PACIFIC RACEWAYS BUSINESS PARK

PRELIMINARY TECHNICAL INFORMATION REPORT

December 11, 2017
JOB NO: 1263-002-016

Prepared for

Pacific Raceways
31101 144th Ave. S.E.
Kent, WA 98042

Submitted by

ESM Consulting Engineers, LLC
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TECHNICAL INFORMATION REPORT

FOR

Pacific Raceways
Business Park

Prepared for:
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31001 144th Ave. S.E.
Kent, WA 98042

Prepared by:
ESM Consulting Engineers
33400 8th Ave S, Ste 205
Federal Way, WA 98003

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Section 1

1. PROJECT OVERVIEW

The purpose of this report is to encapsulate the documents and analysis required by the Drainage Review.

The proposed Pacific Raceway's Business Park project site is located in Section 10, Township 21 North, Range 5 East, W.M., in the City of Kent, WA. More specifically, the project site is located at 31001 144th Ave SE. The parcel is zoned I-P industrial and spans 90 acres, 60 of which will be developed in accordance with the applicable City of Kent code. See Figures 1.1 and 1.2 for the vicinity map and a visual representation of the existing site conditions, respectively.

This parcel is currently a grass field with approximately 5 acres of gravel parking currently used by Green River College. The property slopes gently from north to south at 1 to 8 percent and the closest steep sloping areas are greater than 200 feet from the Phase 1 Lot C area and the paddock area. Stormwater runoff generally drains to a landslide hazard area where the slope is steeper than 15%. The site is located in the Duwamish – Green River drainage basin (WRIA number: 9). See Section 3 of this report for more information.

The project will be developed in three phases over a space of approximately five to seven years. Phase 1 of the commercial development will include the export of about 333,000 cubic yards of gravel and the construction of around 110,000 square feet of commercial buildings as well as the associated access, paved parking areas, and utilities. Phase 1 also includes a proposed retail building on an adjacent parcel to the southeast. Figure 1.3 is a visual representation of the proposed site improvements.

With the addition of new impervious surfaces, the stormwater runoff is required to meet the water quality and flow control requirements set forth in the 2016 KCSWDM. The developed project site will drain to the proposed stormwater facility in the center of the parcel. The runoff will be treated for water quality with an underground media filter prior to being routed to an infiltration trench. See Sections 4 and 5 of this report for more information.

As detailed in the pre-application meeting notes, the proposed development must comply with Level 2 Flow Control specified in the 2016 KCSWDM. See Section 4 of this report for more information.

The Geotechnical Engineering Report and Web Soil Survey map the soils onsite to include mostly Everett very gravelly sandy loam, 0 to 8 percent slopes. See Figure 1.4 and the Geotechnical Engineering Report (Appendix C) for more information. All applicable Flow Control BMP's are listed and explained in Section 4 of this report.

Section 2

2. CONDITIONS AND REQUIREMENTS SUMMARY

Review of the 9 Core Requirements and 5 Special Requirements

This section describes how the project will meet the KCSWDM Core and Special Requirements.

Core Requirement No. 1 - Discharge at the Natural Location

The topography of the site would naturally discharge to a landslide hazard area where the slope is steeper than 15%, which would require a tightline conveyance. However, because the site has highly permeable soils, the KCSWDM allows the site to use retention systems to infiltrate flows up to the 100-year event into the underlying soils. The project proposes an infiltration trench in order to accommodate the site's developed flows.

Core Requirement No. 2 - Off-site Analysis

The off-site analysis has been documented in Section 3 of this report.

Core Requirement No. 3 - Flow Control

The site is located in a Conservation Flow Control area, which requires meeting level 2 flow control. This standard is met with an infiltration trench. See Section 4 of this report for details.

Core Requirement No. 4 - Conveyance System

Stormwater conveyance will be provided by the proposed conveyance system see Section 5 for further details. Calculations will be provided in the final TIR.

Core Requirement No. 5 - Erosion and Sediment Control

Erosion and sediment controls to prevent the transport of sediment from the project site to downstream drainage facilities, water resources, and adjacent properties will be provided in the final TIR.

Core Requirement No. 6 - Maintenance and Operations

The Operations and Maintenance manual will be included with the final TIR.

Core Requirement No. 7 - Financial Guarantees and Liability

"All drainage facilities constructed or modified for projects must comply with the financial guarantee requirements in King County Ordinance 12020 and the liability requirements of King County Code 9.04.100, excepting those privately maintained flow control BMPs not serving a private road designed for 2 or more lots." (Section 1.2.7)

This project is privately owned.

Core Requirement No. 8 - Water Quality

Water quality treatment will be provided by an oil control device along with a media filtration system meeting enhance treatment. See Section 4 of this report for details.

Core Requirement No. 9 - Flow Control BMP's

All applicable Flow Control BMP's are listed and discussed in Section 4 of this report.

Special Requirement No. 1 - Other Adopted Area-Specific Requirements

There are no master drainage plans, basin plans, salmon conservation plans, stormwater compliance plans, flood hazard reduction plan updates, or shared facility drainage plans for this project. Special Requirement No. 1 does not apply.

Special Requirement No. 2 - Flood Hazard Area Delineation

The developed project site location is not in a 100-year floodplain. Special Requirement No. 2 does not apply.

Special Requirement No. 3 - Flood Protection Facilities

The developed project site is not protected by an existing flood protection facility. The proposed site improvements do not include the modification of an existing flood protection facility. Special Requirement No. 3 does not apply.

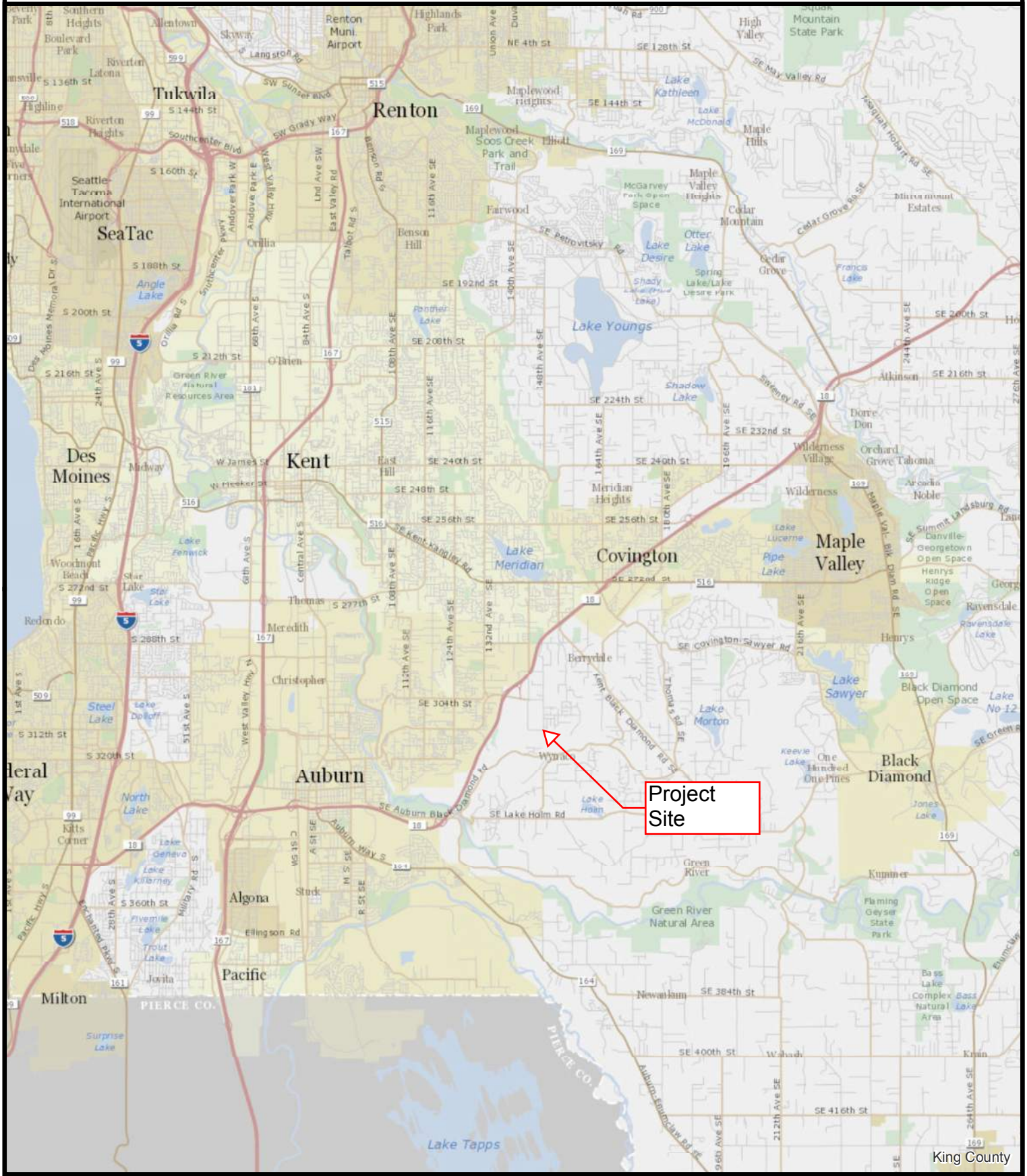
Special Requirement No. 4 - Source Control

The project will follow the King County Stormwater Pollution Prevention Manual and King County Code 9.12 to identify and implement source controls as needed. Due to the proposed use of the project site, source control is not required therefore; Special Requirement No. 4 does not apply.

Special Requirement No. 5 - Oil Control

The proposed development is commercial and (according to the definition provided in the KCSWDM) qualifies as a "high-use site" due to vehicle fleet size; therefore, Special Requirement No. 5 does apply. Specific implementation details regarding oil control will be provided in the final TIR.

Figure 1.1 - Vicinity Map



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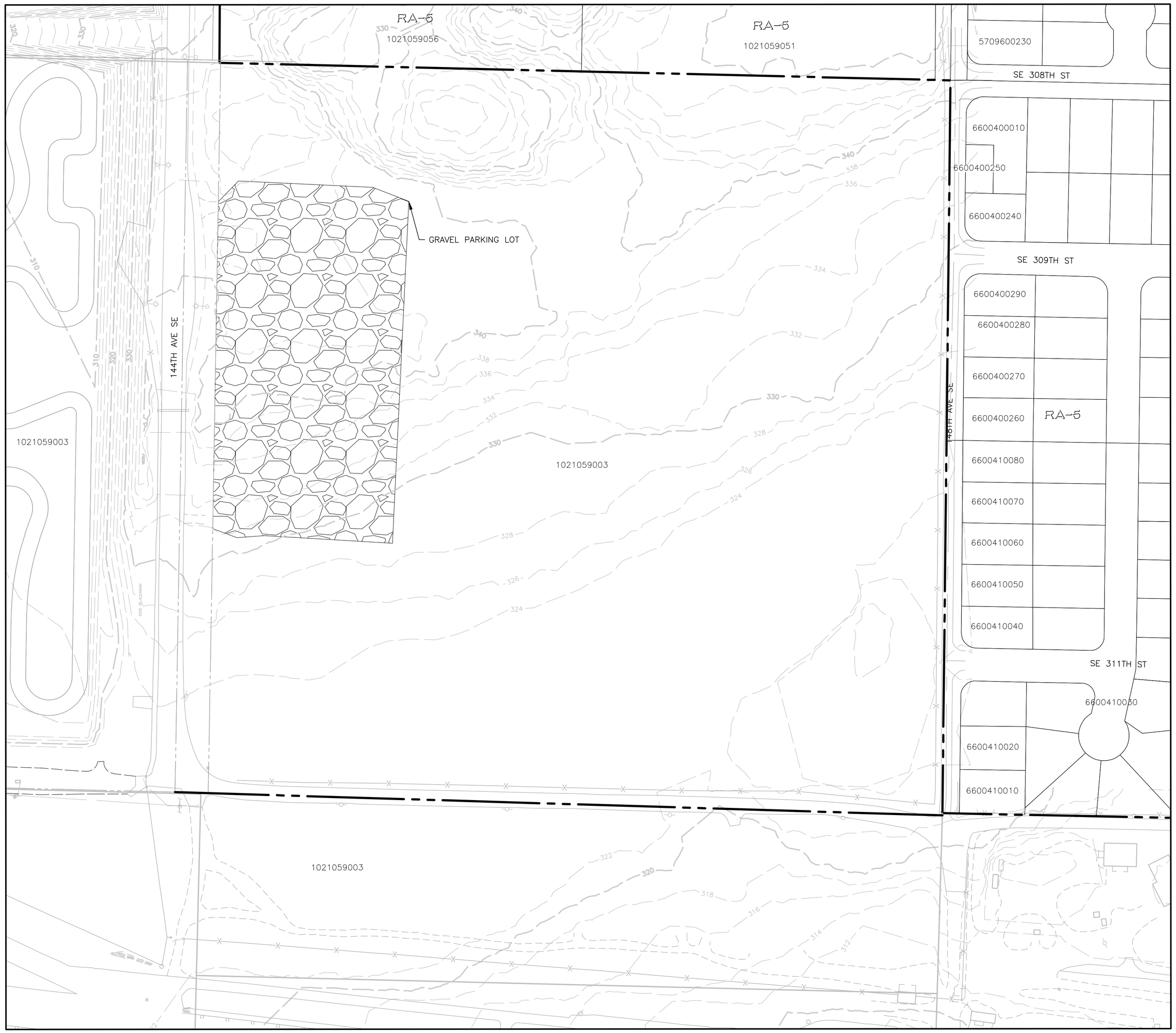
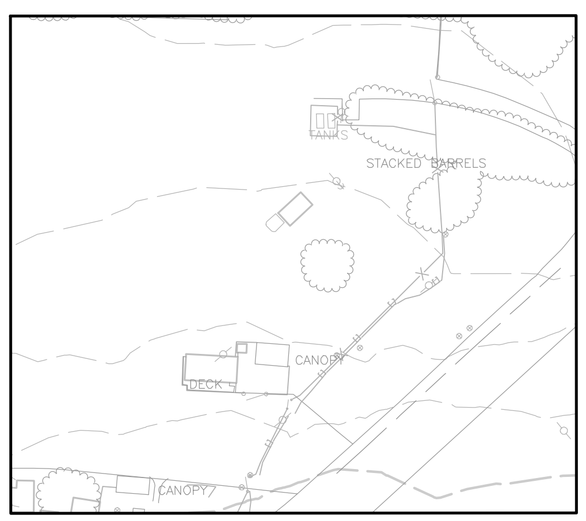
A PORTION OF SEC. 10, T 21 N, R 5 E, W.M.

Figure 2: Existing Site Conditions





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PACIFIC RACEWAYS

BUSINESS PARK

EXISTING SITE CONDITIONS

KING COUNTY WASHINGTON

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DWG. NAME:	ST-03
DESIGNED BY:	
DRAWN BY:	TMA
CHECKED BY:	
DATE:	09/11/2017
DATE OF PRINT:	

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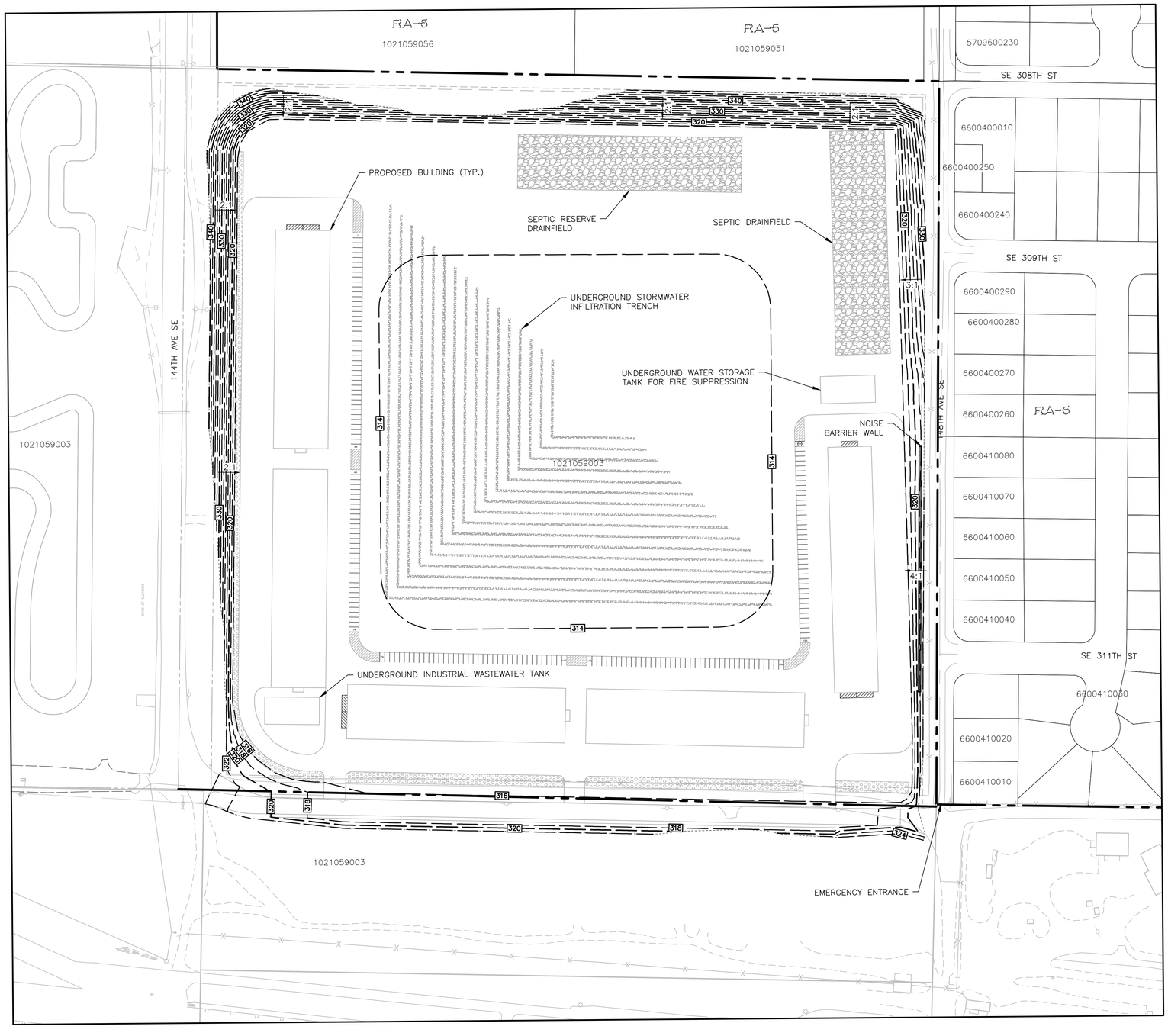
Figure 1.3 - Proposed Site Conditions



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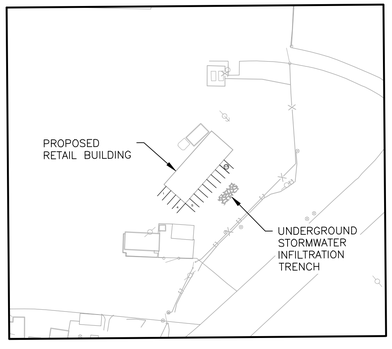

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PACIFIC RACEWAYS

BUSINESS PARK

PROPOSED SITE CONDITIONS

KING COUNTY WASHINGTON

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Figure 1.4 - Soil Map

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 12, Sep 8, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 8, 2014—Jul 15, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

King County Area, Washington (WA633)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
An	Arents, Everett material	2.5	5.8%
EvB	Everett very gravelly sandy loam, 0 to 8 percent slopes	40.3	94.2%
Totals for Area of Interest		**42.9**	**100.0%**

Figure 1.4 - Soil Map

Map Unit Legend

King County Area, Washington (WA633)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
An	Arents, Everett material	0.1	100.0%
Totals for Area of Interest		**0.1**	**100.0%**

Map Unit Descriptions

Section 3

3. OFF-SITE ANALYSIS

Task 1: Study Area Definition and Maps

The study area consists of the project site and ¼ mile downstream flow path for runoff released from the existing site. See Figure 1.2 and Figure 3.2 for the Existing Site Conditions and Downstream Analysis Flow Path exhibits, respectively.

Task 2: Resource Review

Flow Control Map

According to the pre-application meeting notes, the project is required to comply with Level 2 Flow Control criteria.

Soil Survey Map

Web Soil Survey maps the soils onsite include Everett very gravely sandy loam, 0 to 8 percent slopes. Refer to the Geotechnical Engineering Report (Appendix C) for more detail.

King County iMap

According to iMap, the project site is NOT mapped in any of the following areas:

- Landslide Hazard area
- Coal Mine Hazard Areas
- Erosion Hazard area
- Streams & Wetlands
- 100 Year Floodplains
- Seismic Hazard area

The project site is in a category 2 critical aquifer recharge area, therefore water quality treatment will be provided prior to infiltration as specified in Core Requirement #8 and Special Requirement #5. See Section 4 for details.

Figure 3.1 has more information regarding the environmental hazards near the project site.

Road Drainage Problems

None noted.

Wetlands Inventory

According to iMap, the Critical Areas Review, and the 1990 King County Wetlands Inventory Notebooks there are no recorded wetlands on the existing project site.

Migrating River Study
None noted.

Downstream Drainage Complaints
According to iMap, there are no relevant downstream drainage complaints within the scope of this project.

Task 3: Field Inspection (Level 1 Inspection)

A Level 1 Downstream Analysis was completed for the Pacific Raceways Drag Strip by ESM Consulting Engineers, LLC in the afternoon on September 20, 2016, when it was sunny and 66°F. Since the drag strip is adjacent to the proposed business park, it is assumed that both parcels will have similar upstream offsite areas draining to their respective projects. During the inspection it was found that the project site has no apparent upstream offsite areas draining to the property. There did not appear to be any flooding issues over any of the roadways adjacent to, and downstream of, the project site. See Figure 3.2 Downstream Analysis Flow Path, produced using iMap's elevation contours, for additional information.

Task 4: Drainage Description and Problem Descriptions

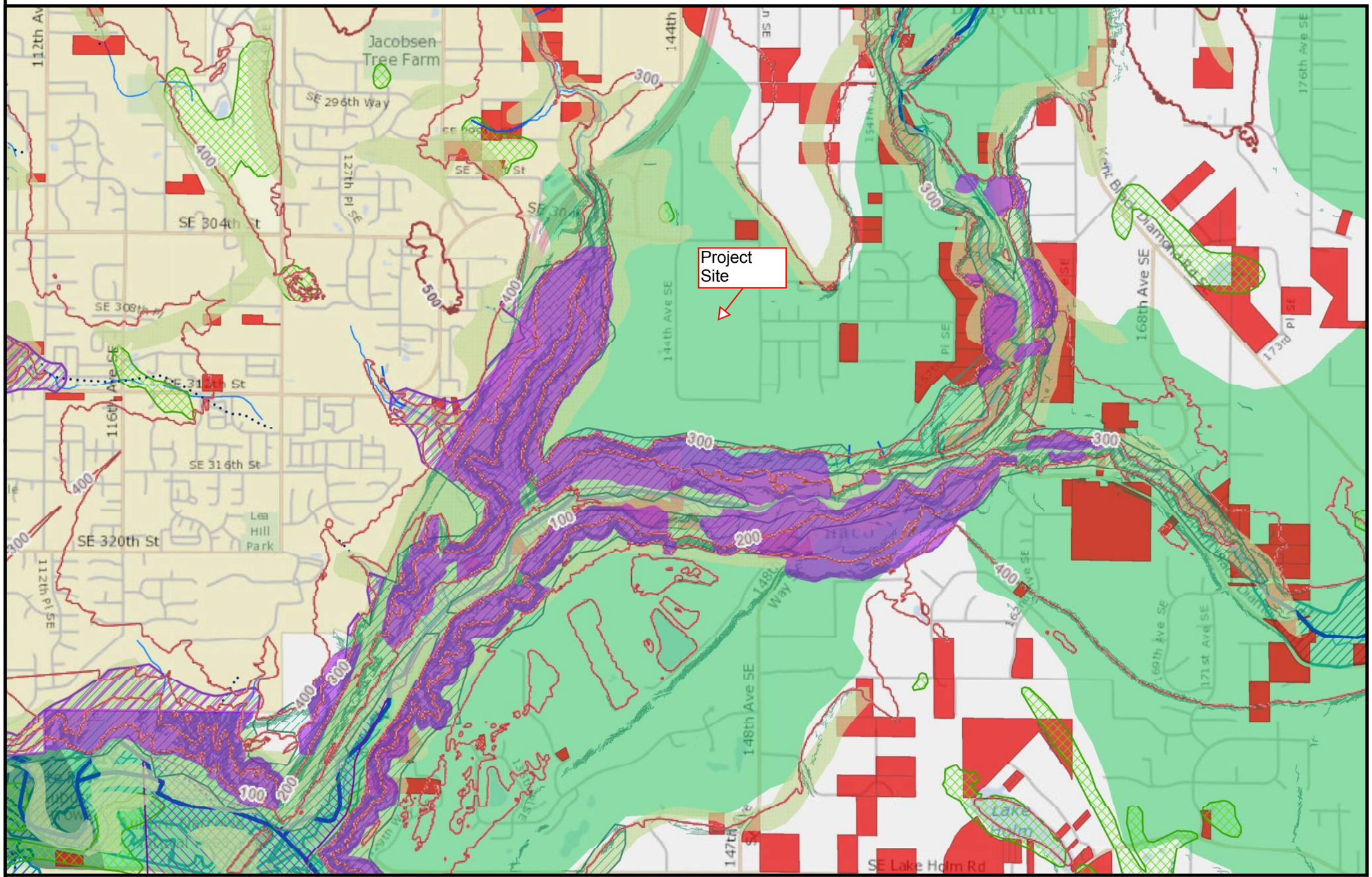
According to iMap, the project site is in the Duwamish – Green River drainage basin (King County WRIA number: 9). Big Soos Creek is located approximately ¼ of a mile south of the project. The section of Big Soos Creek that is tributary to the project is not listed in DOE's 303 (d) list as an impaired water body; however, it is listed as category 2 for bioassessment. No drainage problems are estimated to exist in the site's present condition.

All drainage complaints received have been addressed or are not relevant within the scope of this project.

Task 5: Mitigation of Existing or Potential Problems

No existing or potential problems were observed with the existing drainage system within the scope of the downstream analysis. Therefore, no further mitigation is proposed.

Figure 3.1 - Site Topography and Environmental Hazards



Legend

- index contours - 500 foot
- contours - 100 foot
- Potential landslide hazard areas (2016, see explanation-->)
- Landslide hazards, incorporated KC (1990)
- Potential steep slope hazard areas (2016, see explanation-->)
- Landslide hazard (1990 SAO)
- Erosion hazard (1990 SAO)
- Seismic hazard (1990 SAO)
- Coal mine hazard (1990 SAO)
- class 1
- class 2 perennial
- class 2 salmonid
- class 3
- unclassified
- Wetland (1990 SAO)
- Sensitive area notice on title
- category 1
- category 2
- category 3
- FEMA preliminary 100-year floodplain
- Streams

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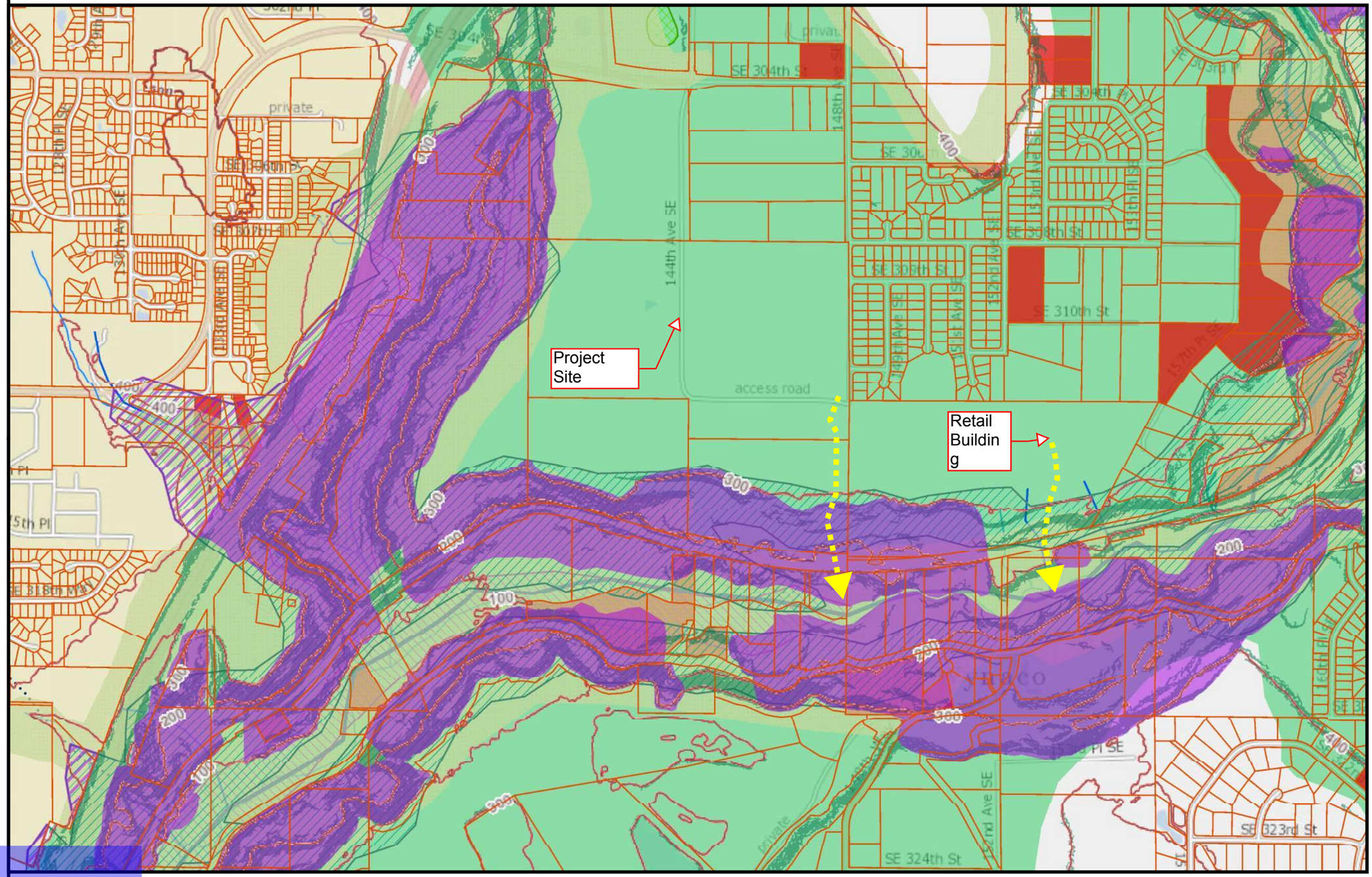
Figure 3.2 - Downstream Analysis Flowpath



Legend

- Parcels
- Potential landslide hazard areas (2016, see explanation-->)
- Landslide hazards, incorporated KC (1990)
- Potential steep slope hazard areas (2016, see explanation-->)
- Landslide hazard (1990 SAO)
- Erosion hazard (1990 SAO)
- Seismic hazard (1990 SAO)
- Coal mine hazard (1990 SAO)
- class 1
- class 2 perennial
- class 2 salmonid
- class 3
- unclassified
- Wetland (1990 SAO)
- Sensitive area notice on title
- category 1
- category 2
- category 3
- FEMA preliminary 100-year floodplain
- Streams
- Downstream flowpath

N

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Section 4

4. FLOW CONTROL & WATER QUALITY FACILITY ANALYSIS AND DESIGN

Existing Site Hydrology

The site currently contains a grass field and 5 acres of gravel parking. The property slopes gently to the north at 1 to 8 percent and the closest steep sloping areas are greater than 200 feet from the Phase 1 Lot C area and the paddock area. Stormwater runoff generally drains to the southeast corner of the lot and proceeds south towards Big Soos Creek. See Section 3 for details. A Stormwater Facility Summary Sheet will be provided with the final TIR.

Developed Site Hydrology

All onsite basins shown in the Developed Basin Exhibit (Appendix A) drain to the Point of Compliance (POC), located at the center of the parcel, due to the topography of the developed project site. The runoff will be treated for water quality with an underground media filtration system that will be located more than 100 feet from the proposed septic system drain field. The site contains a low lying area that requires a closed depression analysis, which will be provided with the final TIR. The proposed retail building will drain to a separate infiltration trench and have the same water quality as the proposed business park. Tables 4.1 and 4.2 summarize the basin areas used in the approved hydrology model for the proposed business park and retail building, respectively.

Table 4.1: Hydrology Model Basin Areas 1

Areas (Acres)	Predeveloped	Developed		
	Total	Total	Detained	Bypass
Forest	41.89	0.00	0.00	0.00
Roof	0.00	4.50	0.00	0.00
Grass	0.00	28.18	0.00	0.00
Pavement	0.00	9.21	0.00	0.00
Total	**41.89**	**41.89**	**41.89**	**0.00**

Table 4.2: Hydrology Model Basin Areas 2

Areas (Acres)	Predeveloped	Developed		
	Total	Total	Detained	Bypass
Forest	0.09	0.00	0.00	0.00
Roof	0.00	0.09	0.00	0.00
Grass	0.00	0.00	0.00	0.00
Pavement	0.00	0.00	0.00	0.00
Total	**0.09**	**0.09**	**0.09**	**0.00**

Performance Standards

Stormwater systems onsite are to be designed to mitigate runoff generated from the project per the requirements of the KCSWDM, specifically the Level 2 Flow Control standards. The facility size is required to be determined by an approved hydrology model per the KCSWDM.

Due to the size of the proposed development, all applicable flow control and water quality requirements are met with an infiltration trench and proprietary media or membrane filter, as described in this section under Flow Control System and Water Quality System.

Flow Control System

The approved hydrology model used to size the infiltration trench was the Western Washington Hydrology Model 2012 (WWHM). The Geotechnical Engineering Report states, "Base on the soils encountered in our explorations and the results of our preliminary infiltration tests, we recommend an infiltration rate of 40 inches per hour or 1.5 minutes per inch be used for planning purposed... Based on our experience, a factor of safety of 2 is typically applied, thus an infiltration rate of 20 inches per hour or 3 minutes per inch should be used as the preliminary design rate". The facility was designed to infiltrate flows up to the 100-year event and meet infiltration trench and flow control standards in Section 1.2.3 and 5.2.5, respectively.

The project site is located within a closed depression and the facility has an additional correction factor of at least 0.5 used in calculating the design infiltration rate, sized to fully infiltrate the 100-year runoff event; and not bermed on any side, therefore the requirement to identify and analyze a 100-year overflow pathway is waived. See Appendix B for the hydrology model output.

Water Quality System

A proprietary media or membrane filter for enhanced treatment is proposed to meet the water quality treatment and presettling standards in Section 1.2.8 and 5.2.1 of the KCSWDM, respectively. Stormfilter or an equivalent media filter, providing enhanced treatment, will be designed to meet the required 2.26 cfs water quality flow. Further design specifications will be provided with the final TIR.

The project site requires enhanced water quality treatment and oil control, which can be satisfied per KCSWDM using one of seven different options for high-use sites. The current proposed design follows the coalescing plate oil/water separator in combination with an enhanced media filter system as described in Section 6.1.5.3. Further design specifications will be provided with the final TIR.

The roof material to be used on the proposed buildings will be coated and treated properly and is considered to be non-leaching, which complies with the requirements specified in Section 1.2.8 of the KCSWDM.

Flow Control BMPs

"Any impervious or pervious surface served by an infiltration facility designed in accordance with the flow control facility requirement (Section 1.2.3.1), the facility implementation requirements (Section 1.2.3.2), and the design criteria for infiltration facilities Section 5.2 is exempt from the flow control BMPs requirement." (Section 1.2.9.3.A). The Geotechnical Engineering Report states, "It is further our opinion that the infiltration of stormwater will be feasible in these [project site] areas, provided design and construction techniques are followed, and the systems maintained". Therefore, this project qualifies for exemption from flow control BMPs. Infiltration trench design specifications will be followed and maintenance and operation instructions will be provided with the final TIR.

Section 5

5. CONVEYANCE SYSTEM ANALYSIS AND DESIGN

Onsite Conveyance System

Runoff from the developed project site will be collected from the developed project lawns, roofs, and roadway by the conveyance system located in the ROW. A conveyance and backwater analysis will be completed to verify the capacity of the critical pipes in the system. The proposed stormwater drainage system will be designed to convey the 25-year peak flow rate generated by the developed tributary basin as required in the KCSWDM. The system will contain the 100-year flow within the catch basin without any conveyance or backwater issues. Conveyance calculations will be provided with the final TIR.

Section 6

6. SPECIAL REPORTS AND STUDIES

The Geotechnical Engineering Report by GeoResources, LLC (dated November 6, 2017) is included in Appendix C.

Section 7

7. OTHER PERMITS

Building and NPDES permits will be required for this project, together with permits for utility connections, which will be applied for at a later date.

Section 8

8. ESC ANALYSIS AND DESIGN

The Erosion and Sedimentation Control will be provided with the final TIR.

Section 9

9. BOND QUANTITIES, FACILITY SUMMARIES, AND DECLARATION OF COVENANT

The Bond Quantities worksheet will be provided with the final TIR.

Section 10

10. OPERATIONS AND MAINTENANCE

The Operations and Maintenance manual will be provided with the final TIR.

Appendix A

APPENDIX A - BASIN EXHIBITS

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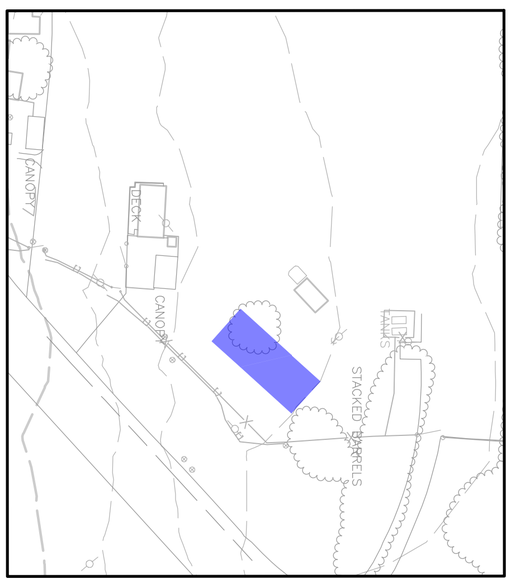

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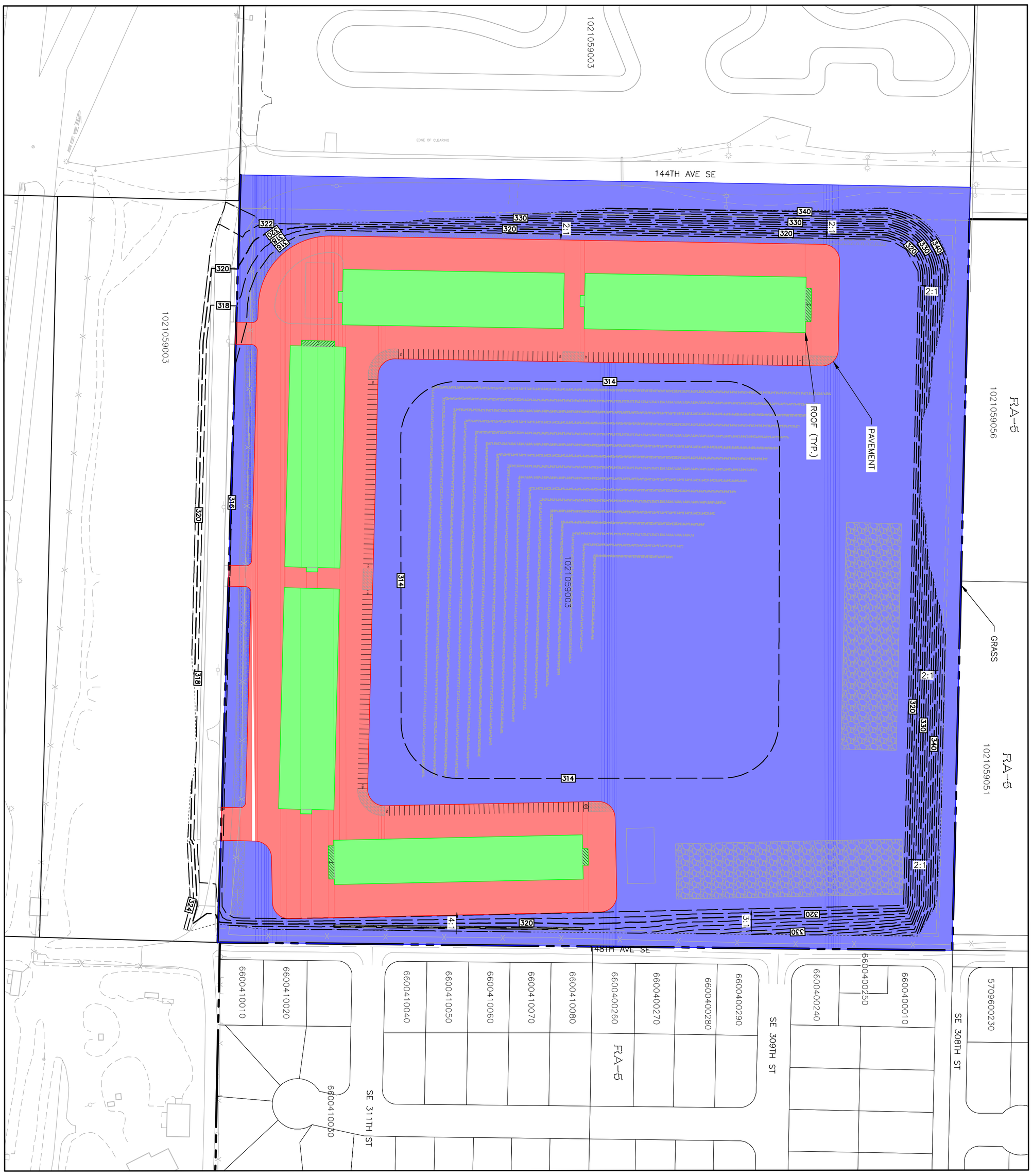

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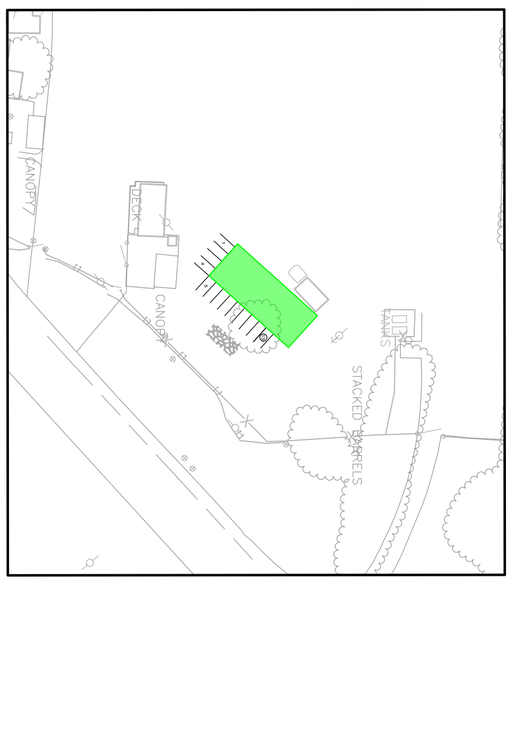

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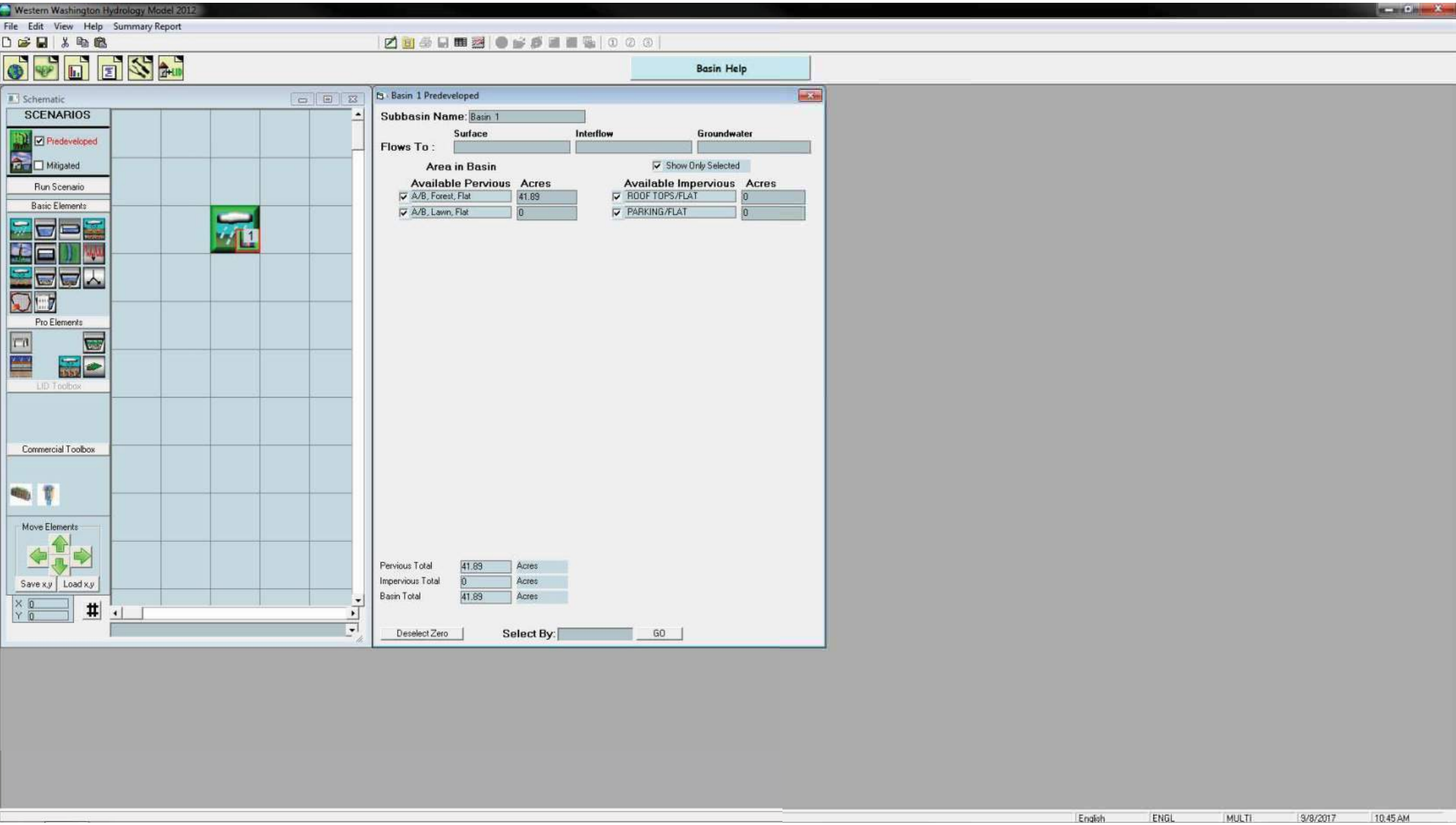
Appendix B

APPENDIX B - HYDROLOGY MODEL OUTPUT


Western Washington Hydrology Model 2012
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Mitigated
Run Scenario
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Pro Elements
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Commercial Toolbox
Move Elements
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Load x,y
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Y 0
Basin 1 Predeveloped
Subbasin Name: Basin 1
Surface
Interflow
Groundwater
Flows To :
Area in Basin
Show Only Selected
Available Pervious
Acres
A/B, Forest, Flat
41.89
A/B, Lawn, Flat
0
Available Impervious
Acres
ROOF TOPS/FLAT
0
PARKING/FLAT
0
Pervious Total
41.89
Acres
Impervious Total
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Acres
Basin Total
41.89
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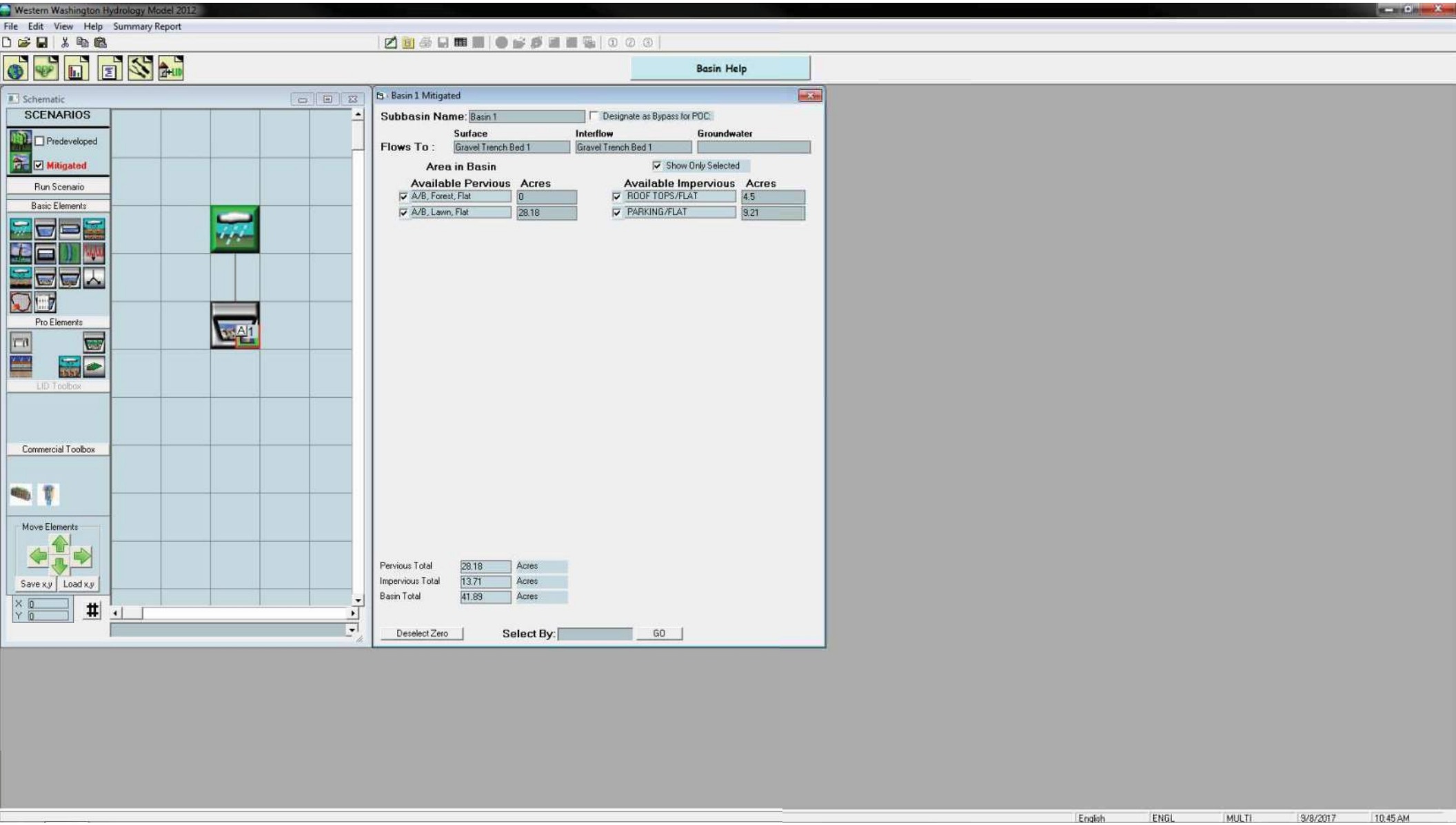
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Y 0
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Subbasin Name: Basin 1
Designate as Bypass for POC
Flows To :
Surface
Interflow
Groundwater
Gravel Trench Bed 1
Gravel Trench Bed 1
Area in Basin
Show Only Selected
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Acres
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0
A/B, Lawn, Flat
28.18
Available Impervious
Acres
ROOF TOPS/FLAT
4.5
PARKING/FLAT
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Pervious Total
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Acres
Impervious Total
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Acres
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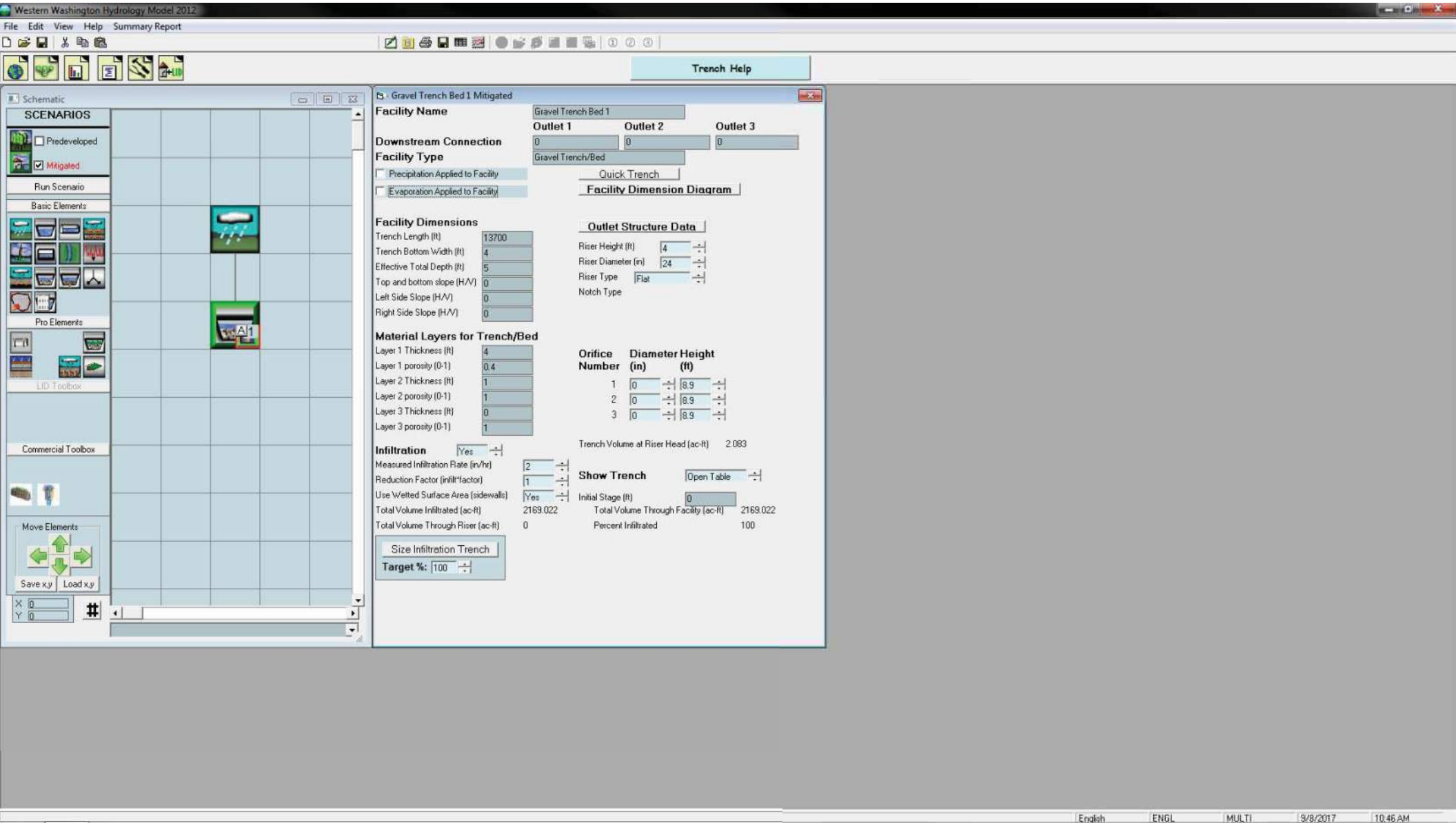
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Pro Elements
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Commercial Toolbox
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Load x,y
Gravel Trench Bed 1 Mitigated
Facility Name
Gravel Trench Bed 1
Outlet 1
Outlet 2
Outlet 3
Downstream Connection
Facility Type
Gravel Trench/Bed
Precipitation Applied to Facility
Evaporation Applied to Facility
Quick Trench
Facility Dimension Diagram
Facility Dimensions
Trench Length (ft) 13700
Trench Bottom Width (ft) 4
Effective Total Depth (ft) 5
Top and bottom slope (H/V) 0
Left Side Slope (H/V) 0
Right Side Slope (H/V) 0
Outlet Structure Data
Riser Height (ft) 4
Riser Diameter (in) 24
Riser Type Flat
Notch Type
Material Layers for Trench/Bed
Layer 1 Thickness (ft) 4
Layer 1 porosity (0-1) 0.4
Layer 2 Thickness (ft) 1
Layer 2 porosity (0-1) 1
Layer 3 Thickness (ft) 0
Layer 3 porosity (0-1) 1
Orifice Number
Diameter (in)
Height (ft)
1 0 8.9
2 0 8.9
3 0 8.9
Trench Volume at Riser Head (ac-ft) 2.083
Infiltration Yes
Measured Infiltration Rate (in/hr) 2
Reduction Factor (infilt*factor) 1
Use Wetted Surface Area (sidewalls) Yes
Total Volume Infiltrated (ac-ft) 2169.022
Total Volume Through Riser (ac-ft) 0
Show Trench Open Table
Initial Stage (ft) 0
Total Volume Through Facility (ac-ft) 2169.022
Percent Infiltrated 100
Size Infiltration Trench
Target %: 100
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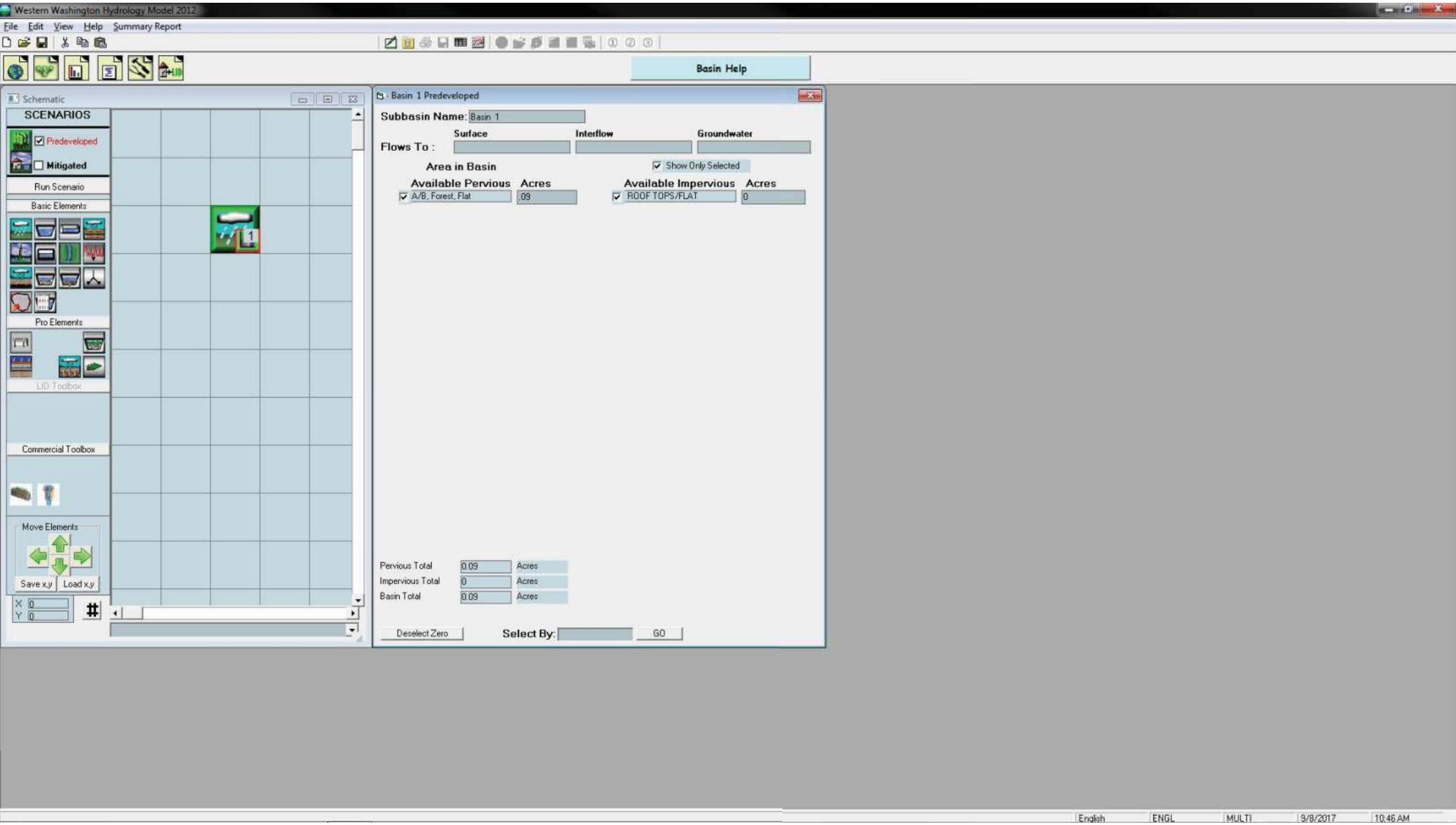
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X 0
Y 0
Basin 1 Predeveloped
Subbasin Name: Basin 1
Surface
Interflow
Groundwater
Flows To :
Area in Basin
Show Only Selected
Available Pervious
Acres
A/B, Forest, Flat
.09
Available Impervious
Acres
ROOF TOPS/FLAT
0
Pervious Total
0.09
Acres
Impervious Total
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Acres
Basin Total
0.09
Acres
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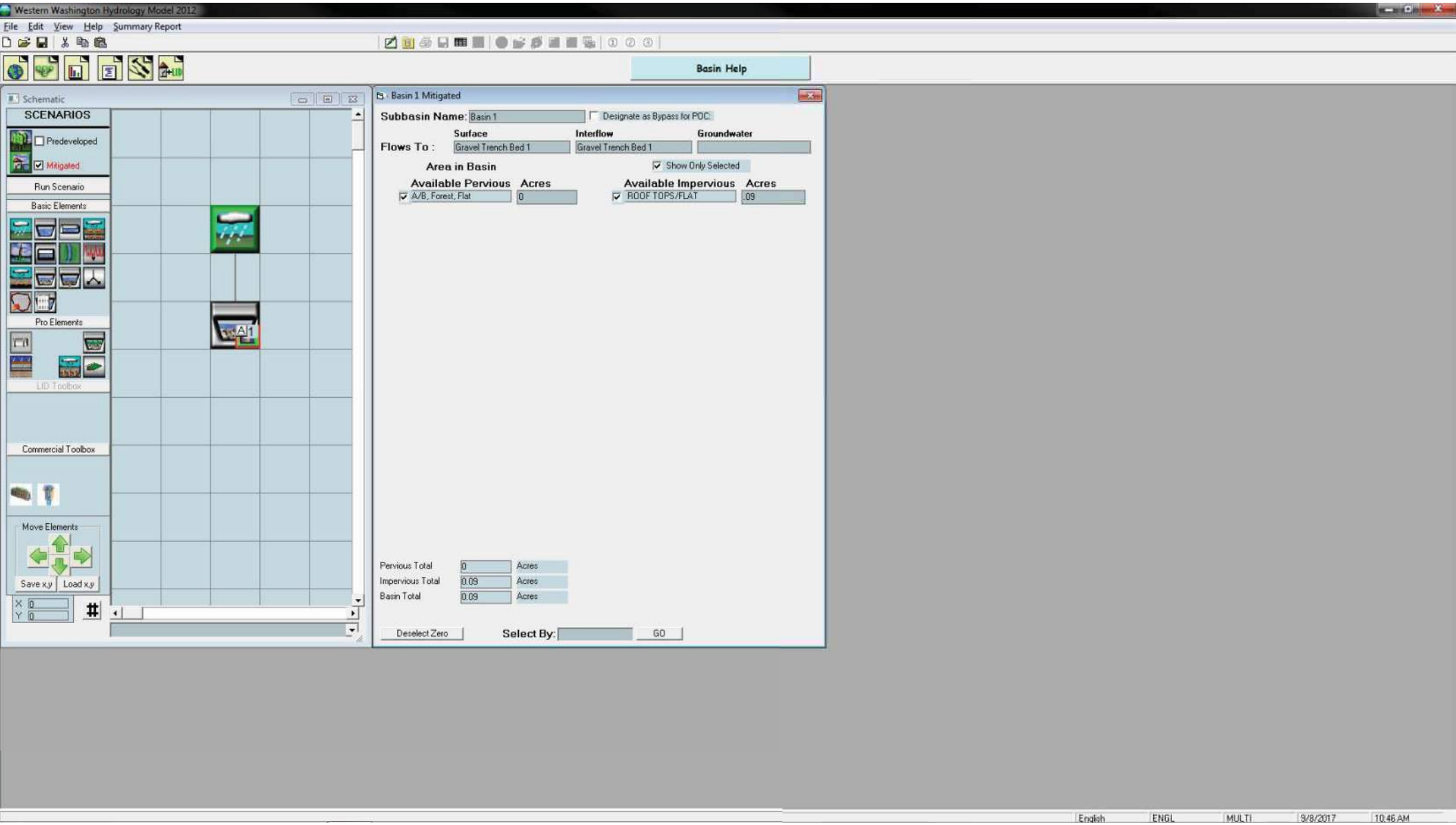
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Move Elements
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Load x,y
X 0
Y 0
Basin 1 Mitigated
Subbasin Name: Basin 1
Designate as Bypass for POC
Flows To :
Surface
Interflow
Groundwater
Gravel Trench Bed 1
Gravel Trench Bed 1
Area in Basin
Show Only Selected
Available Pervious
Acres
A/B, Forest, Flat
0
Available Impervious
Acres
ROOF TOPS/FLAT
.09
Pervious Total
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Acres
Impervious Total
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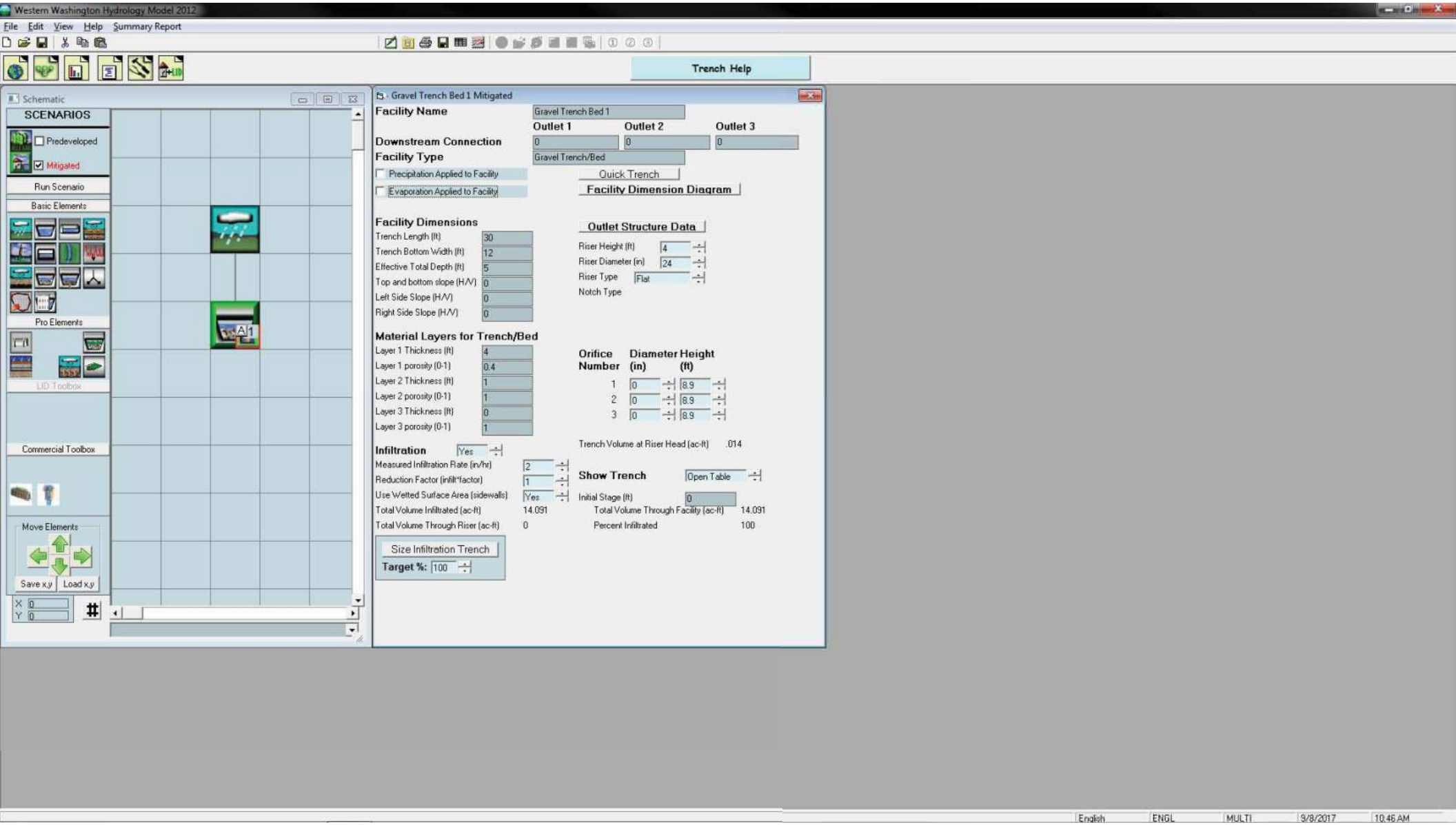
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Gravel Trench Bed 1 Mitigated
Facility Name
Gravel Trench Bed 1
Outlet 1
Outlet 2
Outlet 3
Downstream Connection
0
0
0
Facility Type
Gravel Trench/Bed
Precipitation Applied to Facility
Evaporation Applied to Facility
Quick Trench
Facility Dimension Diagram
Facility Dimensions
Trench Length (ft) 30
Trench Bottom Width (ft) 12
Effective Total Depth (ft) 5
Top and bottom slope (H/V) 0
Left Side Slope (H/V) 0
Right Side Slope (H/V) 0
Outlet Structure Data
Riser Height (ft) 4
Riser Diameter (in) 24
Riser Type Flat
Notch Type
Material Layers for Trench/Bed
Layer 1 Thickness (ft) 4
Layer 1 porosity (0-1) 0.4
Layer 2 Thickness (ft) 1
Layer 2 porosity (0-1) 1
Layer 3 Thickness (ft) 0
Layer 3 porosity (0-1) 1
Orifice Number
Diameter (in)
Height (ft)
1 0 8.9
2 0 8.9
3 0 8.9
Trench Volume at Riser Head (ac-ft) .014
Infiltration Yes
Measured Infiltration Rate (in/hr) 2
Reduction Factor (infilt*factor) 1
Use Wetted Surface Area (sidewalls) Yes
Total Volume Infiltrated (ac-ft) 14.091
Total Volume Through Riser (ac-ft) 0
Show Trench Open Table
Initial Stage (ft) 0
Total Volume Through Facility (ac-ft) 14.091
Percent Infiltrated 100
Size Infiltration Trench
Target %: 100
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Appendix C

APPENDIX C - GEOTECHNICAL ENGINEERING REPORT

GEORESOURCES
earth science & geotechnical engineering
5007 Pacific Hwy E., Suite 16 | Fife, WA 98424 | 253.896.1011 | www.georesources.rocks

November 6, 2017

Pacific Raceways
31001 – 144th Avenue SE
Kent, Washington 98042

Attn: Mr. Jason Fiorito

Geotechnical Engineering &
Hydrogeologic Report
Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington
PN: 1021059003, -035
Doc ID: PacificRaceways.SiteDev.RG3

INTRODUCTION

This report provides geotechnical and hydrogeologic information for the proposed commercial site development to be constructed on a portion of the subject site, generally the north central area. The historic Pacific Raceways site is situated east of SR 18 in King County, Washington, as shown in Figure 1. The overall development project includes the excavation and removal of approximately 1 million (MM) cubic yards of aggregate resources to reach design grades and the construction of approximately 200,000 square feet of commercial building area with associated utilities and paved surfaces. Stormwater collected will be directed to a subgrade infiltration bed that utilizes a sand filter for improved water quality. The proposed site development is expected to occur over approximately 5 years. The proposed Site Plan is illustrated in Figure 2a.

The planned commercial site development will include grading activities for on-site sanitary septic installation, the commercial buildings, stormwater management, fire flow, and the associated access, paved parking areas, and utilities. As noted, to reach final grade it will be necessary to excavate and export approximately 1 million cubic yards of soil material. The proposed 5,000 square foot building in the paddock area will be constructed at approximately the existing site grades in that area. These areas are situated in the gently sloping portions of the site; and greater than 200 feet from any critical areas.

The proposed site grades and engineered cut slopes to reach the design grades will extend up from the existing grade or surface elevation in the south. The cut slopes along the north and east portions of the development area will slope up towards the north and east portions of Parcel C at an inclination of 2H:1V (Horizontal to Vertical). The engineered cut slopes will reach a maximum height of about 30 feet in the northeast and northwest corners of the site. A 25 foot minimum undisturbed green belt will separate the top of the cut slope (graded area) from the adjoining north and east properties. The area from the top of the cut slope to the east margin of the site will remain undisturbed with the existing vegetative cover, or landscaping.

The planned grading activity for the site development will include temporary and permanent erosion and storm water controls. The proposed development will include stormwater collection,

treatment and infiltration utilizing an engineered system. The proposed infiltration bed system for Lot C has been designed to closely match the existing groundwater recharge conditions in this portion of the site. A sand filter will limit the infiltration rate and improve water quality. Stormwater from the proposed paddock building (roof water) will be infiltrated using a conventional trench system.

SITE CONDITIONS

Surface Conditions

The project site is generally located in King County between the cities of Covington, Kent and Auburn, and situated east of SR-18. The site is bounded by residential plats on the east, recreational property to the north and rural residential property on the south, with forested areas and SR (Highway) 18 to the west. The proposed commercial development areas are located east of the existing Kart Track and generally north of the existing road course or track surfaces. The site areas generally consist of gravel/crushed rock surfacing in Parking Lot C, and asphalt surfacing in the east paddock area. Existing site conditions are shown on the Site and Exploration Plan, Figure 2b.

The Pacific Raceway site consists of a historic commercial race track facility with numerous paved/concrete areas and existing buildings. The areas of proposed commercial development are highlighted on the Site Plan, Figure 2a. The paddock building will be constructed near the existing elevation or ground surface of the southeast portion of the property, near the existing school building.

The ground surfaces in the proposed Lot C and paddock commercial areas of the site are gently sloping, generally up to the north at between 1 and 8 percent. The closest steep sloping areas are greater than 200 feet from both Lot C and the paddock areas.

Relative to stormwater, the granular nature of the site soils currently allows for rapid infiltration of any precipitation that falls on the site. The depth of granular soils at the site has been confirmed with numerous test pits and borings, and with the excavation of the Pacific Grand Prix track area to the west. The new commercial development will include engineered collection, treatment and infiltration systems that will disperse the water across the site, thus mimicking the existing conditions. As previously noted, the collected runoff from the new paddock building will be infiltrated using a conventional trench system.

Site Soils

A review of the Soil Survey of King County (NRCS - Soil Conservation Survey) indicates the subject property is located in an area mapped as several different soil types. Table 1 below lists the mapped soil type, soil name, slope inclinations, erosion potential, and development limitations for the soil types mapped in the vicinity around the project site. A copy of the soils map for the site area is included as Figure 3.

Based on our review of the soils encountered in the test pits and borings excavated at the site, we interpret the site to primarily be underlain by sand and gravel. We observed no evidence of surficial erosion at the site or the adjacent areas at the time of our site visits, particularly where vegetation is established.

TABLE 1:
SCS Soil Survey Map Summary

Mapped Soil Type	Soil Type Name	Slope Inclinations (percent)	Classified Erosion Potential	Parent Material
An	Arents, Everett Material	0 to 8	Slight	Outwash
AkF	Alderwood & Kitsap material	25 to 70	Severe	Sandy Outwash
EvB	Everett material	0 to 5	Slight	Gravelly Outwash
PITS	Old Borrow Area	NA	Moderate	SR 18 Source

Site Geology

The site is situated in the southeast portion of the Covington glacial upland area. The existing topography, as well as the surficial and shallow subsurface soils in the area, is the result of the most recent Vashon Stade of the Fraser glaciation that occurred between about 12,000 and 15,000 years ago, and weathering and erosion that has occurred since. Based on the geologic map for the area, *Geologic Map of the Auburn Quadrangle, King and Pierce Counties*, the site is identified as being underlain by proglacial stratified drift or valley train deposits (Qpv). A geologic map of the site area is included as Figure 4.

In general, and based on our experience, the near surface soils at the site consist of Vashon glacial outwash with localized areas of lacustrine or lake sediments. The outwash sand and gravel material overlies glacial till and advance outwash sand and gravel deposits. Based on our subsurface explorations in the area, the till is between 40 feet and 70 feet below the existing ground surface at the site. The recessional outwash material consists of sand with gravel and occasional cobbles, and minor silt. The outwash material is in a medium dense to dense condition. The lacustrine soils consist of medium dense to dense sand with variable gravel and silt. The lacustrine sediments generally occur in the northeast portion of the kart track site, west of the subject development site.

The underlying glacial till occurs below the outwash and lake sediments throughout the upland areas, but is absent to the south and west, where topography is lower near Soos Creeks. The glacial till consists of silty sand with gravel, cobbles and boulders that is in a very dense condition. This glacial till has a low permeability and is generally considered an aquitard in the Puget Sound area.

In extreme south and west portions of the Pacific Raceway property, several hundred feet from the proposed commercial development areas, the till was eroded by meltwaters from the receding glacial ice, and the recessional outwash was deposited directly on the advance outwash. The advance outwash consists of gravelly sand with cobbles, boulders and variable silt content. The advance outwash is also glacially consolidated and in a very dense condition.

Subsurface Explorations

The subsurface conditions in the site and adjacent areas were evaluated by reviewing the geologic and soils maps for the area, reviewing the available water well logs in the area, previously monitoring the excavation of sixteen initial and fifteen additional test pits in the site area, and monitoring eleven power borings completed at various times across the site. Observation wells were installed in the initial six borings completed at the site. Two additional borings were completed

in the northwest portion of the site. One-inch diameter piezometers were installed in these two borings to further evaluate and monitor an intermittent shallow perched water table in the north portion of the site. Three additional borings and piezometers were completed in the grandstand, pro-pit and east drag strip staging areas. The borings generally ranged in depth from 36 to 46 feet. Boring B-5, located southeast of the kart track, and the associated observation well was extended to a depth of approximately 80 feet below the adjacent ground surface, respectively. The deeper well was completed in order to evaluate the deeper soils in the area, and monitor the local aquifer that underlies the site.

Copies of the test pit and boring logs are included in Appendix "A". Water levels recorded in the on-site wells and piezometers are provided as Figures 5a through 5c. Based on our site explorations, data review and experience in the area, the soils encountered at the site are consistent with those mapped in the area. Therefore, no additional subsurface explorations or borings are required.

Select soil samples were collected from both the test pit excavations and the borings, and transported to our laboratory for further evaluation. Six of the soil samples were submitted for grain-size distribution tests. Copies of the laboratory test results are included in Appendix "B".

We also reviewed the available water well logs for the area. Copies of the water well logs in the site area, with a general location map, are included in Appendix "C". As discussed above, water levels in the on-site wells/piezometers are included as Figures **5a through 5c**.

Subsurface Conditions

Soils encountered in our explorations at the proposed development area and the surrounding site area consisted of Vashon Recessional outwash sands and gravels over a thin intermittent layer of glacial till, which overlies Advance outwash materials. A zone of glacial lacustrine sand with silt and silty sand was encountered in the northeast corner of the Kart Track area, in test pits TP-9A and TP-10A, and in Borings B-1 (28 to 40 feet), B-2 (35 to 42 feet), and B-3 (28 to 38 feet). Borings B-7 and B-8 also encountered the sandy lacustrine sediments at depths of approximately 45 feet below the adjacent ground surface. These sandy soil zones appear to occur intermittently traverse the north portion of the site, pinching out towards the southwest. This type of material, although not likely suitable for use as gravel export, will be an excellent medium for reclamation/revegetation or topsoil, if amended. This material is also suitable for use as structural fill with the appropriate moisture content.

The soils encountered in borings B-9, B-10 and B-11 generally consisted of sand and gravel with variable cobbles and boulders to the full depth explored, 36 to 46 feet BGS. Localized thin silt lenses were encountered in the borings, generally deeper to the south.

The Recessional outwash material consisted of sand with gravel and gravelly sand with minor cobbles and occasional boulders. The fines or silt content ranged from approximately 3 percent to 8 percent with localized areas of up to10 percent. The recessional material was in a loose condition near the surface and became increasingly denser with depth. The Recessional material extends to depths of 28 to 38 feet in the Drag Strip and Kart Track areas. We expect that intermittent glacial till occurs below the Recessional and lacustrine soils, where present. The sand and gravel soils encountered at depth in Borings B-4 and B-5 are more likely advance sand and gravel.

Groundwater Conditions

Evidence of perched groundwater seepage was observed in the borings completed in Lot C (Borings B-4, B-5 and B-8). The seepage was related to seasonal shallow perched water encountered above isolated areas of lacustrine sediments and the underlying glacial till. The finer or siltier lake sediment soils and the shallow groundwater was encountered intermittently across the site, but in general slopes or flows to the southwest, or it generally occurs at a lower depth in the southwest portion of the site, based on Boring B-5. As previously noted, this shallower aquifer is seasonal and intermittent across the overall site area.

Localized areas of seepage were encountered at varying depths in many of the borings completed across the Pacific Raceways property, generally perched above isolated silty lacustrine zones (where present) and the underlying glacial till, as well as within the lower portion of the sands and gravels in the underlying siltier and denser Advance outwash sand and gravel soils. Observation wells installed in the borings at the site have been monitored intermittently since their completion in 2006. Water levels in piezometers installed on the property were also monitored intermittently after completion.

Groundwater levels measured in the observations wells and piezometers over time indicates that the seasonal perched groundwater in the site area is intermittent, generally absent in late summer, and slow to recharge through the winter. The shallow seasonal perched groundwater elevations generally decreased to the southwest, as noted above. The shallow perched water zones are recharged by precipitation that infiltrates though the overlying granular soils. The groundwater in these areas is utilized by vegetation in the area. We expect that during above average wet seasons, a portion of this shallow water may flow towards the drainage areas located south and west of the Pacific Raceway property. A good visualization of this aquifer is a series of discontinuous lenses or islands of fine sand surrounded by sand and gravel, overlying a sheet of glacial till. The infiltrated precipitation perches temporarily on the shallow fine sand with silt lenses, slowly migrating over the edges or through the finer grained soils into the adjacent or underlying soils, ultimately perching on the underlying glacial till. The measured groundwater elevations in the observation wells on Lot C are included as **Figures 5a through 5c**.

There are no reported water wells removing water from the shallow seasonal perched aquifer system. This shallow aquifer is an unconfined system, and not likely suitable for use as potable water.

Localized areas of groundwater seepage and wetlands were observed in the lower elevations, near the toe the south and west slope areas, generally near the railroad tracks and Soos Creeks. We expect that these are surface expressions of the underlying advance aquifer. These areas are greater than 200 feet from the proposed subject development areas. As described above, this deeper aquifer occurs at depth below the lake and glacial till sediments, and is utilized as a water source in several of the residential water wells located north and east of the Pacific Raceway property. The deeper Vashon advance aquifer system is recharged by precipitation that falls over a large area, of which the Pacific Raceway site is a small portion. In the site area, this aquifer is overlain and protected by the lake and Vashon glacial till sediments.

Groundwater Recharge Area Criteria

Based on the King County Critical Area Maps for the site area, the subject site is situated within a groundwater recharge area, Category II, **Figure 6**. Copies of the Critical Area Designation documents are included in Appendix “D”.

Critical aquifer recharge areas, or CARAs, in King County are identified as areas that overlie significant groundwater resources and are particularly susceptible to groundwater contamination should pollutants be released on the surface or in the shallow subsurface. A Category II CARA has a medium susceptibility to groundwater contamination and is located in a sole source aquifer or a wellhead protection area or, is highly susceptible to groundwater contamination and not located in a sole source aquifer or wellhead protection area. Based on the results of our subsurface explorations, the subject site area does not meet the technical criteria of a Category II CARA. The shallow perched aquifer does not provide potable water through individual or community wells. The deeper aquifer that is utilized in the surrounding areas for water supply is overlain and protected by dense silty/clay soils (glacial till and lacustrine sediments) that act as an aquitard and confining layer, protecting the underlying aquifer from potential surface or shallow subsurface contamination.

Relative to the proposed commercial site development, no grading will occur into the shallow perched aquifer, thus no disturbance of the deeper aquifer will occur. There will be no disposal of radioactive waste material at the site. There will be no commercial wood treatment facilities located in the project area. All below ground storage tanks utilized for the project will meet the requirements of chapter 173-360 WAC and K.C.C. Title 17. The proposed storage tanks at the site will be utilized for storage of septic effluent until the septic systems can be completed, and for storage of waste fluids associated with the potential commercial businesses operating in the facility. These tanks would be pumped and the fluids removed from the site.

All stormwater infiltrated at the site will be through approved/permitted infiltration systems that will be designed and constructed in accordance with King County and Washington State regulations. Further, the Pacific Grand Prix track has operated for a number of years utilizing stormwater runoff collection and infiltration systems without any indication or report of changes in water quality or quantity.

Infiltration Tests

Falling head infiltration tests were previously performed in the drill casings at the expected depths of the infiltration system in the adjacent site area, Kart Track, Borings B-1, B-2 and B-3. The tests were performed in general accordance with the procedures prescribed in the King County Storm Water Design Manual. Specifically, the 6-inch drill casing was drilled/driven to the desired infiltration test depth and the casing cleaned using air pressure. The drill casing was then filled for the prescribed soaking period. In each case, the water infiltrated at a rate that eliminated the soaking period. Two saturation procedures were conducted (casing fully filled with water) prior to the actual tests being performed. On the third filling, the casing was filled with water to a height of 10 feet above the bottom of the casing. The drop in the water level inside the casing was recorded at 10 minute intervals. We repeated this procedure at each of the three test locations. We calculated the average rate of the two infiltration trials to obtain the final rate at each of the three locations. Infiltration test results are summarized below.

TABLE 2:
Infiltration Test Results for Site Soils – Adjacent Parcel

Boring Number	Location	Depth of Test (feet)	Soil Type	Average Infiltration Rate (inches/hour)
B-1	SW of Proposed New Drag Strip	25	Brown Sandy GRAVEL	288
B-2	West of Site – SW of Kart Track Property	28	Brown Gravelly SAND	260
B-3	North Center of Kart Track Property	20	Brown Sandy GRAVEL	346
Notes: Elevation datum: Elevation information based on King County GIS data.				

Subsequently, confirmatory PIT infiltration tests were completed in the adjacent Kart Track area to the west. The infiltration rates in the southeast portion of the Kart Track, the infiltration gallery area situated directly across the roadway, ranged from 205 to 495 inches per hour. Based on our site work, the soils in the proposed Lot C development area are similar to those previously evaluated in these areas. We expect that confirmatory testing will be completed in the proposed infiltration area once final grades are achieved. The infiltration bed system for Lot C will disperse the infiltrated water over a large area that will include a sand filter for additional water quality improvements. This will closely match the existing conditions at the site.

Stormwater Mounding Analysis

Site specific, historic and the proposed infiltration system design information was input into the MODRET groundwater modeling program for both a 24-hour peak rainfall event (100-year storm), a 30 day Peak Volume period and 30 day Peak Rate period (based on historic Puget Sound data, attached in Appendix "E"). The MODRET model storm volume input data and infiltration system parameters for the proposed infiltration system were provided by ESM Consulting Engineers, the project civil engineers. Soils data for the model is based on site specific soils data collected from the explorations at the site. Observation wells B-4, B-5 and B-8 were completed in the proposed development area and infiltration system area. Soil and water level data from these wells was utilized to establish the depth to groundwater and soil hydrologic parameters. The water level utilized for the model was based on the highest seasonal level recorded in the history/recent water level measurements from the three on-site observation wells. Void ratios for the native soils were estimated based on a standard void ratio tables (Todd, Aquifer Testing, 1980 and Meinzer, Hydrology, 1942) for correlated material using the sieve data, a value of 28 percent. The total available void space within the infiltration bed was assumed to be 28 percent, conservative value in our opinion. The vertical and horizontal infiltration rates were estimated based on standardized tables for hydrologic properties of soil types, relative to the sieve test data from the explorations.

The proposed infiltration system data was provided by ESM, as previously noted. The proposed system is based on a series of 4 feet by 4 feet trenches installed on 10 foot centers, a total

trench length of 13,500 feet. The system will likely be installed in the southeast corner of the interior space, thereby setback and down gradient from the septic drainfields. This should closely mimic the existing conditions. The proposed system layout and parameters are included as Figures 7a through 7e. Specific storm data utilized in the model is included in Appendix "E".

Based on the onsite sand & gravel soils with trace to minor silt, and the previous Falling Head and PIT infiltration testing results for the native recessional outwash soils in area, an infiltration rate of 260 to 346 inches per hour could be utilized for the site systems. However, because the area will effectively be a closed basin, and to improve water quality as well as disperse the infiltrated water over a larger area mimicking the existing conditions, we designed and analyzed the system using a significantly lower rate – 2 inches per hour. To achieve this lower rate, a sand filter layer is included at the trench bottoms.

The MODRET program applies a factor of safety of 2 as part of the standard analyses. The horizontal rate utilized was 2 times that of the vertical rate. This provides a very conservative analysis based on the soil conditions observed. The model predicts little to no mounding, with the exception of a 3 to 4 day extreme event that occurred near the end of the 30 day period. But even under this extreme condition, mounding was limited and did not reach the design maximum level. The MODRET analyses results are included as Appendix "E".

In general, the infiltration system performs as designed for the design level 100 year storm event (4.1 inches in 24 hours) for the site area. The record level rainfall data (maximum peak and volume rates), provides a very conservative analysis, and indicates the pond water level never reached the design elevation. Again, the 30-day analysis is based on very conservative extreme high groundwater levels and rainfall levels occurring at the same time.

Slope Stability Considerations

The proposed commercial development should not result in any adverse impacts to slope stability at the site or the adjacent areas. The Lot C development area and the new paddock building are greater than 200 feet from any steep slope or critical areas. The native slope areas should not be disturbed during the construction of the site improvements. Groundwater conditions should not change significantly because the collected stormwater runoff from the development areas will be dispersed over the large infiltration system located at the site, Lot C. The infiltration system for the new pit building will be a conventional trench system. These systems will closely match the existing conditions at the site.

ENGINEERING CONCLUSIONS AND RECOMMENDATIONS

Based on our site observations, previous explorations and infiltration tests, we conclude that the proposed site improvements will have no adverse impact on stormwater runoff, erosion, slope stability or groundwater recharge. Based on our evaluations of different portions of the site area, no measurable or significant adverse impacts to the off-site wetland or stream areas will occur. It is further our opinion that the infiltration of stormwater will be feasible in these areas, provided appropriate design and construction techniques are followed, and the systems maintained. The water quality and infiltration systems are proposed in portions of the site where the recessional sand and gravel occur. The shallow seasonal aquifer is generally perched on isolated areas of silty lacustrine sediments and intermittent glacial till. These perching layers slow the infiltrated water and provide treatment for water quality. Over time, the water from the shallow aquifer percolates downward and

recharges the underlying advance outwash sand and gravel, thereby maintaining the recharge to the underlying aquifers.

There are no reported water wells withdrawing water from the shallower perched aquifer(s) in this area. Wells located in the general area produce water from deeper confined aquifers, the advance outwash and deeper aquifers. The advance outwash aquifer is protected by a series of silty/clayey sediments including glacial till and lacustrine or lake deposits. These dense silty/clays soils act as an aquitard restrict infiltration from the shallow perched aquifer systems and surface water. Based on this, it is our opinion that the site is not adirect groundwater recharge area for potable water or water supply wells in the area. In addition, the proposed stormwater infiltration and septic systems will be constructed in accordance with regulatory approved plans that will require construction monitoring to verify compliance prior to final approval. Stormwater will be treated for water quality in accordance with the current regulatory guidelines. Waste fluids and materials generated in the commercial facilities will be stored in approved storage tanks that will be monitored and pumped on a regular basis. It should be noted that there have been no reported changes to the underlying aquifers following the installation of the Pacific Grand Prix Kart Track infiltration system.

The localized areas of groundwater seepage and wetlands observed in the toe or lower portions of the off-site west and south steep slope areas should not be impacted by the proposed development or infiltration of collected stormwater. These seepage and wetland areas are related to localized surface discharge of the deeper regional advanced aquifer system that underlies the site area at depth. The deeper aquifer system is recharged by precipitation that falls over the entire upland area, of which the Pacific Raceway site is a small portion. Because no significant changes in groundwater recharge to this aquifer system should occur from the proposed site development, no change in the aquifer system should be observed. The on-site engineered infiltration systems will disperse the collected stormwater runoff throughout the site in a series of individual systems. This will closely match the pre-existing conditions. As noted above, the Kart Track system has been functioning for a number of years with not reported issues.

The localized or intermittent shallow perched seasonal aquifer that was encountered in several of the borings on the Pacific Raceway property and has been monitored on an intermittent basis, will continue to be recharged around the track site. No evidence of seepage was observed in the cut slopes of the drainage swale or the Kart Track, located west of the Lot C. We expect that the shallow perched water is primarily being utilized through vegetative evapotranspiration. Potential excess water may ultimately appear as isolated seepage areas in the upper portions of the slopes area located several hundred feet south and west of the subject site. No significant change is expected in the overall recharge conditions at the site as the proposed infiltration systems will mimic the natural infiltration of the rainfall on the native surficial granular soils.

The soils at the elevation of the infiltration system consist of sand and/or gravel with variable silt, cobble, and boulder content. These soils have a high capacity for the infiltration and storage of water. To provide additional water quality treatment, the proposed system will include a sand filter bed. The underlying sand and gravel soils are also suitable for use as structural fill and will provide excellent support of the new structures, pavement and utilities when properly prepared.

The results of the mounding analyses indicates that the native sand and gravel soils have more than adequate capacity to store and infiltrate the collected stormwater at the developed site. The 30 day analysis using worse case stormwater volumes indicates that even with the proposed sand filter, the system will function adequately with water levels reaching design capacity only under the most extreme conditions.

There should be no adverse impacts to slope stability because of the proposed site development. The closest steep slope areas to the proposed site modifications are located greater than 200 feet from the development areas. The native steep slope areas and the adjacent upland areas will not be disturbed. Groundwater conditions will not change significantly with the infiltration of the collected stormwater runoff from the commercial development areas because of the large area of the infiltration systems located at the site. As previously noted, this will closely match the existing conditions.

The following geotechnical recommendations and design criteria are provided for planning purposes and to comply with King County requirements for projects such as this where grading is proposed.

Seismic Design

Characterization of soil profile type is required to determine the site class definition. Based on soil classification, soil conditions encountered, the local geology, Vs^{30} values, and SPT blow count correlations derived from explorations completed at the project site, it is our opinion that seismic Site Class D is appropriate for structural design per chapter 16 of the 2009 (SBC).

For design of seismic structures using the 2015 IBC, mapped short-period and 1-second period spectral accelerations, S_S and S_1, respectively, are required. S_S and S_1 are for a maximum considered earthquake, which corresponds to ground motions with a 2 percent probability of exceedance in 50 years or about a 2,500-year return period (with a deterministic maximum cap in some regions). The U.S. Geological Survey (USGS) completed probabilistic seismic hazard analyses (PSHA) for the entire country in November 1996, which were updated and republished in 2002 and 2008. The PSHA ground motion results can be obtained from the USGS website. The results of the updated USGS PSHA were referenced to determine S_S and S_1 for this site. The results are summarized below in Table 3 with the relevant parameters necessary for 2015 IBC design.

TABLE 3:
2015 IBC Parameters for Design of Seismic Structures

Spectral Response Acceleration (SRA) and Site Coefficients	Short Period	1 Second Period
Mapped SRA	S_s = 1.246	S_1 = 0.472
Site Coefficients (Site Class D)	F_a = 1.002	F_v = 1.528
Maximum Considered Earthquake SRA	S_{MS} = 1.248	S_{M1} = 0.721
Design SRA	S_{DS} = 0.832	S_{D1} = 0.481

Seismic - Liquefaction Hazards

Liquefaction is a phenomenon where there is a reduction or complete loss of soil strength due to an increase in pore water pressure. The increase in pore water pressure is induced by seismic vibrations. Liquefaction mainly affects geologically recent deposits of loose, fine-grained sands that are below the groundwater table. Based on the soil type and density of the soils observed to underlie the site area, it is our opinion that the risk for liquefaction to occur at this site

during an earthquake is low. Provided the design criteria listed below are followed, the proposed structure should have no greater seismic risk damage than other appropriately designed structures in the Puget Sound area.

Foundation Support

Based on the subsurface soil conditions encountered across the site, we recommend that spread footings for the proposed buildings be founded on the loose to medium dense native soils or on properly placed and compacted structural fill that extends to suitable native soils.

The soil at the base of the footing excavations should be disturbed as little as possible. All loose, soft or unsuitable material should be removed or recompacted per the **Structural Fill** section of this report. A representative from our firm should observe the foundation excavations to determine if suitable bearing surfaces have been prepared, particularly in the areas where the foundation will be situated on fill material.

We recommend a minimum width of 24 inches for isolated footings and at least 16 inches for continuous wall footings. All exterior footing elements should be embedded at least 18 inches below grade for frost protection. Footings founded on the native outwash soils or properly placed and compacted structural fill can be designed using an allowable soil bearing capacity of 2,500 psf (pounds per square foot) for combined dead and long-term live loads. The weight of the footing and any overlying backfill may be neglected. The allowable bearing value may be increased by one-third for transient loads such as those induced by seismic events or wind loads.

Lateral loads may be resisted by friction on the base of footings and floor slabs and as passive pressure on the sides of footings. We recommend that an allowable coefficient of friction of 0.30 be used to calculate friction between the concrete and the underlying soil. Passive pressure may be determined using an allowable equivalent fluid density of 300 pcf (pounds per cubic foot). Passive resistance from soil should be ignored in the upper 1 foot. A factor of safety of 1.5 has been applied to these values.

We estimate that settlements of footings designed and constructed as recommended will be less than ½-inch, for the anticipated load conditions, with differential settlements between comparably loaded footings of an inch or less. Most of the settlements should occur essentially as loads are being applied. However, disturbance of the foundation subgrade during construction could result in larger settlements than predicted.

Floor Slab Support

Slab-on-grade floors should be supported on the medium dense to dense native soils or on structural fill prepared as described above. The exposed subgrade should be compacted to 95 percent of the maximum density as determined by the Modified proctor, and then a uniform subbase of 1-foot of clean imported fill should be installed.

We recommend that garage slabs be underlain by a capillary break that consists of a minimum 4-inch thick layer of pea gravel or clean crushed rock with less than 3 percent fines. This layer should be placed and compacted to an unyielding condition.

A synthetic vapor barrier is recommended to control moisture migration through the slabs. This is of particular importance where the foundation elements are underlain by the native silty soils, or where moisture migration through the slab is an issue, such as where adhesives are used to anchor carpet or tile to the slab.

Subgrade/Basement Walls

No basements or retaining walls are proposed at this time. The following is provided in the event the project plans change. The lateral pressures acting on subgrade walls (such as basement walls) and retaining walls will depend upon the nature and density of the soil behind the wall. It is also dependent upon the presence or absence of hydrostatic pressure. If the walls are backfilled with granular well-drained soil, we recommend using an allowable equivalent fluid pressures of 35 pcf for the active condition and 55 pcf for the at rest condition. This design value assumes a level backslope and drained conditions as described below. A seismic surcharge of 10H should be applied where required by code.

Adequate drainage behind any retaining structure is imperative. Positive drainage which controls the development of hydrostatic pressure can be accomplished by placing a zone of coarse sand and gravel behind the walls. The granular drainage material should contain less than 5 percent fines. The drainage zone should extend horizontally at least 18 inches from the back of the wall. The drainage zone should also extend from the base of the wall to within 1 foot of the top of the wall. The drainage zone should be compacted to approximately 90 percent of the MDD. Over-compaction should be avoided as this can lead to excessive lateral pressures.

A perforated PVC pipe with a minimum diameter of 4 inches should be placed in the drainage zone along the base and behind the wall to provide an outlet for any accumulated water and direct accumulated water to an appropriate discharge location. We recommend that a nonwoven geotextile filter fabric be placed between the drainage material and the remaining wall backfill to reduce silt migration into the drainage zone. The infiltration of silt into the drainage zone can, with time, reduce the permeability of the granular material. The filter fabric should be placed such that it fully separates the drainage material and the backfill, and should be extended over the top of the drainage zone.

Lateral loads may be resisted by friction on the base of footings and as passive pressure on the sides of footings and the buried portion of the wall, as described in the "**Foundation Support**" section. We recommend that an allowable coefficient of friction of 0.30 be used to calculate friction between the concrete and the underlying soil. Passive pressure may be determined using an allowable equivalent fluid density of 300 pcf (pounds per cubic foot). Factors of safety have been applied to these values.

Cut and Fill Slopes

All job site safety issues and precautions are the responsibility of the contractor providing services/work. The following cut/fill slope guidelines are provided for planning purposes.

Temporary cut slopes will likely be necessary during grading operations. As a general guide, temporary slopes of 1H:1V or flatter may be used for temporary cuts in the upper 3 to 4 feet of the soils that are weathered to a loose/medium dense condition. Temporary slopes of 3/4 to 1 or flatter may be used in the unweathered dense to very dense sands and gravels, or till if encountered. Where ground water seepage is encountered, flatter temporary slopes may be required. These values should only be applied where WISHA confined space rules do not apply.

These guidelines assume that all surface loads are kept at a minimum distance of at least one half the depth of the cut away from the top of the slope and that significant seepage is not present on the slope face. Flatter cut slopes will be necessary where significant raveling or seepage occurs.

We recommend a maximum slope of 2H:1V for permanent cut and fill slopes. Where 2H:1V slopes are not feasible, alternative construction techniques or retaining structures should be considered. Fill placed on slopes that are steeper than 5 to 1 should be "keyed" into the undisturbed native soils by cutting a series of horizontal benches. The benches should be 1½ times the width of equipment used for grading and a maximum of 3 feet in height. Subsurface drainage may be required in seepage areas. Surface drainage should be directed away from all slope faces. Some minor raveling may occur with time. All slopes should be seeded as soon as practical to facilitate the development of a protective vegetative cover or otherwise protected.

Temporary Excavations

All job site safety issues and precautions are the responsibility of the contractor providing services/work. The following cut/fill slope guidelines are provided for planning purposes only. Temporary cut slopes will likely be necessary during grading operations or utility installation.

All excavations at the site associated with confined spaces, such as utility trenches and retaining walls, must be completed in accordance with local, state, or federal requirements. Based on current Washington Industrial Safety and Health Act (WISHA, WAC 296-155-66401) regulations, the weathered and undisturbed lacustrine deposits would be classified as Type C soils.

According to WISHA, temporary excavations within Type C soils should be sloped back at an inclination of 1.5H:1V or flatter from the toe to top of the slope. It should be recognized that slopes of this nature do ravel and require occasional maintenance. All exposed slope faces should be covered with a durable reinforced plastic membrane, jute matting, or other erosion control mats during construction to prevent slope raveling and rutting during periods of precipitation. These guidelines assume that all surface loads are kept at a minimum distance of at least one half the depth of the cut away from the top of the slope and that significant seepage is not present on the slope face. Flatter cut slopes will be necessary where significant raveling or seepage occurs, or if construction materials will be stockpiled along the top of the slope.

Given the setback from the top of the slopes (north end of Lot C), it should be feasible to slope the site soils back at the appropriate inclinations, if necessary. This information is provided solely for the benefit of the owner and other design consultants, and should not be construed to imply that GeoResources assumes responsibility for job site safety. It is understood that job site safety is the sole responsibility of the project contractor.

Pavement Subgrade

We recommend that pavement subgrades for the roadways, driveways, parking areas and track surfaces be prepared in accordance with the previously described site preparation and structural fill sections in this report. In general, a minimum of 2 feet of dense granular material should occur below all pavement areas. Where silty or wet material occurs in the roadway subgrade, over-excavation and replacement with suitable granular material may be required. In lieu of this, geotextile fabric may be utilized. The upper 2 feet of roadway subgrade should have a density of at least 95 percent of the MDD (ASTM D-1577).

Site Drainage

All ground surfaces, pavements and sidewalks should be sloped away from structures and areas where moisture is not desired. Surface water runoff should be controlled by a system of curbs,

berms, drainage swales, and or catch basins, and conveyed to the site's stormwater system and subsequently to an appropriate infiltration point.

Drains should be provided behind all retaining walls, if utilized. Pavement surfaces and open spaces should be sloped such that surface water runoff is collected and routed to suitable collection and/or infiltration points.

Groundwater at the site will be protected through the use of appropriate BMPs' and conventional stormwater and erosion control measures. All stormwater runoff collected will be treated in accordance with the current regulations prior to infiltration.

Stormwater Infiltration

Based on the soils encountered in our explorations and the results of our preliminary infiltration tests, an infiltration rate in excess of 40 inches per hour or 1.5 minutes per inch could be used for design purposes. However, to provide additional water quality treatment and disperse the water over a larger area, thus mimicking the existing conditions, a sand filter bed is proposed to reduce the infiltration rate. Based on the use of the sand filter bed, we recommend an infiltration rate of 2-inch per hour. **An appropriate factor of safety should be applied to this value.** Based on our experience, a factor of safety of 2 is typically applied, thus an infiltration rate of 1-inch per hour should be used as the preliminary design rate. No groundwater seepage was encountered in the explorations within the proposed grading depths of the development area or the bottom of the infiltration system.

As previously discussed, there are not reported water wells withdrawing water from the shallow seasonal perched aquifer in this or the surrounding area. All of the reported potable water wells produce water from deeper confined aquifers. The deeper aquifers are recharged by water that infiltrates over the entire basin area, of which the subject site is a small portion of. The existing Kart Track system has been infiltrating water for many years not with no reported adverse impacts.

EARTHWORK RECOMMENDATIONS

Site Preparation

All structural areas on the site to be graded should be stripped of vegetation, organic surface soils, and other deleterious materials including any existing structures, foundations or abandoned utility lines. We anticipate surficial topsoil stripping depths to be on the order of 4 to 18 inches. Any existing topsoil and old fill encountered below the proposed foundation elements should be removed.

Where placement of fill material is required, the stripped/exposed subgrade areas should be compacted to a firm and unyielding surface prior to placement of any fill. Excavations for debris and old fill removal should be backfilled with structural fill compacted to the densities described in the **"Structural Fill"** section of this report.

We recommend that a member of our staff verify exposed subgrade conditions after excavations are completed and prior to placement of structural fill or new foundations. The exposed subgrade soil should be proof-rolled and compacted to a firm and unyielding condition.

Any soft, loose or otherwise unsuitable areas delineated during proof-rolling or probing should be recompacted, if practical, or over-excavated and replaced with structural fill. The depth and extent of over-excavation should be evaluated by our field representative at the time of construction. The areas of fill should be evaluated during grading operations to determine if they need mitigation; re-compaction or removal.

Structural Fill

All material placed as fill associated with mass grading, as utility trench backfill, under building areas, or under roadways should be structural fill. The structural fill should be placed in horizontal lifts of appropriate thickness to allow adequate and uniform compaction of each lift. Fill should be compacted to at least 95 percent of MDD (maximum dry density as determined in accordance with ASTM D-1557).

The appropriate lift thickness will depend on the fill characteristics and compaction equipment used. We recommend that the appropriate lift thickness be evaluated by our field representative during construction. We recommend that our representative be present during site grading activities to observe the work and perform field density tests.

The suitability of material for use as structural fill will depend on the gradation and moisture content of the soil. As the amount of fines (material passing US No. 200 sieve) increases, soil becomes increasingly sensitive to small changes in moisture content and adequate compaction becomes more difficult to achieve. During wet weather, we recommend use of well-graded sand and gravel with less than 5 percent (by weight) passing the US No. 200 sieve based on that fraction passing the 3/4-inch sieve. If prolonged dry weather prevails during the earthwork and foundation installation phase of construction, higher fines content (up to 10 to 12 percent) will be acceptable.

Material placed for structural fill should be free of debris, organic matter, trash, and cobbles greater than 6-inches in diameter. The moisture content of the fill material should be adjusted as necessary for proper compaction.

Suitability of On-Site Materials as Fill

During dry weather construction, any non-organic on-site soil may be considered for use as structural fill provided it meets the criteria described above in the "**Structural Fill**" section and can be compacted as recommended. If the soil material is over-optimum in moisture content when excavated, it will be necessary to aerate or dry the soil prior to placement as structural fill. We generally did not observe the site soils to be excessively moist at the time of our subsurface exploration program.

Based on the previous explorations at the site, the soils at the site generally consists of sand and gravel with localized areas of silty sand/sandy silt. These soils are comparable to select sand and gravel material and are suitable for use as structural fill during virtually any weather condition. The isolated areas of silty soil material are moisture sensitive and require drier conditions. We do not recommend using the silty soils as structural fill during wet weather conditions.

We recommend that graded-areas that utilized the silty soil materials be restricted from traffic or protected prior to wet weather conditions upon completion. These graded areas may be protected by paving, placing asphalt-treated base, a layer of free-draining material such as the native on-site pit run sand and gravel or clean crushed rock material containing less than 5 percent fines, or some combination of the above.

During dry weather construction, any nonorganic on-site soil may be considered for use as structural fill, provided it meets the criteria described above in the structural fill section and can be compacted as recommended. If the material is over-optimum moisture content when excavated, it will be necessary to aerate or dry the soil prior to placement as structural fill. Many of the soils encountered in our test pits appeared above optimum moisture content.

The sand and gravel soils encountered at the track sites are comparable to select pit run material. These materials are suitable for use as structural fill during moderate wet weather conditions.

Structural fill materials should be placed as described in the structural fill section of this report and compacted to at least 95 percent of the MDD. During wet weather conditions, traffic should be confined to protected areas.

Erosion Control

Provided appropriate BMP's for both drainage control and temporary/permanent erosion control are followed, the potential for erosion should be minimal. Furthermore, to manage and reduce the potential for these natural processes, we recommend the following:

- No drainage of concentrated surface water or significant sheet flow onto or near any steep slope area. As noted previously, there are no steep slopes within 200 feet of the proposed development areas.
- Grading should be limited to providing surface grades that promote surface flows away from the top of slopes, native or constructed, to an appropriate discharge location beyond the toe of the slopes.
- Erosion protection measures should be in place prior to clearing or grading activity at the site. Erosion hazards can be mitigated by applying Best Management Practices (BMP's) outlined in the King County *Stormwater Management Manual*.
- Appropriate maintenance should be provided on an ongoing basis. Typically CESCL inspections will likely be required during construction.

Wet Weather and Wet Condition Considerations

In the Puget Sound area, wet weather generally begins about mid-October and continues through about May, although rainy periods could occur at any time of year. Therefore, it is strongly encouraged that earthwork be scheduled during the dry weather months of June through September. Most of the soil at the site contains sufficient fines to produce an unstable mixture when wet. Such soil is highly susceptible to changes in water content and tends to become unstable and impossible to proof-roll and compact if the moisture content exceeds the optimum.

In addition, during wet weather months, the groundwater levels could increase, resulting in seepage into site excavations. Performing earthwork during dry weather would reduce these problems and costs associated with rainwater, construction traffic, and handling of wet soil. However, should wet weather/wet condition earthwork be unavoidable, the following recommendations are provided:

- The ground surface in and surrounding the construction area should be sloped as much as possible to promote runoff of precipitation away from work areas and to prevent ponding of water.
- Work areas or slopes should be covered with plastic. The use of sloping, ditching, sumps, dewatering, and other measures should be employed as necessary to permit proper completion of the work.
- Earthwork should be accomplished in small sections to minimize exposure to wet conditions. That is, each section should be small enough so that the removal of unsuitable soils and

placement and compaction of clean structural fill could be accomplished on the same day. The size of construction equipment may have to be limited to prevent soil disturbance. It may be necessary to excavate soils with a backhoe, or equivalent, and locate them so that equipment does not pass over the excavated area. Thus, subgrade disturbance caused by equipment traffic would be minimized.

- Fill material should consist of clean, well-graded, sand and gravel, of which not more than 5 percent fines by dry weight passes the No. 200 mesh sieve, based on wet-sieving the fraction passing the ¾-inch mesh sieve. The gravel content should range from between 20 and 50 percent retained on a No. 4 mesh sieve. The fines should be non-plastic.
- No exposed soil should be left uncompacted and exposed to moisture. A smooth-drum vibratory roller, or equivalent, should roll the surface to seal out as much water as possible.
- In-place soil or fill soil that becomes wet and unstable and/or too wet to suitably compact should be removed and replaced with clean, granular soil (see gradation requirements above).
- Excavation and placement of structural fill material should be observed on a full-time basis by a geotechnical engineer (or representative) experienced in wet weather/wet condition earthwork to determine that all work is being accomplished in accordance with the project specifications and our recommendations.
- Grading and earthwork should not be accomplished during periods of heavy, continuous rainfall.

We recommend that the above requirements for wet weather/wet condition earthwork be incorporated into the contract specifications.

LIMITATIONS

We have prepared this report for use by Pacific Raceways and members of the design team, for use in the design of a portion of this project. The data used in preparing this report and this report should be provided to prospective contractors for their bidding or estimating purposes only. Our report, conclusions and interpretations are based on data from others and limited site reconnaissance, and should not be construed as a warranty of the subsurface conditions. Minor variations in subsurface conditions are possible between the explorations and may also occur with time. A contingency for unanticipated conditions should be included in the budget and schedule.

Sufficient monitoring, testing and consultation should be provided by our firm during construction to confirm to provide recommendations for design changes should site conditions or circumstances (weather) differ from those anticipated, and to evaluate whether earthwork and foundation installation activities comply with contract plans and specifications.

The scope of our services does not include services related to environmental remediation and construction safety precautions. Our recommendations are not intended to direct the contractor's methods, techniques, sequences or procedures, except as specifically described in our report for consideration in design.

If there are any changes in the loads, grades, locations, configurations or type of facilities to be constructed, the conclusions and recommendations presented in this report may not be fully applicable. If such changes are made, we should be given the opportunity to review our recommendations and provide written modifications or verifications, as appropriate.

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

◆ ◆ ◆

We appreciate the opportunity to be of continued service to you on this project. If you have any questions or comments, please do not hesitate to call at your earliest convenience.

Respectfully submitted,
GeoResources, LLC

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BPB:DCB/bpb
Doc ID: PacificRaceways.SiteDev.RG.rev03
Attachments:
Figure 1: Site Location Map
Figure 2a: Site Plan
Figure 2b: Site & Exploration Plan
Figure 3: NRCS Soils Map
Figure 4: Geologic Map
Figure 5a through 5c: Well Readings (4, 5 8)
Figure 6: King County Critical Aquifer Recharge Areas
Figure 7a through 7e: Site Development Plans
Appendix "A" – Subsurface Explorations – Full Site Area
Appendix "B" – Laboratory Test Results
Appendix "C" – Water Well Location Map & Logs
Appendix "D" – CAD (Critical Area Determination Documents)
Appendix "E" – Mounding Analysis Results

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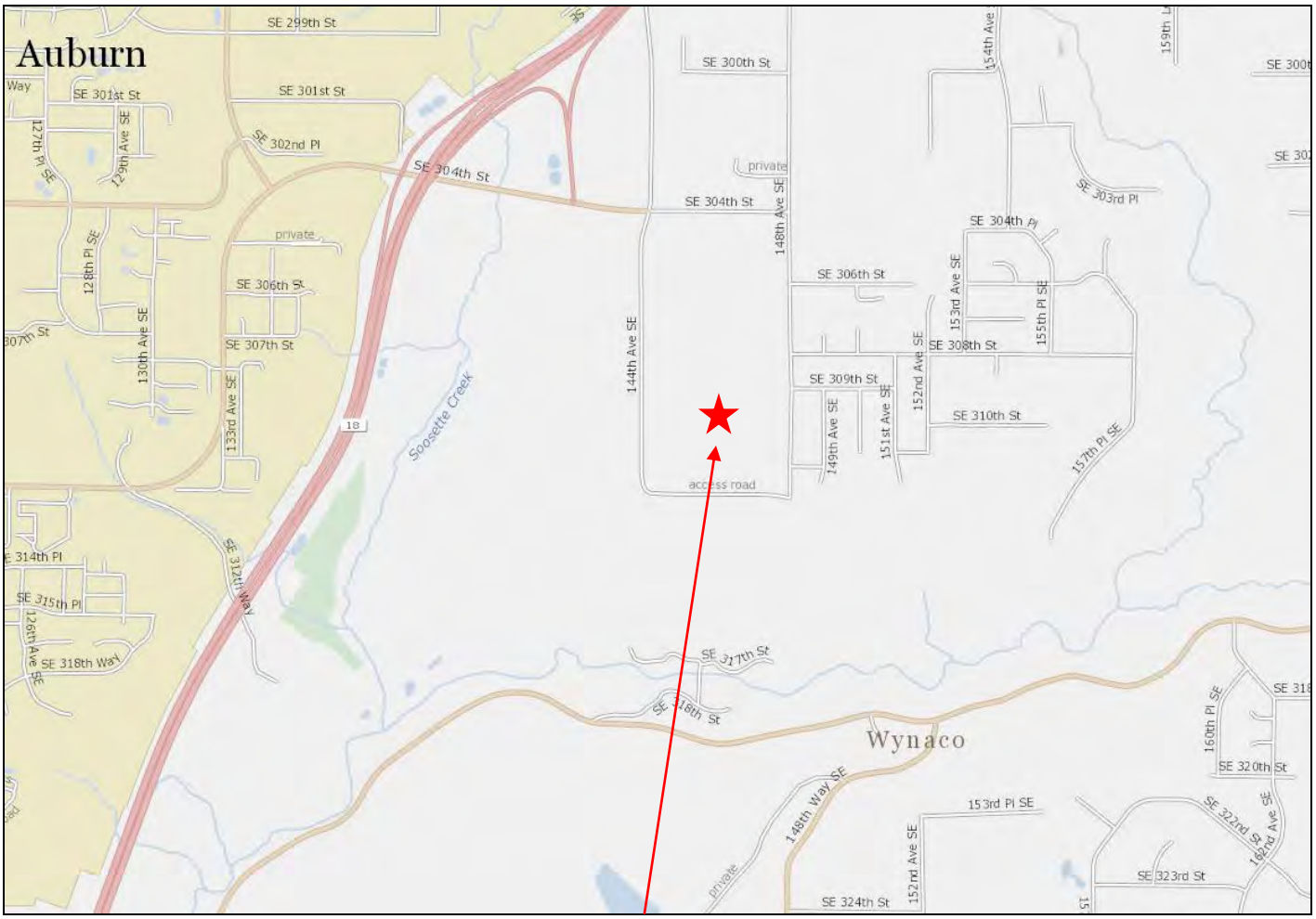

Approximate Site Location

(map created from King County iMap http://gismaps.kingcounty.gov/iMap/)

Not to Scale

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Site Location Map

Proposed Commercial Development

31001 – 144th Avenue SE

King County, Washington

Doc ID: PacificRaceways.SiteDevP1.F.rev02	September 2017	Figure 1

Site Plan prepared and provided by ESM Consulting Engineers, LLC
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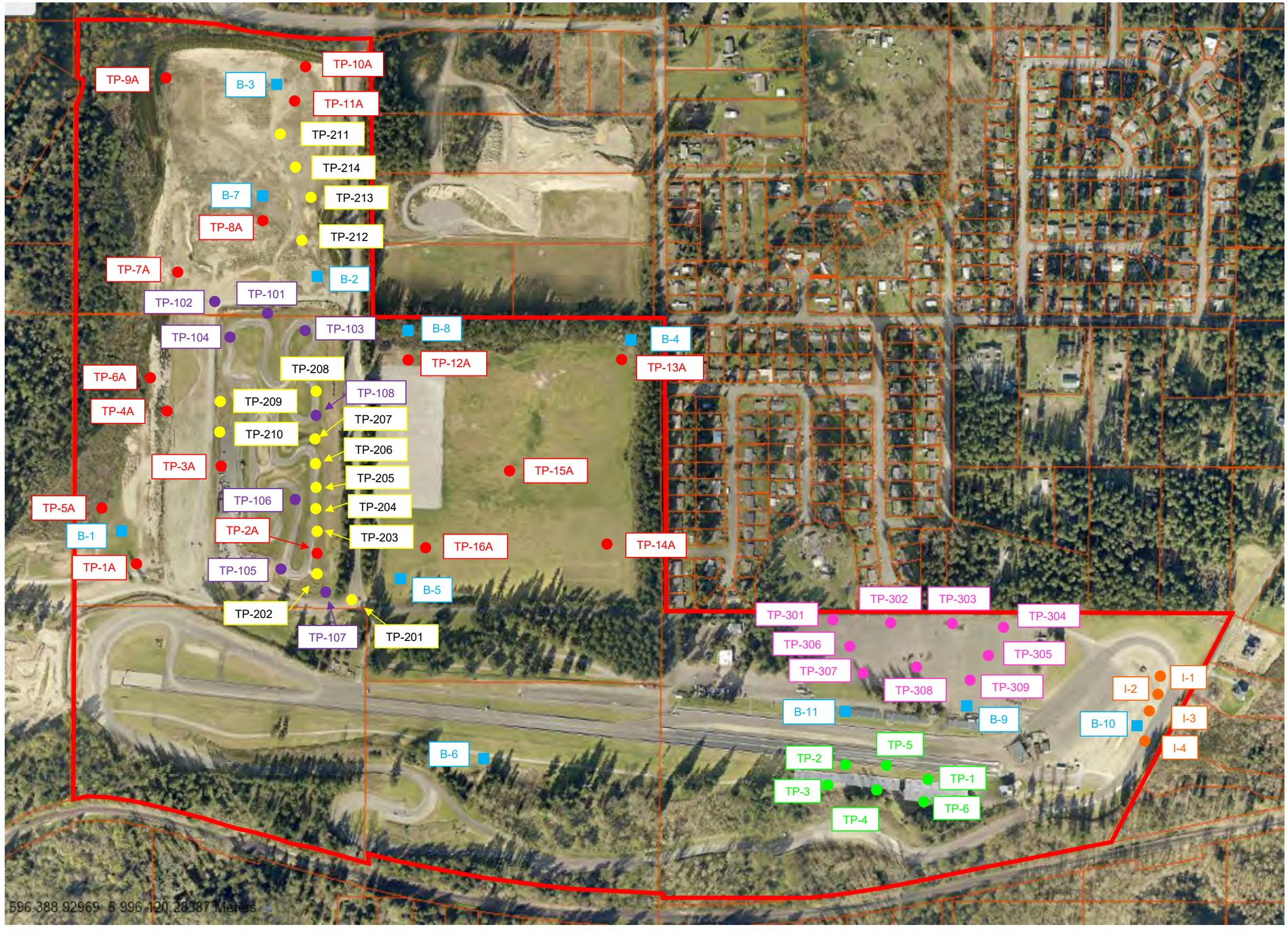
Site Plan
Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.SiteDevP1.SP	September 2017	Figure 2a



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TP-1A through 16A

TP-1 through 6

TP-102 through 108

TP-301 through 309

Borings

I-1 through I-4

TP-201 through 215

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Site and Exploration Plan

Proposed Commercial Development

31001 – 144th Avenue SE

King County, Washington

Doc ID: PacificRaceways.ExplorationMap(u)	September 2017	Figure 2b

Approximate Site Location

Map created from Web Soil Survey (http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx)

Soil Type	Soil Name	Parent Material	Slopes	Erosion Hazard	Hydrologic Soils Group
AkF	Alderwood and Kitsap soils	Lacustrine deposits with a minor amount of volcanic ash	25 to 70	Moderate to Severe	B
An	Arents, Everett material	Basal till	0 to 5	Slight	A
EvB	Everett very gravelly sandy loam	Sandy and gravelly glacial outwash	0 to 8	Slight	A

Not to Scale

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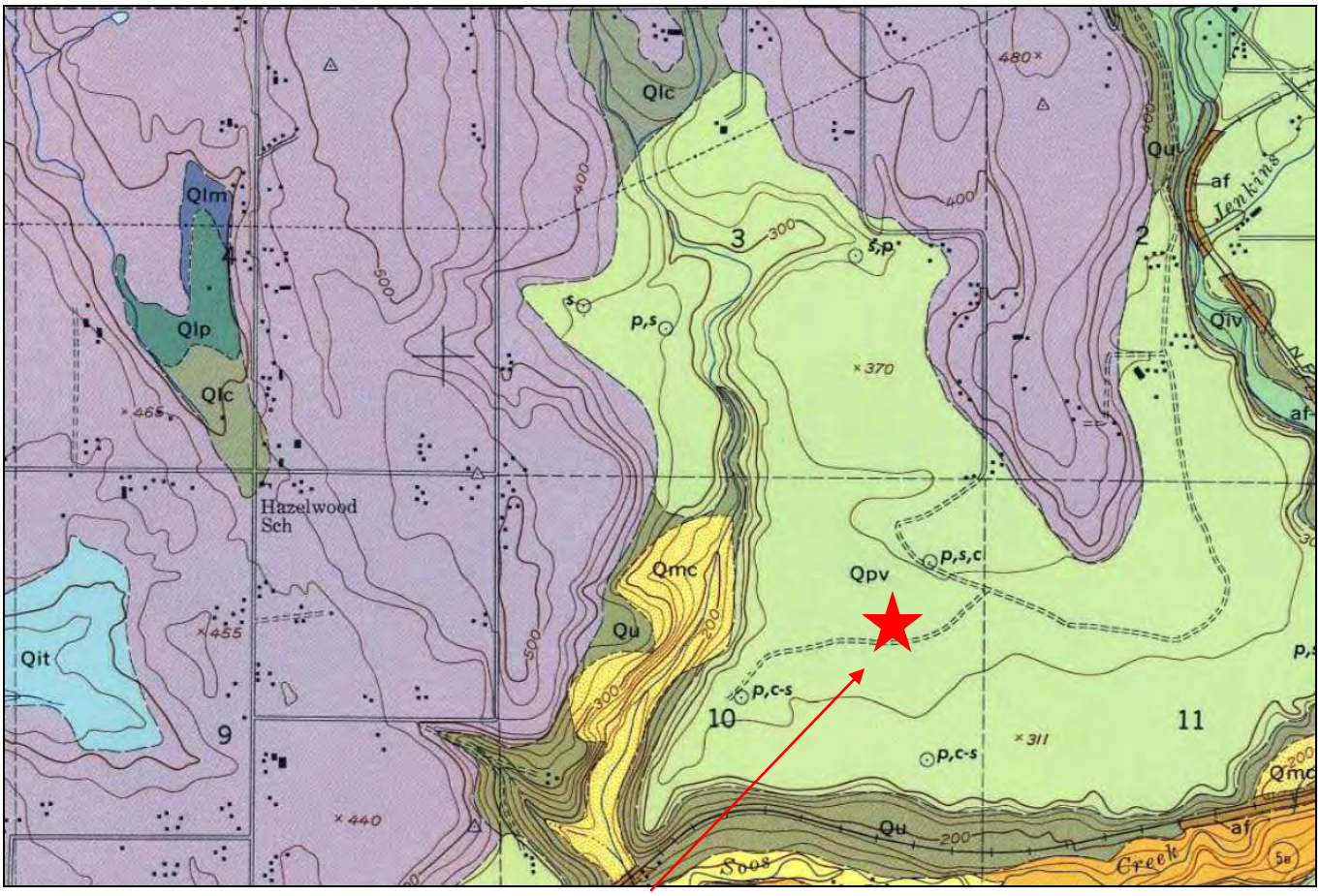
NRCS Soils Map

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.SiteDevP1.F.rev02	September 2017	Figure 3



Approximate Site Location

(An excerpt from the *Geologic Map of the Auburn 7.5-minute Quadrangle, King and Pierce Counties, Washington* by D.R. Mullineaux 1965)

Qmc	Mass wasting deposits – colluvium
Qpv	Proglacial stratified drift – valley train deposits
Qu	Undifferentiated deposits

Not to Scale

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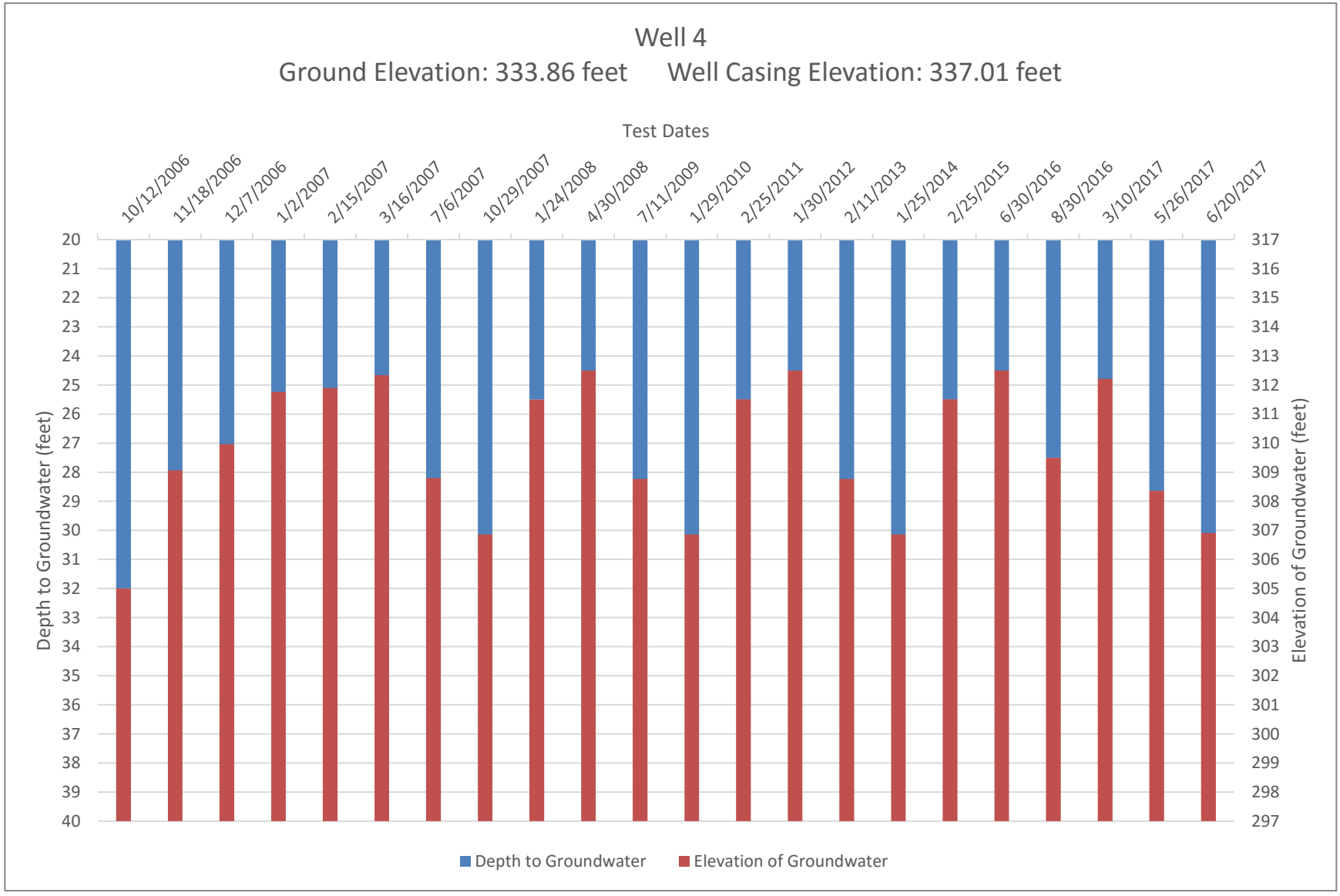
Geologic Map

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington



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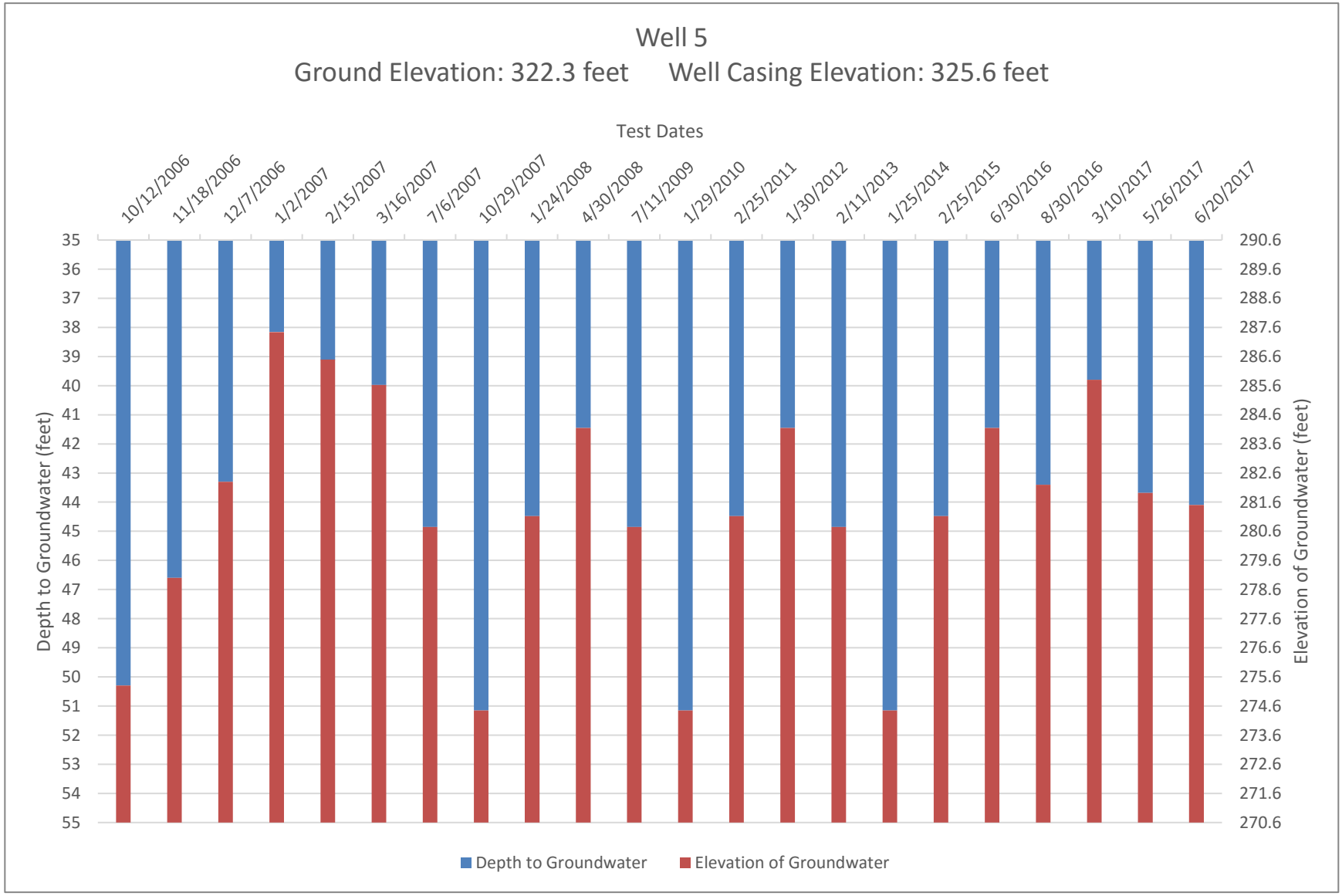
Well Monitoring

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.SiteDev.Graph	September 2017	Figure 5a



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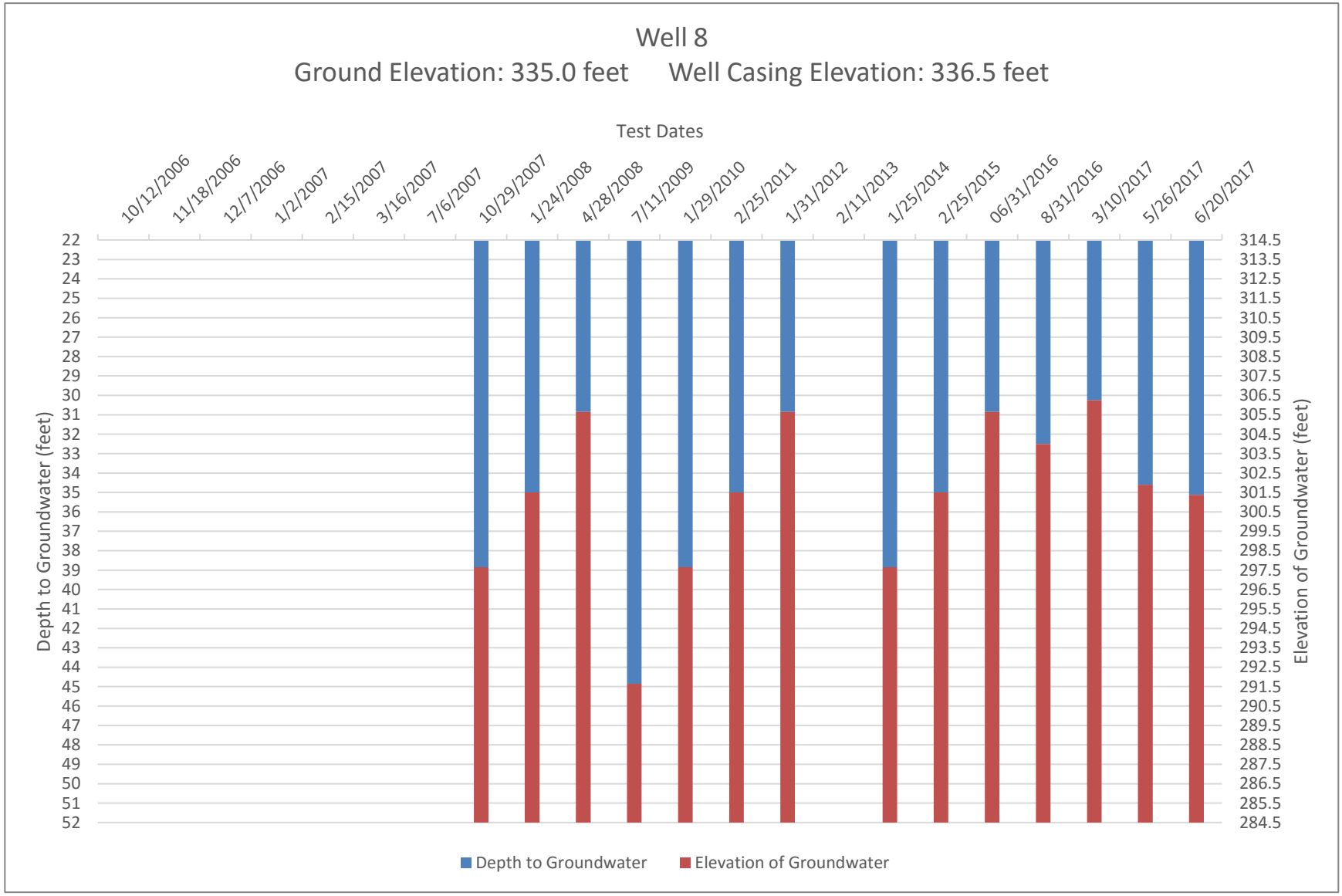
Well Monitoring

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.SiteDev.Graph	September 2017	Figure 5b



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Well Monitoring

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.SiteDev.Graph	September 2017	Figure 5c

Approximate Site Location

(map created from King County iMap http://gismaps.kingcounty.gov/iMap/)

	Critical Aquifer Recharge Area

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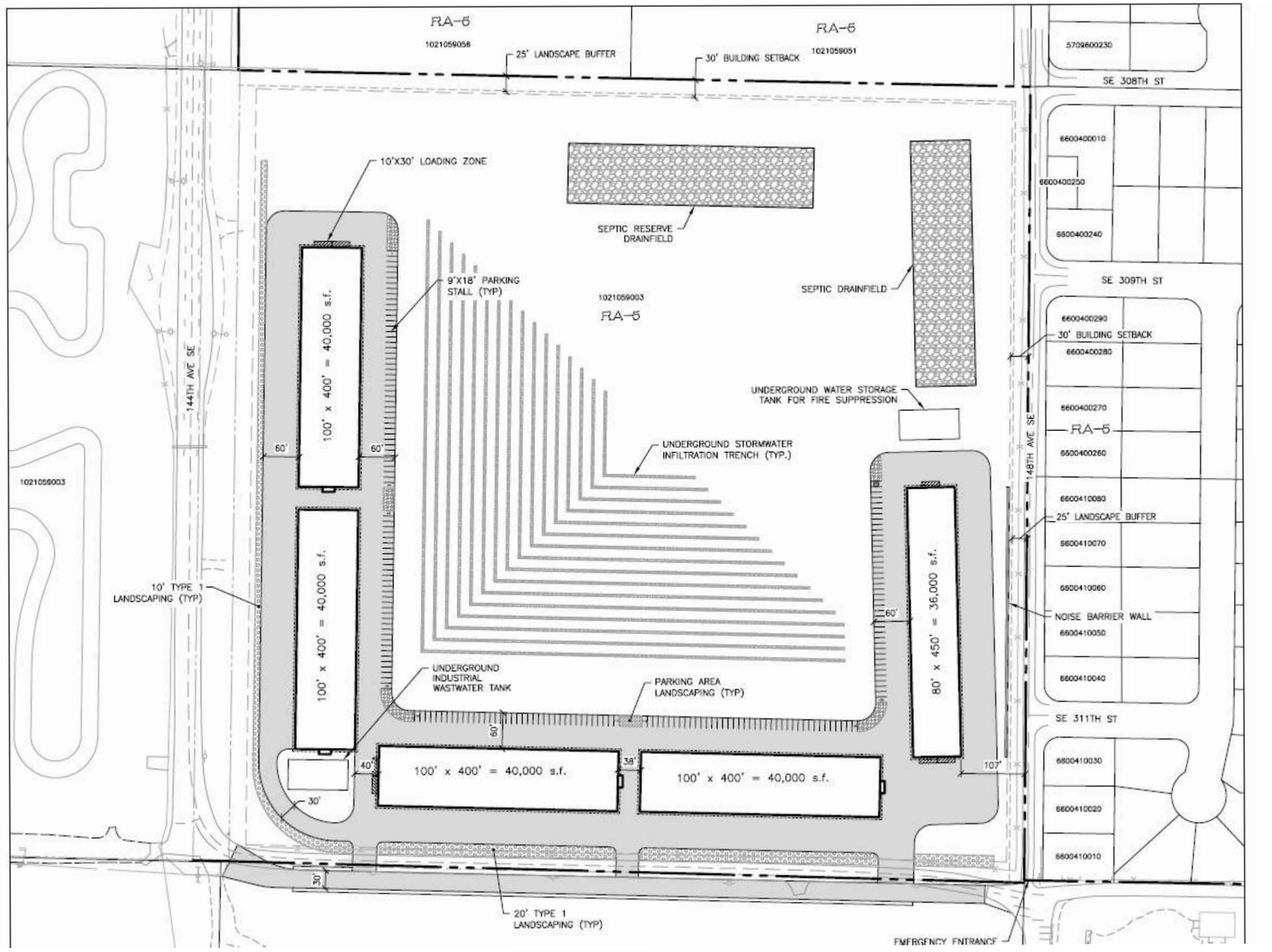
King County Critical Aquifer Recharge Areas

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.SiteDevP1.F.rev02	September 2017	Figure 6



Site Plan prepared and provided by ESM Consulting Engineers, LLC
Not to Scale
N

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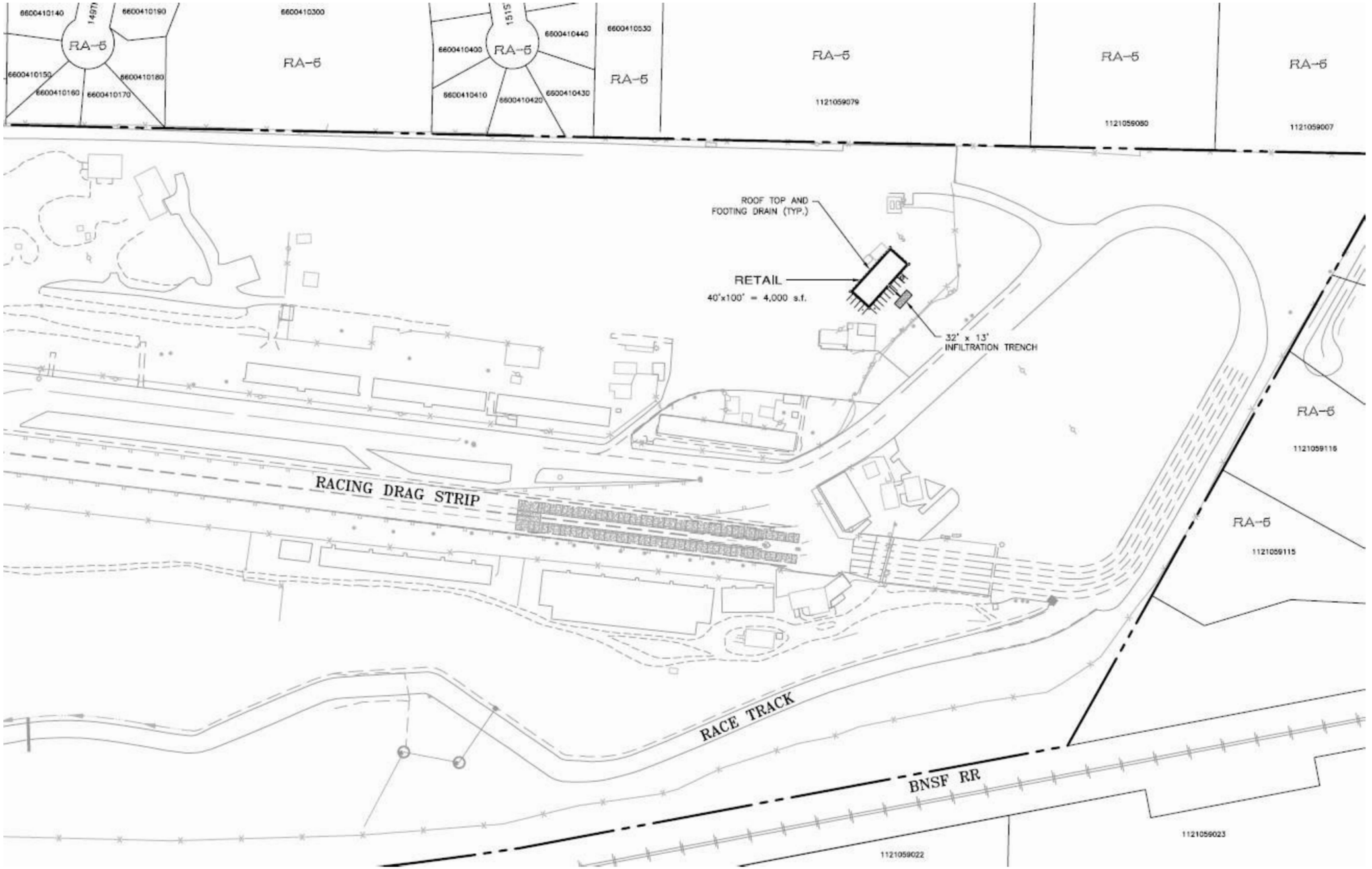
Preliminary Site Plan
Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.SiteDevP1.SP	September 2017	Figure 7a



Site Plan prepared and provided by ESM Consulting Engineers, LLC
Not to Scale
N ↑

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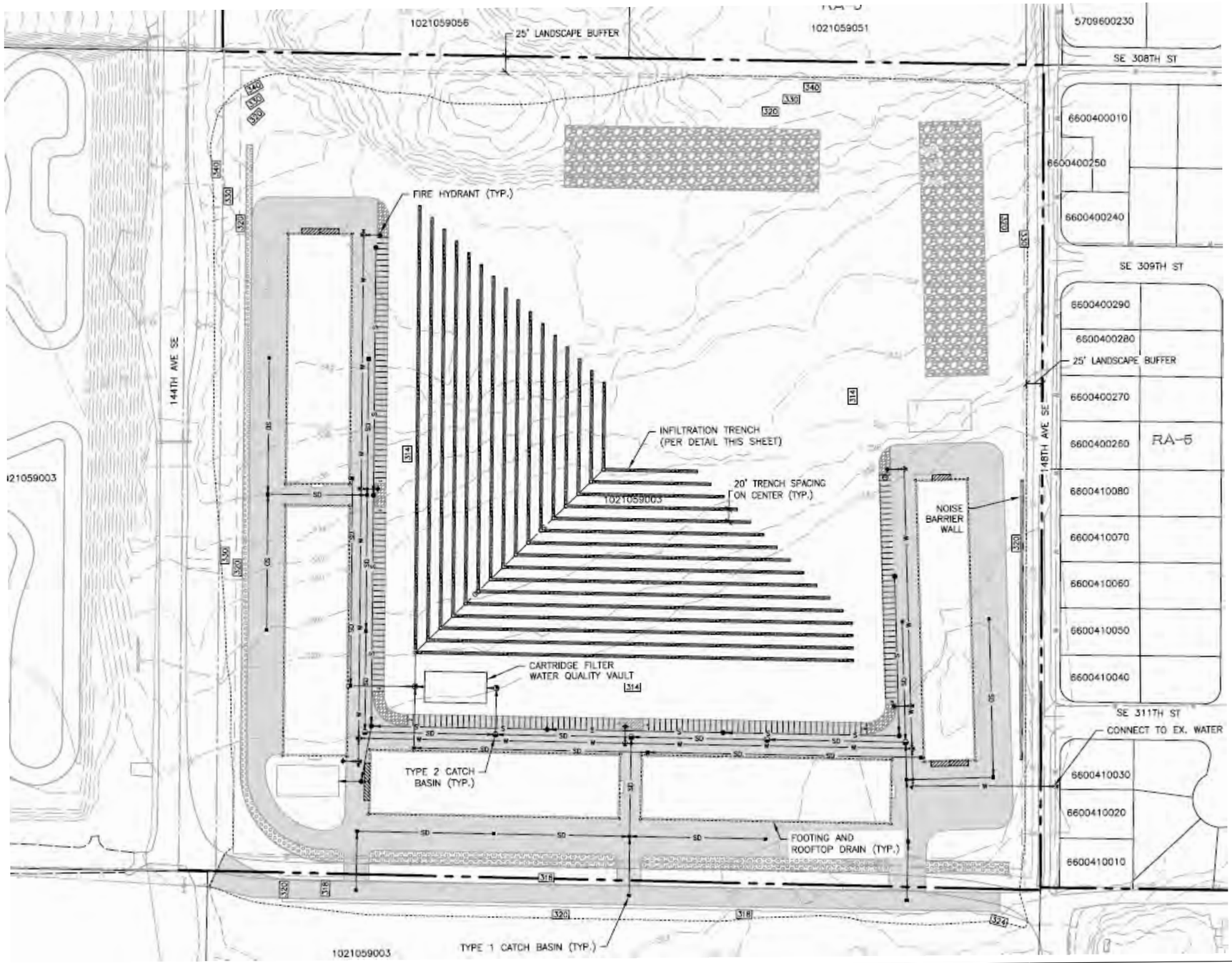
Preliminary Site Plan
Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.SiteDevP1.SP	September 2017	Figure 7b



Site Plan prepared and provided by ESM Consulting Engineers, LLC
Not to Scale
N

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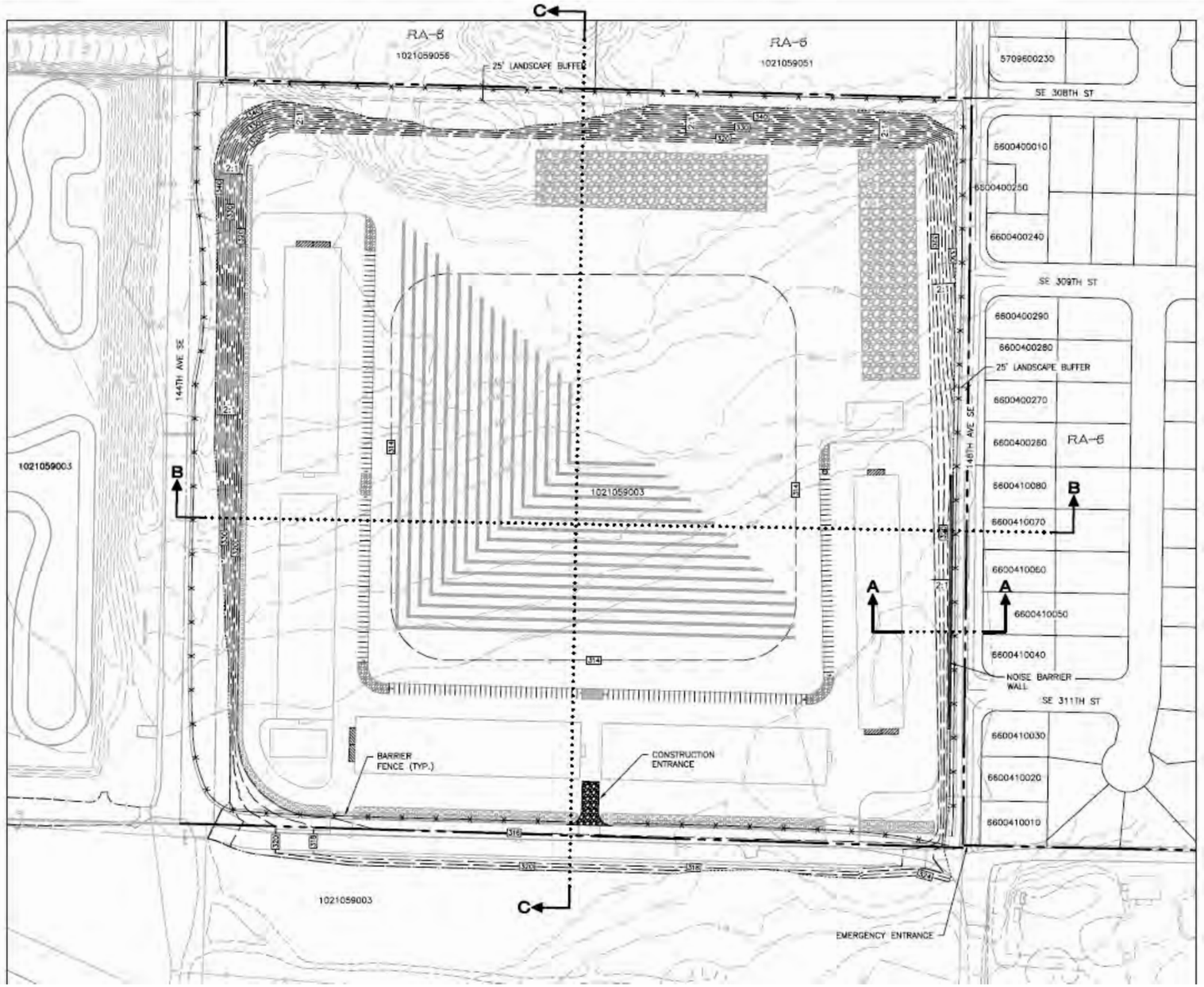
Preliminary Utility Plan
Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.SiteDevP1.SP	September 2017	Figure 7c



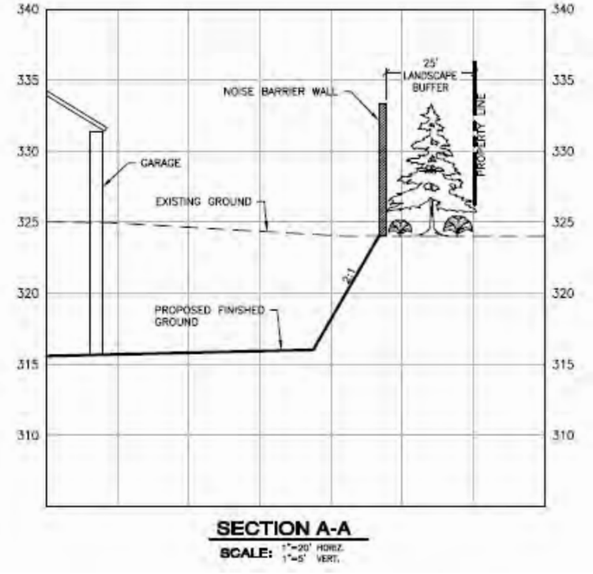
SCALE: 1" = 100'

100 50 0 100 200

CONTOUR INTERVAL = 2'

APPROXIMATE EARTHWORK QUANTITIES	
CUT	= 1,000,000 cu yds.
FILL	= 0 cu yds.
TOTAL	= 1,000,000 net cu yds. CUT

EARTHWORK QUANTITIES ARE FOR PERMIT PURPOSES ONLY. QUANTITIES ARE "NEAT LINE" ONLY. THE QUANTITIES DO NOT ACCOUNT FOR ANY SHRINK OR SWELL FACTORS. IT IS THE CONTRACTORS RESPONSIBILITY TO CALCULATE THE EARTHWORK VOLUMES FOR BID PURPOSES.



SECTION A-A

SCALE: 1"=20' HORIZ. 1"=5' VERT.

Site Plan prepared and provided by ESM Consulting Engineers, LLC
Not to Scale
N ↑

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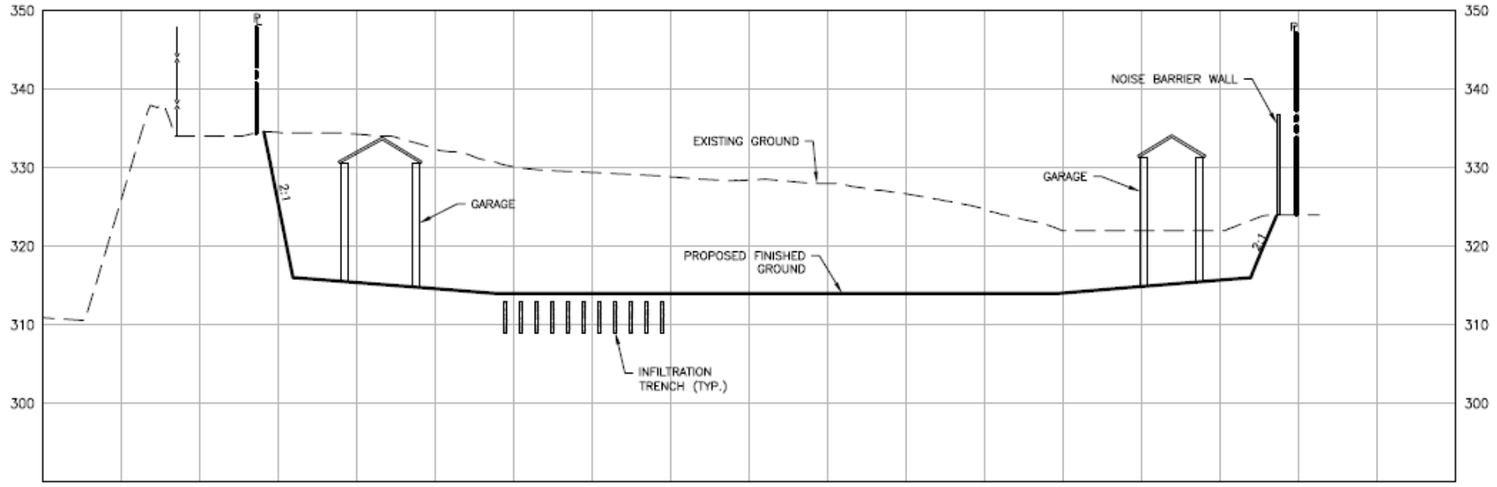
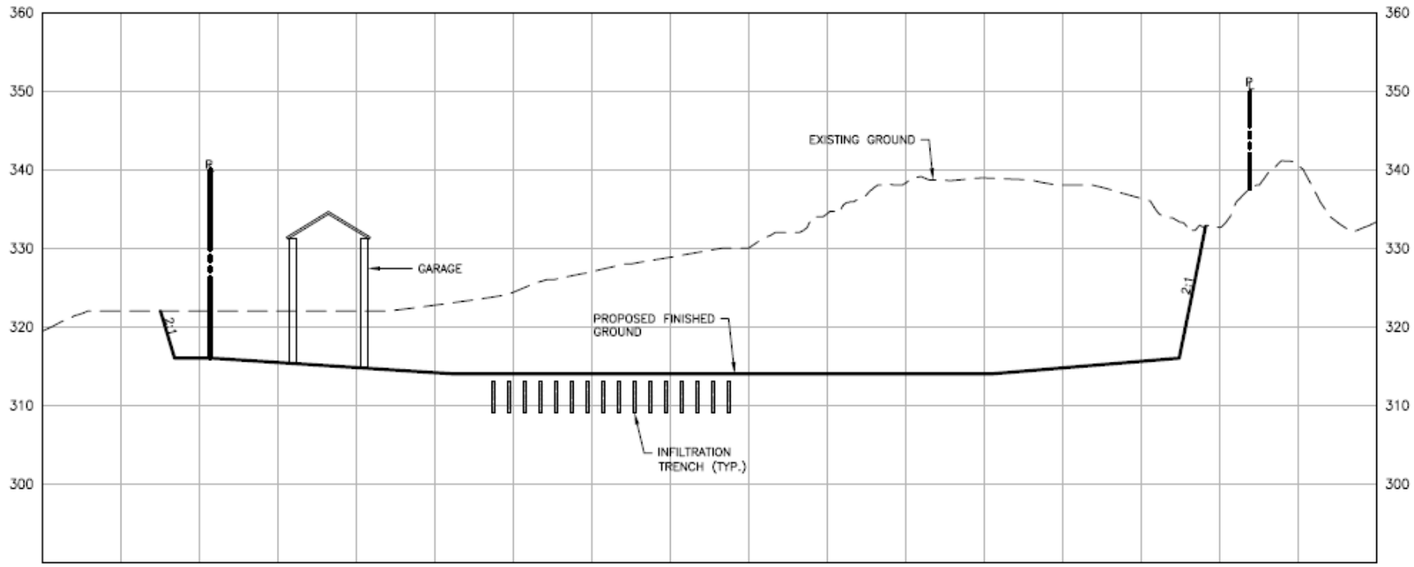
Preliminary Grading/TESC Plan
Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.SiteDevP1.SP	September 2017	Figure 7d



SECTION B-B

SCALE: 1"=100' HORIZ. 1"=10' VERT.



SECTION C-C

SCALE: 1"=100' HORIZ. 1"=10' VERT.

Site Plan prepared and provided by ESM Consulting Engineers, LLC
Not to Scale

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Cross Sections
Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.SiteDevP1.SP	September 2017	Figure 7e

Appendix “A”

Subsurface Explorations – Full Site Area

SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE GRAINED SOILS More than 50% Retained on No. 200 Sieve	GRAVEL More than 50% Of Coarse Fraction Retained on No. 4 Sieve	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND More than 50% Of Coarse Fraction Passes No. 4 Sieve	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE GRAINED SOILS More than 50% Passes No. 200 Sieve	SILT AND CLAY Liquid Limit Less than 50	INORGANIC	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILT AND CLAY Liquid Limit 50 or more	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC CLAY, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT

NOTES:

1. Field classification is based on visual examination of soil in general accordance with ASTM D2488-90.
2. Soil classification using laboratory tests is based on ASTM D2487-90.
3. Description of soil density or consistency are based on interpretation of blow count data, visual appearance of soils, and or test data.

SOIL MOISTURE MODIFIERS:

Dry- Absence of moisture, dry to the touch

Moist- Damp, but no visible water

Wet- Visible free water or saturated, usually soil is obtained from below water table

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Unified Soils Classification System

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Test Pit TP-1

Location: East portion of pond area, IT-1
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0.0 - 2.0	SP	Brn gravelly SAND (dense, moist) (fill)
2.0 - 3.5	SP	Brn med SAND w/ gravel, occ organics (med dense, moist) (old top soil)
3.5 - 4.5	SP	Brn gravelly SAND w/ cobbles, occ boulders (dense, moist)

No caving observed.
No groundwater seepage observed.

Test Pit TP-2

Location: Center of pond area, IT-2
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0.0 - 2.0	SP	Brn gravelly SAND (dense, moist) (fill)
2.0 - 3.5	SP	Brn med SAND w/ gravel, occ organics (med dense, moist) (old top soil)
3.5 - 5.0	SP	Brn gravelly SAND w/ cobbles, occ boulders (dense, moist)

No caving observed.
No groundwater seepage observed.

Test Pit GR TP-3

Location: Center of pond area, IT-3
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0.0 - 2.0	SP	Brn gravelly SAND (dense, moist) (fill)
2.0 - 3.5	SP	Brn med SAND w/ gravel, occ organics (med dense, moist) (old top soil)
3.5 - 4.5	SP	Brn gravelly SAND w/ cobbles, occ boulders (dense, moist)

No caving observed.
No groundwater seepage observed.

Test Pit GR TP-4

Location: Center of pond area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0.0 - 2.0	SP	Brn gravelly SAND (dense, moist) (fill)
2.0 - 3.5	SP	Brn med SAND w/ gravel, occ organics (med dense, moist) (old top soil)
3.5 - 10.5	SP	Brn gravelly SAND w/ cobbles, occ boulders (dense, moist)

No caving observed.
No groundwater seepage observed.

Logged by: DCB **Excavated on: February 20, 2006**

Test Pit TP-5

Location: West portion of pond area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0.0 - 2.0	SP	Brn gravelly SAND (dense, moist) (fill)
2.0 - 2.5	SP	Brn med SAND w/ gravel, cobbles, occ organics (med dense, moist) (old top soil)
2.5 - 10.0	SP	Brn gravelly SAND w/ cobbles (dense, moist)

No caving observed.
No groundwater seepage observed.

Test Pit TP-6

Location: East portion of pond area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0.0 - 2.0	SP	Brn gravelly SAND (dense, moist) (fill)
2.0 - 3.5	SP	Brn med SAND w/ gravel, occ organics (med dense, moist) (old top soil)
3.5 - 10.5	SP	Brn gravelly SAND w/ cobbles, occ boulders (dense, moist)

No caving observed.
Slow to moderate seep zone at 4 to 4.5 feet.

Logged by: DCB **Excavated on: February 20, 2016**

Test Pit TP-1A

Location: SW portion of clearing, N of Motorcross
Approximate Elevation: 328 feet

Depth (feet)	Soil Type	Soil Description
0.0 - 0.3	-	Topsoil/ Duff
0.3 - 3.0	SP	Lt Brn SAND gravel, cobbs and occ silt (loose, moist)
3.0 - 10.0	SP	Gry gravelly SAND w/ cobbs, occ boulders and trace silt (med dense, moist)
10.0 - 26.0	GP	Gry coarse sandy GRAVEL w/ cobbs and trace boulders (med dense, moist)

Moderate caving observed from 3 to 12 feet.
No groundwater seepage observed.

Test Pit TP-2A

Location: SE portion of large cut, near entrance road
Approximate Elevation: 320 feet

Depth (feet)	Soil Type	Soil Description
0.0 - 15.0	GP	Brn sandy GRAVEL w/ occ cobbs (loose, moist)

Terminated due to severe caving
Severe caving observed from 3 to 12 feet.
No groundwater seepage observed.

Test Pit TP-3A

Location: NW portion of existing cut, near machinery
Approximate Elevation: 320 feet

Depth (feet)	Soil Type	Soil Description
0.0 - 10.0	GP	Brn sandy GRAVEL w/ cobbs and occ boulders (loose, moist)

Terminated due to boulder covering entire test pit
Moderate caving observed from 3 to 12 feet.
No groundwater seepage observed.

Test Pit TP-4A

Location: West center of the north parcel
Approximate Elevation: 331 feet

Depth (feet)	Soil Type	Soil Description
0.0 - 1.5	SP	Lt Brn gravelly SAND w/ minor silt (loose to med dense, moist)
1.5 - 11.0	SP	Gry gravelly SAND w/ occ cobbs (med dense, moist)
11.0 - 20.0	SP	Gry gravelly SAND w/ minor cobbs (med dense, moist)
20.0 - 25.0	GP	Gry sandy GRAVEL w/ occ cobbs

Minor caving observed from 6 to 12 feet.
No groundwater seepage observed.

Logged by: DCB **Excavated on: September 14, 2006**

Test Pit TP-5A

Location: SW portion of site, logged but not cleared
Approximate Elevation: 328 feet

Depth (feet)	Soil Type	Soil Description
0.0 - 1.0	-	Topsoil/ Duff
1.0 - 4.0	GP	Tan GRAVEL w/ sand and trace silt (loose, dry to moist)
4.0 - 8.0	GP	Gry sandy GRAVEL w/ occ cobbs (med dense, dry to moist)
8.0 - 25.0	GP	Gry sandy GRAVEL w/ occ cobbs and minor silt (dense, moist)

Minor caving observed from 4 to 8 feet.
No groundwater seepage observed.

Test Pit TP-6A

Location: W portion of the site, near the top of slope to the west
Approximate Elevation: 332 feet

Depth (feet)	Soil Type	Soil Description
0.0 - 1.0	-	Topsoil/Duff
1.0 - 3.5	SP	Gry SAND w/ occ gravel (loose, dry to moist)
3.5 - 8.0	SP	Tan gravelly SAND w/ trace cobbs (loose to med dense, dry to moist)
8.0 - 12.0	GP	Gry sandy GRAVEL w/ cobbs and trace silt (dense, moist)
12.0 - 25.0	GP	Gry sandy GRAVEL w/ cobbs, occ boulders and minor silt (dense, moist)

Minor caving observed 3.5 to 8 feet.
No groundwater seepage observed.

Test Pit TP-7A

Location: N portion of site, near tire pile
Approximate Elevation: 325 feet

Depth (feet)	Soil Type	Soil Description
0.0 - 1.5	-	Gravelly Fill (dense, dry)
1.5 - 10.0	GP	Tan GRAVEL w/ sand, cobbs trace silt and boulders (loose to med dense, moist)
10.0 - 17.0	GP	Gry GRAVEL w/ sand, cobbs and occ silt (med dense, moist)
17.0 - 13.0	GP	Brn GRAVEL w/ occ silt, sand and cobbs (dense, moist) (damp @ 21')

Moderate caving observed from 3 to 12 feet.
No groundwater seepage observed.

Logged by: DCB **Excavated on: September 14, 2006**

Test Pit TP-8A

Location: N portion of the site, near the top of the slope to the north
Approximate Elevation: 340 feet

Depth (feet)	Soil Type	Soil Description
0.0 - 1.0	-	Topsoil/ Duff
1.0 - 12.0	SP	Tan gravelly SAND w/ cobbs (med dense, moist)
12.0 - 18.0	SP	Gry SAND w/ occ gravel and cobbs (med dense, moist)
18.0 - 22.0	SP	Gry gravelly SAND w/ occ cobbs (med dense to dense, moist)
22.0 - 25.0	GM	Tan silty GRAVEL w/ sand and cobbs (dense, moist to damp) (fe staining)

Minor caving observed from 4 to 15 feet.
No groundwater seepage observed.
Rootlets to 18 feet

Test Pit TP-9A

Location: NW corner of the site
Approximate Elevation: 310 feet

Depth (feet)	Soil Type	Soil Description
0.0 - 1.5	-	Topsoil/Duff
1.5 - 6.0	SM	Tan silty fine SAND w/ occ gravel (loose, dry to moist)
6.0 - 8.0	SP	Gry SAND w/ silt, gravel and cobbs (dense to v dense, moist) (tallish)
8.0 - 22.0	GP	Brn sandy GRAVEL w/ occ silt (dense, moist) (heavy fe staining)
22.0 - 25.0	GP	Brn sandy GRAVEL w/ occ silt (dense, damp)

No caving observed.
No groundwater seepage observed.

Test Pit TP-10A

Location: NE corner of the site
Approximate Elevation: 320 feet

Depth (feet)	Soil Type	Soil Description
0.0 - 0.7	-	Topsoil/Duff
0.7 - 7.5	SP	Tan fine SAND w/ silt (loose, dry to moist)
7.5 - 10.5	SP	Gry SAND w/ gravel and minor cobbs (med dense, moist)
10.5 - 25.0	GP	Gry sandy GRAVEL w/ cobbs (med dense, moist)

Severe caving observed from 8 to 20 feet.
No groundwater seepage observed.

Logged by: DCB **Excavated on: September 14, 2006**

Test Pit TP-11A

Location: N center of the site, toe of slope
Approximate Elevation: 322 feet

Depth (feet)	Soil Type	Soil Description
0.0 - 1.0	-	Topsoil/ Duff
1.0 - 9.0	GP	Gry/brn GRAVEL w/ occ sand and cobbs (loose, moist)
9.0 - 15.0	GP	Red/brn GRAVEL w/ sand and minor cobbs (med dense, moist) (fe staining)
15.0 - 23.0	SP	Gry SAND w/ occ gravel (med dense to dense, moist)

Severe caving observed from 8 to 15 feet.
No groundwater seepage observed.

Test Pit TP-12A

Location: NW corner of the parking area
Approximate Elevation: 335 feet

Depth (feet)	Soil Type	Soil Description
0.0 - 0.3	-	Topsoil/Duff
0.3 - 2.0	SM	Tan silty SAND w/ occ gravel (dense, dry to moist) (fill)
2.0 - 7.5	GP	Gry sandy GRAVEL w/ cobbs (loose, moist)
7.5 - 15.0	GP	Gry sandy GRAVEL w/ cobbs (med dense, moist)
15.0 - 24.0	GP	Gry sandy GRAVEL w/ cobbs, occ silt and trace boulders (dense, moist to damp)

Severe caving observed from 2 to 10 feet.
No groundwater seepage observed.

Test Pit TP-13A

Location: NE corner of the parking area
Approximate Elevation: 330 feet

Depth (feet)	Soil Type	Soil Description
0 - 0.3	-	Topsoil/ Duff
0.3 - 2.0	SM	Tan silty SAND w/ occ gravel (dense, dry to moist) (fill)
2.0 - 8.0	GP	Gry sandy GRAVEL w/ cobbs and occ boulders (loose, moist)
8.0 - 15.0	GP	Gry sandy GRAVEL w/ cobbs (med dense, moist)
15.0 - 23.0	GP	Gry sandy GRAVEL w/ cobbs, occ silt and trace boulders (dense, moist to damp)

Moderate caving observed from 2 to 23 feet.
No groundwater seepage observed.
Possible silt lense at 23.0 feet, caving too severe to continue

Logged by: DCB **Excavated on: September 14, 2006**

Test Pit TP-14A

Location: NE corner of the parking area
Approximate Elevation: 328 feet

Depth (feet)	Soil Type	Soil Description
0 - 1.0	-	Topsoil/ Duff
1.0 - 4.0	GP	Tan sandy GRAVEL w/ cobbs (loose, dry to moist)
4.0 - 7.0	GP	Gry sandy GRAVEL w/ cobbs (med dense, moist)
7.0 - 15.0	SP	Gry SAND w/ occ gravel (med dense, moist)
15.0 - 17.0	ML	Gry sandy SILT w/ gravel (stiff, moist to damp) (fe staining)
17.0 - 25.0	SP	Gry/brn gravelly SAND w/ minor silt and cobbs (dense, moist)

Moderate caving observed from 2 to 15 feet.
No groundwater seepage observed.

Test Pit TP-15A

Location: Center of parking area
Approximate Elevation: 330 feet

Depth (feet)	Soil Type	Soil Description
0 - 0.3	-	Topsoil/ Duff
0.3 - 2.0	SM	Tan silty SAND w/ occ gravel (dense, dry to moist)
2.0 - 7.5	GP	Gry sandy GRAVEL w/ cobbs (loose, moist)
7.5 - 15.0	GP	Gry sandy GRAVEL w/ cobbs (med dense, moist)
15.0 - 24.0	GP	Gry sandy GRAVEL w/ cobbs, occ silt and trace boulders (dense, moist to damp)

Minor caving observed from 2 to 10 feet.
No groundwater seepage observed.

Test Pit TP-16A

Location: SW corner of the parking area
Approximate Elevation: 325 feet

Depth (feet)	Soil Type	Soil Description
0 - 0.5	-	Topsoil/ Duff
0.5 - 2.0	SM	Tan silty SAND w/ occ gravel (dense, dry to moist)
2.0 - 9.0	GP	Gry sandy GRAVEL w/ cobbs (loose, moist)
9.0 - 12.0	SP	Gry gravelly SAND w/ cobbs (med dense, moist)
12.0 - 24.0	GP	Gry sandy GRAVEL w/ cobbs, occ silt and trace boulders (dense, moist to damp)

Minor caving observed from 2 to 10 feet.
No groundwater seepage observed.

Logged by: DCB **Excavated on: September 14, 2006**

Test Pit TP-101

Location: N center of the excavated area
Approximate Elevation: 322 feet

Depth (feet)	Soil Type	Soil Description
0 - 1.5	SP	Lt Brn SAND w/ minor silt, occ gravel (dense, moist to damp)
1.5 - 11.0	SP	Gry SAND w/ gravel & occ cobs, min. silt (dense, moist)
11.0 - 15.0	GP	Gry sandy GRAVEL w/ occ cobss

Minor caving observed from 2 to 12 feet.
No groundwater seepage observed.

Test Pit TP-102

Location: NW corner of excavation
Approximate Elevation: 321 feet

Depth (feet)	Soil Type	Soil Description
0 - 4.0	SP	Brown SAND w/ min. silt, gravel (dense, moist)
4.0 - 8.0	SP	Grey SAND w/ silt, occ. gravel (dense, moist to damp)
8.0 - 15.0	SP	Grey gravelly SAND w/ min. silt (dense, moist)

Minor caving observed from 2 to 10 feet.
No groundwater seepage observed.

Test Pit TP-103

Location: NE portion of excavation area
Approximate Elevation: 322 feet

Depth (feet)	Soil Type	Soil Description
0 - 3.5	SP	Gry SAND w/ min. silt, occ gravel (dense, moist)
3.5 - 9.0	SP	Brn SAND w/ gravel, min. silt (dense, moist to damp)
9.0 - 12.0	SP	Gry SAND w/ gravel, min. silt (dense, moist to damp)
12.0 - 16.0	SP	Gry gravelly SAND w/ cobbs, minor silt (dense, moist)

Minor caving observed from 1.5 to 10 feet.
No groundwater seepage observed.

Test Pit TP-104

Location: N central portion of site, about 100 feet south-east channel area
Approximate Elevation: 321 feet

Depth (feet)	Soil Type	Soil Description
0 - 8.5	SP	Brn Sand w/ min. silt and gravel, occ. silt lenses (dense, moist to damp)
8.5 - 13.0	SP	Gry SAND w/ gravel, min. silt (dense, moist)
13.0 - 15.0	GP	Brn GRAVEL w/ occ silt, sand and cobbs (v. dense, moist)

Minor caving observed from 2 to 10 feet.
No groundwater seepage observed.

Logged by: Unknown **Excavated on: February 12, 2007**

Test Pit TP-105

Location: S central portion of excavation
Approximate Elevation: 322 feet

Depth (feet)	Soil Type	Soil Description
0 - 12.0	GP	Brn/gry sandy GRAVEL w/ cobbs (med dense, moist)
12.0 - 14.0	SP	Gry gravelly SAND w/ cobbs (dense, moist)

Minor caving observed from 4 to 14 feet.
No groundwater seepage observed.

Test Pit TP-106

Location: Center of excavation, screen plant to west
Approximate Elevation: 321 feet

Depth (feet)	Soil Type	Soil Description
0 - 6.0	GP	Brn sandy GRAVEL w/ occ cobbles (dense, moist)
6.0 - 15.0	GP	Brn/gry sandy GRAVEL w/ occ cobbles/boulders (dense, moist)

No caving observed.
No groundwater seepage observed.

Test Pit TP-107

Location: SE corner of the site
Approximate Elevation: 320 feet

Depth (feet)	Soil Type	Soil Description
0 - 7.5	SP	Brown gravelly SAND w/ cobbles (dense, moist)
7.5 - 10.5	SP	Gry SAND w/ gravel and minor cobbs (dense, moist)
10.5 - 15.0	GP	Gry sandy GRAVEL w/ cobbs (med dense, moist)

Severe caving observed from 8 to 12 feet
No groundwater seepage observed.

Test Pit TP-108

Location: East-Central portion of the site
Approximate Elevation: 321 feet

Depth (feet)	Soil Type	Soil Description
0 - 4.5	SP	Brn Sand w/ min. silt and gravel, occ. silt lenses (dense, moist to damp)
4.5 - 12.0	SP	Gry SAND w/ gravel, min. silt (dense, moist)
12.0 - 14.0	GP	Brn GRAVEL w/ occ silt, sand and cobbs (v. dense, moist)

Minor caving observed from 1.5 to 13.0 feet.
No groundwater seepage observed.

Logged by: Unknown **Excavated on: February 12, 2007**

Test Pit TP I-1

Location: W portion of the infiltration area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 2.0	SP	Orange-brown gravelly SAND w/ minor organics (dense, moist)
2.0 - 6.5	GP	Brown sandy GRAVEL w/ cobbles, boulders (dense, moist)
6.5 - 16.5	GP	Brown SAND/GRAVEL w/ cobbles, occ. boulders (dense, moist)

No caving was observed.
No groundwater seepage was observed.

Test Pit TP I-2

Location: Central portion of the infiltration area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 2.0	SP	Brown gravelly SAND w/ occ. cobbles (dense, mosit, fill)
2.0 - 5.5	GP	Brown sandy GRAVEL w/ cobbles and min. organics (dense, moist)
5.5 - 15.0	GP	Brown sandy GRAVEL w/ cobbles, occ. boulders (dense, moist)

No caving observed.
No groundwater seepage observed.

Test Pit TP I-3

Location: E portion of the infiltration area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 2.5	SP	Brown gravelly SAND (dense, mosit, fill)
2.5 - 5.5	GP	Brown sandy GRAVEL w/ occ. organics (m. dense, moist)
5.5 - 15.0	GP	Brown sandy GRAVEL w/ cobbles, occ. boulders (dense, moist)

No caving was observed.
No groundwater seepage was observed.

Test Pit TP I-4

Location: W portion of the infiltration area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 2.5	SP	Orange-brown gravelly SAND w/ minor organics (dense, moist)
2.5 - 6.0	GP	Brown sandy GRAVEL w/ cobbles, boulders (dense, moist)
6.0 - 17.5	GP	Brown SAND/GRAVEL w/ cobbles, occ. boulders (dense, moist)

No caving was observed.
No groundwater seepage was observed.

Logged by: Unknown **Excavated on: Unknown**

Test Pit TP-201

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 12.0	GP	Brown GRAVEL w/ sand, cobbles, and min. silt (loose to m. dense, moist)
12.0 - 14.0	SP	Brown SAND w/ gravel and tr. silt (m. dense, moist)
14.0 - 16.0	GP	Brown GRAVEL w/ sand, cobbles, and tr. silt (m. dense, moist to damp)

Severe caving observed.
No groundwater seepage was observed.

Test Pit TP-202

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 8.0	GP	Brown GRAVEL w/ sand, cobbles, and min. silt (loose to m. dense, moist)

Severe caving observed.
No groundwater seepage observed.
Short Term Infiltartion Rate: 360 in/hr

Test Pit TP-203

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 9.0	GP	Brown GRAVEL w/ silt, sand, and min. cobbles (m. dense, moist, fill)
9.0 - 12.0	SP	Brown GRAVEL w/ sand, cobbles, and min. silt (loose to m. dense, moist)

Severe caving observed from 8 to 12 feet.
No groundwater seepage was observed.

Test Pit TP-204

Location: W portion of the infiltration area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 8.5	GP	Brown GRAVEL w/ sand, cobbles, and min. silt (loose to m. dense, moist)

Severe caving observed
No groundwater seepage observed
Short Term Infiltration Rate: 495 in/hr

Logged by: DCB **Excavated on: July 15, 2008**

Test Pit TP-205

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 2.0	GP	Brown GRAVEL w/ silt, sand, and min. cobbles (m. dense, moist, fill)
2.0 - 12.0	GP	Brown GRAVEL w/ sand, cobbles, and min. silt (loose to m. dense, moist)

Severe caving observed from 4 – 10 feet
No groundwater seepage observed

Test Pit TP-206

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 8.0	GP	Brown GRAVEL w/ sand, cobbles, and min. silt (loose to m. dense, moist)

Severe caving observed.
No groundwater seepage observed.
Short Term Infiltration Rate: 205 in/hr

Test Pit TP-207

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 7.5	GP	Brown GRAVEL w/ sand, cobbles, and min. silt (loose to m. dense, moist)
7.5 - 10.0	SM/ML	Brown silty fine SAND/fine sandy SILT (m. dense/stiff, moist)

Severe caving observed from 4 – 10 feet.
No groundwater seepage observed.

Test Pit TP-208

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 8.0	SM/ML	Brown silty fine SAND/fine sandy SILT (m. dense/stiff, moist)

No caving was observed.
No groundwater seepage was observed.

Logged by: DCB **Excavated on: July 15, 2008**

Test Pit TP-209

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 2.0	GP	Brown GRAVEL w/ silt, sand, and min. cobbles (m. dense, moist) (fill)
2.0 - 6.0	SM	Grey/Brown silty SAND w/ gravel and cobbles (dense, moist) (tallish)
6.0 - 10.0	SP	Brown gravelly SAND w/ some silt (dense, moist) (advance)

No caving was observed.
No groundwater seepage was observed.

Test Pit TP-210

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 6.0	SP	Brown SAND w/ silt and gravel (dense, moist)

No caving observed.
No groundwater seepage observed.

Test Pit TP-211

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 10.0	SM	Grey/Brown silty SAND w/ gravel (dense, moist) (till?)
10.0 - 15.0	SP	Brown gravelly SAND w/ some silt (dense, moist) (advance?)

No caving was observed.
Minor groundwater seepage at 13' after 2 hours.

Test Pit TP-212

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 6.0	GP	Brown GRAVEL w/ occ. sand (loose, damp to wet)
6.0 - 7.0	SM	Brown silty fine SAND (dense, moist)

No caving was observed.
Groundwater seepage observed at 5 feet.

Logged by: DCB **Excavated on: July 15, 2008**

Test Pit TP-213

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 3.5	GP	Brown GRAVEL w/ occ. sand (loose, damp to wet)

Severe caving observed.
Groundwater observed at 2.5 feet.

Test Pit TP-214

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 3.0	GP	Brown GRAVEL w/ occ. sand (loose, damp to wet)

Severe caving observed.
Groundwater observed at 2 feet.

Test Pit TP-215

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 4.0	GP	Brn GRAVEL w/ sand, cobbles, boulders and min. silt (m. dense, moist)
4.0 - 13.0	GP	Red-brn GRAVEL w/ cobbles, some sand and silt (loose to m. dense, moist)
13.0 - 16.0	GP	Brn GRAVEL w/ cobbles, some sand and silt (loose to m. dense, moist)

Severe caving observed.
No groundwater seepage observed.

Logged by: DCB **Excavated on: July 15, 2008**

Test Pit TP-301

Location: NW portion of the pit area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 2.0	SP	Brown gravelly SAND w/ occ. organics (dense, moist)
2.0 - 5.5	GP	Brown sand GRAVEL w/ cobbles, boulders (m. dense, moist)
5.5 - 14.5	GP	Brown sandy GRAVEL w/ cobbles, occ. boulders (dense, moist)

No caving was observed.
No groundwater seepage was observed.

Test Pit TP-302

Location: NW portion of pit area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 2.5	SP	Brown gravelly SAND (dense, moist) (till)
2.5 - 4.5	GP	Brown sandy GRAVEL, occ. organics, cobbles (m. dense, moist)
4.5 - 13.0	GP	Brown sandy GRAVEL w/ cobbles, occ. boulders (dense, moist)

No caving observed.
No groundwater seepage observed.

Test Pit TP-303

Location: Center of pit area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 1.5	SP	Brown gravelly SAND (dense, moist) (till)
1.5 - 4.5	GP	Brown sandy GRAVEL, occ. organics, cobbles (m. dense, moist)
4.5 - 12.5	GP	Brown sandy GRAVEL w/ cobbles, occ. boulders (dense, moist)

No caving was observed.
No groundwater seepage observed.

Test Pit TP-304

Location: NE center of pit
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 2.0	SP	Brown gravelly SAND (dense, moist) (till)
2.0 - 4.5	GP	Brown sandy GRAVEL, occ. organics, cobbles (m. dense, moist)
4.5 - 14.5	GP	Brown sandy GRAVEL w/ cobbles, occ. boulders (dense, moist)

No caving was observed.
No groundwater seepage observed.

Logged by: Unknown **Excavated on: Unknown**

Test Pit TP-305

Location: 15 feet N of trench area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 2.0	SP	Brown gravelly SAND (dense, moist) (till)
2.0 - 4.5	GP	Brown sandy GRAVEL w/ sand, cobbles, occ. organics (m. dense, moist)
4.5 - 14.0	GP	Brown sandy GRAVEL w/ cobbles, boulders (dense, moist)

No caving was observed.
No groundwater seepage was observed.

Test Pit TP-306

Location: W portion of the trench area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 1.5	SP	Brown gravelly SAND (dense, moist) (till)
1.5 - 4.5	GP	Brown sandy GRAVEL w/ sand, cobbles, occ. organics (m. dense, moist)
4.5 - 13.0	GP	Brown sandy GRAVEL w/ cobbles, boulders (dense, moist)

No caving observed.
No groundwater seepage observed.

Test Pit TP-307

Location: W portion of the trench area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 2.5	SP	Brown gravelly SAND (dense, moist) (till)
2.5 - 4.5	GP	Brown sandy GRAVEL w/ sand, cobbles, occ. organics (m. dense, moist)
4.5 - 7.0	GP	Brown sandy GRAVEL w/ cobbles, boulders (dense, moist)

No caving was observed.
No groundwater seepage observed.

Test Pit TP-308

Location: Central portion of trench area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 1.5	SP	Brown gravelly SAND (dense, moist) (till)
1.5 - 4.5	GP	Brown sandy GRAVEL w/ sand, cobbles, occ. organics (m. dense, moist)
4.5 - 9.0	GP	Brown sandy GRAVEL w/ cobbles, boulders (dense, moist)

No caving was observed.
No groundwater seepage observed.

Logged by: Unknown **Excavated on: Unknown**

Test Pit TP-309

Location: E portion of trench area
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 1.5	SP	Brown gravelly SAND (dense, moist) (till)
1.5 - 5.0	GP	Brown sandy GRAVEL w/ sand, cobbles, occ. organics (m. dense, moist)
5.0 - 8.0	GP	Brown sandy GRAVEL w/ cobbles, boulders (dense, moist)

No caving was observed.
No groundwater seepage was observed.

Logged by: Unknown **Excavated on: Unknown**

Boring B-1

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 1.5	-	Topsoil/ Duff
1.5 - 28.0	GP	Brown sandy GRAVEL w/ trace silt (moist)
28.0 - 40.0	ML	Grey SILT (hard, moist)

End Blow Count: 50 for 5.5
Terminated at 40.0 feet

Boring B-2

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 30.0	SP	Brown gravelly SAND (moist)
30.0 - 35.0	SP	Brown SAND with gravel (moist)
35.0 - 42.0	ML	Brown SILT with sand (moist)

Terminated at 42.0 feet.

Boring B-3

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 28.0	GP	Brown sandy GRAVEL (moist)
28.0 - 32.0	SM	Brown silty SAND (moist)
32.0 - 38.0	ML	Brown SILT with sand and gravel (damp)

Terminated at 38.0’

Boring B-4

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 30.0	GP	Brown GRAVEL with sand (moist)
30.0 - 36.0	SM	Brown silty GRAVEL with sand (damp to wet)

Terminated at 36.0’.

Logged by: DCB **Excavated on: September 20, 2006**

Boring B-5

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 18.0	GP	Brown sandy GRAVEL (moist)
18.0 - 26.0	GP	Brown sandy GRAVEL with silt (moist)
26.0 - 38.0	GP	Brown GRAVEL with occ. Sand (moist, recessional?)
38.0 - 54.0	GP	Brown GRAVEL w/ sand and occ. Silt (damp, advance?)
54.0 - 70.0	GW	Brown GRAVEL w/ coarse sand (wet)
70.0 - 76.0	ML	Brown gravelly SILT with sand (moist to damp)

Boulder encountered at 35.0'
Groundwater encountered at 55.0'
Terminated at 76.0'

Boring B-6

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 2.0	GP	Topsoil/Duff
2.0 - 6.0	GP	Brown silty SAND w/ organics (Fill, Moist)
6.0 - 12.0	GP	Brown sandy GRAVEL (moist)
12.0 - 37.0	GP	Brown SAND w/ occ. gravel and trace silt increasing with depth (moist to damp)

Terminated at 37.0 feet.

Logged by: DCB **Excavated on: September 20, 2006**

Boring B-7

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 44.0	GP	Brown GRAVEL with sand (m. dense, mosit)
44.0 - 55.0	GP	Brown silty SAND (m. dense, moist)

Became damp to wet around 42 feet.
Terminated at 55.0 feet.

Logged by: LJ/MSM **Excavated on: October 23, 2007**

Boring B-9

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 9.0	GP	Brown sandy GRAVEL w/ cobbles (v. dense, moist)
9.0 - 13.0	ML	Dark grey sandy SILT with gravel (v. dense, moist)
13.0 - 24.0	SP	Grey-brown gravelly SAND w/ cobbles (v. dense, moist)
24.0 - 31.0	SP	Grey coarse SAND w/ gravel (v. dense, wet)
31.0 - 36.5	SP	Grey medium SAND w/ gravel and cobbles (v.dense, wet)

Groundwater encountered at 29'
Terminated at 36.5 feet

Boring B-10

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 16.0	SP	Brown medium SAND with tr. Pebbles, slight staining (dense, moist)
16.0 - 24.0	ML	Brown SILT with fine sand, slight staining (dense, moist)
24.0 - 30.0	SP	Grey brown SAND w/ gravel, cobbles, min. silt (v. dense, moist)
30.0 - 41.5	SW	Grey fine-medium SAND with tr. silt (v. dense, moist)

Groundwater encountered at 37'
Terminated at 41.5 feet

Boring B-11

Location:
Approximate Elevation:

Depth (feet)	Soil Type	Soil Description
0 - 12.5	-	No recovery
12.5 - 30.0	SP	Lt brown/grey gravelly SAND (v. dense, moist to wet)
30.0 - 42.5	-	No recovery
42.5 - 46.0	ML	Brown SILT w/ fine sand, mottling (hard, moist)

Groundwater encountered at 29.5'
Terminated at 46.0 feet

Logged by: LJ/MSM **Excavated on: January 15 -17, 2008**

Appendix “B”

Laboratory Test Results

5007 Pacific Highway E, Suite 20
Fife, WA. 98424
Office (253)896-1011 Fax (253) 896-2633

GeoResources, LLC

Grain Size Analysis

Project Number:	PacificRaceways.Exp	Date Sampled:	10/7/2006
Project Name:	Pacific Raceways	Sampled by:	DB
Client:	Pacific Raceways	Date Tested	12/29/2006
Sample ID:	TP-2	Tested by:	DB
Description:			

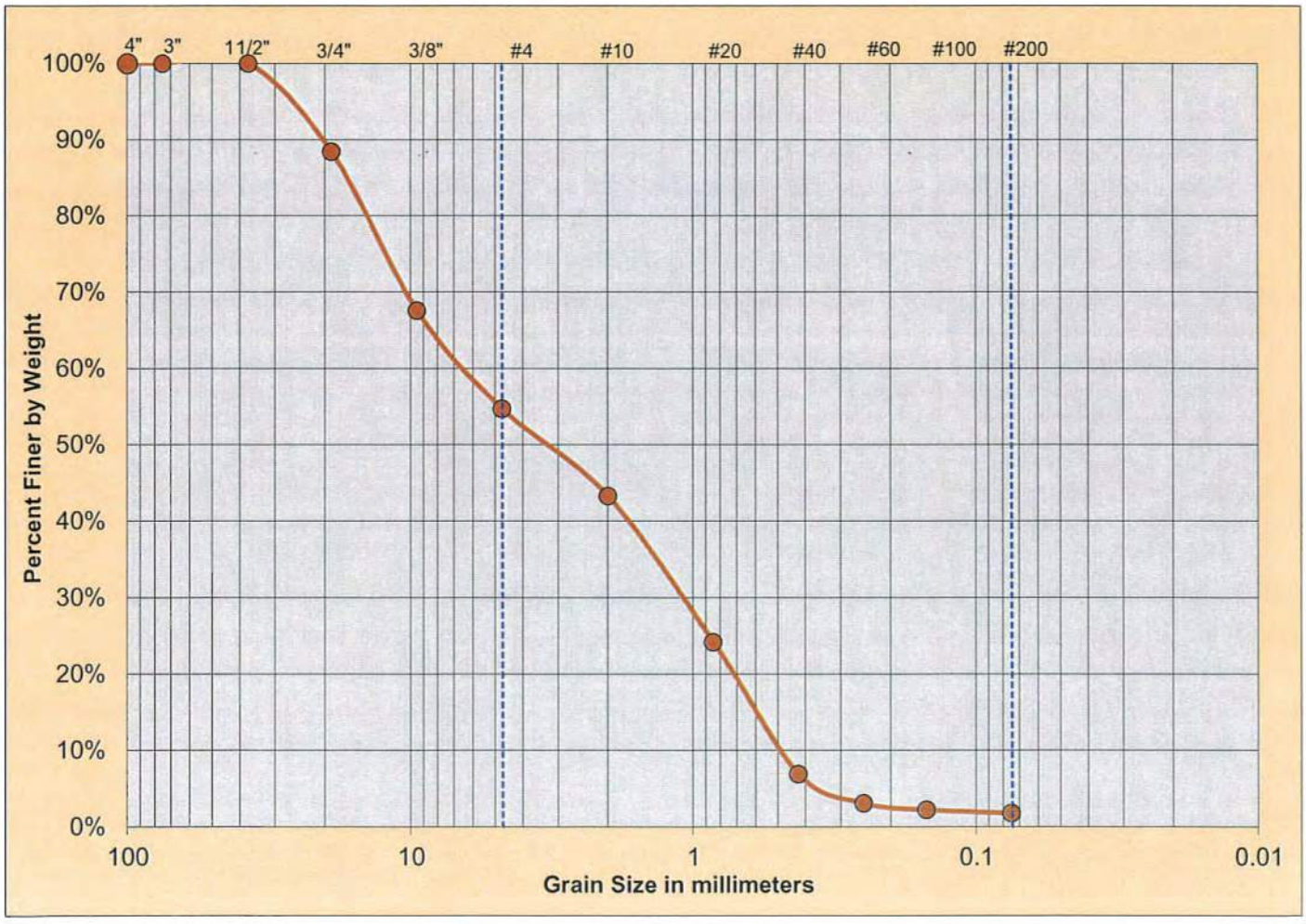
Screen	Weight Retained Individual	Weight Retained Cumulative	Percentage Retained	Percentage Passed	Specification Max.	Specification Min.	Summary	
4"		0.0		100.0%				
3"		0.0		100.0%				
1-1/2"		0.0		100.0%			11.6%	Coarse
3/4"	156.0	156.0	11.6%	88.4%			33.7%	Fine
3/8"	280.5	436.5	32.4%	67.6%			**45.3%**	**Gravel**
#4	173.4	609.9	45.3%	54.7%				
#10	153.9	763.8	56.7%	43.3%			11.4%	Coarse
#20	257.6	1021.4	75.8%	24.2%			36.4%	Medium
#40	232.3	1253.7	93.1%	6.9%			5.1%	Fine
#60	51.4	1305.1	96.9%	3.1%			**52.9%**	**Sand**
#100	11.8	1316.9	97.8%	2.2%				
#200	5.5	1322.4	98.2%	1.8%			**1.8%**	**Fines**
Pan	0.1							

D_{85} = 17.44 D_{50} = 3.6162 D_{15} = 0.6244
D_{60} = 6.7010 D_{30} = 1.2014 D_{10} = 0.5012
C_U = 13.4 C_C = 0.43

USCS Classification:

SAND with gravel. (SP)

Dust Ratio	0.2613
Moisture %	2.1%
Sand Equivalent	



Revised on: 12-13-06

Input Data:

Wet + Tare	1558.3
Dry + Tare	1529.7
Tare	183.0
AW + Tare	1505.5
After Wash	1322.5
- #200 %	2%
Dry Weight	1346.7
Depth:	
Moisture	2.1%

Sieve Sizes	
4"	100
3"	75
1-1/2"	37.5
3/4"	19
3/8"	9.5
#4	4.75
#10	2
#20	0.85
#40	0.425
#60	0.25
#100	0.15
#200	0.075

Gravel - Sand	
4.75	0
4.75	100

Sand - Silt	
0.075	0
0.075	100

Parameters:

D 85	D 60	D 50	D 30	D 15	D 10
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
17.4419	-	-	-	-	-
-	6.700952	-	-	-	-
-	-	3.616228	-	-	-
-	-	-	1.201384	-	-
-	-	-	-	0.624428	0.501237
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

5007 Pacific Highway E, Suite 20
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GeoResources, LLC

Grain Size Analysis

Project Number:	PacificRaceways.Exp	Date Sampled:	10/7/2006
Project Name:	Pacific Raceways	Sampled by:	DB
Client:	Pacific Raceways	Date Tested	1/1/2007
Sample ID:	Center Cut	Tested by:	DB
Description:	Sandier Material in cut at center of the site		

Screen	Weight Retained Individual	Weight Retained Cumulative	Percentage Retained	Percentage Passed	Specification Max.	Specification Min.	Summary	
4"		0.0		100.0%				
3"		0.0		100.0%				
1-1/2"		0.0		100.0%			19.7%	Coarse
3/4"	156.7	156.7	19.7%	80.3%			24.7%	Fine
3/8"	125.9	282.6	35.6%	64.4%			**44.4%**	**Gravel**
#4	70.0	352.6	44.4%	55.6%				
#10	67.8	420.4	52.9%	47.1%			8.5%	Coarse
#20	108.8	529.2	66.6%	33.4%			32.5%	Medium
#40	149.6	678.8	85.5%	14.5%			12.1%	Fine
#60	70.7	749.5	94.4%	5.6%			**53.2%**	**Sand**
#100	18.6	768.1	96.7%	3.3%				
#200	6.8	774.9	97.6%	2.4%			**2.4%**	**Fines**
Pan	0.1							

D_{85} = 23.44 D_{50} = 2.9491 D_{15} = 0.4361
D_{60} = 7.1250 D_{30} = 0.7744 D_{10} = 0.3364
C_U = 21.2 C_C = 0.25

USCS Classification:

SAND with gravel. (SP)

Dust Ratio	0.1658
Moisture %	4.6%
Sand Equivalent	

Revised on: 12-13-06

Input Data:

Wet + Tare	1015.1
Dry + Tare	978.4
Tare	184.4
AW + Tare	959.4
After Wash	775.0
- #200 %	2%
Dry Weight	794.0
Depth:	10'
Moisture	4.6%

Sieve Sizes	
4"	100
3"	75
1-1/2"	37.5
3/4"	19
3/8"	9.5
#4	4.75
#10	2
#20	0.85
#40	0.425
#60	0.25
#100	0.15
#200	0.075

Gravel - Sand	
4.75	0
4.75	100

Sand - Silt	
0.075	0
0.075	100

Parameters:

D 85	D 60	D 50	D 30	D 15	D 10
-	-	-	-	-	-
-	-	-	-	-	-
23.43906	-	-	-	-	-
-	-	-	-	-	-
-	7.125	-	-	-	-
-	-	2.949115	-	-	-
-	-	-	-	-	-
-	-	-	0.774432	0.43608	-
-	-	-	-	-	0.336386
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

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Grain Size Analysis

Project Number:	PacificRaceways.Exp	Date Sampled:	10/7/2006
Project Name:	Pacific Raceways	Sampled by:	DB
Client:	Pacific Raceways	Date Tested	12/30/2006
Sample ID:	B-1	Tested by:	DB
Description:	10-15 feet		

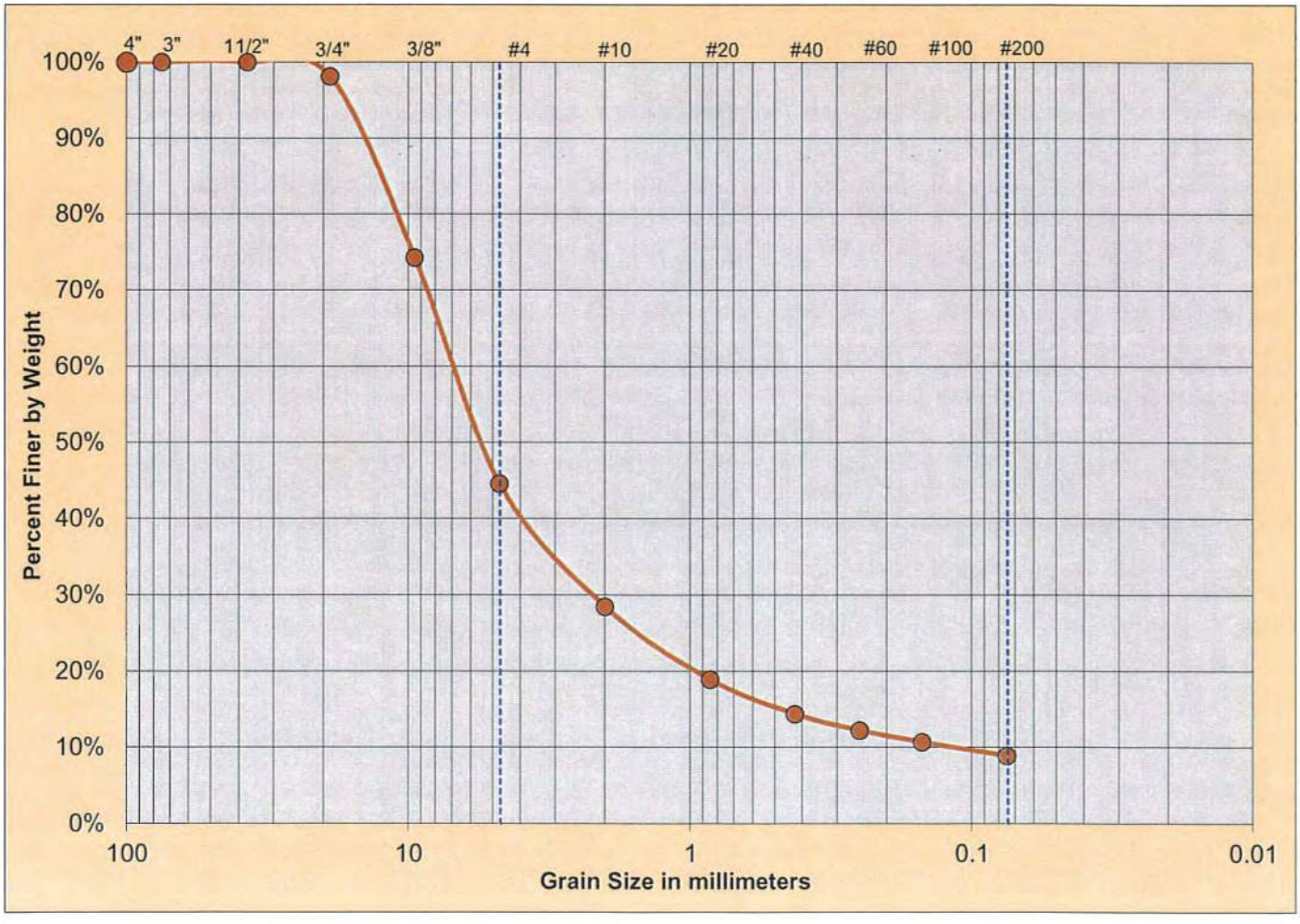
Screen	Weight Retained Individual	Weight Retained Cumulative	Percentage Retained	Percentage Passed	Specification Max.	Specification Min.	Summary	
4"		0.0		100.0%				
3"		0.0		100.0%				
1-1/2"		0.0		100.0%			1.9%	Coarse
3/4"	15.9	15.9	1.9%	98.1%			53.5%	Fine
3/8"	202.1	218.0	25.7%	74.3%			**55.4%**	**Gravel**
#4	251.5	469.5	55.4%	44.6%				
#10	136.9	606.4	71.6%	28.4%			16.2%	Coarse
#20	81.0	687.4	81.1%	18.9%			14.1%	Medium
#40	38.2	725.6	85.6%	14.4%			5.5%	Fine
#60	18.3	743.9	87.8%	12.2%			**35.7%**	**Sand**
#100	12.9	756.8	89.3%	10.7%				
#200	15.4	772.2	91.1%	8.9%			**8.9%**	**Fines**
Pan	-1.5							

D_{85} = 13.77 D_{50} = 5.6150 D_{15} = 0.4841
D_{60} = 7.2155 D_{30} = 2.2656 D_{10} = 0.1215
C_U = 59.4 C_C = 5.86

USCS Classification:

GRAVEL with silt and sand. (GP-GM)

Dust Ratio	0.6174
Moisture %	5.1%
Sand Equivalent	



Revised on: 12-13-06

Input Data:

Wet + Tare	1076.5
Dry + Tare	1032.9
Tare	185.5
AW + Tare	956.2
After Wash	770.7
- #200 %	9%
Dry Weight	847.4
Depth:	10'
Moisture	5.1%

Sieve Sizes	
4"	100
3"	75
1-1/2"	37.5
3/4"	19
3/8"	9.5
#4	4.75
#10	2
#20	0.85
#40	0.425
#60	0.25
#100	0.15
#200	0.075

Gravel - Sand	
4.75	0
4.75	100

Sand - Silt	
0.075	0
0.075	100

Parameters:

D 85	D 60	D 50	D 30	D 15	D 10
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
13.77241	-	-	-	-	-
-	7.215467	5.61501	-	-	-
-	-	-	2.265559	-	-
-	-	-	-	-	-
-	-	-	-	0.484077	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	0.121461
-	-	-	-	-	-

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Grain Size Analysis

Project Number:	PacificRaceways.Exp	Date Sampled:	10/7/2006
Project Name:	Pacific Raceways	Sampled by:	DB
Client:	Pacific Raceways	Date Tested	1/2/2007
Sample ID:	B-2	Tested by:	DB
Description:	Boring 2, sample depth -10'		

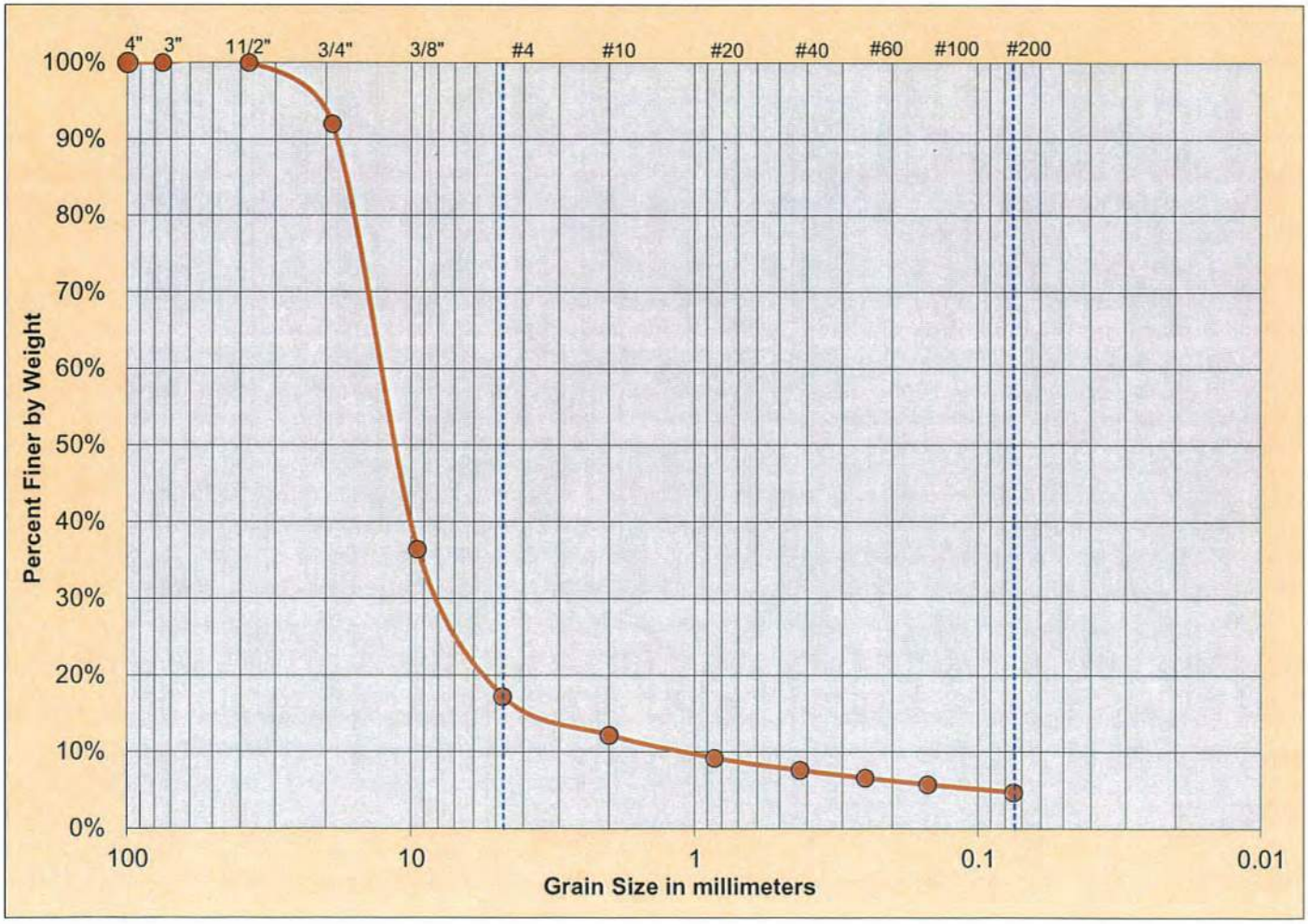
Screen	Weight Retained Individual	Weight Retained Cumulative	Percentage Retained	Percentage Passed	Specification Max.	Specification Min.	Summary	
4"		0.0		100.0%				
3"		0.0		100.0%				
1-1/2"		0.0		100.0%			8.0%	Coarse
3/4"	76.6	76.6	8.0%	92.0%			74.8%	Fine
3/8"	531.9	608.5	63.6%	36.4%			**82.8%**	**Gravel**
#4	183.5	792.0	82.8%	17.2%				
#10	48.3	840.3	87.8%	12.2%			5.0%	Coarse
#20	28.4	868.7	90.8%	9.2%			4.6%	Medium
#40	15.2	883.9	92.4%	7.6%			2.9%	Fine
#60	9.7	893.6	93.4%	6.6%			**12.5%**	**Sand**
#100	8.2	901.8	94.3%	5.7%				
#200	9.9	911.7	95.3%	4.7%			**4.7%**	**Fines**
Pan	0.5							

D_{85} = 17.80 D_{50} = 11.824 D_{15} = 3.5384
D_{60} = 13.533 D_{30} = 7.914 D_{10} = 1.1569
C_U = 11.7 C_C = 4.00

USCS Classification:

GRAVEL with silt. (GP-GM)

Dust Ratio 0.619
Moisture % 3.5%
Sand Equivalent



Revised on: 12-13-06

Input Data:

Wet + Tare	1173.6
Dry + Tare	1140.1
Tare	183.3
AW + Tare	1095.5
After Wash	912.2
- #200 %	5%
Dry Weight	956.8
Depth:	10'
Moisture	3.5%

Sieve Sizes	
4"	100
3"	75
1-1/2"	37.5
3/4"	19
3/8"	9.5
#4	4.75
#10	2
#20	0.85
#40	0.425
#60	0.25
#100	0.15
#200	0.075

Gravel - Sand	
4.75	0
4.75	100

Sand - Silt	
0.075	0
0.075	100

Parameters:

D 85	D 60	D 50	D 30	D 15	D 10
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
17.80478	13.53254	11.82365	-	-	-
-	-	-	7.914251	-	-
-	-	-	-	3.538406	-
-	-	-	-	-	1.156937
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

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GeoResources, LLC

Grain Size Analysis

Project Number:	PacificRaceways.Exp	Date Sampled:	10/7/2006
Project Name:	Pacific Raceways	Sampled by:	DB
Client:	Pacific Raceways	Date Tested	1/2/2007
Sample ID:	B-4	Tested by:	DB
Description:	Boring 4, sample depth -35'		

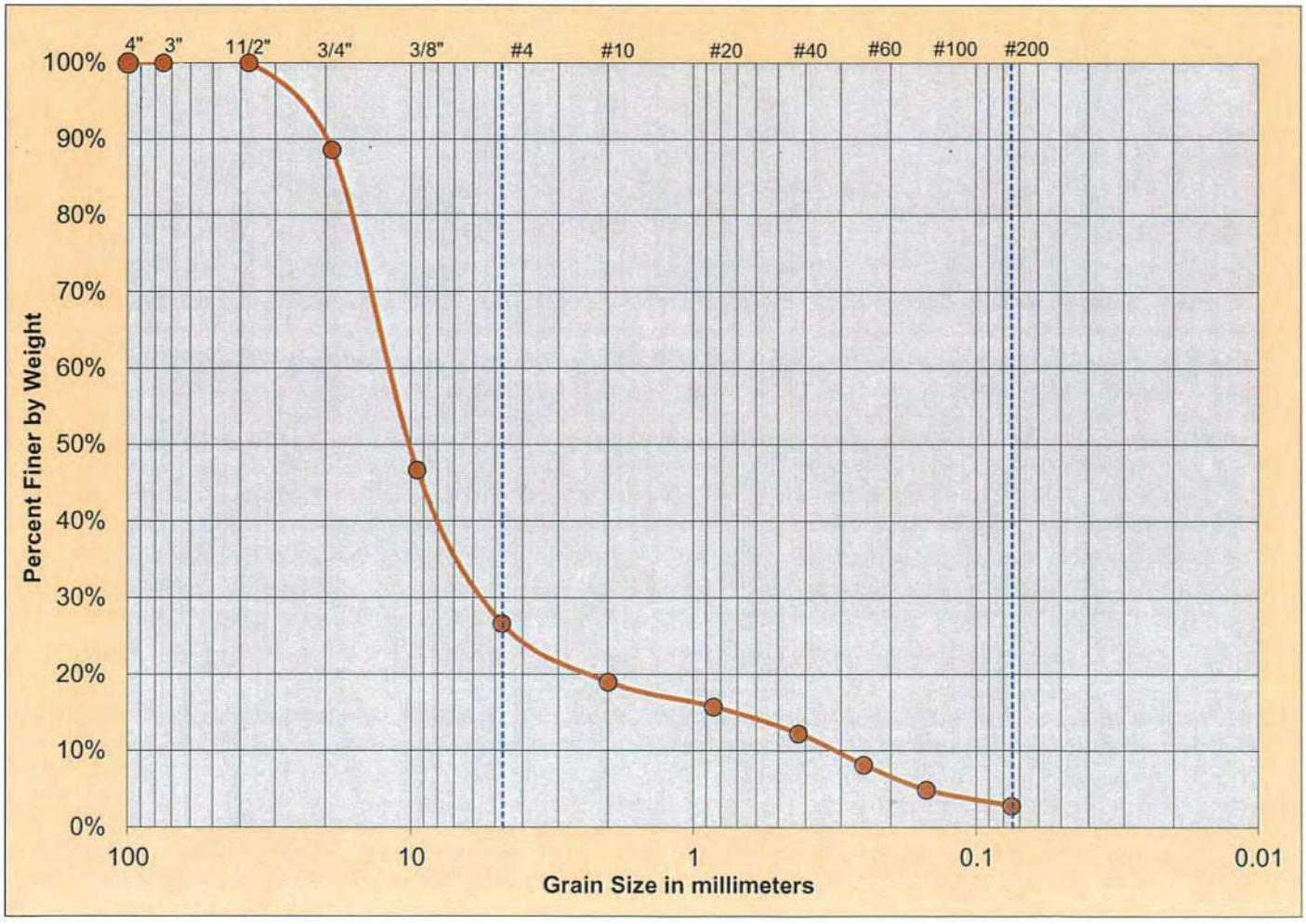
Screen	Weight Retained Individual	Weight Retained Cumulative	Percentage Retained	Percentage Passed	Specification Max.	Specification Min.	Summary	
4"		0.0		100.0%				
3"		0.0		100.0%				
1-1/2"		0.0		100.0%			11.4%	Coarse
3/4"	105.4	105.4	11.4%	88.6%			62.0%	Fine
3/8"	387.1	492.5	53.4%	46.6%			**73.4%**	**Gravel**
#4	185.1	677.6	73.4%	26.6%				
#10	70.4	748.0	81.0%	19.0%			7.6%	Coarse
#20	29.8	777.8	84.3%	15.7%			6.7%	Medium
#40	32.3	810.1	87.8%	12.2%			9.4%	Fine
#60	37.9	848.0	91.9%	8.1%			**23.8%**	**Sand**
#100	29.8	877.8	95.1%	4.9%				
#200	19.5	897.3	97.2%	2.8%			**2.8%**	**Fines**
Pan	-1.2							

D_{85} = 18.19 D_{50} = 10.261 D_{15} = 0.7612
D_{60} = 12.526 D_{30} = 5.558 D_{10} = 0.3299
C_U = 38.0 C_C = 7.48

USCS Classification:

GRAVEL with sand. (SP)

Dust Ratio	0.228
Moisture %	3.7%
Sand Equivalent	



Revised on: 12-13-06

Input Data:

Wet + Tare	1140.5
Dry + Tare	1106.6
Tare	183.6
AW + Tare	1079.7
After Wash	896.1
- #200 %	3%
Dry Weight	923.0
Depth:	35'
Moisture	3.7%

Sieve Sizes	
4"	100
3"	75
1-1/2"	37.5
3/4"	19
3/8"	9.5
#4	4.75
#10	2
#20	0.85
#40	0.425
#60	0.25
#100	0.15
#200	0.075

Gravel - Sand	
4.75	0
4.75	100

Sand - Silt	
0.075	0
0.075	100

Parameters:

D 85	D 60	D 50	D 30	D 15	D 10
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
18.1889	12.52596	10.26079	-	-	-
-	-	-	5.558347	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	0.761184	-
-	-	-	-	-	0.329881
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

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GeoResources, LLC

Grain Size Analysis

Project Number:	PacificRaceways.Pave	Date Sampled:	2/8/2007
Project Name:		Sampled by:	BPB
Client:		Date Tested	2/8/2007
Sample ID:	TP-2 S-1	Tested by:	DCB
Description:	Brn Sand w/ gravel (8-12')		

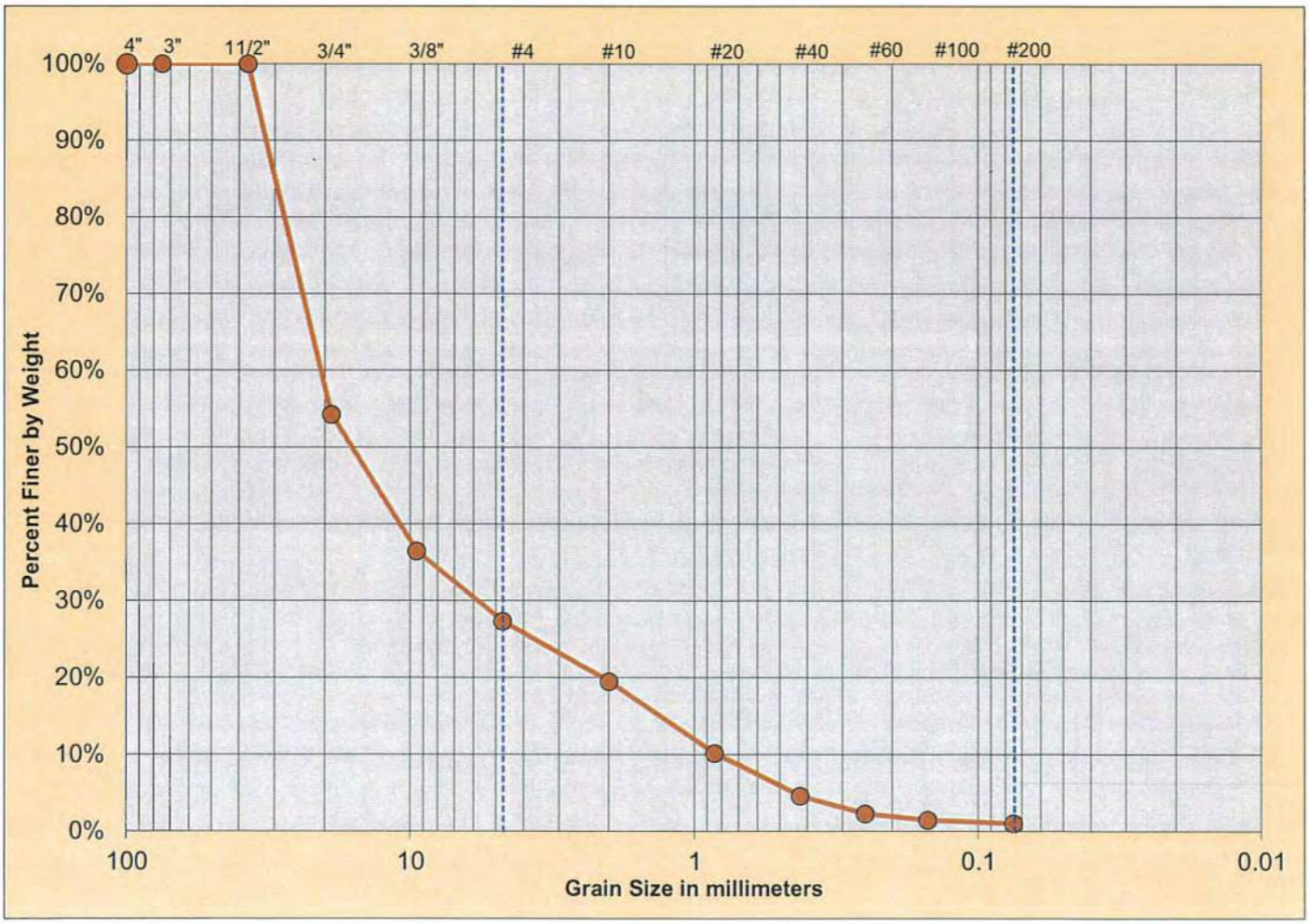
Screen	Weight Retained Individual	Weight Retained Cumulative	Percentage Retained	Percentage Passed	Specification Max.	Specification Min.	Summary	
4"		0.0		100.0%				
3"		0.0		100.0%				
1-1/2"		0.0		100.0%			45.8%	Coarse
3/4"	442.0	442.0	45.8%	54.2%			26.9%	Fine
3/8"	172.0	614.0	63.6%	36.4%			**72.7%**	**Gravel**
#4	88.0	702.0	72.7%	27.3%				
#10	76.0	778.0	80.5%	19.5%			7.9%	Coarse
#20	90.0	868.0	89.9%	10.1%			14.9%	Medium
#40	54.0	922.0	95.4%	4.6%			3.5%	Fine
#60	22.0	944.0	97.7%	2.3%			**26.3%**	**Sand**
#100	8.0	952.0	98.6%	1.4%				
#200	4.0	956.0	99.0%	1.0%			**1.0%**	**Fines**
Pan	0.0							

D_{85} = 31.44 D_{50} = 16.735 D_{15} = 1.4493
D_{60} = 21.327 D_{30} = 6.143 D_{10} = 0.8390
C_U = 25.4 C_C = 2.11

USCS Classification:

well graded GRAVEL w/ sand (GW)

Dust Ratio	0.227
Moisture %	3.1%
Sand Equivalent	



Revised on: 12-13-06

Input Data:

Wet + Tare	1180.0
Dry + Tare	1150.0
Tare	184.0
AW + Tare	1140.0
After Wash	956.0
- #200 %	1%
Dry Weight	966.0
Depth:	
Moisture	3.1%

Sieve Sizes	
4"	100
3"	75
1-1/2"	37.5
3/4"	19
3/8"	9.5
#4	4.75
#10	2
#20	0.85
#40	0.425
#60	0.25
#100	0.15
#200	0.075

Gravel - Sand	
4.75	0
4.75	100

Sand - Silt	
0.075	0
0.075	100

Parameters:

D 85	D 60	D 50	D 30	D 15	D 10
-	-	-	-	-	-
-	-	-	-	-	-
31.43518	21.32715	-	-	-	-
-	-	16.73547	-	-	-
-	-	-	6.142614	-	-
-	-	-	-	-	-
-	-	-	-	1.449278	-
-	-	-	-	-	0.838981
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

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Grain Size Analysis

Project Number:	PacificRaceways.Pave	Date Sampled:	2/8/2007
Project Name:		Sampled by:	BPB
Client:		Date Tested	2/8/2007
Sample ID:	TP-4 S-1	Tested by:	DCB
Description:	Brn Sand w/ gravel (6-10')		

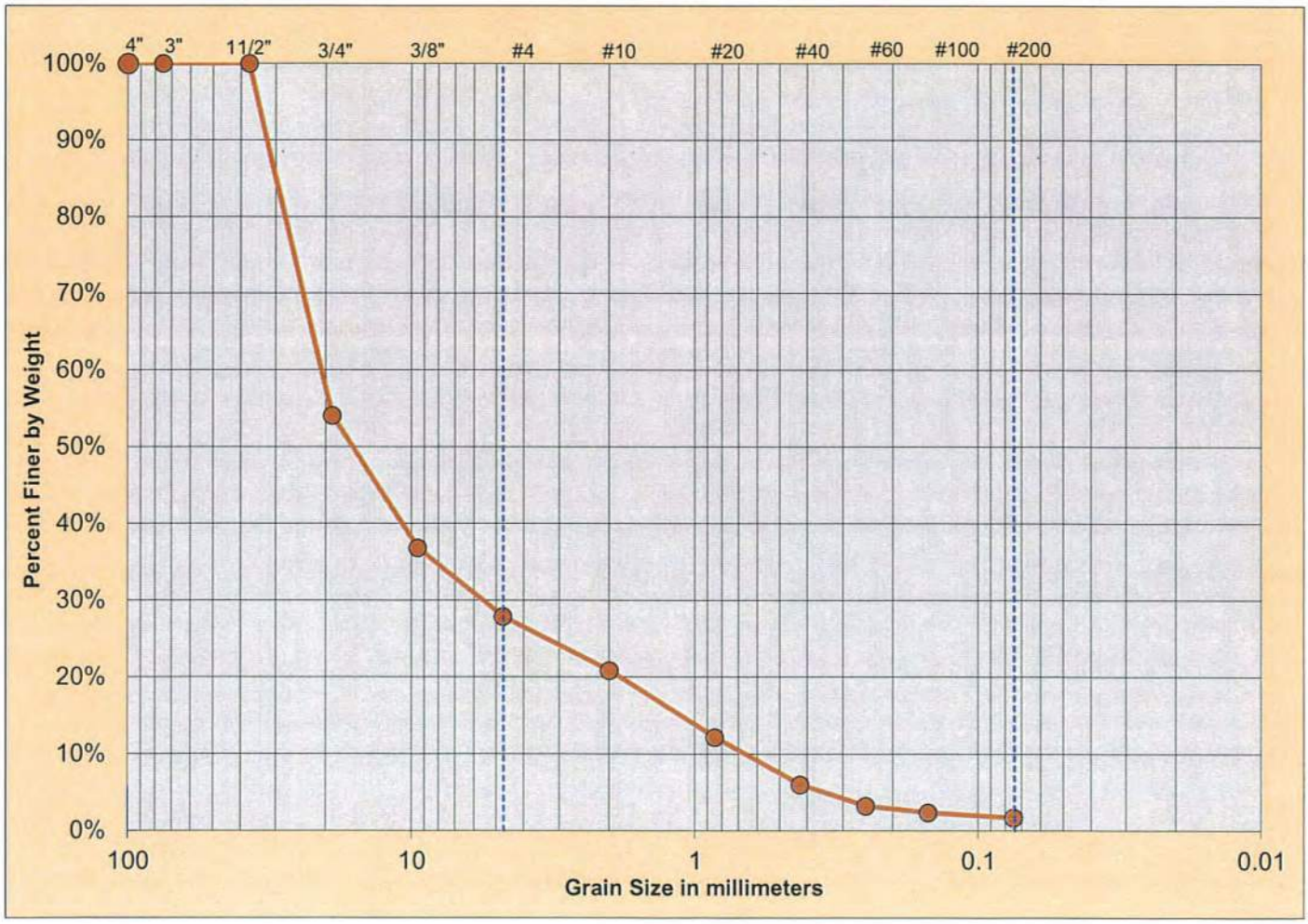
Screen	Weight Retained Individual	Weight Retained Cumulative	Percentage Retained	Percentage Passed	Specification Max.	Specification Min.	Summary	
4"		0.0		100.0%				
3"		0.0		100.0%				
1-1/2"		0.0		100.0%			46.0%	Coarse
3/4"	432.0	432.0	46.0%	54.0%			26.2%	Fine
3/8"	162.0	594.0	63.2%	36.8%			**72.1%**	**Gravel**
#4	84.0	678.0	72.1%	27.9%				
#10	66.0	744.0	79.1%	20.9%			7.0%	Coarse
#20	82.0	826.0	87.9%	12.1%			14.9%	Medium
#40	58.0	884.0	94.0%	6.0%			4.3%	Fine
#60	26.0	910.0	96.8%	3.2%			**26.2%**	**Sand**
#100	8.0	918.0	97.7%	2.3%				
#200	6.0	924.0	98.3%	1.7%			**1.7%**	**Fines**
Pan	0.0							

D_{85} = 31.46 D_{50} = 16.772 D_{15} = 1.2287
D_{60} = 21.398 D_{30} = 5.881 D_{10} = 0.7034
C_U = 30.4 C_C = 2.30

USCS Classification:

well graded GRAVEL w/ sand (GW)

Dust Ratio	0.286
Moisture %	4.0%
Sand Equivalent	



Revised on: 12-13-06

Input Data:

Wet + Tare	1162.0
Dry + Tare	1124.0
Tare	184.0
AW + Tare	1108.0
After Wash	924.0
- #200 %	2%
Dry Weight	940.0
Depth:	
Moisture	4.0%

Sieve Sizes	
4"	100
3"	75
1-1/2"	37.5
3/4"	19
3/8"	9.5
#4	4.75
#10	2
#20	0.85
#40	0.425
#60	0.25
#100	0.15
#200	0.075

Gravel - Sand	
4.75	0
4.75	100

Sand - Silt	
0.075	0
0.075	100

Parameters:

D 85	D 60	D 50	D 30	D 15	D 10
-	-	-	-	-	-
-	-	-	-	-	-
31.46181	21.39815	-	-	-	-
-	-	16.7716	-	-	-
-	-	-	5.880952	-	-
-	-	-	-	-	-
-	-	-	-	1.228659	-
-	-	-	-	-	0.703448
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

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GeoResources, LLC

Grain Size Analysis

Project Number:	PacificRaceways.Pave	Date Sampled:	2/8/2007
Project Name:		Sampled by:	BPB
Client:		Date Tested	2/8/2007
Sample ID:	TP-6 S-1	Tested by:	DCB
Description:	Brn Sand w/ gravel (6-10')		

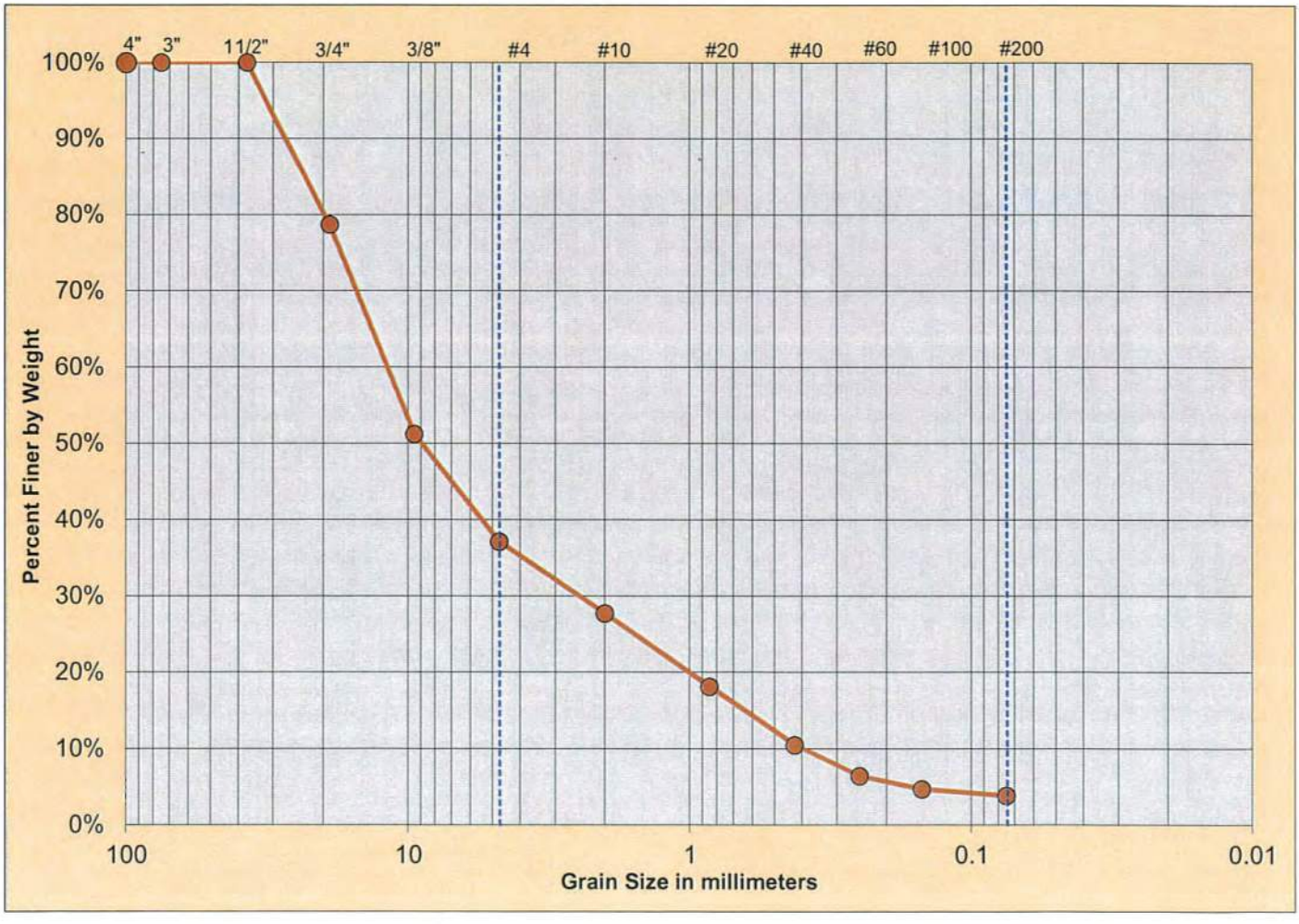
Screen	Weight Retained Individual	Weight Retained Cumulative	Percentage Retained	Percentage Passed	Specification Max.	Specification Min.	Summary	
4"		0.0		100.0%				
3"		0.0		100.0%				
1-1/2"		0.0		100.0%			21.3%	Coarse
3/4"	200.0	200.0	21.3%	78.7%			41.6%	Fine
3/8"	258.0	458.0	48.8%	51.2%			**62.9%**	**Gravel**
#4	132.0	590.0	62.9%	37.1%				
#10	88.0	678.0	72.3%	27.7%			9.4%	Coarse
#20	90.0	768.0	81.9%	18.1%			17.3%	Medium
#40	72.0	840.0	89.6%	10.4%			6.6%	Fine
#60	38.0	878.0	93.6%	6.4%			**33.3%**	**Sand**
#100	16.0	894.0	95.3%	4.7%				
#200	8.0	902.0	96.2%	3.8%			**3.8%**	**Fines**
Pan	0.0							

D_{85} = 24.49 D_{50} = 9.104 D_{15} = 0.6770
D_{60} = 12.549 D_{30} = 2.669 D_{10} = 0.4057
C_U = 30.9 C_C = 1.40

USCS Classification:

well graded GRAVEL w/ sand (GW)

Dust Ratio	0.367
Moisture %	6.8%
Sand Equivalent	



Revised on: 12-13-06

Input Data:

Wet + Tare	1184.0
Dry + Tare	1120.0
Tare	182.0
AW + Tare	1084.0
After Wash	902.0
- #200 %	4%
Dry Weight	938.0
Depth:	
Moisture	6.8%

Sieve Sizes	
4"	100
3"	75
1-1/2"	37.5
3/4"	19
3/8"	9.5
#4	4.75
#10	2
#20	0.85
#40	0.425
#60	0.25
#100	0.15
#200	0.075

Gravel - Sand	
4.75	0
4.75	100

Sand - Silt	
0.075	0
0.075	100

Parameters:

D 85	D 60	D 50	D 30	D 15	D 10
-	-	-	-	-	-
-	-	-	-	-	-
24.48525	-	-	-	-	-
-	12.54884	-	-	-	-
-	-	9.104167	-	-	-
-	-	-	2.66875	-	-
-	-	-	-	-	-
-	-	-	-	0.677049	-
-	-	-	-	-	0.405658
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Appendix “C”

Water Well Location Map & Logs

Approximate Site Location

(Imagery and Locations accessed from Google Earth)

Not to Scale

GEORESOURCES
earth science & geotechnical engineering
5007 Pacific Hwy E., Suite 16 | Fife, WA 98424 | 253.896.1011 | www.georesources.rocks

Well Locations

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.SiteDevP1.F.rev02	September 2017	Figure C-1

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W 20618

UNIQUE WELL I.D. # AAW835

Water Right Permit No. 21/5E/10A

(1) **OWNER:** Name Robert Bentler Address 3146 S 211th, Sea Tac, WA 98198

(2) **LOCATION OF WELL:** County King NE 1/4 NE 1/4 Sec 10 T. 21 N., R 5-E W.M.

(2a) **STREET ADDRESS OF WELL** (or nearest address) 148th SE & 308th, Kent

(3) **PROPOSED USE:** ☒ Domestic ☐ Industrial ☐ Municipal ☐ ☐ Irrigation ☐ Test Well ☐ Other ☐ ☐ DeWater

(4) **TYPE OF WORK:** Owner's number of well (If more than one) _____

Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐ Deepened ☐ Cable ☐ Driven ☐ Reconditioned ☐ Rotary ☒ Jetted ☐

(5) **DIMENSIONS:** Diameter of well 6 inches. Drilled 92 feet. Depth of completed well 92 ft.

(6) **CONSTRUCTION DETAILS:**

Casing installed: 6 " Diam. from 0 ft. to 92 ft.
Welded ☒
Liner installed ☐ _____ " Diam. from _____ ft. to _____ ft.
Threaded ☐ _____ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) **PUMP:** Manufacturer's Name _____
Type: _____ H.P. _____

(8) **WATER LEVELS:** Land-surface elevation above mean sea level _____ ft.
Static level 30 ft. below top of well Date 2-18-94
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) **WELL TESTS:** Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 40 gal./min. with stem set at 80 ft. for 2 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☒

(10) **WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION**

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Brown sand-gravel	0	6
Brown sand-gravel-clay	6	12
Tan gravel-sand-clay	12	25
Tan gravel-clay	25	47
Gray clay	47	60
Tan sand silty	60	65
Gray clay	65	72
Gray gravel clay	72	78
Gray water sand-gravel	78	92

RECEIVED
FEB 28 1994
DEPT. OF ECOLOGY

Work Started 2-17 19. Completed 2-18 1994

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Johnson Drilling Co., Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 19415 108th Ave SE Renton 98055

(Signed) Burl Johnson (WELL DRILLER) License No. 0233

Contractor's Registration No. JOHNSDC207SM Date 2-18 1994

(USE ADDITIONAL SHEETS IF NECESSARY)

ECL 050-1-20 (2/93)

Boart Longyear

Resource Protection Well Report

369567

21-5E-11M

Project Name Pacific Raceway

Date 9-20-06

Well Identification # ALK 322

County King 17 NW ¼ SW ¼

Drilling Method Air Rotary

Section 11 T. 21N R. 5E

Driller Charlie Smith

Street Address 31001 144TH Ave SE Kent, Wa

License # 2358

Start Card R 66928

Consulting Firm Holt Drilling

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	MONUMENT TYPE: Casing	0 - 25 ft. Brown silty sand & gravel
	CONCRETE SURFACE SEAL: 18' Bennoite Chips	25 - 38 ft. & gravel & sand silty
	PVC BLANK: Steel 6"	
	BACKFILL ft.	- ft.
	TYPE:	
	PVC SCREEN: Open bottom	- ft.
	SLOT SIZE:	
	TYPE:	- ft.
	GRAVEL PACK ft.	
	MATERIAL:	
	WELL DEPTH 25.	

REMARKS

RECEIVED
MAR 01 2010
Dept of Ecology
WR-NWRO

Signature

B

21/5/10R

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. 068952
Water Right Permit No.

(1) OWNER: Name HAWKINS, MRS Address 14715 SE 317 AUBURN, WA 98002-

(2) LOCATION OF WELL: County KING - SE 1/4 SE 1/4 Sec 10 T 21 N., R 5 WM
(2a) STREET ADDRESS OF WELL (or nearest address) 14715 SE 317

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 180 ft. Depth of completed well 180 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Dia. from 0 ft. to 180 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: NO
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Diam. slot size from ft. to ft.
Diam. slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 20 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off N/A

(7) PUMP: Manufacturer's Name
Type N/A H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 5 ft. below top of well Date 12/20/91
Artesian Pressure lbs. per square inch Date
Artesian water controlled by N/A

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? NO If yes, by whom?
Yield: gal./min with ft. drawdown after hrs.

Recovery data
Time Water Level Time Water Level Time Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 20 gal/min. w/ stem set at 60 ft. for 1.5 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
BROWN SAND & GRAVEL	0	10
BLUE SILT	10	110
BLUE WATER BEARING SILT	110	180

RECEIVED
DEC 24 1991
DEPT. OF ECOLOGY

Work started 12/19/91 Completed 12/20/91

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME NORTHWEST PUMP & DRILLING
(Person, firm, or corporation) (Type or print)

ADDRESS 3245 AUBURN WAY SOUTH

[SIGNED] Tom Fellows License No. 1913

Contractor's
Registration No. NORTHPD137PQ Date 12/20/91

DEPARTMENT OF ECOLOGY
State of Washington

Water Well Report

Asterisks (*) Indicates Required Field.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

*Notice of Intent Number W357024

*Unique Ecology Well ID Tag Number AFJ-571

Water Right Permit Number 0

*Property Owner Name Yevgeniy Istomin

*Well Street Address 30225 152nd Ave SE

*City Kent *County King

*Location SW 1/4-1/4 SW 1/4 Twn 21 R 5 Sec 2 EWM ■ or WWM ☐

Latitude Lat Deg ____ Lat Min/Sec ____

Longitude Long Deg ____ Long Min/Sec ____

*Tax Parcel No. 022105-9021

*Construction/Decommission

■ Construction

☐ Decommission *Original Installation*

Notice of Intent Number ____

*Proposed Use: ■ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other ____

*Type of work: Owner's number of well (if more than one) ____

■ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ■ Rotary ☐ Jetted

*Dimensions: Diameter of well 6 inches, drilled 173 ft.

Depth of completed well 173 ft.

*Construction Details

Casing Installed: ■ Welded 6" Diameter from +1 ft. to 173 ft.

☐ Liner installed ____" Diameter from ____ ft. to ____ ft.

☐ Threaded ____" Diameter from ____ ft. to ____ ft.

*Perforations: ☐ Yes ■ No

Type of perforator used ____

Size of perforators ____ in. by ____ in. and

Number of perforators ____ from ____ ft. to ____ ft.

*Screens: ☐ Yes ■ No ☐ K-Pac Location ____

Manufacturer's Name ____

Type ____ Model No. ____

Diameter ____ Slot size ____ from ____ ft. to ____ ft.

Diameter ____ Slot size ____ from ____ ft. to ____ ft.

*Gravel/Filter packed: ☐ Yes ■ No Size of gravel/sand ____

Materials placed from ____ ft. to ____ ft.

*Surface Seal: ■ Yes ☐ No To what depth? 18 ft.

Material used in seal bentonite

Did any strata contain unusable water? ☐ Yes ■ No

Type of water? ____ Depth of strata ____

Method of sealing strata off ____

*Pump: Manufacturer's Name ____

Type: ____ H.P. ____

*Water Levels: Land-surface elevation above mean sea level ____ ft.

Static level 130 ft. below top of well Date 4-30-2015

Artesian pressure ____ lbs. per square inch Date ____

Artesian water is controlled by ____ (cap, valve, etc.)

*Well Tests: Drawdown is amount water level is lowered below static level

*Was a pump test made? ☐ No ■ Yes If yes, by whom? ____

Yield: ____ gallon/minute with ____ ft. drawdown after ____ hrs.

Yield: ____ gallon/minute with ____ ft. drawdown after ____ hrs.

Yield: ____ gallon/minute with ____ ft. drawdown after ____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

*Time	Water Level	Time	Water Level	Time	Water Level

*Date of test ____

*Bailer test ____ gallon/minute with ____ ft. drawdown after ____ hrs.

*Airtest 15 gallon/minute with stem set at 166 ft. for 2 hrs.

*Artesian flow ____ gpm *Date ____

*Temperature of water ____ *Was a chemical analysis made? ☐ Yes ■ No

***Construction Or Decommission Procedure**

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Use additional sheets if necessary.

Material	From	To
Surface	0	3
Clay-gravel-brown	3	11
Hardpan-gray	11	71
Clay-gray	71	90
Sand brown	90	94
Clay-gray	94	160
Sand-gray-fine-water	160	173
Hardpan-gray	173	–

RECEIVED
JUN 15 2015
DEPT OF ECOLOGY
NWRO - WR

*Start Date 4-22-2015 *Completed Date 4-30-2015

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

*■ Driller ☐ Engineer ☐ Trainee Name (Print) Brad Johnson

*Driller/Engineer/Trainee Signature Brad Johnson

*Driller or trainee License Number 0233

*If Trainee: Driller's License Number

*Driller's Signature

*Drilling Company Johnson Drilling Co., Inc

*Address 19415 108th Ave SE

*City, State, Zip Renton, WA 98055

Contractor's Registration Number JOHNSDC207JA *Date 4-30-2015

21/SE/10 R

B

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. [redacted]
Water Right Permit No

(1) OWNER: Name JACKSON, DEE Address 14417 SE 317 AUBURN, WA 98002-

(2) LOCATION OF WELL: County KING - SE 1/4 SE 1/4 Sec 10 T 21 N., R 5 WM
(2a) STREET ADDRESS OF WELL (or nearest address) 14417 SE 317

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 80 ft. Depth of completed well 80 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Dia. from 0 ft. to 80 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: NO
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Diam. slot size from ft. to ft.
Diam. slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 20 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off N/A

(7) PUMP: Manufacturer's Name
Type N/A H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level ft. below top of well Date / /
Artesian Pressure 2 lbs. per square inch Date 01/02/92
Artesian water controlled by VALVE

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? NO If yes, by whom?
Yield: gal./min with ft. drawdown after hrs.

Recovery data
Time Water Level Time Water Level Time Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 8 gal/min. w/ stem set at 40 ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
BROWN TOPSOIL	0	15
BLUE SILT	15	70
BLUE SILTY SAND	70	80

[redacted]
FEB 5 19[redacted]
DEPT. OF ECOLOGY

Work started 12/30/91 Completed 01/02/92

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME NORTHWEST PUMP & DRILLING
(Person, firm, or corporation) (Type or print)

ADDRESS 3245 AUBURN WAY SOUTH

[SIGNED] Tom Fogley License No. 1913

Contractor's
Registration No. NORTHPD137PQ Date 01/07/92

ENTERED

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W 064769
Unique Well I.D.
Water Right Permit No.

(1) OWNER: Name KING, JASON Address PO BOX 1575 SUMNER, WA 98390- 21-5E-3R

(2) LOCATION OF WELL: County KING - SE 1/4 SE 1/4 Sec 3 T 21 N., R 5 WM
(2a) STREET ADDRESS OF WELL (or nearest address) 30251 148 AVE SE, KENT

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 180 ft. Depth of completed well 180 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Dia. from 0 ft. to 180 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: YES
Type of perforator used ROTARY STAR
SIZE of perforations 3/16 in. by 1 in.
100 perforations from 57 ft. to 62 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Diam. slot size from ft. to ft.
Diam. slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off N/A

(7) PUMP: Manufacturer's Name
Type N/A H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 30 ft. below top of well Date 02/14/96
Artesian Pressure lbs. per square inch Date
Artesian water controlled by N/A

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? NO If yes, by whom?
Yield: gal./min with ft. drawdown after hrs.

Recovery data

Time	Water Level	Time	Water Level	Time	Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 20 gal/min. w/ stem set at 60 ft. for 2 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
BROWN CEMENTED SAND & GRAVEL	0	50
WATER BEARING SAND & GRAVEL	50	62
BLUE SILT	62	67
BLUE SILTY SAND W/OCC GRAVEL	67	85
BLUE SILT	85	90
BROWN SILTY SAND	90	106
BLUE SILTY SAND W/OCC GRAVEL	106	180

RECEIVED
MAR 06 1996
DEPT. OF ECOLOGY

Work started 02/09/96 Completed 02/14/96

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME NORTHWEST PUMP & DRILLING
(Person, firm, or corporation) (Type or print)

ADDRESS 3245 AUBURN WAY SOUTH

[SIGNED] [signature] License No. 0097

Contractor's Registration No. NORTHPD137PO Date 02/22/96

371712

21-5E-10G

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

Construction/Decommission *("x" in circle)*

- ⊕ Construction
- ○ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

CURRENT
Notice of Intent No. W2C7779
Unique Ecology Well ID Tag No. BAA-C08
Water Right Permit No. -0-
Property Owner Name Pacific Grand Prix
Well Street Address 31001 144th Ave SE
City Kent County King
Location SW 1/4-1/4 NE 1/4 Sec 10 Twn 21 R 5 (EWM or WWM) circle one
Lat/Long (s, t, r Still **REQUIRED**) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____
Tax Parcel No. 102105-9002

PROPOSED USE: ☐ DeWater ☒ Domestic ☒ Irrigation ☐ Industrial ☐ Test Well ☐ Municipal ☐ Other (½ ACRE, 5,000 gpd or less)

TYPE OF WORK: Owner's number of well (if more than one) _____
☒ New well ☐ Reconditioned ☐ Deepened *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 67 ft.
Depth of completed well 67 ft.

CONSTRUCTION DETAILS
Casing Installed: ☒ Welded 6" Diam. from 0 ft. to 67 ft.
☐ Liner installed _____" Diam. from _____ ft. to _____ ft.
☐ Threaded _____" Diam. from _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No
Type of perforator used _____
SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location _____
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand _____
Materials placed from _____ ft. to _____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft.
Material used in seal bentonite
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 37 ft. below top of well Date 3-18-10
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☒ No If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 20 gal./min. with stem set at 10 ft. for 1 1/2 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? ☐ Yes ☒ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Surface sand-gravel	0	6
Hardpacked gravel	6	17
Clay-sandy tan	17	26
Hardpacked sand-gravel	26	41
Sand-gravel-brown	41	48
clay-gray	48	59
Sand-gravel-water brown	59	67

RECEIVED
DEPARTMENT OF ECOLOGY
MAR 25 2010
WATER RESOURCES PROGRAM
NWRO

Start Date 3-16-10 Completed Date 3-18-10

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Brad Johnson
Driller/Engineer/Trainee Signature _____
Driller or trainee License No. 0233

Drilling Company Johnson Drilling Co., Inc
Address 19415 108th Ave SE
City, State, Zip Renton, WA 98055
Contractor's Registration No JOHNSOC207QM Date 3-18-10

If TRAINEE,
Driller's Licensed No. _____
Driller's Signature _____

Ecology is an Equal Opportunity Employer.

ECY 050-1-20 (Rev 3/05) **The Department of Ecology does NOT warranty the Data and/or Information on this Well Report.**

21-5E 3R

WATER WELL REPORT

STATE OF WASHINGTON ECOLOGY — Original & 1st copy - Ecology, 2nd copy - owner, 3rd copy - driller

Construction/Decommission ("x" in circle)
☒ Construction 181896
○ Decommission *ORIGINAL CONSTRUCTION Notice of Intent Number*

CURRENT Notice of Intent No. W184313

Unique Ecology Well ID Tag No. AAG 588

Water Right Permit No. N/A

Property Owner Name JERRY PURDOM

Well Street Address 30245 148TH AVE SE.

City KENT County: KING

Location SE 1/4- 1/4 SE 1/4 Sec 3 Twn 21N R 5E (EWM) or WWM *circle one*

Lat/Long: (s,t,r still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 0321059037

PROPOSED USE: ☒ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other

TYPE OF WORK: Owner's number of well (if more than one)
☒ New Well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 121 ft.
Depth of completed well 120 ft.

CONSTRUCTION DETAILS
Casing Installed: ☒ Welded 6" Diam. from 0 ft. to 112 ft.
☐ Liner installed _____" Diam. from _____ ft. to _____ ft.
☐ Threaded _____" Diam. from _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No
Type of perforator used
SIZE of perfs ____ in. by ____ in. and no. of perfs ____ from ____ ft. to ____ ft.

Screens: ☒ Yes ☐ No ☒ K-Pac Location 10?
Manufacturer's Name
Type Model No.
Diam. 5 Slot Size 15 from 118 ft. to 113 ft.
Diam. ____ Slot Size ____ from ____ ft. to ____ ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand
Materials placed from ____ ft. to ____ ft.

Surface Seal: ☒ Yes ☐ No To what depth? 18 ft
Materials used in seal Bentonite Chips
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

PUMP: Manufacturer's Name
Type: H.P.

WATER LEVELS: Land-surface elevation above mean sea level ____ ft.
Static level 51 ft. below top of well Date 7-31-04
Artesian pressure ____ lbs. per square inch Date
Artesian water is controlled by (cap,valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? ☐ Yes ☐ No If yes, by whom?
Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.
Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.
Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.
Recovery data (time taken as zero when pump turned off)(water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test ____ gal./min. with ____ ft. drawdown after ____ hrs.
Airtest 8 gal./min. with stem set at 100 ft. for 1 hrs.
Artesian flow ____ g.p.m. Date
Temperature of water ____ Was a chemical analysis made? ☐ Yes ☐ No

CONSTRUCTION OR DECOMMISSION PROCEDURE
Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
silty sand	0	10
Brown silty gravel	10	50
grey silty gravel	50	60
grey clay	60	88
Sand water @ 91m	88	121

RECEIVED
OCT 12 2005
DEPT OF ECOLOGY

Start Date 7-29-04 Completed Date 7-31-04

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Charlie Smith
Driller/Engineer/Trainee Signature
Driller or Trainee License No. 2359

Drilling Company HOLT DRILLING INC.
Address PO Box 1890
City, State, Zip MILTON WA. 98354
Contractor's Registration No. HOLTDI*13 606 Date 8-7-04

If trainee, licensed driller's Signature and License no.

Ecology is an Equal Opportunity Employer. ECY 050-1-20 (Rev 4/01)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Appendix “D”

CAD (Critical Area Determination Documents)

King County
Department of Permitting and Environmental Review
35030 SE Douglas Street, Suite 210
Snoqualmie, WA 98065-9266
206-296-6600 TTY: Relay: 711
www.kingcounty.gov

Critical Areas Designation Application

For alternate formats, call 206-296-6600.

Background/General Information

The critical areas designation process establishes conditions and constraints on site development (King County Code (KCC) 21A.24.500). Through this process a property owner can establish a site plan that will be vested for a period of five years. The scope of the process can be adapted to meet the property owner's needs. Options include:

1. Limited Scope Critical Areas Designations – address only a portion of the property, as requested by the applicant.
2. Comprehensive Critical Areas Designations – address all critical areas in the proposed development area.

For more information, see Permitting Customer Information Bulletin 21, *Critical Areas Review*, available via the Department of Permitting and Environmental Review (Permitting) Web site at www.kingcounty.gov/permits, or request a copy of the bulletin by telephone at 206-296-6600.

Application Requirements

The following information is required at the time a Critical Areas Designation is requested:

1. A completed Critical Areas Designation Application Form. (See page 2 of this document.)
2. If the request for site designation is for less than the entire parcel, clearly show the area to be evaluated on the site plan.
3. Fees. Fees vary with the quantity of parcels included in the application and the type of critical areas present on the parcels. A minimum fee amount of $1,379 per parcel is due at application submittal. The fees may be adjusted based upon the findings of site visits or County review of consultant studies or other parcel information that confirm either the absence of any critical area or the presence of critical areas that requires review by multiple disciplines. Any additional fees due must be paid prior to receiving formal designation. Any excess fees paid will be refunded upon completion of formal designation.

If available, please submit any surveys of the site or special studies, including site plans showing the location of features, geotechnical studies, or wetland reports.

Site preparation

Prior to application, the property boundaries must be clearly flagged. If the site designation request is for only a portion of the property, the boundaries of the area covered by the request must be flagged prior to the initial site investigation. Failure to clearly flag the property may result in increased costs and delays in completing the site designation.

Critical Areas Designation Application

For Permitting Use - Application Number assigned: _____

Parcel Number: 1021059003 **(one parcel per application)**

Address of proposed work: 31001 - 144th Avenue SE, Kent, WA 98042 ☐ address not assigned yet
(if not assigned yet, check box at right)

Related permit number(s): _____

Provide a brief description of the purpose of site designation:

Commercial site development on parcels PN: 1021059003 and 1021059035.

Portion of parcel to evaluate:
☒ The entire parcel
☐ Only a portion of the property (*must* include site plan showing specific location of review. Include all areas within 200 feet of any proposed development within the area for review.)

Property Owner: Race Track LLC - Pacific Raceways

Phone: 253-636-5927 E-mail: _____

Mailing Address: 31001 - 144th Ave SE City: Kent St: WA Zip: 98042

Applicant Name: Pacific Raceways

Phone: 253-636-5927 E-mail: _____

Mailing Address: 31001 - 144th Ave SE City: Kent St: WA Zip: 98042

Contact/Agent Name: GeoResources, LLC - Brad Biggerstaff

Phone: 253-896-1011 E-mail: bradb@georesources.us

Mailing Address: 5007 Pacific Hwy E, Ste 16 City: Fife St: WA Zip: 98424

Critical Area Compliance:

The undersigned applicant declares:

I am the legal owner of this parcel, or have obtained permission from the legal owner for King County staff to access the site.

I certify under penalty of perjury and under the laws of the State of Washington the forgoing is true and correct. **I accept financial responsibility for all fees** associated with this permit, approval or application and will receive any refunds. Please mail any refunds to the address above. I also understand that signing and submitting this application authorizes Permitting staff to inspect the site at any reasonable time for the purpose of reviewing this application.

Applicant Signature: _____ Date: 11/7/17

Approximate Site Location

(map created from King County iMap http://gismaps.kingcounty.gov/iMap/)

Subject Site

Approximate Proposed Commercial Development Areas

N W E S

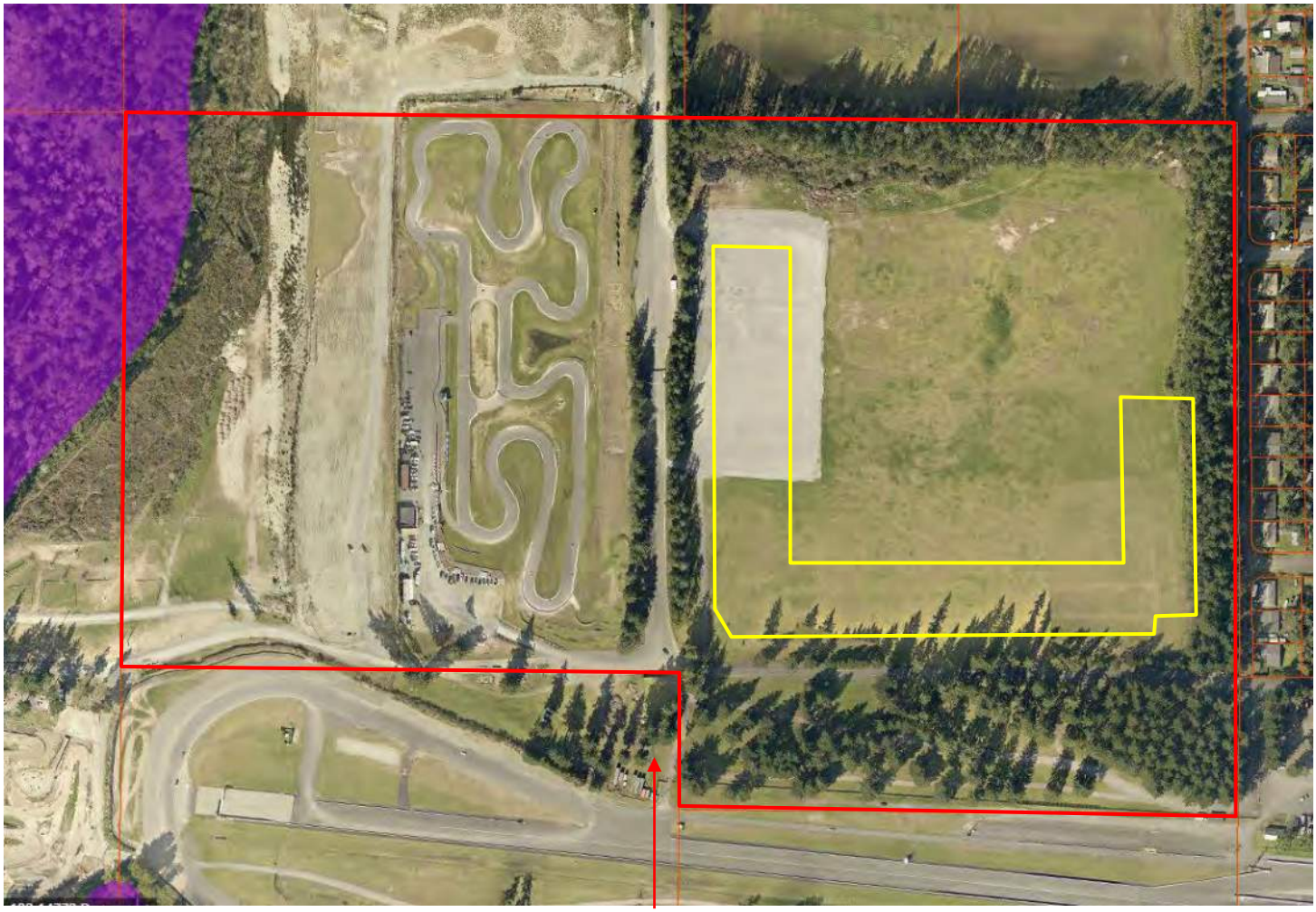
Not to Scale

GEORESOURCES
earth science & geotechnical engineering
5007 Pacific Hwy E., Suite 16 | Fife, WA 98424 | 253.896.1011 | www.georesources.rocks

Site Location Map

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.003.CAD.F	November 2017	Figure D-1



Approximate Site Location

(map created from King County iMap http://gismaps.kingcounty.gov/iMap/)

Subject Parcel – PN: 1021059003

Potential Landslide Hazard areas (2016)

Approximate Proposed Commercial Development Area

N W E S

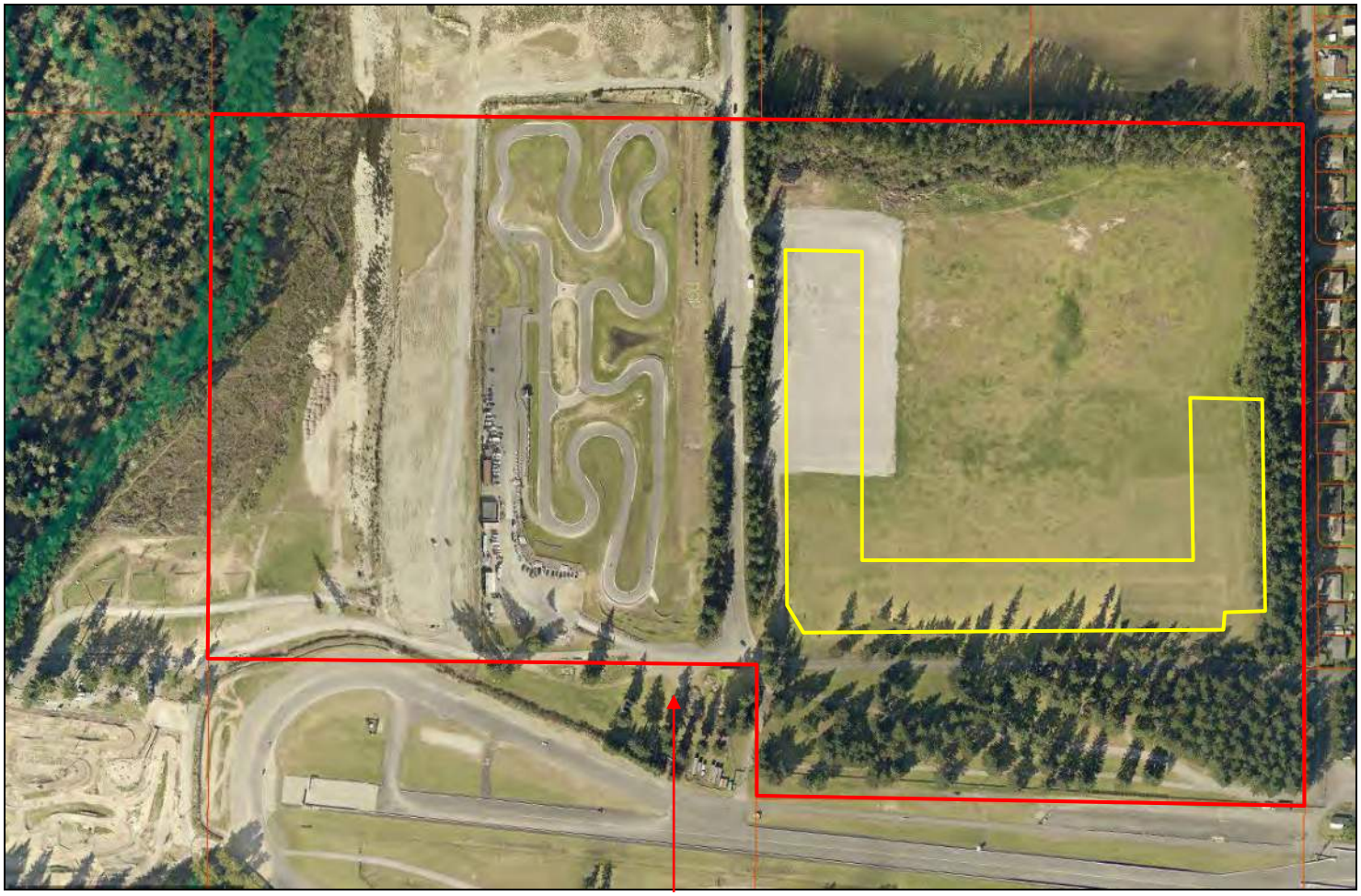
Not to Scale

GEORESOURCES
earth science & geotechnical engineering
5007 Pacific Hwy E., Suite 16 | Fife, WA 98424 | 253.896.1011 | www.georesources.rocks

Potential Landslide Hazard Areas

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.003.CAD.F	November 2017	Figure D-2



Approximate Site Location

(map created from King County iMap http://gismaps.kingcounty.gov/iMap/)

Subject Parcel – PN: 1021059003

Potential Steep Slope Hazard areas (2016)

Approximate Proposed Commercial Development Area

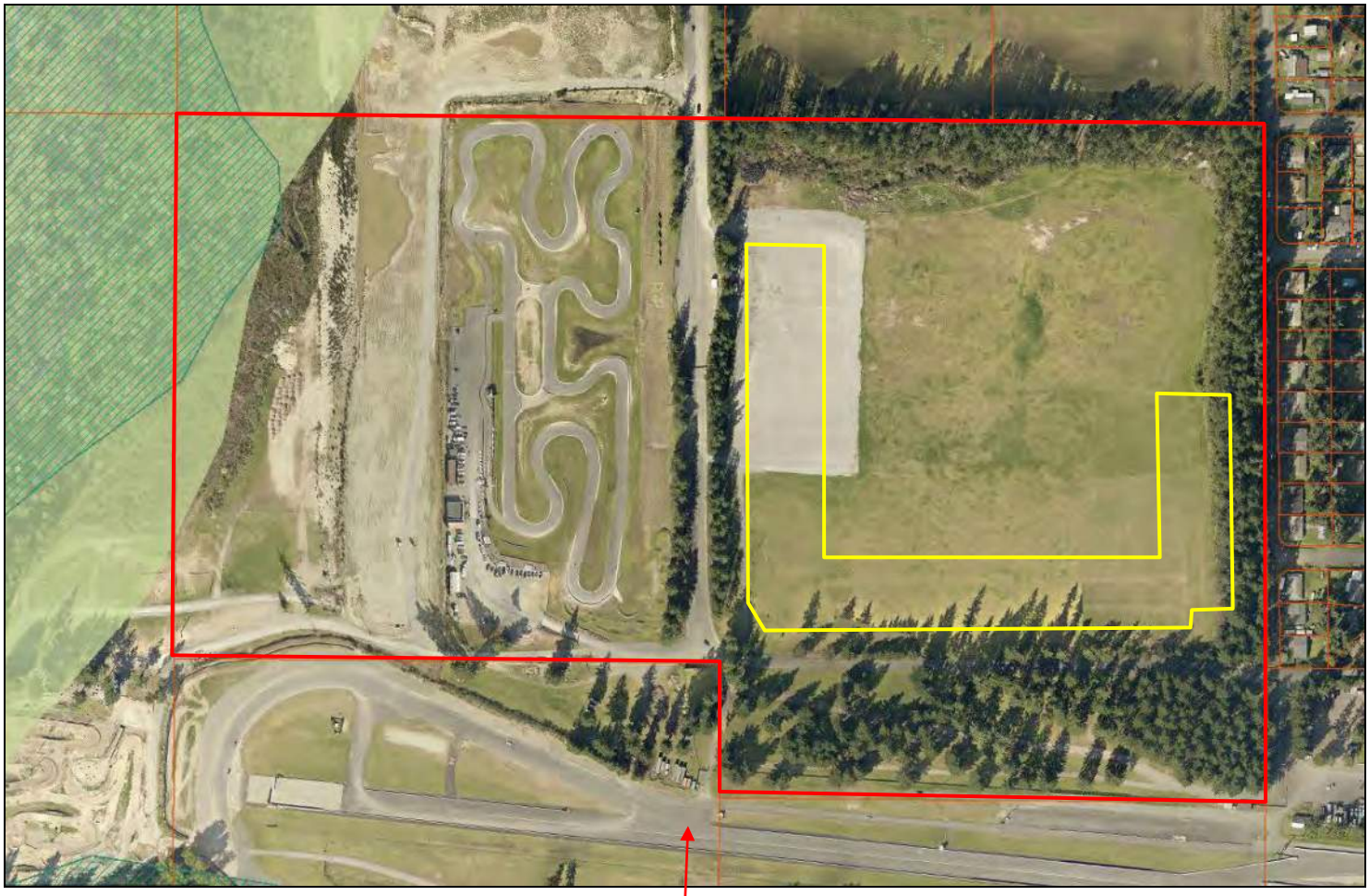
Not to Scale

GEORESOURCES
earth science & geotechnical engineering
5007 Pacific Hwy E., Suite 16 | Fife, WA 98424 | 253.896.1011 | www.georesources.rocks

Potential Steep Slope Hazard Areas

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.003.CAD.F	November 2017	Figure D-3



Approximate Site Location

(map created from King County iMap http://gismaps.kingcounty.gov/iMap/)

- Subject Parcel – PN: 1021059003
- Landslide Hazard (1990)
- Erosion Hazard (1990)
- Seismic Hazard (1990)
- Approximate Proposed Commercial Development Area

N W E S

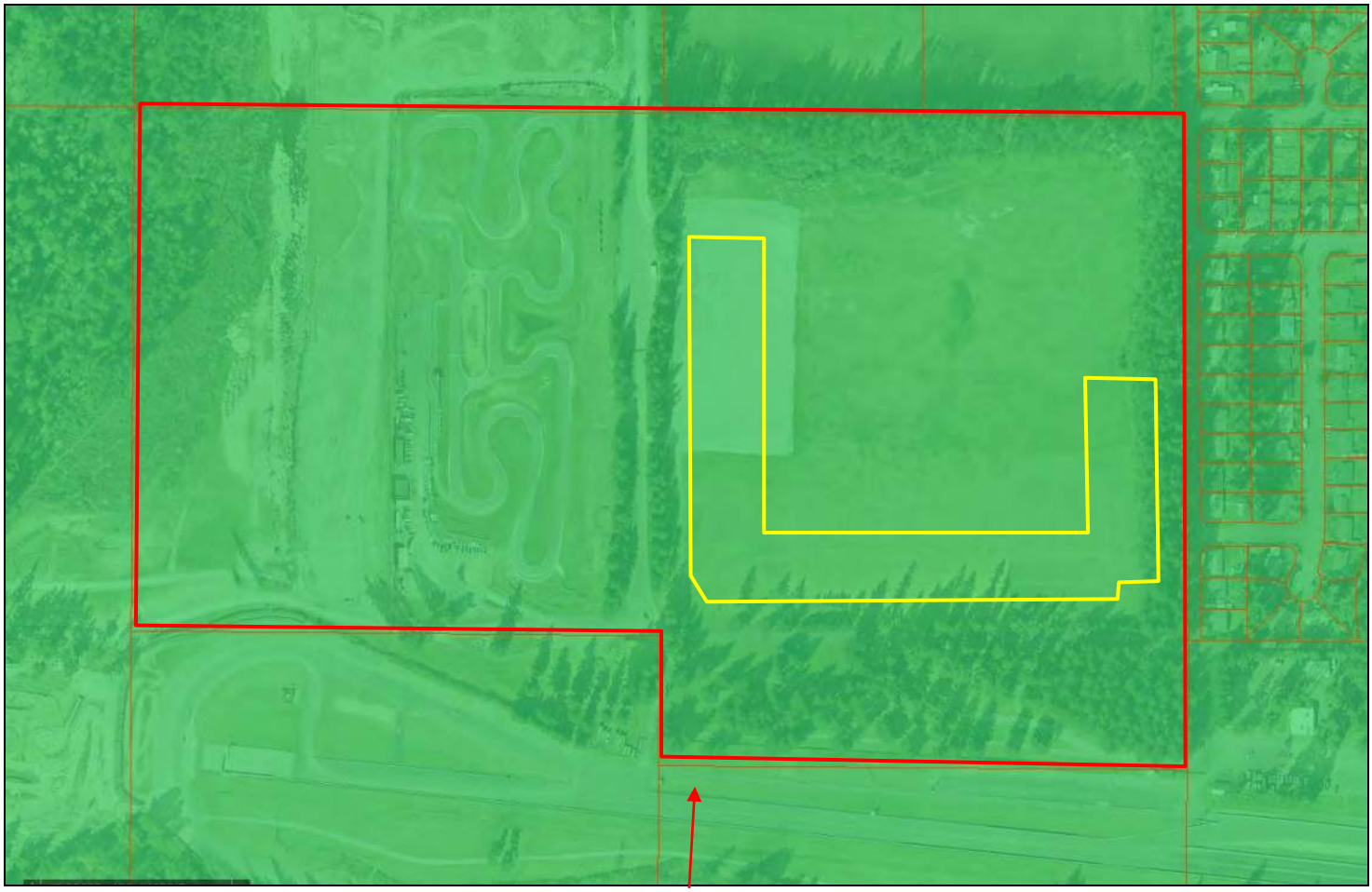
Not to Scale

GEORESOURCES
earth science & geotechnical engineering
5007 Pacific Hwy E., Suite 16 | Fife, WA 98424 | 253.896.1011 | www.georesources.rocks

Critical Areas

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.003.CAD.F	November 2017	Figure D-4



Approximate Site Location

(map created from King County iMap http://gismaps.kingcounty.gov/iMap/)

Subject Parcel – PN: 1021059003

Critical Aquifer Recharge Area

Approximate Proposed Commercial Development Area

Not to Scale

GEORESOURCES

earth science & geotechnical engineering

5007 Pacific Hwy E., Suite 16 | Fife, WA 98424 | 253.896.1011 | www.georesources.rocks

Critical Aquifer Recharge Area

Proposed Commercial Development

31001 – 144th Avenue SE

King County, Washington

Doc ID: PacificRaceways.003.CAD.F	November 2017	Figure D-5

King County
Department of Permitting and Environmental Review
35030 SE Douglas Street, Suite 210
Snoqualmie, WA 98065-9266
206-296-6600 TTY: Relay: 711
www.kingcounty.gov

Critical Areas Designation Application

For alternate formats, call 206-296-6600.

Background/General Information

The critical areas designation process establishes conditions and constraints on site development (King County Code (KCC) 21A.24.500). Through this process a property owner can establish a site plan that will be vested for a period of five years. The scope of the process can be adapted to meet the property owner's needs. Options include:

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Application Requirements

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1. A completed Critical Areas Designation Application Form. (See page 2 of this document.)
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Site preparation

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Critical Areas Designation Application

For Permitting Use - Application Number assigned: _____

Parcel Number: 1021059035 **(one parcel per application)**

Address of proposed work: 31001 - 144th Avenue SE, Kent, WA 98042 ☐ address not assigned yet
(if not assigned yet, check box at right)

Related permit number(s): _____

Provide a brief description of the purpose of site designation:

Commercial site development on the parcels PN: 1021059003 and 1021059035.

Portion of parcel to evaluate:
☒ The entire parcel
☐ Only a portion of the property (*must* include site plan showing specific location of review. Include all areas within 200 feet of any proposed development within the area for review.)

Property Owner: Race Track LLC - Pacific Raceways

Phone: 253-636-5927 E-mail: _____

Mailing Address: 31001 - 144th Ave SE City: Kent St: WA Zip: 98042

Applicant Name: Pacific Raceways

Phone: 253-636-5927 E-mail: _____

Mailing Address: 31001 - 144th Ave SE City: Kent St: WA Zip: 98042

Contact/Agent Name: GeoResources, LLC - Brad Biggerstaff

Phone: 253-896-1011 E-mail: bradb@georesources.us

Mailing Address: 5007 Pacific Hwy E, Ste 16 City: Fife St: WA Zip: 98424

Critical Area Compliance:

The undersigned applicant declares:

I am the legal owner of this parcel, or have obtained permission from the legal owner for King County staff to access the site.

I certify under penalty of perjury and under the laws of the State of Washington the forgoing is true and correct. **I accept financial responsibility for all fees** associated with this permit, approval or application and will receive any refunds. Please mail any refunds to the address above. I also understand that signing and submitting this application authorizes Permitting staff to inspect the site at any reasonable time for the purpose of reviewing this application.

Applicant Signature: _____ Date: 11/10/17

Approximate Site Location

(map created from King County iMap http://gismaps.kingcounty.gov/iMap/)

Subject Site

Approximate Proposed Commercial Development Areas

N W E S

Not to Scale

GEORESOURCES
earth science & geotechnical engineering
5007 Pacific Hwy E., Suite 16 | Fife, WA 98424 | 253.896.1011 | www.georesources.rocks

Site Location Map

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.035.CAD.F	November 2017	Figure D-1

Approximate Site Location

(map created from King County iMap http://gismaps.kingcounty.gov/iMap/)

Subject Parcel – PN: 1021059035

Potential Landslide Hazard areas (2016)

Approximate Proposed Commercial Development Area

N W E S

Not to Scale

GEORESOURCES

earth science & geotechnical engineering

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Potential Landslide Hazard Areas

Proposed Commercial Development

31001 – 144th Avenue SE

King County, Washington

Doc ID: PacificRaceways.035.CAD.F	November 2017	Figure D-2

Approximate Site Location

(map created from King County iMap http://gismaps.kingcounty.gov/iMap/)

Subject Parcel – PN: 1021059035

Potential Steep Slope Hazard areas (2016)

Approximate Proposed Commercial Development Area

Not to Scale

GEORESOURCES
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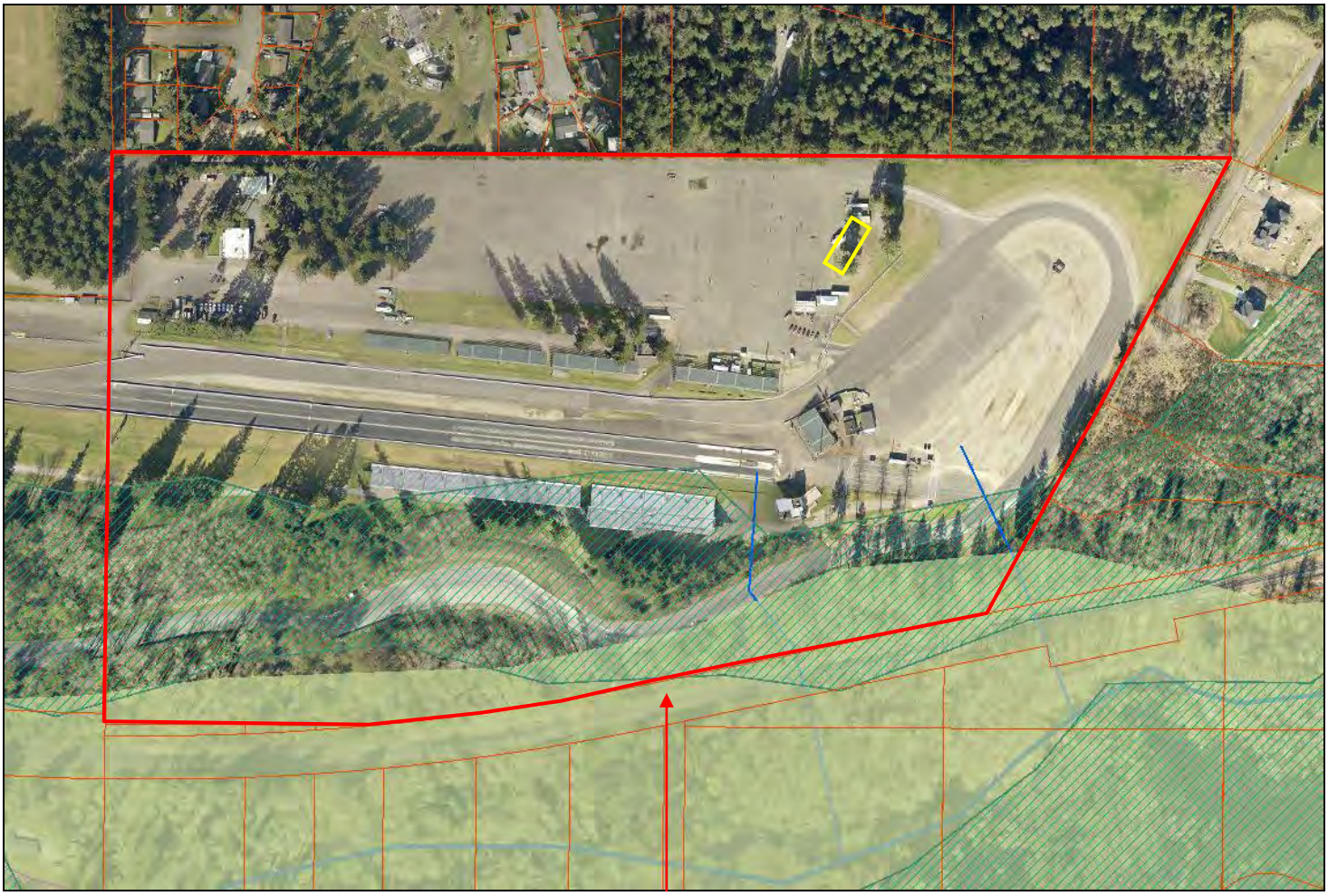
Potential Steep Slope Hazard Areas

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.035.CAD.F	November 2017	Figure D-3



Approximate Site Location

(map created from King County iMap http://gismaps.kingcounty.gov/iMap/)

- Subject Parcel – PN: 1021059035
- Landslide Hazard (1990)
- Erosion Hazard (1990)
- Seismic Hazard (1990)
- Approximate Proposed Commercial Development Area

N W E S

Not to Scale

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Critical Areas

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.035.CAD.F	November 2017	Figure D-4

Approximate Site Location

(map created from King County iMap http://gismaps.kingcounty.gov/iMap/)

Subject Parcel – PN: 1021059035

Critical Aquifer Recharge Area

Approximate Proposed Commercial Development Area

Not to Scale

GEORESOURCES
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Critical Aquifer Recharge Area

Proposed Commercial Development
31001 – 144th Avenue SE
King County, Washington

Doc ID: PacificRaceways.035.CAD.F	November 2017	Figure D-5

Appendix “E”

Mounding Analysis Results

MODRET

SUMMARY OF UNSATURATED & SATURATED INPUT PARAMETERS

PROJECT NAME : Pacific Race Site Development
MANUAL RUNOFF DATA USED
UNSATURATED ANALYSIS EXCLUDED

Pond Bottom Area	53,250.00 ft²
Pond Volume between Bottom & DHWL	213,000.00 ft³
Pond Length to Width Ratio (L/W)	2.00
Elevation of Effective Aquifer Base	255.00 ft
Elevation of Seasonal High Groundwater Table	286.00 ft
Elevation of Starting Water Level	286.00 ft
Elevation of Pond Bottom	308.00 ft
Design High Water Level Elevation	312.00 ft
Avg. Effective Storage Coefficient of Soil for Unsaturated Analysis	0.28
Unsaturated Vertical Hydraulic Conductivity	40.00 ft/d
Factor of Safety	2.00
Saturated Horizontal Hydraulic Conductivity	80.00 ft/d
Avg. Effective Storage Coefficient of Soil for Saturated Analysis	0.28
Avg. Effective Storage Coefficient of Pond/Exfiltration Trench	0.40

Hydraulic Control Features:

	Top	Bottom	Left	Right
Groundwater Control Features - Y/N	N	N	N	N
Distance to Edge of Pond	0.00	0.00	0.00	0.00
Elevation of Water Level	0.00	0.00	0.00	0.00
Impervious Barrier - Y/N	N	N	N	N
Elevation of Barrier Bottom	0.00	0.00	0.00	0.00

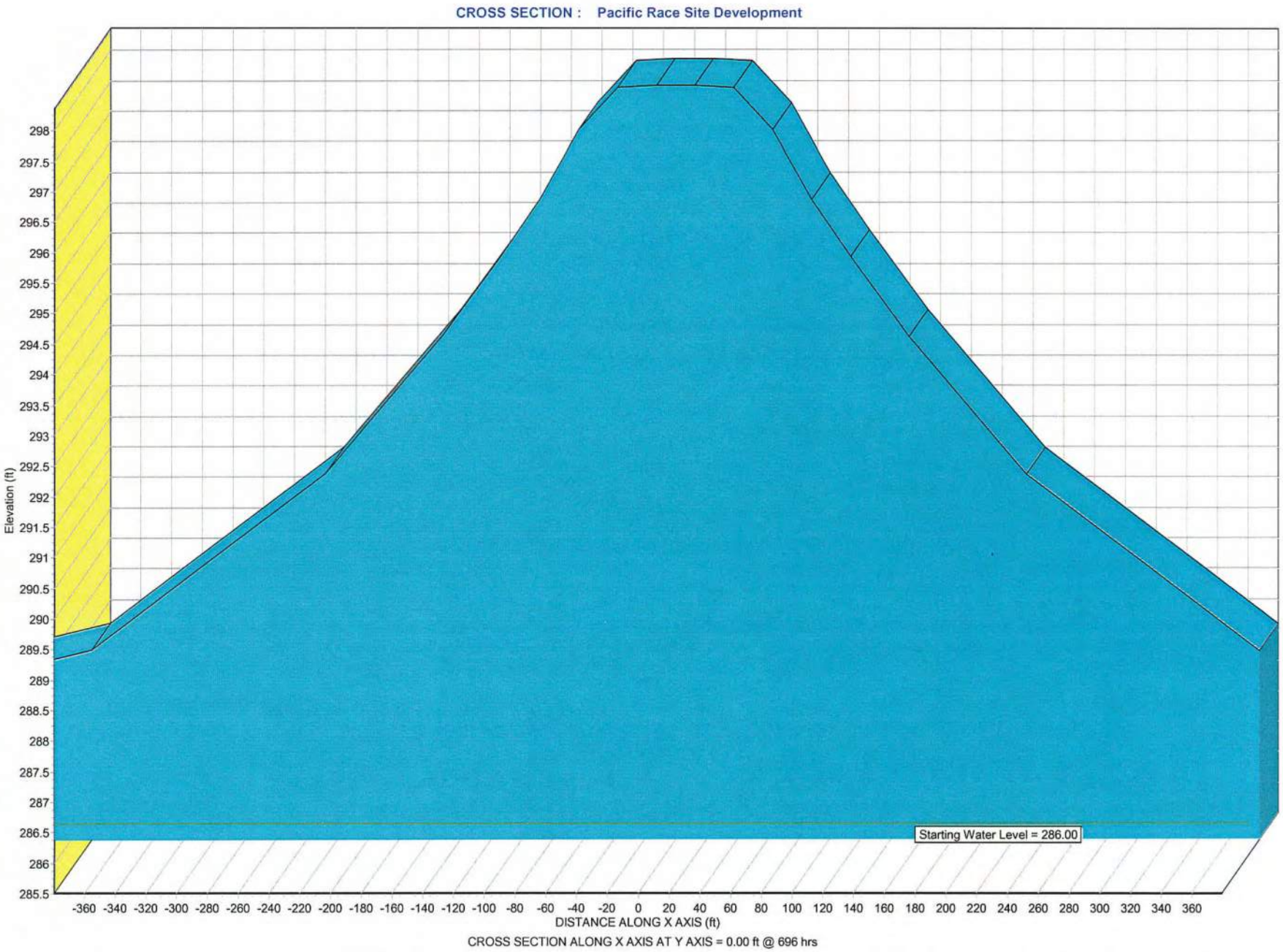
Analysis Date: 9/14/2017

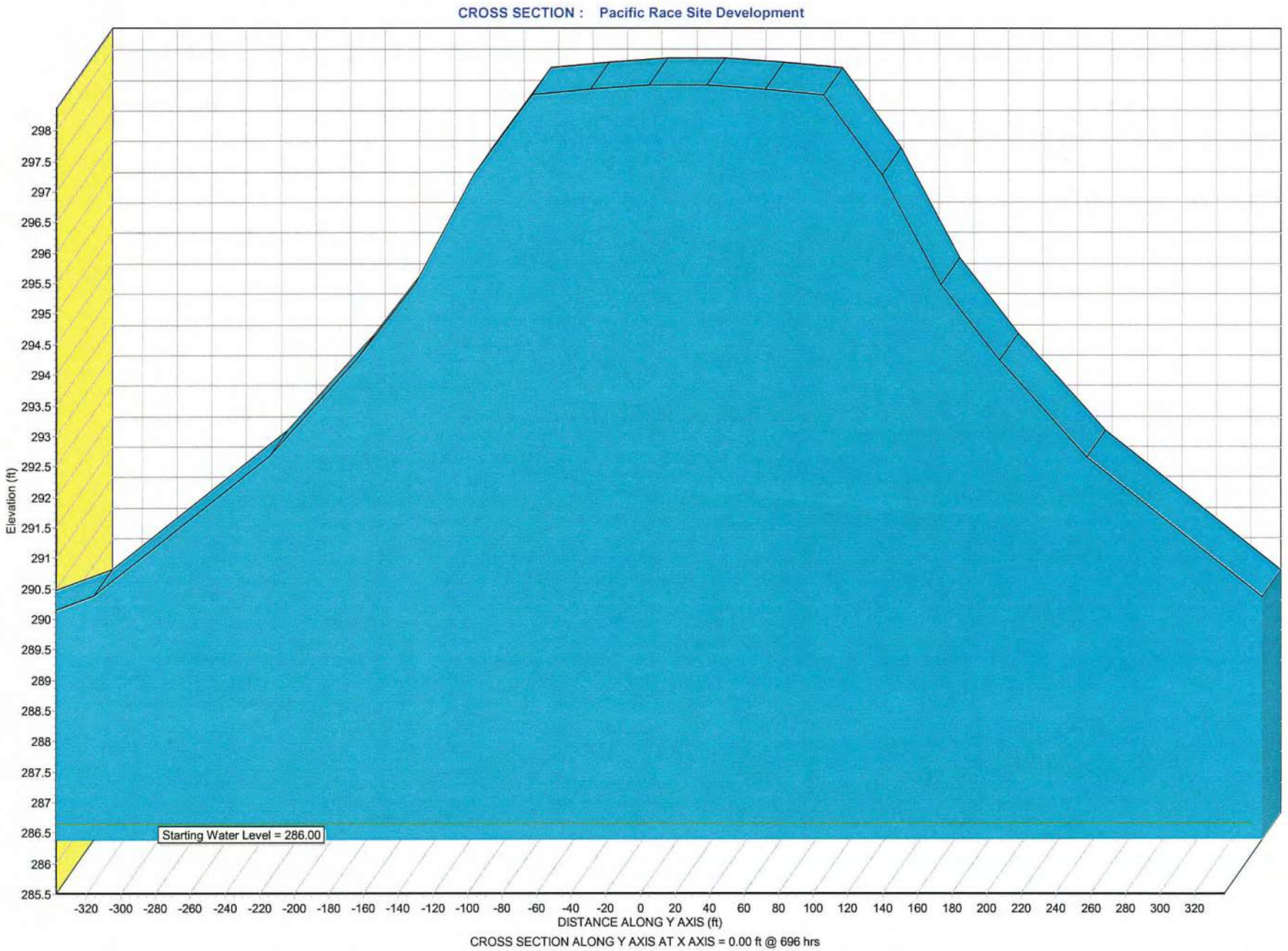
MODRET

TIME - RUNOFF INPUT DATA

PROJECT NAME: PACIFIC RACE SITE DEVELOPMENT

STRESS PERIOD NUMBER	INCREMENT OF TIME (hrs)	VOLUME OF RUNOFF (ft^3)
Unsat	24.00	0.00
1	24.00	32,689.00
2	24.00	64,678.00
3	24.00	43,988.00
4	24.00	19,934.00
5	24.00	29,694.00
6	24.00	23,823.00
7	24.00	38,901.00
8	24.00	103,947.00
9	24.00	44,661.00
10	24.00	25,759.00
11	24.00	51,176.00
12	24.00	47,038.00
13	24.00	21,317.00
14	24.00	10,359.00
15	24.00	5,152.00
16	24.00	2,580.00
17	24.00	1,281.00
18	24.00	617.00
19	24.00	27,869.00
20	24.00	54,798.00
21	24.00	39,021.00
22	24.00	13,409.00
23	24.00	6,562.00
24	24.00	19,409.00
25	24.00	76,226.00
26	24.00	118,739.00
27	24.00	316,118.00
28	24.00	140,728.00
29	24.00	76,926.00


CROSS SECTION : Pacific Race Site Development
Elevation (ft)
298
297.5
297
296.5
296
295.5
295
294.5
294
293.5
293
292.5
292
291.5
291
290.5
290
289.5
289
288.5
288
287.5
287
286.5
286
285.5
-360 -340 -320 -300 -280 -260 -240 -220 -200 -180 -160 -140 -120 -100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360
DISTANCE ALONG X AXIS (ft)
Starting Water Level = 286.00
CROSS SECTION ALONG X AXIS AT Y AXIS = 0.00 ft @ 696 hrs


CROSS SECTION : Pacific Race Site Development
Elevation (ft)
298
297.5
297
296.5
296
295.5
295
294.5
294
293.5
293
292.5
292
291.5
291
290.5
290
289.5
289
288.5
288
287.5
287
286.5
286
285.5
Starting Water Level = 286.00
-320 -300 -280 -260 -240 -220 -200 -180 -160 -140 -120 -100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320
DISTANCE ALONG Y AXIS (ft)
CROSS SECTION ALONG Y AXIS AT X AXIS = 0.00 ft @ 696 hrs