required for the energy to reach the geophones near the source (direct wave arrivals) is based only on the seismic velocity of the energy traveling though the upper (low velocity) layer. At a certain distance from the source, called the critical distance, the first seismic waves to reach the

geophones will be those that have refracted from a deeper, higher velocity layer. Although these waves have traveled a greater distance than the direct waves, they have traveled at a greater velocity over most of their path, and thus arrive before the slower direct arrivals to the geophones farther from the source. Successively deeper layers with higher velocities affect the time-distance graph in a similar manner

Using the time-distance graph, the velocities of the layers can be calculated (based on the slope of the arrival times), and the layer thicknesses can be calculated using the intercept times. The equation used in the time-intercept method to determine thicknesses is:

$$Z_1 = \frac{T_i V_1}{2COS(SIN^{-1} V_1 / V_2)} + \frac{\text{SHOT DEPTH}}{2};$$

Figure 2 is a sketch of a multiple layer case and the corresponding time distance curve showing the intercept times.

For more complex geologic models, as is usually observed, additional energy source locations are required at both ends of a seismic line as was done for this survey. The layer velocities are calculated using the data from all of the time-distance curves (delay-time method).

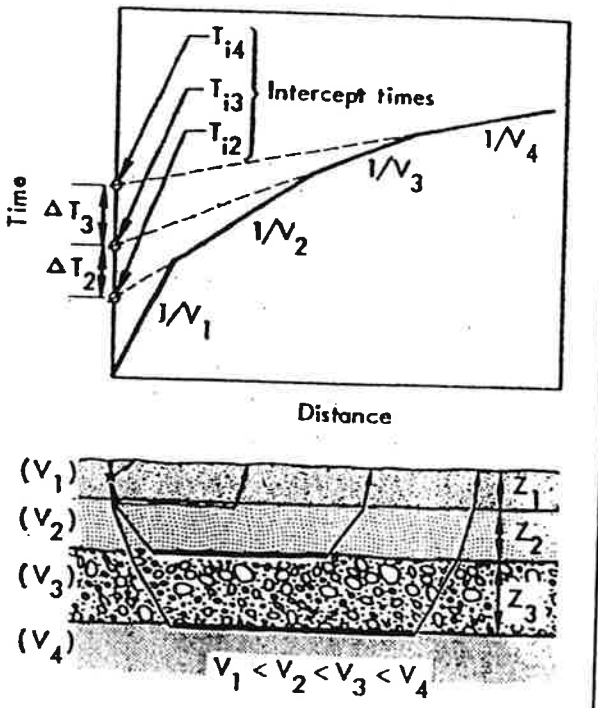


Figure 2: Multiple layer geologic model and associated time-distance graph (Redpath, 1973).

Limitations

Two types of geologic conditions can cause a *hidden zone* problem. One type of hidden zone is a layer with a lower velocity than the layer above it. Energy approaching the layer at the critical angle will pass through the layer, and will not be refracted back to the surface until it encounters a deeper layer with a higher velocity, so no first arrivals are observed from the low-velocity layer. The presence of an unknown low-velocity layer will cause the calculated depths to be greater than the actual depths.

The other type of hidden zone is a layer with a greater velocity than the layer above it, but one that is too thin and/or does not have a large enough velocity contrast. The effect of a thin layer will cause the calculated depths to be shallower than the actual depths.

In areas with hidden zones, the amount of error can be determined based on direct observations (such as test pits or boreholes), and can be compensated for over the rest of the seismic lines.

References

Redpath, Bruce B. (1973). "Seismic Refraction Exploration for Engineering Site Investigations." *Tech. Report E-73-4*, U.S. Army Engineer Waterways Experiment Station Explosive Excavation Research Laboratory, Livermore, CA

ATTACHMENT B

- Calculating Production
- Using Seismic Charts

Rippers

USE OF SEISMIC VELOCITY CHARTS

The charts of ripper performance estimated by seismic wave velocities have been developed from field tests conducted in a variety of materials. Considering the extreme variations among materials and even among rocks of a specific classification, the charts must be recognized as being at best only one indicator of rippability.

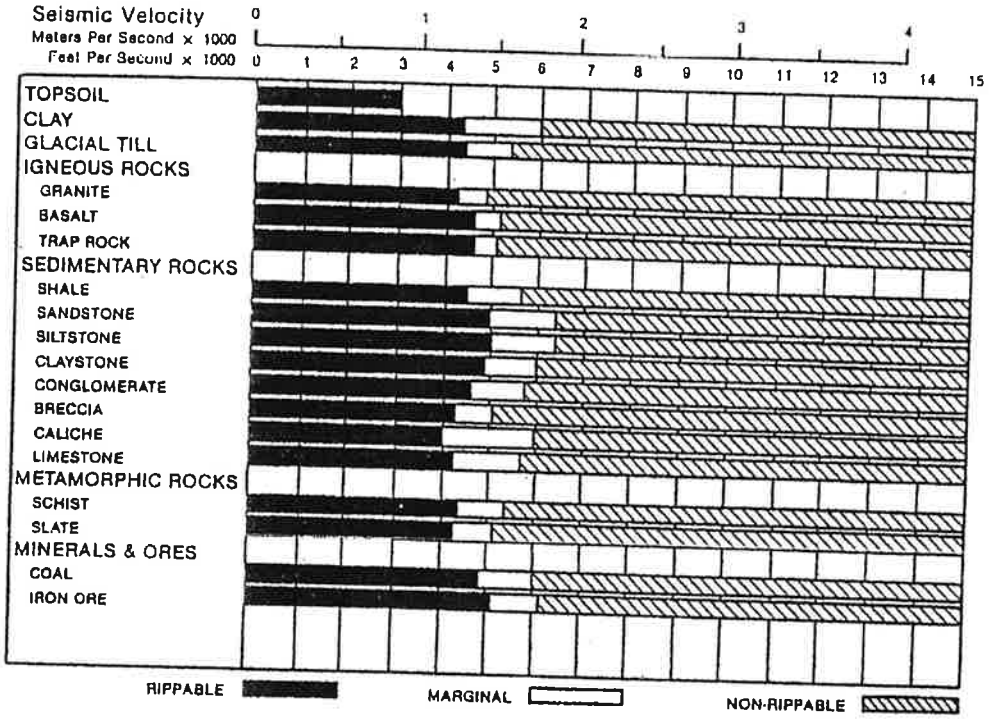
Accordingly, consider the following precautions when evaluating the feasibility of ripping a given formation:

- Tooth penetration is often the key to ripping success, regardless of seismic velocity. This is particularly true in homogeneous materials such as mudstones and claystones and the fine-grained caliches. It is also true in tightly cemented formations such as conglomerates, some glacial tills and caliches containing rock fragments.
- Low seismic velocities of sedimentaries can indicate probable rippability. However, if the fractures and bedding joints do not allow tooth penetration, the material may not be ripped effectively.
- Pre-blasting or "popping" may induce sufficient fracturing to permit tooth entry, particularly in the caliches, conglomerates and some other rocks; but the economics should be checked carefully when considering popping in the higher grades of sandstones, limestones and granites.

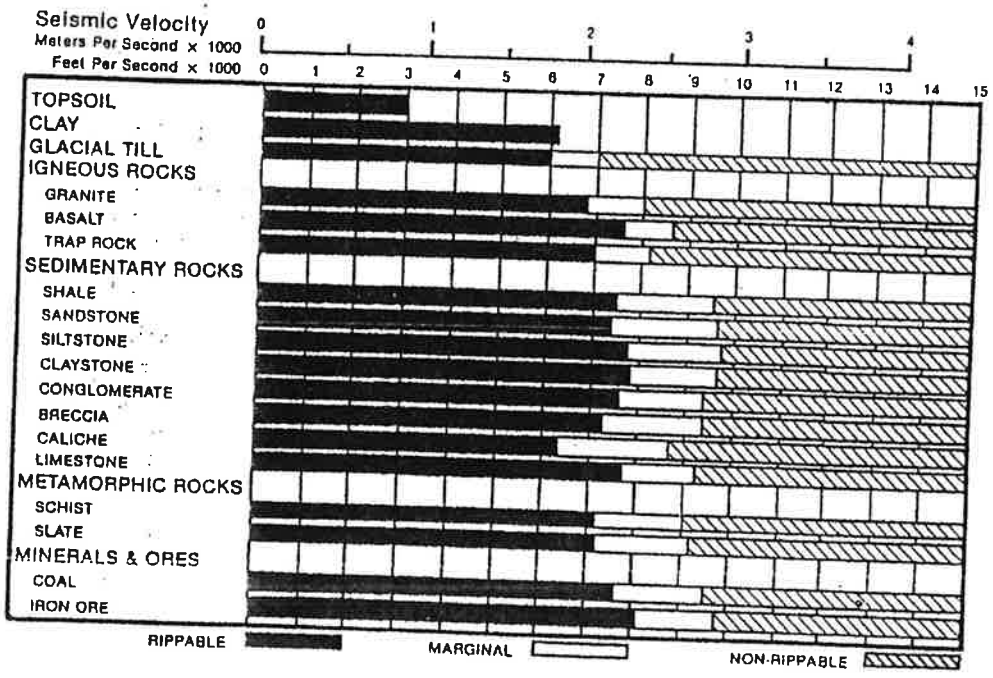
Ripping is still more art than science, and much will depend on the skill and experience of the tractor operator. Ripping for scraper loading may call for different techniques than if the same material is to be dozed away. If cross-ripping is called for, it, too, requires a change in approach. The number of shanks used, length and depth of shank and tooth angle, direction, throttle position — all must be adjusted according to field conditions encountered. Ripping success may well depend on the operator finding the proper combination for those conditions.

From Caterpillar Performance Handbook, October 1986
Caterpillar Inc., Peoria, Illinois, p. 97-102

D7G Ripper Performance
- Estimated by Seismic Wave Velocities

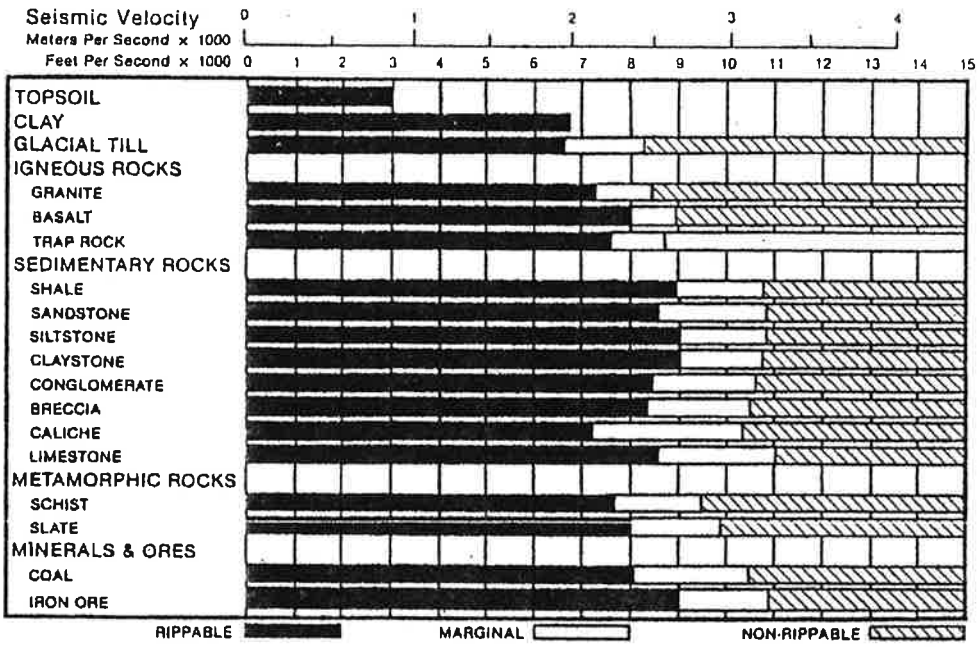


D8L Ripper Performance
- Multi or Single Shank No. 8 Ripper
- Estimated by Seismic Wave Velocities



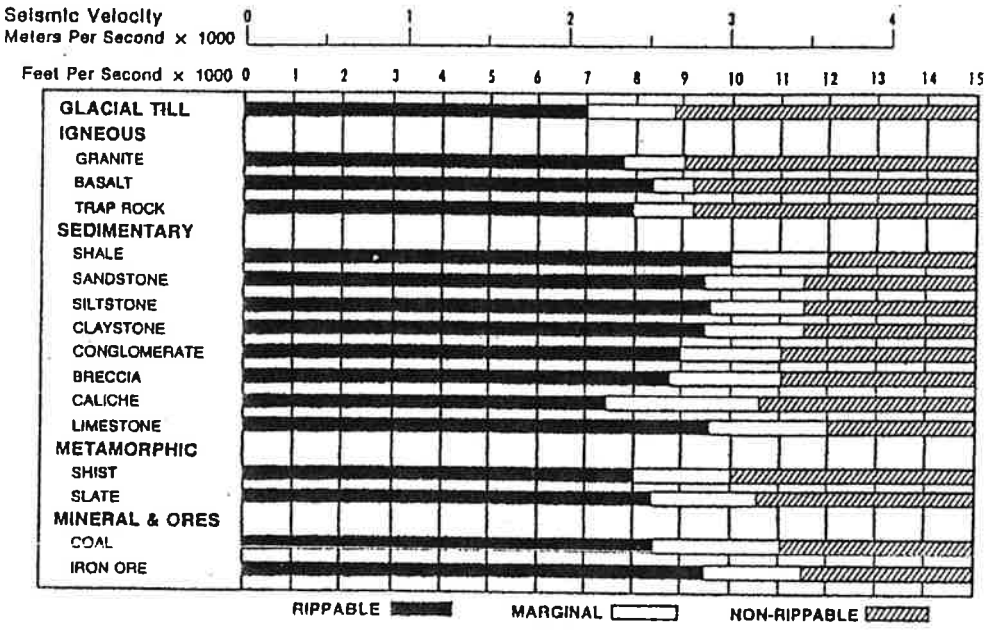
D9L Ripper Performance

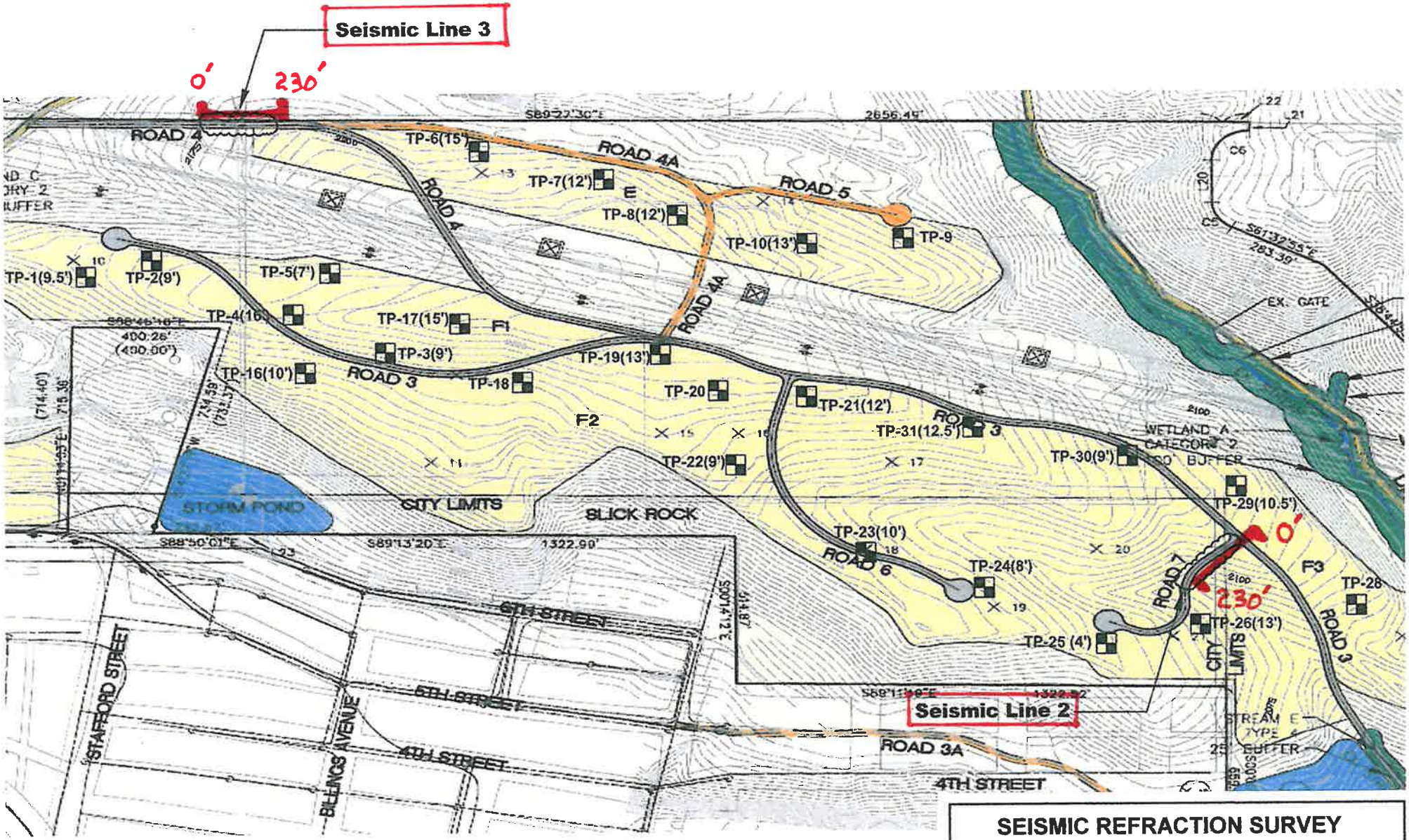
- Multi or Single Shank No. 9 Ripper
- Estimated by Seismic Wave Velocities



D10 Ripper Performance

- Multi or Single Shank No. 10 Ripper
- Estimated by Seismic Wave Velocities

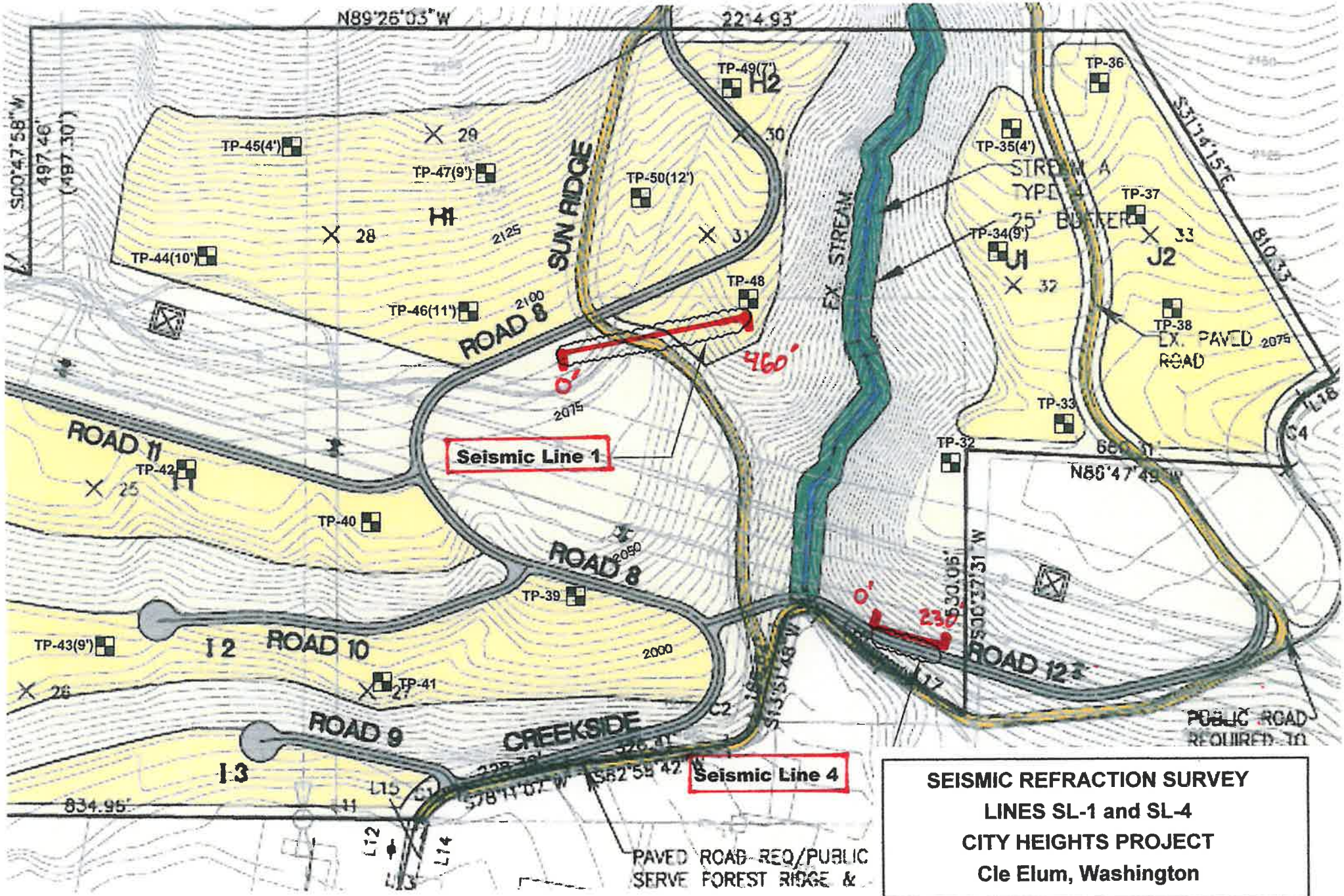




SEISMIC REFRACTION SURVEY
LINES SL-2 and SL-3
CITY HEIGHTS PROJECT
Cle Elum, Washington

Philip H. Duoos, Geophysical Consultant
Project No. 938-10 December 8, 2010

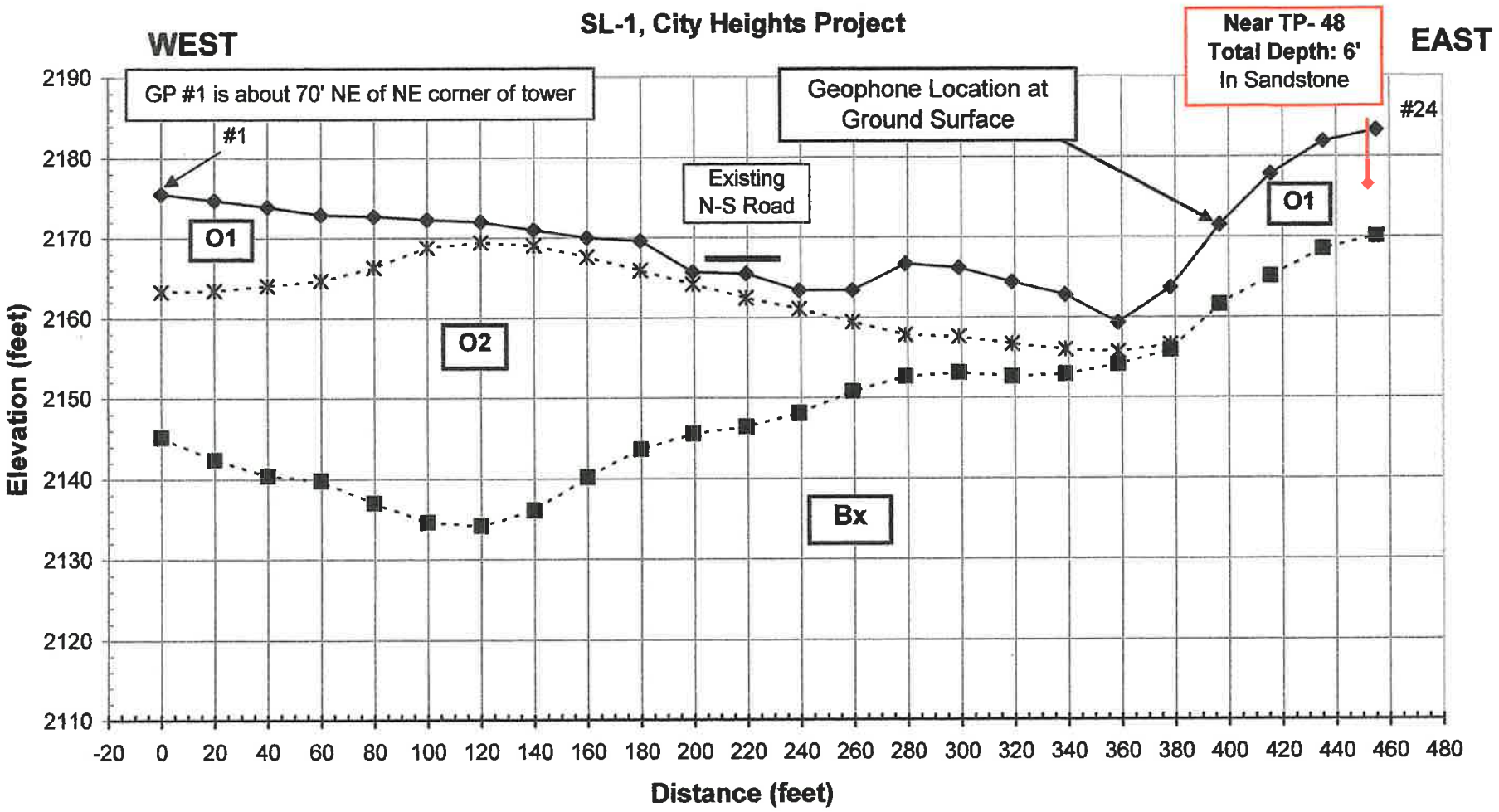
Not to scale **MAP 1**



SEISMIC REFRACTION SURVEY
LINES SL-1 and SL-4
CITY HEIGHTS PROJECT
Cle Elum, Washington

Philip H. Duoos, Geophysical Consultant
Project No. 938-10 December 8, 2010

Not to scale **MAP 2**



Seismic Layer Velocities

O1:	1,300	-	1,600 fps
O2:	2,200	-	3,000 fps
Bx:	6,100	-	7,800 fps

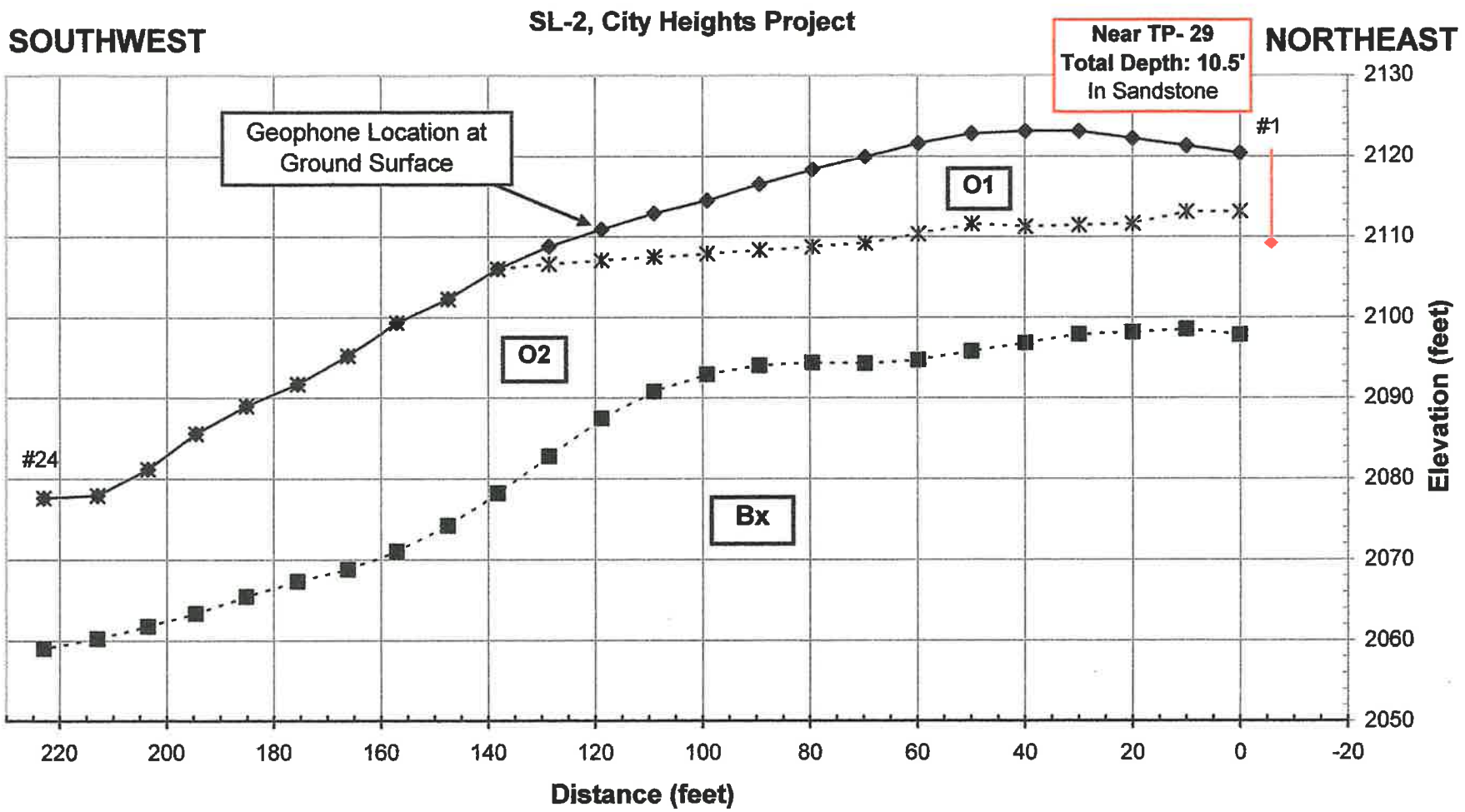
Horizontal Scale: 1" = 60'
Vertical Scale: 1" = 20'

Ground surface elevations are approximate using contour map and hand level measurements.

SEISMIC PROFILE, SL-1

PROPOSED ROAD 8
CITY HEIGHTS PROJECT
CLE ELUM, WASHINGTON

Philip H. Duoos, Geophysical Consultant
PN 938-10, December 8, 2010



Seismic Layer Velocities

O1:	1,100	-	1,200 fps
O2:	2,600	-	2,900 fps
Bx:	5,500	-	6,800 fps

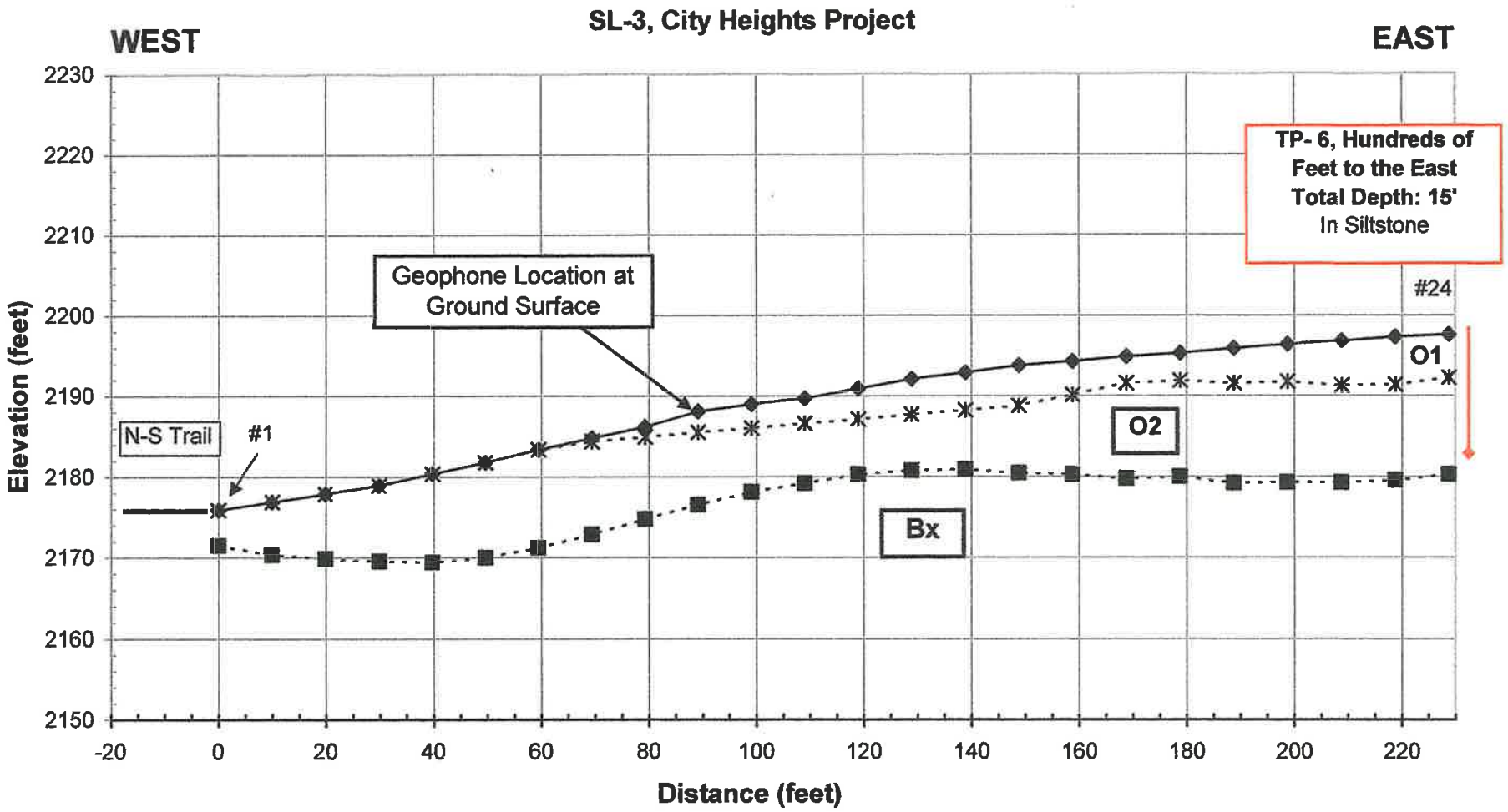
Horizontal Scale: 1" = 30'
Vertical Scale: 1" = 20'

Ground surface elevations are approximate using contour map and hand level measurements.

SEISMIC PROFILE, SL-2

PROPOSED ROAD 7
CITY HEIGHTS PROJECT
CLE ELUM, WASHINGTON

Philip H. Duoos, Geophysical Consultant
PN 938-10, December 8, 2010



Seismic Layer Velocities			
O1:	1,000	- 1,300	fps
O2:	2,800	- 3,400	fps
Bx:	5,500	- 6,500	fps

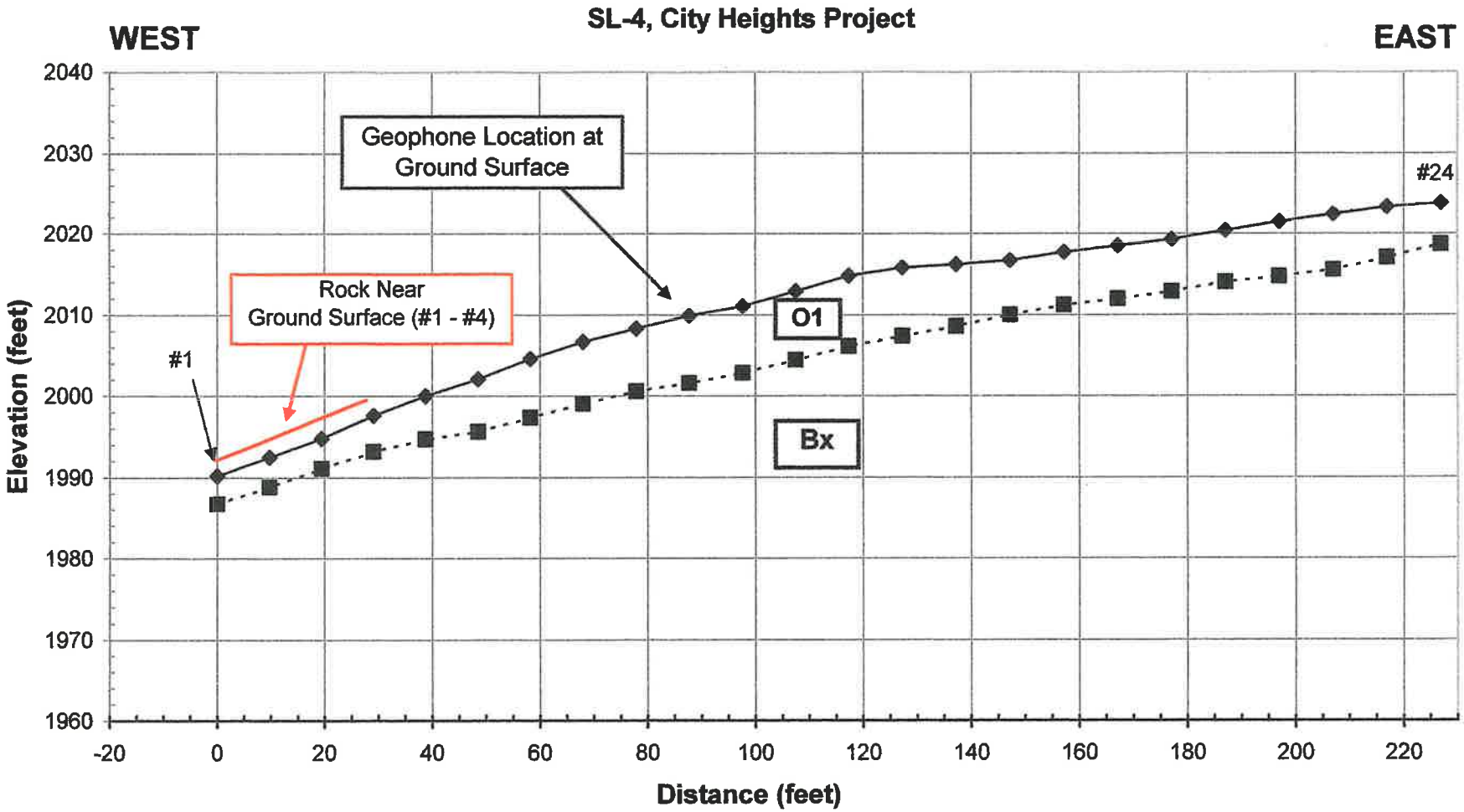
Horizontal Scale: 1" = 30'
Vertical Scale: 1" = 20'

Ground surface elevations are approximate using contour map and hand level measurements.

SEISMIC PROFILE, SL-3

PROPOSED ROAD 4
CITY HEIGHTS PROJECT
CLE ELUM, WASHINGTON

Philip H. Duoos, Geophysical Consultant
PN 938-10, December 8, 2010



Seismic Layer Velocities

O1:	1,100	-	1,400 fps
Bx:	6,200	-	7,800 fps

Horizontal Scale: 1" = 30'
Vertical Scale: 1" = 20'

Ground surface elevations are approximate using contour map and hand level measurements.

SEISMIC PROFILE, SL-4

PROPOSED ROAD 12
CITY HEIGHTS PROJECT
CLE ELUM, WASHINGTON

Philip H. Duoos, Geophysical Consultant
PN 938-10, December 8, 2010

APPENDIX C

COAL WASTE ANALYTICAL TEST RESULTS

December 6, 2010

Memo

To: Dave Blanchard
Sapphire Skies, LLC

From: Chuck Lie
Terra Associates, Inc.

Re: Coal Waste
Analytical Test Results
OnSite Environmental Laboratory Report 1011-074

Test Results

The testing shows consistent levels of Naphthalene slightly elevated in respect to the MTCA (173-340 WAC) method A levels presented in table 1. The testing shows consistent levels of carcinogenic poly cyclic aromatic hydrocarbons (cPAHs) slightly elevated in respect to the MTCA method A levels presented in table 740-1 of the MTCA. None of the testing indicates that the tailings would designate as dangerous waste , Chapter 173-303 WAC. The material would likely designate as problem waste such as petroleum contaminated waste from a gas station cleanup.

The Naphthalene Method A level is 5 ppm and is for the sum of naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene. This value is based on protection of groundwater. The method B cleanup level for the ingestion only pathway is 1,600 ppm.

The Benzo (a) Pyrene (BaP) Method A level is 0.1 ppm. This is based on direct contact and its cancer risk rating. The method B level for the ingestion pathway is 0.14 ppm. There are six other carcinogenic PAHs present that need to be added to the BaP value however the driver is BaP. The attached spread sheet shows the corrected sum of the cPAHs.

Impacts

Natural Background Approach

One could make an argument that these compounds are naturally occurring in the coal. However the coal has been mined and the debris concentrated in one location through industrial processes. In addition, the levels of the PAHs may be elevated based on past coal tailing fires. In order to claim naturally occurring background conditions, one would likely need to test soil from nearby off site areas where there are no accumulation of coal tailings and find similar levels. This is unlikely to be the case.

MTCA cap and leave approach

To clean up using the MTCA would in the least require a site specific risk analysis and some form of capping. This may also require a Disproportionate Cost Analysis to demonstrate that cleanup costs far

exceed the benefit of on site management with capping and/or the upward adjustment of the cancer risk to greater than 1 in one million. Even with the adjusted cancer risk, capping would be needed. Capping would also require a covenant that would restrict the use of the land at that location.

MTCA Dig and dump approach

To clean up and address the issue through offsite disposal would require excavation and trucking of the soils to an offsite disposal facility such as the Roosevelt Landfill operated by Allied Waste or the Greater Wenatchee Regional Landfill. The tipping fee at the Landfill will be about $50 to $80 per ton. The Wenatchee landfill is at 91 Webb Road in East Wenatchee, Douglas County, The Roosevelt Landfill is in Klickitat County.

MTCA treatment option

It may be possible to oxidize the cPAHs and naphthalene's in on a site treatment facility. This may require excavating the materials and mixing the tailings with the oxidizers and mulching the process on an impermeable bed prior to placement back into the fill piles. It could conceivable be done in place through deep soil mixing. The in situ treatment piles would likely require groundwater monitoring wells to demonstrate that the oxidizers and by products were not impacting the drinking water or the River. However, the chemical and biologic oxygen demand of the organics present in the coal tailings would likely make this non cost effective.

Landfill Option

To address the issue using the minimum functional standards for landfills may require groundwater wells and some form of a cap. This is addressed in Chapter 173-304 WAC. This would also require a covenant to restrict the land use at the location of the landfill mass.

TP61 1ft

Compound	Test Result	TEF	Adjusted Value
benzo(a)pyrene	0.071	1	0.071
benzo(a)anthracene	0.16	0.1	0.016
benzo(b)fluoranthene	0.16	0.1	0.016
benzo(k)fluoranthene	0.026	0.1	0.0026
chrysene	0.15	0.01	0.0015
dibenz(a,h)anthracene	0.004	0.1	0.0004
indeno(1,2,3-cd)pyrene	0.014	0.1	0.0014
TOTAL CPAH	0.585		***0.1089***

TP61 5ft

Compound	Test Result	TEF	Adjusted Value
benzo(a)pyrene	0.022	1	0.022
benzo(a)anthracene	0.043	0.1	0.0043
benzo(b)fluoranthene	0.041	0.1	0.0041
benzo(k)fluoranthene	0.012	0.1	0.0012
chrysene	0.038	0.01	0.00038
dibenz(a,h)anthracene	0.004	0.1	0.0004
indeno(1,2,3-cd)pyrene	0.004	0.1	0.0004
TOTAL CPAH	0.164		***0.03278***

TP62 3ft

Compound	Test Result	TEF	Adjusted Value
benzo(a)pyrene	0.23	1	0.23
benzo(a)anthracene	0.48	0.1	0.048
benzo(b)fluoranthene	0.62	0.1	0.062
benzo(k)fluoranthene	0.66	0.1	0.066
chrysene	0.41	0.01	0.0041
dibenz(a,h)anthracene	0.015	0.1	0.0015
indeno(1,2,3-cd)pyrene	0.05	0.1	0.005
TOTAL CPAH	2.465		***0.4166***

TP63 1ft

Compound	Test Result	TEF	Adjusted Value
benzo(a)pyrene	0.19	1	0.19
benzo(a)anthracene	0.44	0.1	0.044
benzo(b)fluoranthene	0.39	0.1	0.039
benzo(k)fluoranthene	0.067	0.1	0.0067
chrysene	0.37	0.01	0.0037
dibenz(a,h)anthracene	0.013	0.1	0.0013
indeno(1,2,3-cd)pyrene	0.026	0.1	0.0026
TOTAL CPAH	1.496		***0.2873***

TP63 4ft

Compound	Test Result	TEF	Adjusted Value
benzo(a)pyrene	0.21	1	0.21
benzo(a)anthracene	0.37	0.1	0.037
benzo(b)fluoranthene	0.45	0.1	0.045
benzo(k)fluoranthene	0.087	0.1	0.0087
chrysene	0.34	0.01	0.0034
dibenz(a,h)anthracene	0.1	0.1	0.01
indeno(1,2,3-cd)pyrene	0.062	0.1	0.0062
TOTAL CPAH	1.619		***0.3203***

TP64 1 ft

Compound	Test Result	TEF	Adjusted Value
benzo(a)pyrene	0.21	1	0.21
benzo(a)anthracene	0.37	0.1	0.037
benzo(b)fluoranthene	0.45	0.1	0.045
benzo(k)fluoranthene	0.087	0.1	0.0087
chrysene	0.34	0.01	0.0034
dibenz(a,h)anthracene	0.01	0.1	0.001
indeno(1,2,3-cd)pyrene	0.062	0.1	0.0062
TOTAL CPAH	1.529		***0.3113***

TP64 8 ft

Compound	Test Result	TEF	Adjusted Value
benzo(a)pyrene	0.19	1	0.19
benzo(a)anthracene	0.31	0.1	0.031
benzo(b)fluoranthene	0.3	0.1	0.03
benzo(k)fluoranthene	0.067	0.1	0.0067
chrysene	0.27	0.01	0.0027
dibenz(a,h)anthracene	0.011	0.1	0.0011
indeno(1,2,3-cd)pyrene	0.057	0.1	0.0057
TOTAL CPAH	1.205		***0.2672***

TP68 1ft

Compound	Test Result	TEF	Adjusted Value
benzo(a)pyrene	0.24	1	0.24
benzo(a)anthracene	0.52	0.1	0.052
benzo(b)fluoranthene	0.49	0.1	0.049
benzo(k)fluoranthene	0.11	0.1	0.011
chrysene	0.45	0.01	0.0045
dibenz(a,h)anthracene	0.012	0.1	0.0012
indeno(1,2,3-cd)pyrene	0.046	0.1	0.0046
TOTAL CPAH	1.868		***0.3623***

TP68 4ft

Compound	Test Result	TEF	Adjusted Value
benzo(a)pyrene	0.17	1	0.17
benzo(a)anthracene	0.32	0.1	0.032
benzo(b)fluoranthene	0.27	0.1	0.027
benzo(k)fluoranthene	0.068	0.1	0.0068
chrysene	0.28	0.01	0.0028
dibenz(a,h)anthracene	0.018	0.1	0.0018
indeno(1,2,3-cd)pyrene	0.039	0.1	0.0039
TOTAL CPAH	1.165		***0.2443***

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

PAHs by EPA 8270D/SIM
(with silica gel clean-up)

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TP 61@ -1'**					
Laboratory ID:	11-074-01					
Naphthalene	**0.74** } 5	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
2-Methylnaphthalene	**1.7** } 5	0.040	EPA 8270/SIM	11-9-10	11-15-10	
1-Methylnaphthalene	**1.4** } 5	0.040	EPA 8270/SIM	11-9-10	11-15-10	
Acenaphthylene	**0.026**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Acenaphthene	**0.026**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Fluorene	**0.050**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Phenanthrene	**0.64**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Anthracene	**0.13**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Fluoranthene	**0.11**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Pyrene	**0.16**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Benzo[a]anthracene	**0.16**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Chrysene	**0.15**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Benzo[b]fluoranthene	**0.16**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Benzo[k]fluoranthene	**0.026** } 0.1	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Benzo[a]pyrene	**0.071** } 0.1	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Indeno(1,2,3-c,d)pyrene	**0.014**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Dibenz[a,h]anthracene	**ND**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Benzo[g,h,i]perylene	**0.032**	0.0080	EPA 8270/SIM	11-9-10	11-9-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*79*	*45 - 101*				
Pyrene-d10	*85*	*52 - 118*				
Terphenyl-d14	*83*	*41 - 106*				

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

PAHs by EPA 8270D/SIM
(with silica gel clean-up)

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TP 61@ -5'**					
Laboratory ID:	11-074-02					
Naphthalene	**0.16**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
2-Methylnaphthalene	**0.42**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
1-Methylnaphthalene	**0.34**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Acenaphthylene	**ND**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Acenaphthene	**0.0084**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Fluorene	**0.016**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Phenanthrene	**0.15**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Anthracene	**0.033**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Fluoranthene	**0.028**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Pyrene	**0.039**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]anthracene	**0.043**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Chrysene	**0.038**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[b]fluoranthene	**0.041**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[k]fluoranthene	**0.012**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]pyrene	**0.022**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Dibenz[a,h]anthracene	**ND**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[g,h,i]perylene	**0.015**	0.0076	EPA 8270/SIM	11-9-10	11-10-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*80*	*45 - 101*				
Pyrene-d10	*86*	*52 - 118*				
Terphenyl-d14	*87*	*41 - 106*				

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

PAHs by EPA 8270D/SIM
(with silica gel clean-up)

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TP 62@ -1'**					
Laboratory ID:	11-074-03					
Naphthalene	**2.4**	0.090	EPA 8270/SIM	11-9-10	11-12-10	
2-Methylnaphthalene	**5.1**	0.090	EPA 8270/SIM	11-9-10	11-12-10	
1-Methylnaphthalene	**3.9**	0.090	EPA 8270/SIM	11-9-10	11-12-10	
Acenaphthylene	**0.084**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Acenaphthene	**0.12**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Fluorene	**0.18**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Phenanthrene	**1.5**	0.090	EPA 8270/SIM	11-9-10	11-12-10	
Anthracene	**0.47**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Fluoranthene	**0.36**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Pyrene	**0.47**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]anthracene	**0.45**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Chrysene	**0.39**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[b]fluoranthene	**0.57**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[k]fluoranthene	**0.076**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]pyrene	**0.20**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Indeno(1,2,3-c,d)pyrene	**0.044**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Dibenz[a,h]anthracene	**0.015**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[g,h,i]perylene	**0.10**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*60*	*45 - 101*				
Pyrene-d10	*86*	*52 - 118*				
Terphenyl-d14	*80*	*41 - 106*				

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

PAHs by EPA 8270D/SIM
(with silica gel clean-up)

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TP 62@ -3'**					
Laboratory ID:	11-074-04					
Naphthalene	**2.8**	0.079	EPA 8270/SIM	11-9-10	11-12-10	
2-Methylnaphthalene	**5.9**	0.079	EPA 8270/SIM	11-9-10	11-12-10	
1-Methylnaphthalene	**4.5**	0.079	EPA 8270/SIM	11-9-10	11-12-10	
Acenaphthylene	**0.092**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Acenaphthene	**0.13**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Fluorene	**0.22**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Phenanthrene	**1.6**	0.079	EPA 8270/SIM	11-9-10	11-12-10	
Anthracene	**0.54**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Fluoranthene	**0.40**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Pyrene	**0.51**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]anthracene	**0.48**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Chrysene	**0.41**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[b]fluoranthene	**0.62**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[k]fluoranthene	**0.66**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]pyrene	**0.23**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Indeno(1,2,3-c,d)pyrene	**0.050**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Dibenz[a,h]anthracene	**0.015**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[g,h,i]perylene	**0.13**	0.0079	EPA 8270/SIM	11-9-10	11-10-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*63*	*45 - 101*				
Pyrene-d10	*93*	*52 - 118*				
Terphenyl-d14	*87*	*41 - 106*				

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

PAHs by EPA 8270D/SIM
(with silica gel clean-up)

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TP 63@ -1'**					
Laboratory ID:	11-074-05					
Naphthalene	**5.7**	0.15	EPA 8270/SIM	11-9-10	11-12-10	
2-Methylnaphthalene	**11**	0.15	EPA 8270/SIM	11-9-10	11-12-10	
1-Methylnaphthalene	**8.0**	0.15	EPA 8270/SIM	11-9-10	11-12-10	
Acenaphthylene	**0.14**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Acenaphthene	**0.098**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Fluorene	**0.21**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Phenanthrene	**1.9**	0.15	EPA 8270/SIM	11-9-10	11-12-10	
Anthracene	**0.74**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Fluoranthene	**0.32**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Pyrene	**0.44**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]anthracene	**0.44**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Chrysene	**0.37**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[b]fluoranthene	**0.39**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[k]fluoranthene	**0.067**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]pyrene	**0.19**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Indeno(1,2,3-c,d)pyrene	**0.026**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Dibenz[a,h]anthracene	**0.013**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[g,h,i]perylene	**0.086**	0.0075	EPA 8270/SIM	11-9-10	11-10-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*59*	*45 - 101*				
Pyrene-d10	*97*	*52 - 118*				
Terphenyl-d14	*89*	*41 - 106*				

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

PAHs by EPA 8270D/SIM
(with silica gel clean-up)

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TP 63@ -4'**					
Laboratory ID:	11-074-06					
Naphthalene	**1.5**	0.098	EPA 8270/SIM	11-9-10	11-12-10	
2-Methylnaphthalene	**3.3**	0.098	EPA 8270/SIM	11-9-10	11-12-10	
1-Methylnaphthalene	**2.5**	0.098	EPA 8270/SIM	11-9-10	11-12-10	
Acenaphthylene	**0.069**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Acenaphthene	**0.10**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Fluorene	**0.16**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Phenanthrene	**1.2**	0.098	EPA 8270/SIM	11-9-10	11-12-10	
Anthracene	**0.39**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Fluoranthene	**0.37**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Pyrene	**0.46**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]anthracene	**0.37**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Chrysene	**0.34**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[b]fluoranthene	**0.45**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[k]fluoranthene	**0.087**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]pyrene	**0.21**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Indeno(1,2,3-c,d)pyrene	**0.062**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Dibenz[a,h]anthracene	**0.010**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[g,h,i]perylene	**0.12**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*79*	*45 - 101*				
Pyrene-d10	*97*	*52 - 118*				
Terphenyl-d14	*97*	*41 - 106*				

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

PAHs by EPA 8270D/SIM
(with silica gel clean-up)

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TP 64@ -1'**					
Laboratory ID:	11-074-07					
Naphthalene	**3.0**	0.17	EPA 8270/SIM	11-9-10	11-12-10	
2-Methylnaphthalene	**6.2**	0.17	EPA 8270/SIM	11-9-10	11-12-10	
1-Methylnaphthalene	**4.8**	0.17	EPA 8270/SIM	11-9-10	11-12-10	
Acenaphthylene	**0.069**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Acenaphthene	**0.10**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Fluorene	**0.16**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Phenanthrene	**1.8**	0.17	EPA 8270/SIM	11-9-10	11-12-10	
Anthracene	**0.39**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Fluoranthene	**0.37**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Pyrene	**0.46**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]anthracene	**0.37**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Chrysene	**0.34**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[b]fluoranthene	**0.45**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[k]fluoranthene	**0.087**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]pyrene	**0.21**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Indeno(1,2,3-c,d)pyrene	**0.062**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Dibenz[a,h]anthracene	**0.010**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[g,h,i]perylene	**0.12**	0.0098	EPA 8270/SIM	11-9-10	11-10-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*79*	*45 - 101*				
Pyrene-d10	*97*	*52 - 118*				
Terphenyl-d14	*97*	*41 - 106*				

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

PAHs by EPA 8270D/SIM
(with silica gel clean-up)

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TP 64@ -8'**					
Laboratory ID:	11-074-08					
Naphthalene	**1.3**	0.10	EPA 8270/SIM	11-9-10	11-12-10	
2-Methylnaphthalene	**3.0**	0.10	EPA 8270/SIM	11-9-10	11-12-10	
1-Methylnaphthalene	**2.2**	0.10	EPA 8270/SIM	11-9-10	11-12-10	
Acenaphthylene	**0.10**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Acenaphthene	**0.13**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Fluorene	**0.24**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Phenanthrene	**1.2**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Anthracene	**0.36**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Fluoranthene	**0.30**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Pyrene	**0.38**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]anthracene	**0.31**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Chrysene	**0.27**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[b]fluoranthene	**0.30**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[k]fluoranthene	**0.067**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]pyrene	**0.19**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Indeno(1,2,3-c,d)pyrene	**0.057**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Dibenz[a,h]anthracene	**0.011**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[g,h,i]perylene	**0.12**	0.010	EPA 8270/SIM	11-9-10	11-10-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*79*	*45 - 101*				
Pyrene-d10	*100*	*52 - 118*				
Terphenyl-d14	*102*	*41 - 106*				

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

PAHs by EPA 8270D/SIM
(with silica gel clean-up)

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TP 68@ -1'**					
Laboratory ID:	11-074-09					
Naphthalene	**3.1**	0.090	EPA 8270/SIM	11-9-10	11-12-10	
2-Methylnaphthalene	**6.7**	0.090	EPA 8270/SIM	11-9-10	11-12-10	
1-Methylnaphthalene	**5.3**	0.090	EPA 8270/SIM	11-9-10	11-12-10	
Acenaphthylene	**0.10**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Acenaphthene	**0.11**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Fluorene	**0.21**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Phenanthrene	**1.8**	0.090	EPA 8270/SIM	11-9-10	11-12-10	
Anthracene	**0.61**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Fluoranthene	**0.43**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Pyrene	**0.54**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]anthracene	**0.52**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Chrysene	**0.45**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[b]fluoranthene	**0.49**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[k]fluoranthene	**0.11**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]pyrene	**0.24**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Indeno(1,2,3-c,d)pyrene	**0.046**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Dibenz[a,h]anthracene	**0.012**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[g,h,i]perylene	**0.12**	0.0090	EPA 8270/SIM	11-9-10	11-10-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*56*	*45 - 101*				
Pyrene-d10	*93*	*52 - 118*				
Terphenyl-d14	*93*	*41 - 106*				

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

PAHs by EPA 8270D/SIM
(with silica gel clean-up)

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TP 68@ -4'**					
Laboratory ID:	11-074-10					
Naphthalene	**2.0**	0.084	EPA 8270/SIM	11-9-10	11-12-10	
2-Methylnaphthalene	**4.3**	0.084	EPA 8270/SIM	11-9-10	11-12-10	
1-Methylnaphthalene	**3.2**	0.084	EPA 8270/SIM	11-9-10	11-12-10	
Acenaphthylene	**0.076**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Acenaphthene	**0.085**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Fluorene	**0.15**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Phenanthrene	**1.2**	0.084	EPA 8270/SIM	11-9-10	11-12-10	
Anthracene	**0.35**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Fluoranthene	**0.28**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Pyrene	**0.34**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]anthracene	**0.32**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Chrysene	**0.28**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[b]fluoranthene	**0.27**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[k]fluoranthene	**0.068**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[a]pyrene	**0.17**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Indeno(1,2,3-c,d)pyrene	**0.039**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Dibenz[a,h]anthracene	**0.018**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Benzo[g,h,i]perylene	**0.088**	0.0084	EPA 8270/SIM	11-9-10	11-10-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*68*	*45 - 101*				
Pyrene-d10	*99*	*52 - 118*				
Terphenyl-d14	*94*	*41 - 106*				

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

PAHs by EPA 8270D/SIM
(with silica gel clean-up)
METHOD BLANK QUALITY CONTROL

Matrix: Soil
Units: mg/Kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Laboratory ID:	MB1109S1					
Naphthalene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
2-Methylnaphthalene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
1-Methylnaphthalene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Acenaphthylene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Acenaphthene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Fluorene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Phenanthrene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Anthracene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Fluoranthene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Pyrene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Benzo[a]anthracene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Chrysene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Benzo[b]fluoranthene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Benzo[k]fluoranthene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Benzo[a]pyrene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Indeno(1,2,3-c,d)pyrene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Dibenz[a,h]anthracene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Benzo[g,h,i]perylene	**ND**	0.0067	EPA 8270/SIM	11-9-10	11-9-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorobiphenyl	*85*	*45 - 101*				
Pyrene-d10	*94*	*52 - 118*				
Terphenyl-d14	*90*	*41 - 106*				

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

PAHs by EPA 8270D/SIM
(with silica gel clean-up)
SB/SBD QUALITY CONTROL

Matrix: Soil
Units: mg/Kg

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB1109S1									
	SB	SBD	SB	SBD	SB	SBD				
Naphthalene	**0.0567**	**0.0635**	0.0833	0.0833	68	76	33 - 105	11	30	
Acenaphthylene	**0.0777**	**0.0756**	0.0833	0.0833	93	91	51 - 110	3	22	
Acenaphthene	**0.0766**	**0.0755**	0.0833	0.0833	92	91	51 - 105	1	20	
Fluorene	**0.0880**	**0.0835**	0.0833	0.0833	106	100	61 - 107	5	17	
Phenanthrene	**0.0832**	**0.0814**	0.0833	0.0833	100	98	61 - 106	2	12	
Anthracene	**0.0813**	**0.0790**	0.0833	0.0833	98	95	59 - 106	3	12	
Fluoranthene	**0.0825**	**0.0834**	0.0833	0.0833	99	100	66 - 116	1	12	
Pyrene	**0.0799**	**0.0817**	0.0833	0.0833	96	98	67 - 118	2	14	
Benzo[a]anthracene	**0.0849**	**0.0845**	0.0833	0.0833	102	101	60 - 114	0	11	
Chrysene	**0.0891**	**0.0880**	0.0833	0.0833	107	106	64 - 112	1	12	
Benzo[b]fluoranthene	**0.0880**	**0.0846**	0.0833	0.0833	106	102	61 - 123	4	14	
Benzo[k]fluoranthene	**0.0874**	**0.0866**	0.0833	0.0833	105	104	50 - 124	1	17	
Benzo[a]pyrene	**0.0873**	**0.0842**	0.0833	0.0833	105	101	50 - 114	4	17	
Indeno(1,2,3-c,d)pyrene	**0.0894**	**0.0885**	0.0833	0.0833	107	106	56 - 122	1	16	
Dibenz[a,h]anthracene	**0.0886**	**0.0864**	0.0833	0.0833	106	104	57 - 124	3	16	
Benzo[g,h,i]perylene	**0.0890**	**0.0877**	0.0833	0.0833	107	105	56 - 121	1	15	
Surrogate:										
2-Fluorobiphenyl					*81*	*80*	*45 - 101*			
Pyrene-d10					*94*	*91*	*52 - 118*			
Terphenyl-d14					*89*	*89*	*41 - 106*			

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

TOTAL METALS
EPA 6010B/7471A

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	11-074-01					
Client ID:	**TP61@-1'**					
Arsenic	**13**	12	6010B	11-12-10	11-15-10	
Barium	**340**	3.0	6010B	11-12-10	11-15-10	
Cadmium	**ND**	0.60	6010B	11-12-10	11-15-10	
Chromium	**29**	0.60	6010B	11-12-10	11-15-10	
Lead	**9.8**	6.0	6010B	11-12-10	11-15-10	
Mercury	**ND**	0.30	7471A	11-9-10	11-9-10	
Selenium	**ND**	12	6010B	11-12-10	11-15-10	
Silver	**ND**	0.60	6010B	11-12-10	11-15-10	
Lab ID:	11-074-02					
Client ID:	**TP61@-5'**					
Arsenic	**14**	11	6010B	11-12-10	11-15-10	
Barium	**710**	29	6010B	11-12-10	11-16-10	
Cadmium	**ND**	0.57	6010B	11-12-10	11-15-10	
Chromium	**25**	0.57	6010B	11-12-10	11-15-10	
Lead	**8.4**	5.7	6010B	11-12-10	11-15-10	
Mercury	**0.52**	0.29	7471A	11-9-10	11-9-10	
Selenium	**ND**	11	6010B	11-12-10	11-15-10	
Silver	**ND**	0.57	6010B	11-12-10	11-15-10	

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
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Project: T-6504

TOTAL METALS
EPA 6010B/7471A

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	11-074-03					
Client ID:	**TP62@-1'**					
Arsenic	**ND**	14	6010B	11-12-10	11-15-10	
Barium	**370**	3.4	6010B	11-12-10	11-15-10	
Cadmium	**ND**	0.68	6010B	11-12-10	11-15-10	
Chromium	**23**	0.68	6010B	11-12-10	11-15-10	
Lead	**24**	6.8	6010B	11-12-10	11-15-10	
Mercury	**ND**	0.34	7471A	11-9-10	11-9-10	
Selenium	**ND**	14	6010B	11-12-10	11-15-10	
Silver	**ND**	0.68	6010B	11-12-10	11-15-10	
Lab ID:	11-074-04					
Client ID:	**TP62@-3'**					
Arsenic	**ND**	12	6010B	11-12-10	11-15-10	
Barium	**650**	30	6010B	11-12-10	11-16-10	
Cadmium	**ND**	0.60	6010B	11-12-10	11-15-10	
Chromium	**24**	0.60	6010B	11-12-10	11-15-10	
Lead	**21**	6.0	6010B	11-12-10	11-15-10	
Mercury	**ND**	0.30	7471A	11-9-10	11-9-10	
Selenium	**ND**	12	6010B	11-12-10	11-15-10	
Silver	**ND**	0.60	6010B	11-12-10	11-15-10	

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
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Project: T-6504

TOTAL METALS
EPA 6010B/7471A

Units: mg/kg (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	11-074-05					
Client ID:	**TP63@-1'**					
Arsenic	**ND**	11	6010B	11-12-10	11-15-10	
Barium	**770**	28	6010B	11-12-10	11-16-10	
Cadmium	**ND**	0.56	6010B	11-12-10	11-15-10	
Chromium	**33**	0.56	6010B	11-12-10	11-15-10	
Lead	**15**	5.6	6010B	11-12-10	11-15-10	
Mercury	**ND**	0.28	7471A	11-9-10	11-9-10	
Selenium	**ND**	11	6010B	11-12-10	11-15-10	
Silver	**ND**	0.56	6010B	11-12-10	11-15-10	
Lab ID:	11-074-06					
Client ID:	**TP63@-4'**					
Arsenic	**ND**	15	6010B	11-12-10	11-15-10	
Barium	**380**	3.7	6010B	11-12-10	11-15-10	
Cadmium	**ND**	0.73	6010B	11-12-10	11-15-10	
Chromium	**33**	0.73	6010B	11-12-10	11-15-10	
Lead	**13**	7.3	6010B	11-12-10	11-15-10	
Mercury	**ND**	0.73	7471A	11-9-10	11-9-10	
Selenium	**ND**	15	6010B	11-12-10	11-15-10	
Silver	**ND**	0.73	6010B	11-12-10	11-15-10	

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
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Project: T-6504

TOTAL METALS
EPA 6010B/7471A

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	11-074-07					
Client ID:	**TP64@-1'**					
Arsenic	**ND**	13	6010B	11-12-10	11-15-10	
Barium	**340**	3.2	6010B	11-12-10	11-15-10	
Cadmium	**ND**	0.64	6010B	11-12-10	11-15-10	
Chromium	**26**	0.64	6010B	11-12-10	11-15-10	
Lead	**15**	6.4	6010B	11-12-10	11-15-10	
Mercury	**ND**	0.32	7471A	11-9-10	11-9-10	
Selenium	**ND**	13	6010B	11-12-10	11-15-10	
Silver	**ND**	0.64	6010B	11-12-10	11-15-10	
Lab ID:	11-074-08					
Client ID:	**TP64@-8'**					
Arsenic	**ND**	15	6010B	11-12-10	11-15-10	
Barium	**330**	3.9	6010B	11-12-10	11-15-10	
Cadmium	**ND**	0.77	6010B	11-12-10	11-15-10	
Chromium	**22**	0.77	6010B	11-12-10	11-15-10	
Lead	**ND**	7.7	6010B	11-12-10	11-15-10	
Mercury	**ND**	0.39	7471A	11-9-10	11-9-10	
Selenium	**ND**	15	6010B	11-12-10	11-15-10	
Silver	**ND**	0.77	6010B	11-12-10	11-15-10	

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

TOTAL METALS
EPA 6010B/7471A

Matrix: Soil
Units: mg/kg (ppm)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	11-074-09					
Client ID:	**TP68@-1'**					
Arsenic	**ND**	13	6010B	11-12-10	11-15-10	
Barium	**350**	3.4	6010B	11-12-10	11-15-10	
Cadmium	**ND**	0.67	6010B	11-12-10	11-15-10	
Chromium	**31**	0.67	6010B	11-12-10	11-15-10	
Lead	**12**	6.7	6010B	11-12-10	11-15-10	
Mercury	**ND**	0.34	7471A	11-9-10	11-9-10	
Selenium	**ND**	13	6010B	11-12-10	11-15-10	
Silver	**ND**	0.67	6010B	11-12-10	11-15-10	
Lab ID:	11-074-10					
Client ID:	**TP68@-4'**					
Arsenic	**ND**	13	6010B	11-12-10	11-15-10	
Barium	**320**	3.1	6010B	11-12-10	11-15-10	
Cadmium	**ND**	0.63	6010B	11-12-10	11-15-10	
Chromium	**20**	0.63	6010B	11-12-10	11-15-10	
Lead	**8.6**	6.3	6010B	11-12-10	11-15-10	
Mercury	**ND**	0.31	7471A	11-9-10	11-9-10	
Selenium	**ND**	13	6010B	11-12-10	11-15-10	
Silver	**ND**	0.63	6010B	11-12-10	11-15-10	

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

TOTAL METALS
EPA 6010B/7471A
METHOD BLANK QUALITY CONTROL

Date Extracted:	11-9-&12-10
Date Analyzed:	11-9,15&16-10
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB1109S2&MB1112S1

Analyte	Method	Result	PQL
Arsenic	6010B	**ND**	10
Barium	6010B	**ND**	2.5
Cadmium	6010B	**ND**	0.50
Chromium	6010B	**ND**	0.50
Lead	6010B	**ND**	5.0
Mercury	7471A	**ND**	0.25
Selenium	6010B	**ND**	10
Silver	6010B	**ND**	0.50

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

TOTAL METALS
EPA 6010B/7471A
DUPLICATE QUALITY CONTROL

Date Extracted: 11-9-&12-10
Date Analyzed: 11-9,15&16-10

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 11-079-02

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Arsenic	**ND**	**ND**	NA	10	
Barium	**40.2**	**40.2**	0	2.5	
Cadmium	**ND**	**ND**	NA	0.50	
Chromium	**31.3**	**27.9**	11	0.50	
Lead	**ND**	**ND**	NA	5.0	
Mercury	**ND**	**ND**	NA	0.25	
Selenium	**ND**	**ND**	NA	10	
Silver	**ND**	**ND**	NA	0.50	

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

TOTAL METALS
EPA 6010B/7471A
MS/MSD QUALITY CONTROL

Date Extracted: 11-9-&12-10
Date Analyzed: 11-9,15&16-10

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 11-079-02

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Arsenic	100	**90.4**	90	**91.9**	92	2	
Barium	100	**135**	95	**136**	95	1	
Cadmium	50	**43.9**	88	**44.8**	90	2	
Chromium	100	**127**	96	**129**	97	1	
Lead	250	**203**	81	**210**	84	3	
Mercury	0.50	**0.499**	100	**0.496**	99	1	
Selenium	100	**93.7**	94	**93.2**	93	1	
Silver	25	**22.1**	88	**22.7**	91	3	

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

TOTAL ORGANIC CARBON
EPA 9060

Matrix: Soil
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TP 61@-1'**					
Laboratory ID:	11-074-01					
Total Organic Carbon	**34**	1.1	9060	11-16-10	11-16-10	
Client ID:	**TP 61@-5'**					
Laboratory ID:	11-074-02					
Total Organic Carbon	**30**	1.7	9060	11-16-10	11-16-10	
Client ID:	**TP 62@-1'**					
Laboratory ID:	11-074-03					
Total Organic Carbon	**63**	1.7	9060	11-16-10	11-16-10	
Client ID:	**TP 62@-3'**					
Laboratory ID:	11-074-04					
Total Organic Carbon	**61**	1.7	9060	11-16-10	11-16-10	
Client ID:	**TP 63@-1'**					
Laboratory ID:	11-074-05					
Total Organic Carbon	**61**	1.6	9060	11-16-10	11-16-10	
Client ID:	**TP 63@-4'**					
Laboratory ID:	11-074-06					
Total Organic Carbon	**52**	1.7	9060	11-16-10	11-16-10	
Client ID:	**TP 64@-1'**					
Laboratory ID:	11-074-07					
Total Organic Carbon	**58**	1.6	9060	11-16-10	11-16-10	
Client ID:	**TP 64@-8'**					
Laboratory ID:	11-074-08					
Total Organic Carbon	**59**	1.8	9060	11-16-10	11-16-10	

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
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Project: T-6504

TOTAL ORGANIC CARBON
EPA 9060

Matrix: Soil
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**TP 68@-1'**					
Laboratory ID:	11-074-09					
Total Organic Carbon	**41**	1.9	9060	11-16-10	11-16-10	
Client ID:	**TP 68@-4'**					
Laboratory ID:	11-074-10					
Total Organic Carbon	**63**	1.7	9060	11-16-10	11-16-10	

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
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Project: T-6504

TOTAL ORGANIC CARBON
EPA 9060
QUALITY CONTROL

Matrix: Soil
Units: % Carbon

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1115S1					
Total Organic Carbon	**ND**	0.042	9060	11-16-10	11-16-10	

Analyte	Result		PQL	RPD	Limit	Flags
DUPLICATE						
Laboratory ID:	11-074-01					
	Sample	Duplicate				
Total Organic Carbon	**33.6**	**37.5**	1.1	11	20	

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	Flags
SPIKE BLANK						
Laboratory ID:	SB1115S1					
Total Organic Carbon	**46.3**	42.1	ND	**110**	80-120	

Date of Report: November 17, 2010
Samples Submitted: November 8, 2010
Laboratory Reference: 1011-074
Project: T-6504

% MOISTURE

Date Analyzed: 11-9-10

Client ID	Lab ID	% Moisture
TP61@-1'	11-074-01	16
TP61@-5'	11-074-02	12
TP62@-1'	11-074-03	26
TP62@-3'	11-074-04	16
TP63@-1'	11-074-05	11
TP63@-4'	11-074-06	32
TP64@-1'	11-074-07	22
TP64@-8'	11-074-08	35
TP68@-1'	11-074-09	26
TP68@-4'	11-074-10	20

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: TERRA ASSOCIATES, INC.
Project Number: T-6504
Project Name: _____
Project Manager: TED SCHEPPER
Sampled by: JMC

Turnaround Request (in working days)

(Check One)

☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

Laboratory Number: 11-074

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx	Volatiles 8260B	Halogenated Volatiles 8260B	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082	Organochlorine Pesticides 8081A	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA / MTCA Metals (circle one)	TCLP Metals	HEM (oil and grease) 1664	TOTAL ORGANIC CARBON					% Moisture
1	TP 61 @ -1'	11-5-10	10:14	S									X					X			X					X
2	TP 61 @ -5'		10:25										X					X			X					X
3	TP 62 @ -1'		10:42										X					X			X					X
4	TP 62 @ -3'		10:50										X					X			X					X
5	TP 63 @ -1'		10:57										X					X			X					X
6	TP 63 @ -4'		11:04										X					X			X					X
7	TP 64 @ -1'		11:17										X					X			X					X
8	TP 64 @ -8'		11:41										X					X			X					X
9	TP 68 @ -1'		12:36										X					X			X					X
10	TP 68 @ -4'		12:41										X					X			X					X

	Signature	Company	Date	Time
Relinquished	Jessica M. Chrichton	TERRA ASSOCIATES	11/8/10	10:46
Received		OSE	11/8/10	10:46
Relinquished				
Received				
Relinquished				
Received				

Comments/Special Instructions

Reviewed/Date

Reviewed/Date

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____