CONTOUR
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TECHNICAL INFORMATION REPORT

FOR

RAVENSDALE RECLAMATION TRENCH FILLING AND RESTORATION PROJECT

KING COUNTY, WASHINGTON

JUNE 2020

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Project # 09-040

I hereby state that this Technical Information Report for Ravensdale Reclamation Trench Filling and Restoration Project has been prepared by me or under my supervision and meets the standard of care and expertise that is usual and customary in this community of professional engineers. I understand that King County does not and will not assume liability for the sufficiency, suitability or performance of drainage facilities prepared by Contour Engineering LLC. This analysis is based on data and records either supplied to, or obtained by, Contour Engineering, LLC. These documents are referenced within the text of the analysis. The analysis has been prepared utilizing procedures and practices within the standard accepted practices of the industry.

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1.0 PROJECT OVERVIEW

1.1 Purpose and Scope

This Technical Information Report accompanies the grading permit application associated with the reclamation of eight trenches. The site is located at 26900 Block of SE Ravensdale Way, Ravensdale, WA King County in portions of Section 1, Township 21 North, Range 6 East; Section 36, Township 22 North, Range 6 East; and Section 31, Township 22 North, Range 7 East, W.M.

The 2016 King County, Washington Surface Water Design Manual (KCSWDM) established the design methodology and design criteria used for this project.

The following is a description of pertinent site information associated with the proposed project:

Location – 26900 Block SE Ravensdale Way, Ravensdale, WA

Tax Parcel Numbers – 3122079040, 3122079080, 3122079035, 3622069009, 3622069064, 0121069001, and 0121069007

Site Area – 698 Acres

1.2 Pre-Developed Conditions

Topography

The following topographic information was compiled from King County IMAP, limited topographic survey of the project site, and available LIDAR data. Generally, the northern portion of the project site, consisting of tax parcels 0121069001, 3622069009, 3122079080, 3122079040, 3122079035, and 3622069064 slopes downward from south to northwest, with a total vertical relief of 270 feet from high point to low point. These parcels generally also slope into Trench G on Parcel 3622069009, and into a small creek. The southern portion of the project site, consisting of tax parcels 0121069001, and 0121069007, generally slopes downward from north to southwest, with a total vertical relief of 100 feet from high to low point. The slopes range from 0% to 80%+.

Soils

The Natural Resources Conservation Service (NRCS) soil survey identifies four primary types of soil group within the project area: Alderwood gravelly sandy loam, Beausite gravelly sandy loam, Everett very gravelly sandy loam, and Chuckanut gravelly ashy sandy loam. See Appendix A for the NRCS soil map and soil descriptions.

Groundcover

The site currently is covered in multiple different surface types; presently, there are multiple previously excavated mining trenches that will be filled and revegetated. The site also has gravel access roads which will be maintained throughout reclamation. The site also has scattered clear areas around the trenches. The majority of the site, however, is forested with dense underbrush.

Adjacent Land Uses

The site is bounded as follows:

North: Town of Ravensdale (Zoned RA-5)
West: Mining Facilities (Zoned M)
East: Forested Parcels (Zoned F)
South: Single-family Residences, Zoned UR-P, and mining facilities, zoned M

Drainage Patterns

The Project is located within two drainage basins. The northern parcels are mostly within the Covington Creek drainage basin, a sub-basin of the Duwamish – Green River (WRIA 9) Watershed. The southern parcels are mostly within the Lower Cedar River drainage basin, a sub-basin of the Cedar River / Lake Washington (WRIA 8) Watershed.

Stormwater runoff from the northern parcels, north of tax parcel 0121069001, sheet flows into a small creek which begins in the center of tax parcel 3622069009, and flows to the northwest. Runoff from parcels south of tax parcel 0121069001 either sheet flow east into unnamed tributaries to Rock Creek River, or sheet flow southwest onto adjacent properties. The dividing line between watersheds, which generally follows the high point in topography, runs through the centers of tax parcels 0121069005, 0121069006, and 0121069007. Maps illustrating these drainage patterns can be found in Appendix C.

Critical and Sensitive Areas

SLOPES

The project area features slopes in excess of 30%. There are landslide and erosion hazard areas located across the subject parcels per King County IMAP, in the area of the existing trenches that will be filled. There are no landslide hazard areas on site.

STREAMS

There is a stream to the southeast of the project site. Located onsite is Buck Lake, as well as several streams. These were identified in a report titled Technical Memorandum dated 05.30.2018, by Soundview Consultants.

WETLANDS

There are six wetlands located on site. These were identified in a report titled Technical Memorandum dated 05.30.2018, by Soundview Consultants.

AQUIFER RECHARGE

There is a critical aquifer recharge area just north of the project site. See Appendix A for an exhibit from King County IMAP.

FLOODPLAIN

The proposed development is not located within 300-ft of any identified floodplains.

Other Existing Site Information

No wells were identified in the immediate vicinity of the project site. There are no known underground tanks or septic systems on or adjacent to the project site.

Storm Drainage and Utilities

The site currently has no known existing storm drainage system or any known utilities extended onto the site.

1.3 Developed Conditions

Developed Site Description & Proposed Work

The developed site will consist of eight reclaimed and reforested historical mining trenches. No new permanent impervious surfaces are being proposed as part of this development; all proposed impervious surfaces are temporary gravel access points for use during reclamation and will be removed except for the existing main site access roads. After each trench is filled, one foot of native top soil will be spread over the disturbed areas, and then replanted and brought back to the original forested condition. Some trenches are already partially filled, and some are still untouched. The following table details the current status of each trench, and how much fill each trench will receive. The civil plans are included in Appendix B.

Trench Name	Permitted 2011 Import Quantity (CY)	As-built Import Quantity 2017 (CY)	Proposed Additional Import Quantity (CY)	Total Import Quantity (Bank Yards) (CY)
Trench A	96,300	Not As-built	162,358	258,658
Trench K	0	0	621	621
Trench C	213,207	Not As-built	140,190	353,397
Trench D	11,125	20,723	0	20,723
Trench G	0	0	107,914	107,914
Trench H	0	0	21,196	21,196
Trench I	0	0	2,620	2,632
Trench J	0	0	7,882	7,882
Totals	320,632	20,723	661,320	773,023

2.0 CONDITIONS AND REQUIREMENTS SUMMARY

Per KCSWDM Figure 1.1.2.A, the project results in more than 7,000 square feet of land-disturbing activity but does not have a project site >50 acres within a critical aquifer recharge area, proposes no new impervious surface, and is not in the Urban Planned Development area per King County IMAP. Therefore, this project is subject to Full Drainage Review and all 9 core requirements and 5 special requirements will be addressed as part of this report.

Core Requirement #1 Discharge at a Natural Location

All stormwater runoff associated with the developed site will be discharged to its natural location. The natural discharge locations for the site are discussed in the Drainage Patterns section above. Once filled and regraded, the reforested areas will drain to their appropriate watersheds and streams.

Core Requirement #2 Offsite Analysis

Offsite analysis is presented in Section 3.0: Offsite Analysis

Core Requirement #3 Flow Control

This project is not mapped in a flow control area per King County IMAP, so it is assumed to be in a basic flow control area. (exhibit included in Appendix A.) No flow control facilities are being proposed as part of this project, as this project will reforest denuded areas from mining processes. No added impervious surfaces are proposed at this time. See Section 4.0 for further discussion.

Core Requirement #4 Conveyance System

No conveyance system is proposed as part of this development, as no stormwater management facilities are proposed, and no permanent new impervious surfaces are added that require stormwater conveyance.

Core Requirement #5 Erosion and Sediment Control

An updated Construction SWPPP has been included with this submittal.

Core Requirement #6 Maintenance and Operations

Per Section 1.2.9.1A of the 2016 SWDM, this project is not required to comply with Core Requirement #6 as it proposes under 2,000 square feet of new plus replaced impervious surface.

Core Requirement #7 Financial Guarantees and Liability

All Financial Guarantees and Liability will be provided as required by the grading permit.

Core Requirement #8 Water Quality

The proposed project is not mapped within a water quality treatment area, so it is assumed to be a basic WQ treatment area. However, no impervious surfaces are added, and this project is reclaiming and reforesting stripped areas. As such, no water quality BMP's are being proposed.

Core Requirement #9 Flow Control BMPs

Per Section 1.2.9.1.C, this project does not trigger Core Requirement #9. This project does not propose any impervious surface or new pervious surface.

Special Requirement #1 Other Adopted Area-Specific Requirements

No known area-specific requirements exist which impact the proposed project.

Special Requirement #2 Floodplain/Floodway Analysis
No flood hazard areas are located on or adjacent to the project site.

Special Requirement #3 Flood Protection Facilities
No flood protection facilities are proposed or required.

Special Requirement #4 Source Control
This project does not require any post construction source control measurements.

Special Requirement #5 Oil Control
The project does not meet the criteria of a high-use site as defined below (Per Section 1.3.5 of the 2016 SWDM), and therefore Oil Control is not required:

High-use site means that area within a commercial or industrial site that typically generates or is subject to runoff containing high concentrations of oil due to high traffic turnover, on-site vehicle or heavy or stationary equipment use, or the frequent transfer of liquid petroleum or coal derivative products. High-use sites include:

1. That area of a commercial or industrial site that:
    a. has an expected average daily traffic (ADT) count equal to or greater than 100 vehicles per 1,000 square feet of gross building area; or
    b. is subject to petroleum storage or transfer in excess of 1,500 gallons per year, not including delivered heating oil at the end-user point of delivery; or
    c. is subject to use, storage, or maintenance of a fleet of 25 or more diesel or jet fuel (aviation turbine fuel) vehicles that are over 10 tons net weight (trucks, buses, trains, airplanes, tugs, mobile and fuel-driven or hydraulic stationary heavy equipment, etc.); or
2. The interior of any road intersection and that portion of lanes leading into the intersection subject to braking, turning, or stopping, with a measured ADT count of 25,000 vehicles or more on the main roadway and 15,000 vehicles or more on any intersecting roadway. Projects proposing primarily pedestrian or bicycle use improvements are excluded.

3.0 OFFSITE ANALYSIS

Task 1: Define and Map the Study Area

The northern downstream study area consists of the subject property and was extended downstream from the project site approximately 3.0 miles to Lake Sawyer. Stormwater runoff from the northern parcels sheet flows into Covington Creek, which begins on tax parcel 3622069009. Covington Creek flows northwest through tax parcel 3622069064, through a culvert under SE Ravensdale Way, and into Ravensdale Lake. From Ravensdale Lake, Covington Creek flows west and has smaller tributary streams join with it. It crosses under the Burlington Northern Santa Fe Railroad, followed by Maple Valley Black Diamond Road SE, and eventually outlets at Lake Sawyer.

Water sheet flowing off the southwest parcels ends in a tributary to Ginder Lake, which continues draining to the west. There are no known stormwater management structures or conveyance structures in the area, so it's likely that a negligible amount of stormwater runoff actually ends in Ginder Lake.

Similarly, stormwater runoff on the southeast corner of the site ends in various streams. It appears that there are no conveyance structures or stormwater management facilities handling any sheet flow.

This information was all found using King County GIS. Exhibits from the KC IMAP are included in Appendix A and C.

Task 2: Review all available information on the study area

All available information regarding existing and potential water quality, runoff volumes and rates, flooding and stream bank erosion problems within the study area have been reviewed. Reviewed material included NRSC soil information and King County GIS maps.

Task 3: Field inspect the study area

Contour Engineering has field inspected the study area. The majority of stormwater drains to Buck Lake. The stream Buck Lake outlets to appears to end near the Burlington Northern Railroad, on tax parcel 3622069009. Since there are no signs of flooding on site, it is assumed that the stormwater is fully infiltrating into the forested ground. Similarly, on the southern portion of the site, signs of stormwater runoff from the site aren't visible, and there is no clear downstream flowpath.

4.0 FLOW CONTROL, LOW IMPACT DEVELOPMENT (LID) AND WATER QUALITY DISCUSSION

Existing Site Hydrology

The Project is located within two drainage basins. The northern parcels are mostly within the Covington Creek drainage basin, a sub-basin of the Duwamish – Green River

(WRIA 9) Watershed. The southern parcels are mostly within the Lower Cedar River drainage basin, a sub-basin of the Cedar River / Lake Washington (WRIA 8) Watershed.

Stormwater runoff from the northern parcels, north of tax parcel 0121069001, sheet flows into a small creek which begins in the center of tax parcel 3622069009, and flows to the northwest. Runoff from parcels south of tax parcel 0121069001 either sheet flow east into unnamed tributaries to Rock Creek River, or sheet flow southwest onto adjacent properties. The dividing line between watersheds, which generally follows the high point in topography, runs through the centers of tax parcels 0121069005, 0121069006, and 0121069007. Maps illustrating these drainage patterns can be found in Appendix A.

Developed Site Hydrology

Stormwater drainage patterns will match the existing site hydrology, as there is a net decrease in impervious surfaces on the site as these trenches are refilled and replanted. There will be temporary gravel access points during reclamation that will be removed and replanted as the trenches are reclaimed. Reclaimed trenches shall be graded to maintain existing watershed drainage courses, and the stripped areas are to be reforested, so it is expected that the downstream hydrology of the site will be improved.

Flow Control BMPs/Low Impact Development

No flow control BMP's are applicable to this project because it is not proposing any new or replaced impervious surfaces or new pervious surfaces. As there are no target surfaces to manage with a BMP, they have not been evaluated for feasibility.

Flow Control System

The project meets the exemption criteria for core requirement #3 as it will not create any impervious surface or new pervious surface.

Water Quality System

The proposed project is not mapped within a water quality treatment area, so it is assumed to be a basic WQ treatment area. However, this project has no targetable pollution generating surfaces to provide basic treatment for. All new construction roads will be removed and reforested, and existing access existing access roads throughout the site will remain for accessing the power lines and other portions of the site. The site ultimately will return to the forested condition.

5.0 Conveyance System Analysis and Design

No new pipe systems are proposed as part of this development.

6.0 Special Reports and Studies

A report titled Technical Memorandum, dated 05.30.2018, has been prepared by Soundview Consultants for this project.

7.0 Other Permits

The NPDES Permit is already in place for the operation.

8.0 CSWPP Plan Analysis and Design

An updated Construction SWPPP has been included with this submittal.

9.0 Bond Quantities, Facility Summaries, and Declaration of Covenant

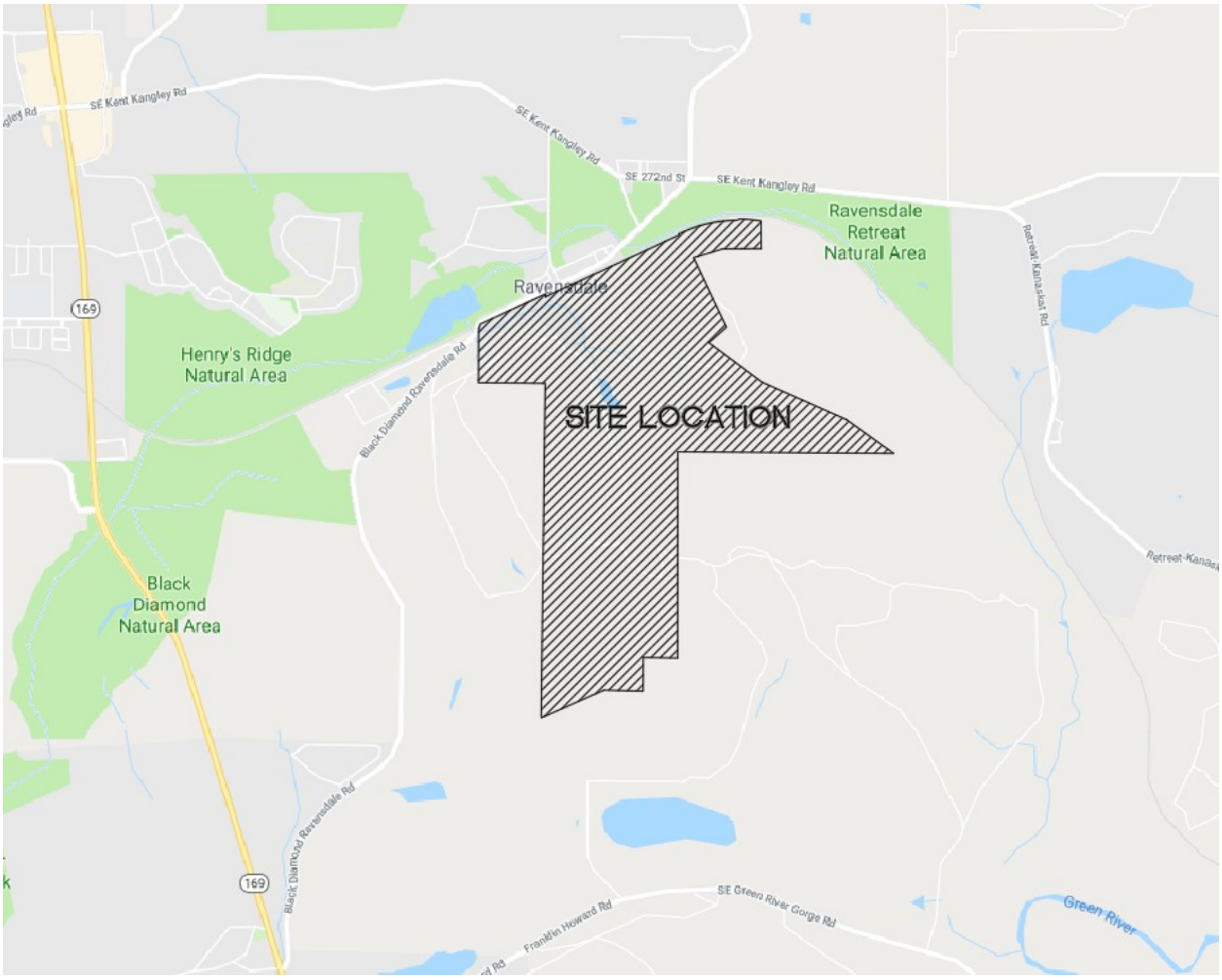
All applicable bond quantities will be provided during the site development permit process.

10.0 Operations and Maintenance Manual

Per Section 1.2.9.1A of the 2016 SWDM, this project is not required to comply with Core Requirement #6 as it proposes under 2,000 square feet of new plus replaced impervious surface.

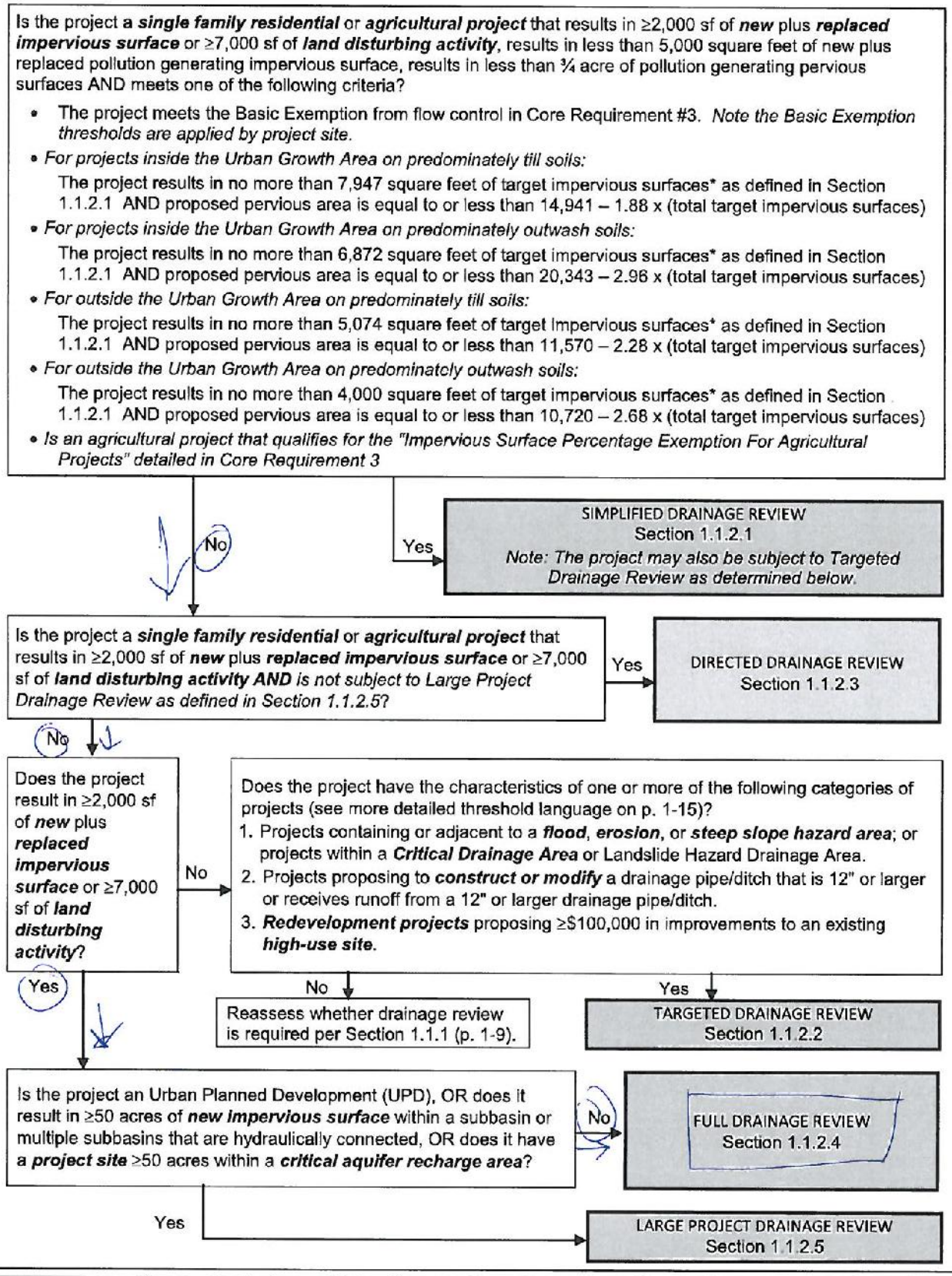
APPENDIX A

General Exhibits



Vicinity Map

FIGURE 1.1.2.A FLOW CHART FOR DETERMINING TYPE OF DRAINAGE REVIEW REQUIRED



King County iMap

Aerial Imagery

The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

Date: 5/31/2018

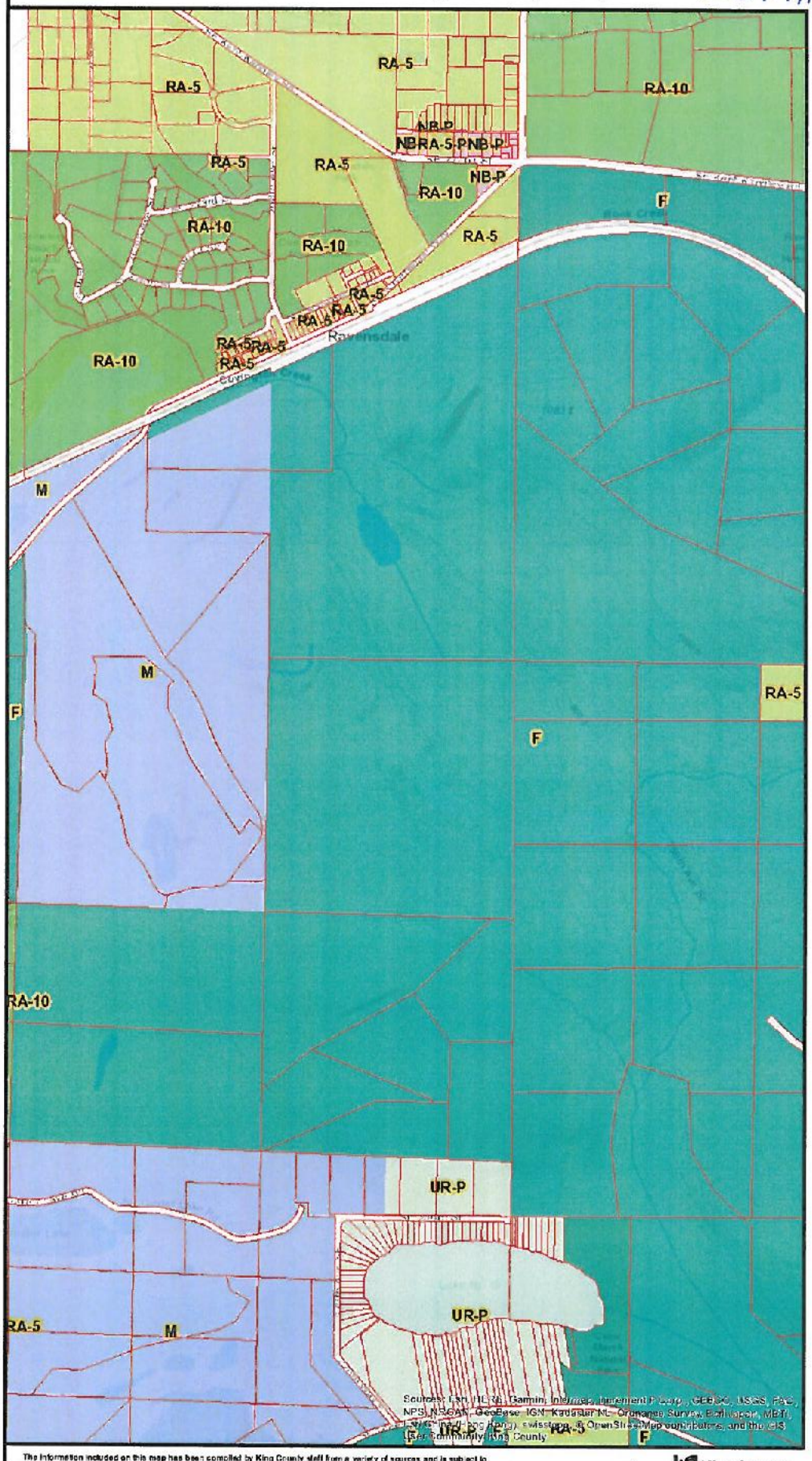
Notes:

N

King County GIS Center

King County iMap

Zoning



Legend

Parcels

Unincorporated KC zoning

- A-10 - agricultural, one DU per 10 acres
- A-35 - agricultural, one DU per 35 acres
- F - forest
- M - mineral
- RA-2.5 - rural area, one DU per 5 acres
- RA-5 - rural area, one DU per 5 acres
- RA-10 - rural area, one DU per 10 acres
- UR - urban reserve, one DU per 5 acres
- R-1 - residential, one DU per acre
- R-4 - residential, 4 DU per acre
- R-6 - residential, 6 DU per acre
- R-8 - residential, 8 DU per acre
- R-12 - residential, 12 DU per acre
- R-18 - residential, 18 DU per acre
- R-24 - residential, 24 DU per acre
- R-48 - residential, 48 DU per acre
- NB - neighborhood business
- CB - community business
- RB - regional business
- O - office
- I - industrial

Zoning labels

Date: 5/21/2018

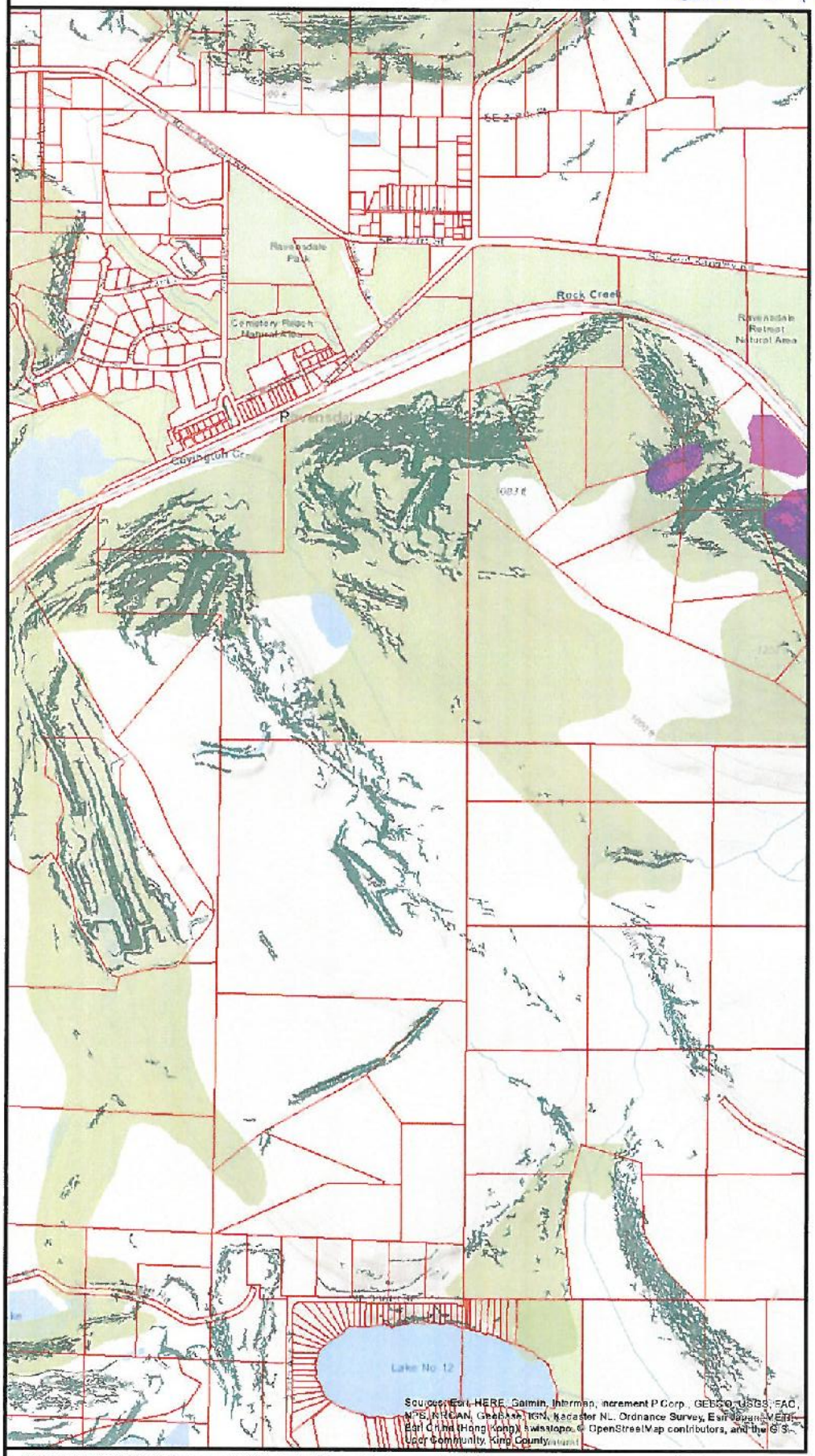
Notes:

N

King County GIS Center

King County iMap

Landslide Hazards



Legend

- Parcels
- Potential landslide hazard areas (2016, see explanation-->)
- Potential steep slope hazard areas (2016, see explanation-->)
- Erosion hazard (1990 SAO)

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community, King County

Date: 5/22/2018

Notes:

N

King County GIS Center

King County iMap

Aquifer Recharge Areas

Legend

- Parcels

Groundwater quality sampling sites

- group A wells
- group B wells
- group D wells

Critical aquifer recharge areas

- category 1
- category 2
- category 3

Date: 5/22/2018

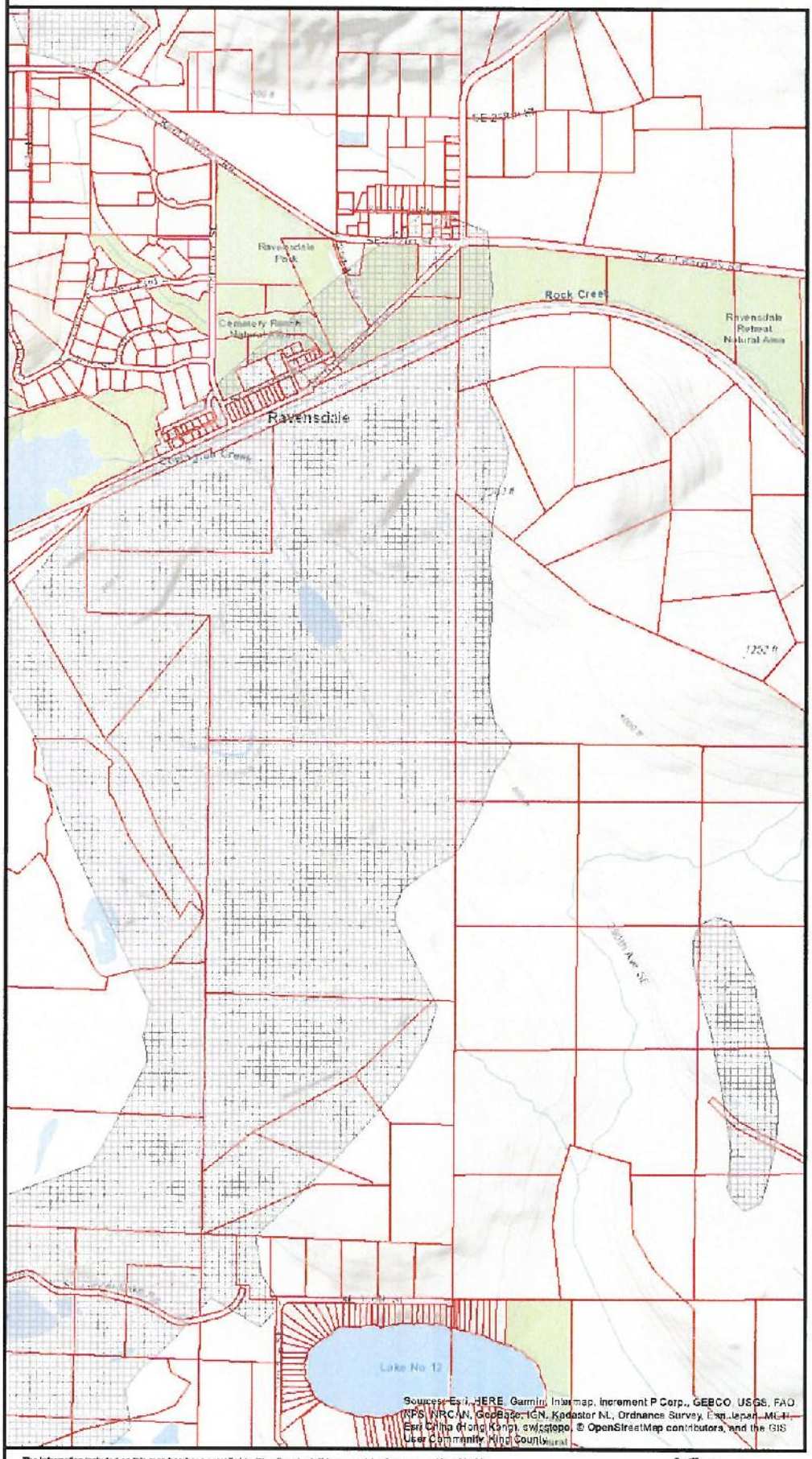
Notes:

N

King County GIS Center

King County iMap

Coal Mining Hazards



Legend

- Parcels
- Coal mine hazard (1990 SAO)

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community, King County

Date: 5/22/2018

Notes:

N

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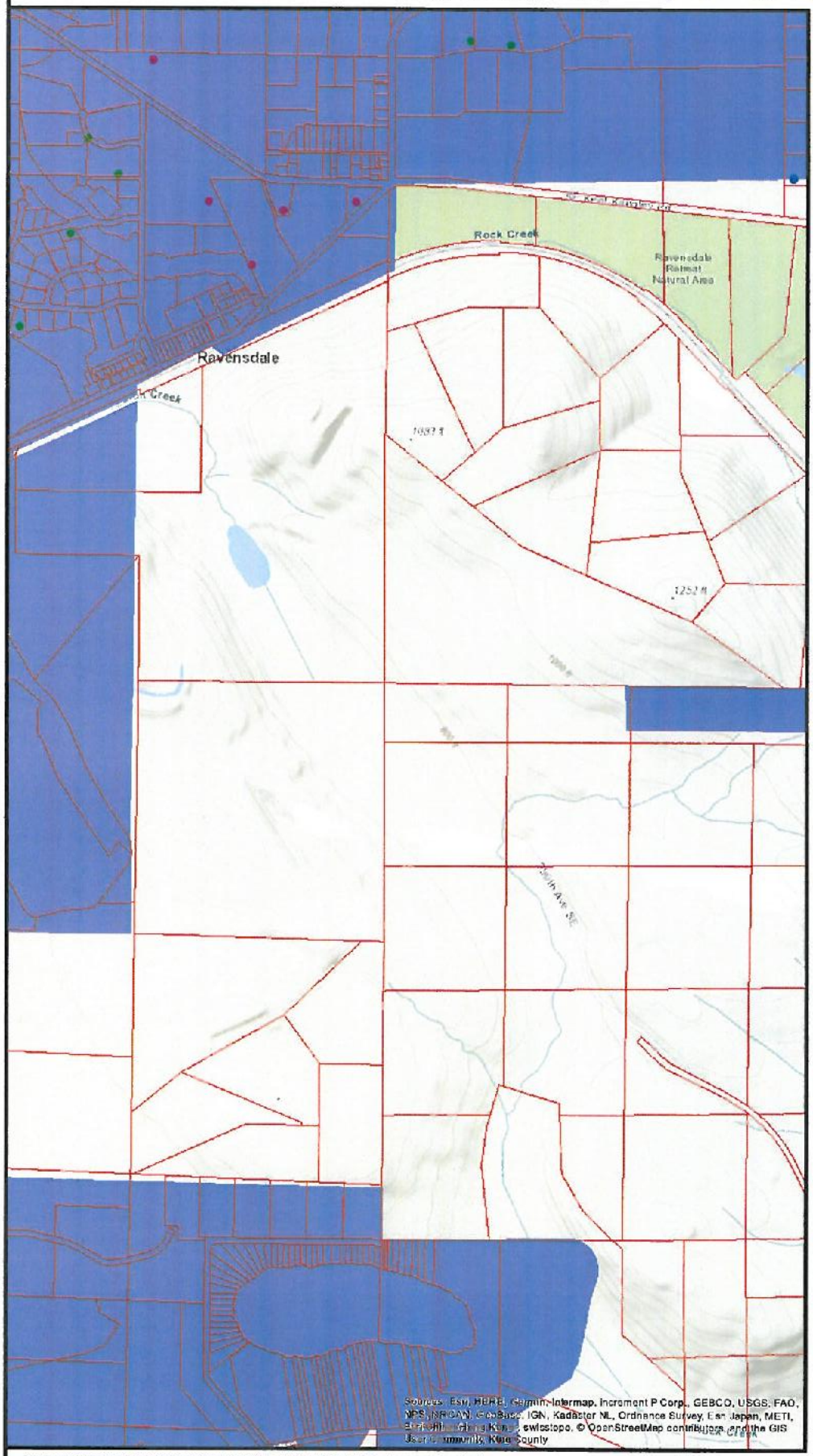
Flow control areas



Legend

- Parcels

Stormwater facilities

- Bonded
- Commercial-MF
- Commercial-SF
- Construction
- DOT
- FMD
- Regional
- Residential

Flow control

- basic flow
- conservation flow
- flood problem flow

Water quality

- basic water quality treatment
- sensitive lake treatment
- bog drainage area

Date: 5/22/2018

Notes:

N

King County GIS Center

King County iMap

water quality areas

Parcels

Water

- basic water quality treatment
- sensitive lake treatment
- bog drainage

Date: 5/30/2018

Notes:

N

King County GIS Center

Map Scale: 1:11,100 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

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.

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 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Mar 29, 2016—Oct 10, 2016

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AgC	Alderwood gravelly sandy loam, 8 to 15 percent slopes	68.3	10.5%
AgD	Alderwood gravelly sandy loam, 15 to 30 percent slopes	33.0	5.1%
AkF	Alderwood and Kitsap soils, very steep	2.1	0.3%
BeC	Beausite gravelly sandy loam, 6 to 15 percent slopes	41.3	6.4%
BeD	Beausite gravelly sandy loam, 15 to 30 percent slopes	37.9	5.8%
EvC	Everett very gravelly sandy loam, 8 to 15 percent slopes	38.8	6.0%
Subtotals for Soil Survey Area		**221.4**	**34.1%**
Totals for Area of Interest		**648.7**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Alderwood gravelly loam, 0 to 15 percent slopes	77.2	11.9%
2	Alderwood gravelly loam, 15 to 30 percent slopes	65.3	10.1%
10	Barneston gravelly ashy coarse sandy loam, 0 to 8 percent slopes	18.2	2.8%
11	Barneston gravelly ashy coarse sandy loam, 8 to 15 percent slopes	84.2	13.0%
17	Beausite gravelly loam, 6 to 30 percent slopes	2.8	0.4%
18	Beausite gravelly loam, 30 to 65 percent slopes	133.1	20.5%
42	Chuckanut gravelly ashy sandy loam, 15 to 30 percent slopes	41.7	6.4%
285	Water	4.9	0.8%
Subtotals for Soil Survey Area		**427.3**	**65.9%**
Totals for Area of Interest		**648.7**	**100.0%**

King County Area, Washington

AgC—Alderwood gravelly sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2t626
Elevation: 50 to 800 feet
Mean annual precipitation: 20 to 60 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Alderwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alderwood

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope, talf
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Glacial drift and/or glacial outwash over dense glaciomarine deposits

Typical profile

A - 0 to 7 inches: gravelly sandy loam
Bw1 - 7 to 21 inches: very gravelly sandy loam
Bw2 - 21 to 30 inches: very gravelly sandy loam
Bg - 30 to 35 inches: very gravelly sandy loam
2Cd1 - 35 to 43 inches: very gravelly sandy loam
2Cd2 - 43 to 59 inches: very gravelly sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: B
Forage suitability group: Limited Depth Soils (G002XN302WA), Limited Depth Soils (G002XS301WA), Limited Depth Soils (G002XF303WA)
Hydric soil rating: No

Minor Components

Everett
Percent of map unit: 5 percent
Landform: Kames, eskers, moraines
Landform position (two-dimensional): Shoulder, footslope
Landform position (three-dimensional): Crest, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Indianola
Percent of map unit: 5 percent
Landform: Eskers, kames, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Shalcar
Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Norma
Percent of map unit: 2 percent
Landform: Depressions, drainageways
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

King County Area, Washington

AgD—Alderwood gravelly sandy loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 2t627
Elevation: 0 to 1,000 feet
Mean annual precipitation: 25 to 60 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Alderwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alderwood

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, nose slope, talf
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Glacial drift and/or glacial outwash over dense glaciomarine deposits

Typical profile

A - 0 to 7 inches: gravelly sandy loam
Bw1 - 7 to 21 inches: very gravelly sandy loam
Bw2 - 21 to 30 inches: very gravelly sandy loam
Bg - 30 to 35 inches: very gravelly sandy loam
2Cd1 - 35 to 43 inches: very gravelly sandy loam
2Cd2 - 43 to 59 inches: very gravelly sandy loam

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B
Forage suitability group: Limited Depth Soils (G002XN302WA), Limited Depth Soils (G002XF303WA), Limited Depth Soils (G002XS301WA)
Hydric soil rating: No

Minor Components

Everett
Percent of map unit: 5 percent
Landform: Kames, eskers, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Indianola
Percent of map unit: 5 percent
Landform: Kames, terraces, eskers
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Shalcar
Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Norma
Percent of map unit: 2 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

King County Area, Washington

BeC—Beausite gravelly sandy loam, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: 1hmss
Elevation: 0 to 1,500 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Beausite and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beausite

Setting

Parent material: Till over residuum from sandstone

Typical profile

H1 - 0 to 6 inches: gravelly ashy sandy loam
H2 - 6 to 19 inches: gravelly ashy sandy loam
H3 - 19 to 38 inches: very gravelly sandy loam
H4 - 38 to 42 inches: bedrock

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: 24 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Forage suitability group: Droughty Soils (G002XF403WA)
Hydric soil rating: No

Minor Components

Norma

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

Seattle

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

King County Area, Washington

BeD—Beausite gravelly sandy loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 1hmst
Elevation: 0 to 1,500 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Beausite and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beausite

Setting

Parent material: Till over residuum from sandstone

Typical profile

H1 - 0 to 6 inches: gravelly ashy sandy loam
H2 - 6 to 19 inches: gravelly ashy sandy loam
H3 - 19 to 38 inches: very gravelly sandy loam
H4 - 38 to 42 inches:

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: More than 80 inches; 24 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Forage suitability group: Droughty Soils (G002XF403WA)
Hydric soil rating: No

Minor Components

Norma

Percent of map unit: 3 percent
Landform: Depressions

Hydric soil rating: Yes

Seattle

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

King County Area, Washington

EvC—Everett very gravelly sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2t62b
Elevation: 30 to 900 feet
Mean annual precipitation: 35 to 91 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 180 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Everett and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Everett

Setting

Landform: Kames, eskers, moraines
Landform position (two-dimensional): Shoulder, footslope
Landform position (three-dimensional): Crest, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glacial outwash

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 3 inches: very gravelly sandy loam
Bw - 3 to 24 inches: very gravelly sandy loam
C1 - 24 to 35 inches: very gravelly loamy sand
C2 - 35 to 60 inches: extremely cobbly coarse sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A

Forage suitability group: Droughty Soils (G002XN402WA), Droughty Soils (G002XS401WA), Droughty Soils (G002XF403WA)
Hydric soil rating: No

Minor Components

Alderwood
Percent of map unit: 10 percent
Landform: Hills, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Indianola
Percent of map unit: 10 percent
Landform: Eskers, kames, terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)

1—Alderwood gravelly loam, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2t62h
Elevation: 50 to 800 feet
Mean annual precipitation: 25 to 60 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Alderwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alderwood

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Glacial drift and/or glacial outwash over dense glaciomarine deposits

Typical profile

A - 0 to 7 inches: gravelly loam
Bw1 - 7 to 21 inches: very gravelly sandy loam
Bw2 - 21 to 30 inches: very gravelly sandy loam
Bg - 30 to 35 inches: very gravelly sandy loam
2Cd1 - 35 to 43 inches: very gravelly sandy loam
2Cd2 - 43 to 59 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: B
Forage suitability group: Limited Depth Soils (G002XF303WA), Limited Depth Soils (G002XN302WA)
Hydric soil rating: No

Minor Components

Mckenna
Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Everett
Percent of map unit: 5 percent
Landform: Moraines, kames, eskers
Landform position (two-dimensional): Shoulder, footslope
Landform position (three-dimensional): Crest, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Shalcar
Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Norma
Percent of map unit: 2 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)

2—Alderwood gravelly loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 2t62j
Elevation: 50 to 800 feet
Mean annual precipitation: 25 to 60 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Alderwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alderwood

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Glacial drift and/or glacial outwash over dense glaciomarine deposits

Typical profile

A - 0 to 7 inches: gravelly loam
Bw1 - 7 to 21 inches: very gravelly sandy loam
Bw2 - 21 to 30 inches: very gravelly sandy loam
Bg - 30 to 35 inches: very gravelly sandy loam
2Cd1 - 35 to 43 inches: very gravelly sandy loam
2Cd2 - 43 to 59 inches: very gravelly sandy loam

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B
Forage suitability group: Limited Depth Soils (G002XF303WA)
Hydric soil rating: No

Minor Components

Mckenna
Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Everett
Percent of map unit: 5 percent
Landform: Moraines, kames, eskers
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Shalcar
Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Norma
Percent of map unit: 2 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)

10—Barneston gravelly ashy coarse sandy loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w173
Elevation: 80 to 1,800 feet
Mean annual precipitation: 47 to 87 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Barneston, coarse sandy loam, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barneston, Coarse Sandy Loam

Setting

Landform: Moraines, kames, eskers
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Volcanic ash mixed with loess over sandy and gravelly glacial outwash

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 3 inches: gravelly ashy coarse sandy loam
Bw1 - 3 to 6 inches: very gravelly ashy coarse sandy loam
Bw2 - 6 to 19 inches: very gravelly ashy coarse sandy loam
2C - 19 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (3.54 to 21.26 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A
Forage suitability group: Droughty Soils (G002XF403WA), Droughty Soils (G003XF403WA)
Hydric soil rating: No

Minor Components

Norma
Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Nargar
Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Birdsview
Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)

11—Barneston gravelly ashy coarse sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w174
Elevation: 80 to 1,480 feet
Mean annual precipitation: 39 to 79 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Barneston, coarse sandy loam, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barneston, Coarse Sandy Loam

Setting

Landform: Moraines, kames, eskers
Landform position (two-dimensional): Shoulder, footslope
Landform position (three-dimensional): Crest, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Volcanic ash mixed with loess over sandy and gravelly glacial outwash

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 3 inches: gravelly ashy coarse sandy loam
Bw1 - 3 to 6 inches: very gravelly ashy coarse sandy loam
Bw2 - 6 to 19 inches: very gravelly ashy coarse sandy loam
2C - 19 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (3.54 to 21.26 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A
Forage suitability group: Droughty Soils (G002XS401WA), Droughty Soils (G003XF403WA)
Hydric soil rating: No

Minor Components

Norma
Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Nargar
Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Birdsview
Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Toeslope, footslope, backslope
Landform position (three-dimensional): Base slope, side slope, tread
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)

18—Beausite gravelly loam, 30 to 65 percent slopes

Map Unit Setting

National map unit symbol: 2gzj
Elevation: 0 to 1,500 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Beausite and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beausite

Setting

Landform: Hills
Parent material: Glacial till and colluvium derived from sandstone

Typical profile

H1 - 0 to 5 inches: gravelly loam
H2 - 5 to 11 inches: very gravelly sandy loam
H3 - 11 to 36 inches: extremely gravelly sandy loam
H4 - 36 to 46 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 65 percent
Depth to restrictive feature: 24 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C

Hydric soil rating: No

Data Source Information

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)

42—Chuckanut gravelly ashy sandy loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 2r3lb
Elevation: 390 to 1,870 feet
Mean annual precipitation: 35 to 45 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 160 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Chuckanut and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chuckanut

Setting

Landform: Hillslopes
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Volcanic ash mixed with colluvium derived from sandstone over dense glacial till

Typical profile

Oi - 0 to 5 inches: slightly decomposed plant material
Oe - 5 to 7 inches: moderately decomposed plant material
E - 7 to 9 inches: gravelly ashy sandy loam
Bs1 - 9 to 16 inches: gravelly ashy loam
Bs2 - 16 to 22 inches: gravelly ashy loam
2BC - 22 to 42 inches: gravelly sandy loam
2C - 42 to 56 inches: gravelly loam
2Cr - 56 to 60 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 39 to 60 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Forage suitability group: Sloping to Steep Soils (G002XF703WA), Soils with Moderate Limitations (G002XF603WA)
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

Beausite

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Base slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Bellingham

Percent of map unit: 5 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Tokul

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)

42—Chuckanut gravelly ashy sandy loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 2r3lb
Elevation: 390 to 1,870 feet
Mean annual precipitation: 35 to 45 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 160 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Chuckanut and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chuckanut

Setting

Landform: Hillslopes
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Volcanic ash mixed with colluvium derived from sandstone over dense glacial till

Typical profile

Oi - 0 to 5 inches: slightly decomposed plant material
Oe - 5 to 7 inches: moderately decomposed plant material
E - 7 to 9 inches: gravelly ashy sandy loam
Bs1 - 9 to 16 inches: gravelly ashy loam
Bs2 - 16 to 22 inches: gravelly ashy loam
2BC - 22 to 42 inches: gravelly sandy loam
2C - 42 to 56 inches: gravelly loam
2Cr - 56 to 60 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 39 to 60 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Forage suitability group: Sloping to Steep Soils (G002XF703WA), Soils with Moderate Limitations (G002XF603WA)
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

Beausite

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Base slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Bellingham

Percent of map unit: 5 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Tokul

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 19, Mar 29, 2018

APPENDIX B

Plan Exhibits

RAVENSDALE RECLAMATION TRENCH FILLING AND RESTORATION PROJECT

PORTIONS OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST,
SECTION 36, TOWNSHIP 22 NORTH, RANGE 6 EAST, AND SECTION 31, TOWNSHIP 22 NORTH, RANGE 7 EAST, W.M.
KING COUNTY, WASHINGTON
COVER SHEET

LEGAL DESCRIPTION:

THE EAST 1/2 OF SEC. 1, TWP 21 N, RGE 6 E, W.M.

VERTICAL DATUM:

NAVD 88

KING COUNTY POINT NUMBER 6201 NORTHEAST SECTION CORNER OF SECTION 36, TOWNSHIP 22N, RANGE 6 E, ELEVATION BEING 623.74

BASIS OF BEARING:

BEARING IS BASED OFF RECORD OF SURVEY APN NO. 9303159008

SITE DATA:

LOCATED IN THE 26900 BLOCK OF SE RAVENSDALE WAY, RAVENSDALE WA., KING COUNTY.

N.P.D.E.S. NOTE:

NO CONSTRUCTION OR SITE DISTURBANCE FOR THIS PROJECT MAY BEGIN BEFORE THE APPLICANT FIRST OBTAINS A GENERAL PERMIT TO DISCHARGE STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY PERMIT FROM THE WASHINGTON STATE DEPARTMENT OF ECOLOGY (DOE).

PLAN NOTES:

1. FILLING SHALL OCCUR ON ONE TRENCH AT A TIME TO MINIMIZE POTENTIAL EROSION ISSUES.
2. EXISTING PROPERTY LINES AND EASEMENTS WERE OBTAINED FROM KING COUNTY ASSESSOR'S MAPS.

NOTES:

SOILS MAP PER "RAVENSDALE MINE TRENCH" BY *GENESIS RESOURCE CONSULTING* DATED NOV, 28 2007.

PARCEL NUMBER:

3122079040
3122079080
3122079035
3622069009
3622069064
0121069001
0121069004
0121069005
0121069006
0121069007

EARTHWORK:

TOTALS:
CUT = 15,723 CY±
FILL = 1,017,987 CY±

TRENCH	CY±
A	191,516
B	621
C	329,571
D	0
E	210,931
F	99,244
G	107,914
H	21,196
I	2,620
J	7,882
TOTAL	971,475

THIS CALCULATION IS FOR REVIEW AND PERMIT PURPOSES ONLY, CONTRACTOR SHALL DO THEIR OWN CALCULATION BASED ON THE INFORMATION PROVIDED WITHIN THESE PLANS.

THE QUANTITIES MAY VARY BASED ON THE FOLLOWING FACTORS:

1. SHRINK/SWELL OF SOILS.
2. SURFACE STRIPPING.
3. VARIANCE OF STRUCTURAL MATERIAL REQUIRED FOR ACCESS ROADS.

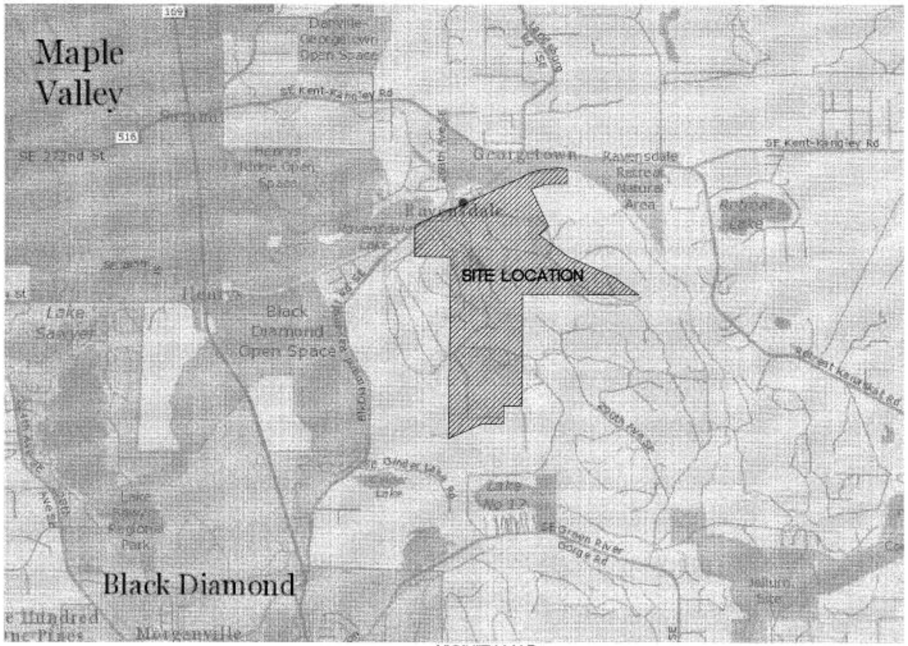
UTILITIES:

TELEPHONE: NONE
CABLE: NONE
SCHOOL: TAHOMA #409
FIRE PROTECTION: K.C. FIRE PROTECTION DISTRICT #43
GAS: NONE

TOPOGRAPHIC NOTE:

THE EXISTING CULTURAL AND TOPOGRAPHIC DATA SHOWN ON THESE DRAWINGS HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY *DAN PRICE LAND SURVEYING* AND *APEX ENGINEERING PLLC*. WHILE THIS INFORMATION IS BELIEVED RELIABLE, CONTOUR ENGINEERING CANNOT ENSURE ITS ACCURACY AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THAT INFORMATION OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DRAWINGS AS A RESULT.

L:\PROJECT FILES\09-040 RAVENSDALE\DRAWINGS\PLAN SET\09-040-C.DWG



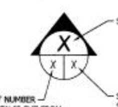
VICINITY MAP
SCALE: 1" = 2000'

SHEET INDEX:

SHEET 1	COVER SHEET
SHEET 2	TRENCH AND PARCEL LOCATIONS MAP
SHEET 3	NOTES AND DETAILS
SHEET 4	T.E.S. C. NOTES AND
SHEET 5	TRENCH - A GRADING AND T.E.S.C. PLAN
SHEET 6	TRENCH - A GRADING PROFILE SECTIONS
SHEET 7	TRENCH - A GRADING PROFILE SECTIONS
SHEET 8	TRENCH - A GRADING PROFILE SECTIONS
SHEET 9	TRENCH - B GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 10	TRENCH - C GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 11	TRENCH - C GRADING PROFILE SECTIONS
SHEET 12	TRENCH - C GRADING PROFILE SECTIONS
SHEET 13	TRENCH - C GRADING PROFILE SECTIONS
SHEET 14	TRENCH - C GRADING PROFILE SECTIONS
SHEET 15	TRENCH - D GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 16	TRENCH - E GRADING AND T.E.S.C. PLAN
SHEET 17	TRENCH - E 2011 GRADING PROFILE SECTIONS
SHEET 18	TRENCH - E GRADING PROFILE SECTIONS
SHEET 19	TRENCH - E GRADING PROFILE SECTIONS
SHEET 20	TRENCH - F GRADING AND T.E.S.C. PLAN
SHEET 21	TRENCH - F 2011 GRADING PROFILE SECTIONS
SHEET 22	TRENCH - F GRADING PROFILE SECTIONS
SHEET 23	TRENCH - F GRADING PROFILE SECTIONS
SHEET 24	TRENCH - G GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 25	TRENCH - G GRADING PROFILE SECTIONS
SHEET 26	TRENCH - G GRADING PROFILE SECTIONS
SHEET 27	TRENCH - H GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 28	TRENCH - H GRADING PROFILE SECTIONS
SHEET 29	TRENCH - H GRADING PROFILE SECTIONS
SHEET 30	TRENCH - I GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 31	BLANK PAGE
SHEET 32	TRENCH - J GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 33	TRENCH - J GRADING PROFILE SECTIONS

LEGEND:

PROPOSED GRAVEL ACCESS ROAD
EXISTING WETLAND
PROPOSED EASEMENT
LOT BOUNDARY LINES



SECTION NUMBER
SHEET NUMBER SECTION IS CUT FROM
SHEET NUMBER SECTION IS SHOWN ON

TRENCH NOTES:

IF WORKERS ENTER ANY TRENCH OR OTHER EXCAVATION FOUR OR MORE FEET IN DEPTH THAT DOES NOT MEET THE OPEN PIT REQUIREMENTS OF WSDOT SECTION 2-09.3(3)B, IT SHALL BE SHORED AND CRIBBED. THE CONTRACTOR IS ALONE RESPONSIBLE FOR WORKER SAFETY. ALL TRENCH SAFETY SYSTEMS SHALL MEET THE REQUIREMENTS OF THE WASHINGTON INDUSTRIAL SAFETY AND HEALTH ACT, CHAPTER 49.17 RCW.

UTILITY NOTES:

EXISTING UTILITY INFORMATION DEPICTED ON THESE PLANS WAS OBTAINED FROM BEST AVAILABLE SOURCES AT THE TIME OF DESIGN. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE RELOCATION OF EXISTING UNDERGROUND CONFLICTING UTILITIES DEPICTED OR NOT DEPICTED ON THESE PLANS.

FILL SPECIFICATION:

FILL MATERIAL SHALL NOT CONTAIN PETROLEUM PRODUCTS, OR SUBSTANCES WHICH ARE HAZARDOUS, DANGEROUS, TOXIC, OR WHICH OTHERWISE VIOLATE ANY STATE, FEDERAL, OR LOCAL LAW ORDINANCE, CODE, REGULATION, RULE, ORDER, OR STANDARD. ONLY EARTH MATERIAL SHALL BE PLACED IN FILLS.

ONE CALL AT 1-800-424-5555

UNDERGROUND UTILITIES ARE SHOWN IN THE APPROXIMATE LOCATION THERE IS NO GUARANTEE THAT ALL UTILITY LINES ARE SHOWN, OR THAT THE LOCATION, SIZE, AND MATERIAL IS ACCURATE. THE CONTRACTOR SHALL UNCOVER ALL INDICATED PIPING WHERE CROSSING, INTERFERENCES, OR CONNECTIONS OCCUR PRIOR TO TRENCHING OR EXCAVATION FOR ANY PIPE OR STRUCTURE. TO DETERMINE ACTUAL LOCATIONS, SIZE, AND MATERIAL. THE CONTRACTOR SHALL MAKE THE APPROPRIATE PROVISION FOR PROTECTION OF SAID FACILITIES. THE CONTRACTOR SHALL NOTIFY ONE CALL AT 1-800-424-5555 AND ARRANGE FOR FIELD LOCATION OF EXISTING FACILITIES BEFORE CONSTRUCTION.

(Note to Engineer: This approval signature block not required for cover page.

KING COUNTY DDES APPROVAL

Review Engineer	Date
Senior Engineer	Date
Wally Archuleta, P.E. DEVELOPMENT ENGINEER	Date

Vicinity Map Scale 1"=

Soils Map Scale 1"=

Notice Required

Contractors shall notify operators who maintain underground utility lines in the area of proposed excavation or blasting at least two business days, but not more than ten working days prior to commencement of excavation or demolition in accordance with RCW Title 19. Names and telephone numbers of the operators of underground utility lines in this project appear below. These numbers shall also be used to serve in an emergency conditions as required.

	Phone
Sanitary Sewer	
Water District	
Gas Company	
Power Company	
Call Before You Dig DIAL-A-DIG	1-800-424-5555

Notes

1. The Developer is required to notify the Land Use Services Division, Land Use Inspection Section (206) 296-6642, three days prior to the beginning of construction for a preconstruction conference and specifically request inspection before beginning:
   A. Installing siltation and erosion control measures
   B. Clearing and grubbing
   C. Earthwork
   D. Installation of any underground utility
   E. Before placing subbase, base or paving surfaces
   F. Installation of any forms or placing any concrete
2. A permit must be obtained from the office of the Resident Engineer, Washington State Department of Transportation, before any construction is started on any existing state route.
3. A Hydraulic Project Approval (HPA) Permit must be obtained from the Washington State Department of Fisheries prior to any work when required.

Bonding Information

Restoration Bond Amount $ ____________

Performance Bond Amount $ ____________

Site Plan Approval

Approval of these plans is for construction of road and drainage improvements, site drainage & grading and temporary erosion control in unincorporated King County only. These plans do not authorize any other utility approval or improvements proposed in any State right of way.

Site plan approval is void if the commercial building permit has not been obtained or renewed within two years of approval.

Subdivision plan approval is void if the final plat is not recorded prior to the preliminary plat approval expiration.

PRO RATA SHARE ASSESSMENT ANALYSIS
(County Use Only)

Section Township Range Tax Parcel Number

Site Location is within the ____________ drainage shed(s)
Pro Rata Share Assessment(s) are: ☐ Required ☐ Not Required
from the site due to development for increased storm water runoff.
Peak Runoff Assessment Rate($) per c.f.s. increases.(10 year, 2 hour storm)
Peak Volume Assessment Rate($) per Ac. Ft. increases.(2 year, 2 hour storm)

AGREEMENTS, PLAN REFERENCES, PERMITS ETC.
(To be completed by Consultant)

Preliminary Plat Approval/Permit Issued Date: ____________
Expiration Date: ____________
Other Related Permit Numbers Received:
Right-of-Way Use Permit ____________
Grading ____________
Building/Structural ____________
Other ____________ ____________
Board feet of tree removal on site: ____________
Cubic yards of material hauled on/off the site: ____________
Is this a highly sensitive area site? (Yes/No): ____________
Note: If "yes", per SWDM Appendix D44 a Highly Sensitive Site Erosion Control Supervisor is required. See ESC plan.

Emergency
911
Police–Fire–Rescue

RECOMMENDED FOR APPROVAL
(To be completed by King County)

Date
Review Engineer
Senior Engineer
Traffic & Planning Engineer
Sensitive Areas
Structural Review Engineer
Other

King County
APPROVED FOR CONSTRUCTION
DEPARTMENT OF DEVELOPMENT & ENVIRONMENTAL SERVICES

Date
Molly A. Johnson, P.E.
Development Engineer

PROJECT CONTACT INFORMATION
(To be completed by Consultant)

Applicant ☐ Contract ☐ Owner ☐ Lease
Name Phone
Address and Zip Code

Ownership ☐ Owner ☐ Trustee
☐ A Partnership
☐ An Individual
RAVENSDALE LLC (KURT ERICKSON) (253) 606-6060
Name Phone
41306 90TH AVENUE E, EATONVILLE, WA 98328
Address and Zip Code

Certified Surveyor ☐ or Engineer ☐
☐ A Corporation
☐ A Partnership
☐ An Individual
CONTOUR ENGINEERING LLC (BRETT ALLEN) (253) 857-5454
Name Phone
3309 56TH STREET NW, SUITE 106, GIG HARBOR, WA 98335
Address and Zip Code

CONTOUR ENGINEERING · LLC
CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourpllc.com

PROJECT #09-040

RAVENSDALE TRENCH FILLING
COVER SHEET
Project Title/Name

DDES FILE NUMBERS:
Activity Number: ____________
Project Number: ____________
Development No: ____________

BRETT M. ALLEN
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

GRAPHIC SCALE

0 500 1000

1 INCH = 500 FEET (24"x36")

RAVENSDALE RECLAMATION TRENCH FILLING AND RESTORATION PROJECT

PORTIONS OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST,
SECTION 36, TOWNSHIP 22 NORTH, RANGE 6 EAST, AND SECTION 31, TOWNSHIP 22 NORTH, RANGE 7 EAST, W.M.
KING COUNTY, WASHINGTON
TRENCH AND PARCEL LOCATIONS MAP

NOTE: THIS MAP IS A GRAPHICAL REPRESENTATION ONLY, NO SURVEYING WAS DONE TO DETERMINE PROPERTY LINE LOCATIONS.

REVISION	DESCRIPTION	DATE	BY
1	REVISE LOCATION OF TRENCH I	2019-10-07	JJ

CONTOUR ENGINEERING, LLC
CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS
3309 56th Street NW, Suite 106, Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0944 ~ info@contourplic.com

SHEET TITLE: TRENCH AND PARCEL LOCATION MAP

RAVENSDALE RECLAMATION TRANCH FILLING AND RESTORATION

CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328

CONTACT: KURT ERICKSON PHONE:(253) 606-6060

DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6E WM
DATE: 2019.12.31
REVISED:

PROJECT: 09-040
DWG NAME: 09-040 SEC

SHEET C2
2 OF 33

REV. 1

RAVENSDALE RECLAMATION TRENCH FILLING AND RESTORATION PROJECT

PORTIONS OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST,
SECTION 36, TOWNSHIP 22 NORTH, RANGE 6 EAST, AND SECTION 31, TOWNSHIP 22 NORTH, RANGE 7 EAST, W.M.
KING COUNTY, WASHINGTON

GENERAL NOTES:

(1) ALL DESIGN AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH PERMIT CONDITIONS, THE KING COUNTY CODE (KCC), ROAD STANDARDS (KCRS), WASHINGTON STATE DOT (WSDOT) STANDARD SPECIFICATIONS AND THE CONDITIONS OF PRELIMINARY APPROVAL. IT SHALL BE THE SOLE RESPONSIBILITY OF THE APPLICANT AND THE PROFESSIONAL CIVIL ENGINEER TO CORRECT ANY ERROR, OMISSION, OR VARIATION FROM THE ABOVE REQUIREMENTS FOUND IN THESE PLANS. ALL CORRECTIONS SHALL BE AT NO ADDITIONAL COST OR LIABILITY TO KING COUNTY.

(2) THE DESIGN ELEMENTS WITHIN THESE PLANS HAVE BEEN REVIEWED ACCORDING TO THE KING COUNTY DEPARTMENT OF DEVELOPMENT AND ENVIRONMENTAL SERVICES (DDES) ENGINEERING REVIEW CHECKLIST. SOME ELEMENTS MAY HAVE BEEN OVERLOOKED OR MISSED BY THE DDES PLAN REVIEWER. ANY VARIANCE FROM ADOPTED STANDARDS IS NOT ALLOWED UNLESS SPECIFICALLY APPROVED BY KING COUNTY PRIOR TO CONSTRUCTION.

(3) APPROVAL OF THIS ROAD, GRADING, PARKING AND DRAINAGE PLAN DOES NOT CONSTITUTE AN APPROVAL OF ANY OTHER CONSTRUCTION (E.G. DOMESTIC WATER CONVEYANCE, SEWER CONVEYANCE, GAS, ELECTRICAL, ETC.)

(4) BEFORE ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY, A PRECONSTRUCTION MEETING MUST BE HELD BETWEEN THE DDES'S LAND USE INSPECTION SECTION, THE APPLICANT, AND THE APPLICANT'S CONSTRUCTION REPRESENTATIVE.

(5) A COPY OF THESE APPROVED PLANS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.

(6) GRADING ACTIVITIES (SITE ALTERATION) ARE LIMITED TO THE HOURS OF 7 A.M. TO 7 P.M. MONDAY THROUGH SATURDAY AND 10 A.M. TO 5 P.M. ON SUNDAY, UNLESS OTHERWISE APPROVED WITH A WRITTEN DECISION BY THE REVIEWING AGENCY.

(7) IT SHALL BE THE APPLICANT'S/CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL CONSTRUCTION EASEMENTS NECESSARY BEFORE INITIATING OFF-SITE WORK. EASEMENTS REQUIRE REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

(8) FRANCHISED UTILITIES OR OTHER INSTALLATIONS THAT ARE NOT SHOWN ON THESE APPROVED PLANS SHALL NOT BE CONSTRUCTED UNLESS AN APPROVED SET OF PLANS THAT MEET ALL REQUIREMENTS OF KCRS CHAPTER 8 ARE SUBMITTED TO THE DDES'S LAND USE INSPECTION SECTION THREE DAYS PRIOR TO CONSTRUCTION.

(9) DATUM SHALL BE KCAS UNLESS OTHERWISE APPROVED BY DDES.

(10) DEWATERING SYSTEM (UNDERDRAIN) CONSTRUCTION SHALL BE WITHIN A RIGHT-OF-WAY OR APPROPRIATE DRAINAGE EASEMENT, BUT NOT UNDERNEATH THE ROADWAY SECTION. ALL UNDERDRAIN SYSTEMS MUST BE CONSTRUCTED IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATIONS.

(11) ALL UTILITY TRENCHES AND ROADWAY SUBGRADE SHALL BE BACKFILLED AND COMPACTED TO 95 PERCENT DENSITY, STANDARD PROCTOR.

(12) OPEN CUTTING OF EXISTING ROADWAYS FOR NON-FRANCHISED UTILITY OR STORM WORK IS NOT ALLOWED UNLESS SPECIFICALLY APPROVED BY DDES AND NOTED ON THESE APPROVED PLANS. ANY OPEN CUT SHALL BE RESTORED IN ACCORDANCE WITH KCRS.

(13) THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER NEEDED ACTIONS TO PROTECT THE LIFE, HEALTH, AND SAFETY OF THE PUBLIC, AND TO PROTECT PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THE CONTRACTOR. ANY WORK WITHIN THE TRAVELED RIGHT-OF-WAY THAT MAY INTERRUPT NORMAL TRAFFIC FLOW SHALL REQUIRE AT LEAST ONE FLAGGER FOR EACH LANE OF TRAFFIC AFFECTED. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) SHALL APPLY. WORK IN RIGHT-OF-WAY IS NOT AUTHORIZED UNTIL A TRAFFIC CONTROL PLAN IS APPROVED BY KING COUNTY.

BPA EASEMENT NOTES:

1. COORDINATE WITH BPA PRIOR TO ANY CONSTRUCTION. ALL WORK SHALL CONFORM TO BPA REQUIREMENTS AND CONDITIONS.
2. VERIFY ACTUAL TOWER LOCATIONS AND CLEARANCES PRIOR TO ANY CONSTRUCTION / WORK.
3. APPROXIMATE LOCATIONS OF POWER LINE TOWERS WERE OBTAINED FROM EXHIBIT A OF THE NON-TRANSFERABLE LAND USE AGREEMENT.
4. MAINTAIN 50' MINIMUM CLEARANCE AROUND TOWERS
5. MAINTAIN 20' MINIMUM CLEARANCE BETWEEN ALL CONSTRUCTION EQUIPMENT AND TRANSMISSION LINE CONDUCTORS (WIRES).

GEOTECHNICAL NOTES:

1. A GEOTECHNICAL ENGINEER IS TO MONITOR AND DOCUMENT ALL CUTS, FILLS, BENCHING AND COMPACTION ON SITES INCLUDING COAL MINE HAZARDS. A COPY OF THE DOCUMENTATION SHALL BE GIVEN TO THE LU.I.S. INSPECTOR UPON HIS/HER REQUEST. PROVIDE COPIES TO ENGINEER.
2. PROPOSED CUT AND FILL SLOPES SHALL NOT EXCEED 2: 1 WITHOUT GEO TECHNICAL ENGINEER'S APPROVAL.
3. FILL MATERIAL IS TO BE IMPORTED FROM OFFSITE, LOCAL AREA PROJECTS. SOILS ARE TO BE CLEAN. AND BELOW MTCA SOIL LEVEL STANDARDS.
4. ALL WORK WITHIN COAL MINE HAZARD AREAS ARE TO CONFORM TO KING COUNTY ZONING CODE/REQUIREMENTS AND GEOTECHNICAL ENGINEERS RECOMMENDATIONS.

SLOPE COVER / PROTECTION NOTES:

1. ALL PERMANENT SLOPES 3: 1 OR STEEPER SHALL BE PROTECTED AS FOLLOWS:
   a) ROUGHEN SURFACE LEAVING CLEAT IMPRINTS PARALLEL TO SLOPE CONTOURS.

a) HYDROSEED ENTIRE AREA WITH THE APPROVED FORESTRY SEED MIX ..

b) INSTALL MULCH.

c) SECURE ENTIRE AREA WITH EROSION CONTROL BLANKET.

EROSION AND SEDIMENTATION CONTROL NOTES:

(1) APPROVAL OF THIS EROSION AND SEDIMENTATION CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)

(2) THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/ESC SUPERVISOR UNTIL ALL CONSTRUCTION IS APPROVED.

(3) THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED BY SURVEY TAPE OR FENCING, IF REQUIRED, PRIOR TO CONSTRUCTION (SWDM APPENDIX D). DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE CLEARING LIMITS SHALL BE MAINTAINED BY THE APPLICANT/ESC SUPERVISOR FOR THE DURATION OF CONSTRUCTION.

(4) STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES, SUCH AS CONSTRUCTED WHEEL WASH SYSTEMS OR WASH PADS, MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN AND TRACK OUT TO ROAD RIGHT OF WAY DOES NOT OCCUR FOR THE DURATION OF THE PROJECT.

(5) THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED PRIOR TO OR IN CONJUNCTION WITH ALL CLEARING AND GRADING SO AS TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.

(6) THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND MODIFIED TO ACCOUNT FOR CHANGING SITE CONDITIONS (E.G. ADDITIONAL COVER MEASURES, ADDITIONAL SUMP PUMPS, RELOCATION OF DITCHES AND SILT FENCES, PERIMETER PROTECTION ETC.).

(7) THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/ESC SUPERVISOR AND MAINTAINED TO ENSURE CONTINUED PROPER FUNCTIONING. WRITTEN RECORDS SHALL BE KEPT OF WEEKLY REVIEWS OF THE ESC FACILITIES.

(8) ANY AREAS OF EXPOSED SOILS, INCLUDING ROADWAY EMBANKMENTS, THAT WILL NOT BE DISTURBED FOR TWO DAYS DURING THE WET SEASON OR SEVEN DAYS DURING THE DRY SEASON SHALL BE IMMEDIATELY STABILIZED WITH THE APPROVED ESC COVER METHODS (E.G., SEEDING, MULCHING, PLASTIC COVERING, ETC.).

(9) ANY AREA NEEDING ESC MEASURES, NOT REQUIRING IMMEDIATE ATTENTION, SHALL BE ADDRESSED WITHIN SEVEN (7) DAYS.

(10) THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN 24 HOURS FOLLOWING A STORM EVENT.

(11) AT NO TIME SHALL MORE THAN ONE (1) FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT-LADEN WATER INTO THE DOWNSTREAM SYSTEM.

(12) ANY PERMANENT RETENTION/DETENTION FACILITY USED AS A TEMPORARY SETTLING BASIN SHALL BE MODIFIED WITH THE NECESSARY EROSION CONTROL MEASURES AND SHALL PROVIDE ADEQUATE STORAGE CAPACITY. IF THE PERMANENT FACILITY IS TO FUNCTION ULTIMATELY AS AN INFILTRATION SYSTEM, THE TEMPORARY FACILITY MUST BE ROUGH GRADED SO THAT THE BOTTOM AND SIDES ARE AT LEAST THREE FEET ABOVE THE FINAL GRADE OF THE PERMANENT FACILITY.

(13) COVER MEASURES WILL BE APPLIED IN CONFORMANCE WITH APPENDIX D OF THE SURFACE WATER DESIGN MANUAL.

(14) PRIOR TO THE BEGINNING OF THE WET SEASON (OCT. 1), ALL DISTURBED AREAS SHALL BE REVIEWED TO IDENTIFY WHICH ONES CAN BE SEEDED IN PREPARATION FOR THE WINTER RAINS. DISTURBED AREAS SHALL BE SEEDED WITHIN ONE WEEK OF THE BEGINNING OF THE WET SEASON. A SKETCH MAP OF THOSE AREAS TO BE SEEDED AND THOSE AREAS TO REMAIN UNCOVERED SHALL BE SUBMITTED TO THE DDES INSPECTOR FOR REVIEW.

SOIL NOTES:

LAND SHOULD BE RESTORED IN ACCORDANCE WITH KING COUNTY'S BEST MANAGEMENT PRACTICES FOR RECLAIMING SURFACE MINES.

AFTER THE LAND HAS BEEN SHAPED, IT SHOULD BE REGRADED TO PRODUCE A ROUGH, IRREGULAR SURFACE, PARTICULARLY ON SLOPES TO ENSURE THAT REPLACED SOIL IS KEYED INTO THE SUBSTRATE TO SLOW EROSION.

TOPSOIL SHOULD BE REPLACED ON SLOPES AS SOON AS POSSIBLE AFTER RESTORING TOPOGRAPHY. SOIL HORIZONS FROM STOCKPILES SHOULD BE REPLACED SEPARATELY IN PROPER ORDER FOR BEST USE OF THE RESOURCE. AFTER THE TOP SOIL IS SPREAD, IT SHOULD BE TILLED TO CONSTRUCT A PROPER SEED BED. A MINIMUM SOIL REPLACEMENT DEPTH OF 12 INCHES OF TOPSOIL IS RECOMMENDED FOR RECLAMATION FOR POST-MINE USES.

WHERE LITTLE OR NO TOPSOIL EXISTS PRIOR TO MINING, IT MAY BE NECESSARY TO AMEND SOILS. RECONSTRUCTED SOILS SHOULD HAVE THE SAME CHARACTERISTICS AS TOPSOIL.

CLEAN SOIL MATERIAL IS DEFINED AS IMPORTED SOIL THAT DOES NOT CONTAIN DELETERIOUS MATERIAL SUCH AS WOOD, METAL, WIRE, REBAR, CONCRETE, ASPHALT, AND CONTAMINATED SOIL (HYDROCARBONS, HEAVY METALS, PCBS, AND OTHER REGULATED CONTAMINATES). (PER ICICLE CREEK ENGINEERS)

T.E.S.C. PLAN NOTES:

1. EROSION AND SEDIMENT CONTROL BMP'S SHALL CONFORM TO APPENDIX D, KING COUNTY SURFACE WATER DESIGN MANUAL A COPY SHALL BE
   ONSITE AT ALL TIMES DURING CONSTRUCTION.
2. WHERE CONSTRUCTION VEHICLES CROSS PROPOSED. TEMPORARY INTERCEPTOR DITCHES PROVIDE TEMPORARY (12" CMP OR APPROVED EQUAL) CULVERTS.
3. ALL PERMANENT SLOPES 3: 1 OR STEEPER SHALL BE PROTECTED AS FOLLOWS:
   (a) ROUGHEN SURFACE LEAVING CLEAT IMPRINTS PARALLEL TO SLOPE CONTOURS.
   (b)HYDROSEED ENTIRE AREA WITH THE APPROVED FORESTRY SEED MIX ..

CLEAN SOIL MATERIAL NOTE

CLEAN SOIL MATERIAL IS DEFINED AS IMPORTED SOIL THAT DOES NOT CONTAIN DELETERIOUS MATERIAL SUCH AS WOOD, METAL WIRE, REBAR, CONCRETE, ASPHALT, AND CONTAMINATED SOIL (HYDROCARBONS, HEAVY METALS, PCBS, AND OTHER REGULATED CONTAMINATES).

CONSTRUCTION SEQUENCE:

(1) PRE-CONSTRUCTION MEETING.

(2) POST SIGN WITH NAME AND PHONE NUMBER OF ESC SUPERVISOR (MAY BE CONSOLIDATED WITH THE REQUIRED NOTICE OF CONSTRUCTION SIGN).

(3) FLAG OR FENCE CLEARING LIMITS.

(4) INSTALL CATCH BASIN PROTECTION IF REQUIRED.

(5) GRADE AND INSTALL CONSTRUCTION ENTRANCE(S).

(6) INSTALL PERIMETER PROTECTION (SILT FENCE, BRUSH BARRIER, ETC.).

(7) CONSTRUCT SEDIMENT PONDS AND TRAPS.

(8) GRADE AND STABILIZE CONSTRUCTION ROADS.

(9) CONSTRUCT SURFACE WATER CONTROLS (INTERCEPTOR DIKES, PIPE SLOPE DRAINS, ETC.) SIMULTANEOUSLY WITH CLEARING AND GRADING FOR PROJECT DEVELOPMENT.

(10) MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH KING COUNTY STANDARDS AND MANUFACTURER'S RECOMMENDATIONS.

(11) RELOCATE EROSION CONTROL MEASURES OR INSTALL NEW MEASURES SO THAT AS SITE CONDITIONS CHANGE THE EROSION AND SEDIMENT CONTROL IS ALWAYS IN ACCORDANCE WITH THE KING COUNTY EROSION AND SEDIMENT CONTROL STANDARDS.

(12) COVER ALL AREAS THAT WILL BE UNWORKED FOR MORE THAN SEVEN DAYS DURING THE DRY SEASON OR TWO DAYS DURING THE WET SEASON WITH STRAW, WOOD FIBER MULCH, COMPOST, PLASTIC SHEETING OR EQUIVALENT.

(13) STABILIZE ALL AREAS THAT REACH FINAL GRADE WITHIN SEVEN DAYS.

(14) SEED OR SOD ANY AREAS TO REMAIN UNWORKED FOR MORE THAN 30 DAYS.

(15) UPON COMPLETION OF THE PROJECT, ALL DISTURBED AREAS MUST BE STABILIZED AND BMPS REMOVED IF APPROPRIATE.

DRAINAGE NOTES:

(1) PROOF OF LIABILITY INSURANCE SHALL BE SUBMITTED TO DDES PRIOR TO THE CONSTRUCTION OF THE DRAINAGE FACILITIES, PREFERABLY AT THE PRECONSTRUCTION MEETING.

(2) ALL PIPE AND APPURTENANCES SHALL BE LAID ON A PROPERLY PREPARED FOUNDATION IN ACCORDANCE WITH WSDOT SPECIFICATIONS. THIS SHALL INCLUDE LEVELING AND COMPACTING THE TRENCH BOTTOM, THE TOP OF THE FOUNDATION MATERIAL, AND ANY REQUIRED PIPE BEDDING, TO A UNIFORM GRADE SO THAT THE ENTIRE PIPE IS SUPPORTED BY A UNIFORMLY DENSE UNYIELDING BASE.

(3) STEEL PIPE SHALL BE ALUMINIZED, OR GALVANIZED WITH ASPHALT TREATMENT #1 OR BETTER INSIDE AND OUTSIDE.

(4) ALL DRAINAGE STRUCTURES, SUCH AS CATCH BASINS AND MANHOLES, NOT LOCATED WITHIN A TRAVELED ROADWAY OR SIDEWALK, SHALL HAVE SOLID LOCKING LIDS. ALL DRAINAGE STRUCTURES ASSOCIATED WITH A PERMANENT RETENTION/DETENTION FACILITY SHALL HAVE SOLID LOCKING LIDS.

(5) ALL CATCH BASIN GRATES SHALL CONFORM TO KCRS, WHICH INCLUDES THE STAMPING "OUTFALL TO STREAM, DUMP NO POLLUTANTS" AND "PROPERTY OF KING COUNTY", EXCEPT THAT PRIVATE DRAINAGE SYSTEMS SHALL NOT HAVE THE WORDS "PROPERTY OF KING COUNTY".

(6) ALL DRIVEWAY CULVERTS LOCATED WITHIN KING COUNTY RIGHT-OF-WAY SHALL BE OF SUFFICIENT LENGTH TO PROVIDE A MINIMUM 3:1 SLOPE FROM THE EDGE OF THE DRIVEWAY TO THE BOTTOM OF THE DITCH. CULVERTS SHALL HAVE BEVELED END SECTIONS TO MATCH THE SIDE SLOPE KCRS.

(7) ROCK FOR EROSION PROTECTION OF ROADWAY DITCHES, WHERE REQUIRED, MUST BE OF SOUND QUARRY ROCK, PLACED TO A DEPTH OF 1 FOOT, AND MUST MEET THE FOLLOWING SPECIFICATIONS: 4"-8"/40%-70% PASSING; 2"- 4" ROCK/30%-40% PASSING; AND -2" ROCK/10%-20% PASSING. INSTALLATION SHALL BE IN ACCORDANCE WITH KCRS.

(8) DRAINAGE OUTLETS (STUB-OUTS) SHALL BE PROVIDED FOR EACH INDIVIDUAL LOT, EXCEPT FOR THOSE LOTS APPROVED FOR INFILTRATION BY KING COUNTY. STUB-OUTS SHALL CONFORM TO THE FOLLOWING:

A) EACH OUTLET SHALL BE SUITABLY LOCATED AT THE LOWEST ELEVATION ON THE LOT, SO AS TO SERVICE ALL FUTURE ROOF DOWNSPOUTS AND FOOTING DRAINS, DRIVEWAYS, YARD DRAINS, AND ANY OTHER SURFACE OR SUBSURFACE DRAINS NECESSARY TO RENDER THE LOTS SUITABLE FOR THEIR INTENDED USE. EACH OUTLET SHALL HAVE FREE-FLOWING, POSITIVE DRAINAGE TO AN APPROVED STORMWATER CONVEYANCE SYSTEM OR TO AN APPROVED OUTFALL LOCATION.

B) OUTLETS ON EACH LOT SHALL BE LOCATED WITH A FIVE-FOOT-HIGH, 2" X 4" STAKE MARKED "STORM" OR "DRAIN". THE STUB-OUT SHALL EXTEND ABOVE SURFACE LEVEL, BE VISIBLE, AND BE SECURED TO THE STAKE.

C) PIPE MATERIAL SHALL CONFORM TO UNDERDRAIN SPECIFICATIONS DESCRIBED IN KCRS AND, IF NON-METALLIC, THE PIPE SHALL CONTAIN WIRE OR OTHER ACCEPTABLE DETECTION.

D) DRAINAGE EASEMENTS ARE REQUIRED FOR DRAINAGE SYSTEMS DESIGNED TO CONVEY FLOWS THROUGH INDIVIDUAL LOTS.

E) THE APPLICANT/CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE LOCATIONS OF ALL STUB-OUT CONVEYANCE LINES WITH RESPECT TO THE UTILITIES (E.G. POWER, GAS, TELEPHONE, TELEVISION).

F) ALL INDIVIDUAL STUB-OUTS SHALL BE PRIVATELY OWNED AND MAINTAINED BY THE LOT HOME OWNER.

(1) ALL DISTURBED PERVIOUS AREAS (COMPACTED, GRADED, LANDSCAPED, ETC.) OF THE DEVELOPMENT SITE MUST DEMONSTRATE ONE OF THE FOLLOWING: THE EXISTING DUFF LAYER SHALL BE STAGED AND REDISTRIBUTED TO MAINTAIN THE MOISTURE CAPACITY OF THE SOIL, OR; AMENDED SOIL SHALL BE ADDED TO MAINTAIN THE MOISTURE CAPACITY.

(2) SEASONAL CLEARING IS LIMITED BETWEEN OCTOBER 1 AND MARCH 30 INCLUSIVE, UNLESS OTHERWISE APPROVED WITH A WRITTEN DECISION BY THE REVIEWING AGENCY.

(3) IMPROVEMENTS AND/OR BUILDINGS SHALL NOT BE INSTALLED UNTIL DRAINAGE FACILITIES ARE "IN OPERATION". (KCC 9.04).

SEEDING NOTES: (WHERE REQUIRED)

1. SEEDING SHOULD BE DONE IMMEDIATELY AFTER FINAL SHAPING IF COMPLETED DURING THE PERIODS OF APRIL 1 THROUGH JUNE 30 AND SEPTEMBER I THROUGH OCTOBER 31 (IF PLANTED BETWEEN JULY 1 AND AUGUST 31, IRRIGATION MAY BE REQUIRED). SITES WHICH CANNOT BE SEEDED DURING THIS TIME PERIOD SHOULD BE PROTECTED UNTIL THE NEXT SEEDING PERIOD WITH MULCHING.
2. PERMANENT VEGETATION MAY BE IN THE FORM OF GRASS SEED MIXTURES, SOD, OR WETLAND SEED / TUBER MIXTURES. SEED ESTABLISHMENT SHALL INCLUDE THE USE OF SUPPLEMENTAL MATERIALS, SUCH AS MULCH.
3. SITE PREPARATION - INSTALL SURFACE RUNOFF CONTROL MEASURES.
4. SEEDBED PREPARATION MAY INCLUDE THE FOLLOWING:
   a. IF INFERTILE OR COARSE TEXTURED SUBSOIL MILL BE EXPOSED DURING GRADING, STOCKPILE TOPSOIL AND RE-SPREAD IT OVER THE FINISHED SLOPE AND ROLL IT TO PROVIDE A FIRM SEEDBED.
   b. IF CONSTRUCTION FILLS HAVE LEFT SOIL EXPOSED WITH A LOOSE, ROUGH, OR IRREGULAR SURFACE, TRACK WALK UP SLOPE.
   c. IF CUTS OR CONSTRUCTION EQUIPMENT HAVE LEFT A TIGHTLY COMPACTED SURFACE, BREAK WITH CHISEL PLOW OR OTHER SUITABLE IMPLEMENT.
5. PERFORM ALL CULTURAL OPERATIONS ACROSS OR AT RIGHT ANGLES TO THE SLOPES (CONTOURED). THE SEEDBED SHOULD BE FIRM WITH A FAIRLY FINE SURFACE AFTER ROUGHENING.
6. FERTILIZATION - AS PER SUPPLIER'S RECOMMENDATIONS. DEVELOPMENTS ADJACENT TO WATER BODIES MUST USE NON-PHOSPHOROUS FERTILIZER.
7. "HYDROSEEDING" APPLICATIONS WITH APPROVED SEED-MULCH-FERTILIZER MIXTURES MAY ALSO BE USED.
8. SEEDING - APPLY APPROPRIATE MIXTURE TO THE PREPARED SEEDBED AT A RATE OF 120 LBS/ACRE COVER THE SEED WITH TOPSOIL OR MULCH NO DEEPER THAN 1/2 INCH.
9. INSPECT SEEDED AREAS FOR FAILURE AND MAKE NECESSARY REPAIRS AND RE-SEEDINGS IMMEDIATELY.
   a. IF VEGETATION COVER IS INADEQUATE TO PREVENT RILL EROSION, OVERSEED AND FERTILIZE IN ACCORDANCE WITH SOIL TEST RESULTS.
   b. IF A STAND HAS LESS THAN 40% COVER, REEVALUATE CHOICE OF PLANT MATERIALS AND QUANTITIES OF LIME AND FERTILIZER. REESTABLISH THE STAND FOLLOWING SEEDBED PREPARATION AND SEEDING RECOMMENDATIONS, OMITTING LIME AND FERTILIZER IN THE ABSENCE OF SOIL TEST RESULTS.
10. TEMPORARY EROSION CONTROL SEED MIXTURES

SEED MIX TYPE	PROPORTIONS BY WEIGHT	PERCENT PURITY	PERCENT GERMINATION
CHEWINGS OR RED FESCUE	40%	98%	90
ANNUAL OR PREENNIAL RYE	40%	98%	90
REDTOP OR COLONIAL BENTGRASS	10%	92%	85
WHITE DUTCH CLOVER	10%	98%	90

*APPLY THIS MIXTURE AT A RATE OF 120 LBS/ACRE. THIS RATE CAN BE REDUCED IF SOIL AMENDMENTS OR SLOW RELEASE FERTILIZERS ARE USED.

MULCHING:

1. MULCH MATERIALS USED SHALL BE HAY OR STRAW, AND SHALL BE APPLIED AT THE RATE OF 2-3 TONS PER ACRE.
2. MULCHES SHALL BE APPLIED ON ALL EXPOSED AREAS.
3. MULCHING SHALL BE USED IMMEDIATELY AFTER SEEDING OR IN AREAS WHICH CANNOT BE SEEDED BECAUSE OF THE SEASON.
4. ALL AREAS NEEDING MULCH SHALL BE COVERED BY NOVEMBER 1.

PLANTING NOTES:

1. THE PROJECT AREAS WILL HAVE A CAP OF TOPSOIL WITH AN APPROPRIATE MIXTURE OF FUNGI PERFECTI AND GLOMALIN TO SUPPORT SOIL DEVELOPMENT AND VEGETATION SURVIVAL.
2. THE PRIMARY CONIFER SPECIES WILL CONSIST OF DOUGLAS-FIR 2+0 SEEDLINGS AND THE PLANTING RATE WILL BE APPROXIMATELY 680 TREES PER ACRE. THE SPACING ON THE PLANTED SEEDLINGS WILL BE 8 FEET BY 8 FEET. ADDITIONALLY, RED ALDER IS A PIONEER SPECIES FOR THIS REGION AND WILL NATURALLY REGENERATE ON EXPOSED SOILS.
3. AN APPROVED FORESTRY SEED MIX WILL BE APPLIED EVENLY ACROSS THE COMPLETED SITE.

REVISION	DESCRIPTION	DATE	BY

CONTOUR ENGINEERING · LLC
CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourpllc.com

BRETT M. ALLEN
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER

SHEET TITLE: CONSTRUCTION NOTES

RAVENSDALE TRENCH FILLING

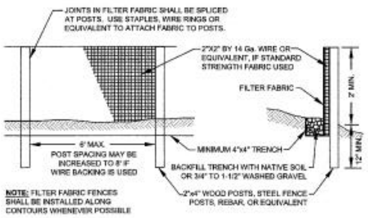
CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT ERICKSON
PHONE:(253) 606-6060

DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6E WM
DATE: 2019.12.31
REVISED:
PROJECT: 09-040
DWG NAME: 09-040-C

SHEET	REV.
C3	△
3 OF 33	

RAVENSDALE RECLAMATION TRENCH FILLING AND RESTORATION PROJECT

PORTIONS OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST,
SECTION 36, TOWNSHIP 22 NORTH, RANGE 6 EAST, AND SECTION 31, TOWNSHIP 22 NORTH, RANGE 7 EAST, W.M.
KING COUNTY, WASHINGTON



NOTE: FILTER FABRIC FENCES SHALL BE INSTALLED ALONG CONTOURS WHENEVER POSSIBLE

MAINTENANCE STANDARDS

1. Any damage shall be repaired immediately.
2. If concentrated flows are evident uphill of the fence, they must be intercepted and conveyed to a sediment trap or pond.
3. It is important to check the uphill side of the fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence or remove the trapped sediment.
4. Sediment must be removed when the sediment is 6 inches high.
5. If the filter fabric (geotextile) has deteriorated due to ultraviolet breakdown, it shall be replaced.

FILTER FABRIC FENCE NOTES:

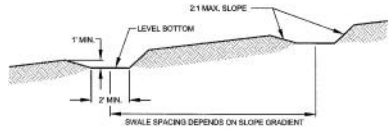
1. SEE FIGURE C.3.6.A AND FIGURE C.3.6.B FOR DETAILS.
2. THE GEOTEXTILE USED MUST MEET THE STANDARDS LISTED BELOW. A COPY OF THE MANUFACTURER'S FABRIC SPECIFICATIONS MUST BE AVAILABLE ONSITE.

AOS (ASTM D4751)	30-100 sieve size (0.60-0.15 mm) for silt film 50-100 sieve size (0.30-0.15 mm) for other fabrics
Water Permittivity (ASTM D4491)	0.02 sec^{-1} minimum
Grab Tensile Strength (ASTM D4632)	180 lbs. min. for extra strength fabric 100 lbs. min. for standard strength fabric
Grab Tensile Elongation (ASTM D4632)	30% max.
Ultraviolet Resistance (ASTM D4355)	70% min.

3. STANDARD STRENGTH FABRIC REQUIRES WIRE BACKING TO INCREASE THE STRENGTH OF THE FENCE. WIRE BACKING OR CLOSER POST SPACING MAY BE REQUIRED FOR EXTRA STRENGTH FABRIC IF FIELD PERFORMANCE WARRANTS A STRONGER FENCE.
4. WHERE THE FENCE IS INSTALLED, THE SLOPE SHALL BE NO STEEPER THAN 2H:1V.
5. IF A TYPICAL SILT FENCE (PER FIGURE C.3.6.A) IS USED, THE STANDARD 4 X 4 TRENCH MAY NOT BE REDUCED AS LONG AS THE BOTTOM 8 INCHES OF THE SILT FENCE IS WELL BURIED AND SECURED IN A TRENCH THAT STABILIZES THE FENCE AND DOES NOT ALLOW WATER TO BYPASS OR UNDERMINE THE SILT FENCE.
6. SILT FENCES SHALL BE LOCATED SO AS TO AVOID INTERFERING WITH THE MOVEMENT OF JUVENILE SALMONIDS ATTEMPTING TO ENTER OFF-CHANNEL AREAS OR DRAINAGES.

FILTER FABRIC FENCE DETAIL

NOT TO SCALE



DESIGN AND INSTALLATION SPECIFICATIONS

1. SEE FIGURE D.2.1.6.B FOR DETAILS OF AN INTERCEPTOR DIKE AND FIGURE D.2.1.6.C FOR AN INTERCEPTOR SWALE.
2. INTERCEPTOR DIKES AND SWALES SHALL BE SPACED HORIZONTALLY AS FOLLOWS:

AVERAGE SLOPE	SLOPE PERCENT	FLOWPATH LENGTH
20H:1V OR LESS	3-5%	300 FEET
(10 TO 20)H:1V	5-10%	200 FEET
(4 TO 10)H:1V	10-25%	100 FEET
(2 TO 4)H:1V	25-50%	50 FEET

3. FOR SLOPES STEEPER THAN 2H:1V WITH MORE THAN 10 FEET OF VERTICAL RELIEF, BENCHES MAY BE CONSTRUCTED OR CLOSER SPACED INTERCEPTOR DIKES OR SWALES MAY BE USED. WHICHEVER MEASURE IS CHOSEN, THE SPACING AND CAPACITY OF THE MEASURES MUST BE DESIGNED BY THE ENGINEER AND THE DESIGN MUST INCLUDE PROVISIONS FOR EFFECTIVELY INTERCEPTING THE HIGH VELOCITY RUNOFF ASSOCIATED WITH STEEP SLOPES.
4. IF THE DIKE OR SWALE INTERCEPTS RUNOFF FROM DISTURBED AREAS, IT SHALL DISCHARGE TO A STABLE CONVEYANCE SYSTEM THAT ROUTES THE RUNOFF TO A SEDIMENT POND OR TRAP (SEE SECTION D.2.1.5). IF THE DIKE OR SWALE INTERCEPTS RUNOFF THAT ORIGINATES FROM UNDISTURBED AREAS, IT SHALL DISCHARGE TO A STABLE CONVEYANCE SYSTEM THAT ROUTES THE RUNOFF DOWNSLOPE OF ANY DISTURBED AREAS AND RELEASES THE WATER AT A STABILIZED OUTLET.
5. CONSTRUCTION TRAFFIC OVER TEMPORARY DIKES AND SWALES SHALL BE MINIMIZED.

MAINTENANCE STANDARDS

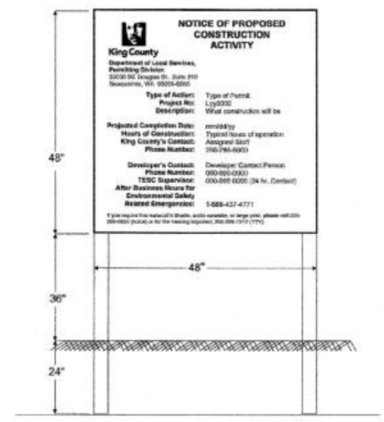
1. DAMAGE RESULTING FROM RUNOFF OR CONSTRUCTION ACTIVITY SHALL BE REPAIRED IMMEDIATELY.
2. IF THE FACILITIES DO NOT REGULARLY RETAIN STORM RUNOFF, THE CAPACITY AND/OR FREQUENCY OF THE DIKES/SWALES SHALL BE INCREASED.

INTERCEPTOR SWALES NOTES:

1. SEED AND MULCH SHALL BE APPLIED WITHIN 5 DAYS OF CONSTRUCTION (SEE VEGETATION).
2. NO EROSION SHALL OCCUR AT THE OUTLET. PROVIDE ENERGY DISSIPATION MEASURES AS NECESSARY.
3. SEDIMENT LADEN RUNOFF MUST BE RELEASED THROUGH A SEDIMENT TRAPPING FACILITY SUCH AS A POND, TRAP, OR SILT FENCE AS APPROPRIATE TO DRAINAGE AREA SIZE.

INTERCEPTOR DITCH DETAIL

NOT TO SCALE



NOTICE BOARD CONSTRUCTION SPECIFICATIONS

THE NOTICE BOARD SHALL BE CONSTRUCTED WITH 4' X 4' X 1/2" PLYWOOD, EXTERIOR GRADE, GOOD SURFACE ONE SIDE. PROFESSIONALLY PREPARED PLASTIC BOARD OVERLAYS, PERMANENTLY AFFIXED TO THE BOARD ARE PERMISSIBLE. THE NOTICE BOARD SHALL DISPLAY THE INFORMATION AS SHOWN IN THE FIGURE ON PAGE TWO AND AS SPECIFIED AT THE PRE-CONSTRUCTION MEETING. NOTICE BOARDS MAY BE REUSED, BUT THEY MUST BE CLEAN AND SHOW NO EVIDENCE OF FORMER WORDING.

1. LETTERING STYLE — HELVETICA OR SIMILAR TYPEFACE
2. LETTERING SIZE — TITLE SHOULD BE 3" CAPITAL LETTERS (NOTICE OF PROPOSED CONSTRUCTION ACTIVITY). OTHER LETTERS SHOULD BE 2" LETTERS AND THE 'EMERGENCY' TEXT AND PHONE MAY BE 1-1/2" LETTERS. SEE ILLUSTRATION ON PAGE TWO FOR USE OF CAPITAL AND LOWERCASE LETTERS. *THE SIZE OF THE COUNTY LOGO WITH THE DEPARTMENT OF PERMITTING AND ENVIRONMENTAL REVIEW'S (PERMITTING) ADDRESS (LETTERING HEIGHT 1") SHALL FIT THE AVAILABLE SPACE AS SHOWN. BORDER AREA AND LINES OF TEXT SHALL BE EVENLY SPACED TO APPROXIMATE THE SAMPLE SHOWN.*
3. LETTERING — BLACK (PERMANENT INK OR SILK-SCREEN)
4. BACKGROUND COLOR — WHITE
5. LOGO — KING COUNTY EMBLEM, IN BLACK

THE APPLICANT/DEVELOPER SHALL ERECT THE NOTICE BOARD BY SOLIDLY SETTING TWO 4" X 4" POSTS TO 12 TO 24 INCHES INTO THE GROUND; OR STRUCTURALLY ATTACHING IT TO AN EXISTING BUILDING. POST LENGTH SHALL BE AT LEAST 7 FEET ABOVE THE GROUND. TWO 2" X 4" DIAGONAL BRACES SHOULD BE NAILED TO THE INSIDE BACK OF THE POSTS AND STAKED AT THE GROUND TO PROVIDE STABILITY AGAINST WIND OR SOFT SOIL CONDITIONS IF POSTS ARE LESS THAN 24 INCHES INTO THE GROUND.

THE NOTICE BOARD SHALL BE ATTACHED TO THE POSTS WITH FOUR LAG BOLTS AND WASHERS (3/8-INCH DIAMETER AND 3" LONG).

NOTICE BOARD LOCATION

THE NOTICE BOARD SHALL BE LOCATED:

- AT THE MIDPOINT ON THE SITE STREET FRONTAGE OR AS OTHERWISE DIRECTED BY PERMITTING STAFF TO MAXIMIZE VISIBILITY.
- AT A LOCATION 5 FEET INSIDE THE STREET PROPERTY LINE; A NOTICE BOARD STRUCTURALLY ATTACHED TO AN EXISTING BUILDING SHALL BE EXEMPT FROM THE SETBACK PROVISIONS, PROVIDED THAT THE NOTICE BOARD IS LOCATED NOT MORE THAN 5 FEET FROM THE PROPERTY LINE WITHOUT APPROVAL FROM PERMITTING STAFF.
- SO THAT THE TOP OF THE NOTICE BOARD IS BETWEEN 7 TO 9 FEET ABOVE GRADE.
- SO THAT IT IS TOTALLY VISIBLE TO PEDESTRIANS.

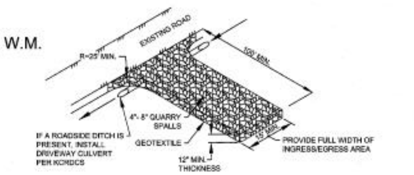
MAINTENANCE AND REMOVAL OF NOTICE BOARD

THE APPLICANT/DEVELOPER SHALL MAINTAIN THE NOTICE BOARD IN GOOD CONDITION THROUGHOUT THE SITE IMPROVEMENT CONSTRUCTION PERIOD, WHICH SHALL EXTEND THROUGH THE TIME OF FINAL CONSTRUCTION APPROVAL BY KING COUNTY PERMITTING OR ITS SUCCESSOR AGENCY OR JURISDICTION.

THE NOTICE BOARD SHALL BE REMOVED WITHIN 14 DAYS AFTER FINAL CONSTRUCTION APPROVAL. EARLY REMOVAL OF THE NOTICE BOARD MAY RESULT IN ENFORCEMENT ACTIONS AUTHORIZED UNDER KCC, TITLE 23 AND MAY DELAY FINAL CONSTRUCTION APPROVAL.

NOTICE OF CONSTRUCTION ACTIVITY SIGN

NOT TO SCALE



NOTES:

- PER KING COUNTY ROAD DESIGN AND CONSTRUCTION STANDARDS (KCRDCS), DRIVEWAYS SHALL BE PAVED TO EDGE OF R-O-W PRIOR TO INSTALLATION OF THE CONSTRUCTION ENTRANCE TO AVOID DAMAGING OF THE ROADWAY.
- IT IS RECOMMENDED THAT THE ENTRANCE BE CROWNED SO THAT RUNOFF DRAINS OFF THE PAD.

DESIGN AND INSTALLATION SPECIFICATIONS

1. SEE FIGURE D.2.1.4.A FOR DETAILS.
2. A SEPARATION GEOTEXTILE SHALL BE PLACED UNDER THE SPALLS TO PREVENT FINE SEDIMENT FROM PUMPING UP INTO THE ROCK PAD. THE GEOTEXTILE SHALL MEET THE FOLLOWING STANDARDS:

GRAB TENSILE STRENGTH (ASTM D4632)	200 LBS MIN.
GRAB TENSILE ELONGATION (ASTM D4632)	30% MAX.(WOVEN)
PUNCTURE STRENGTH (ASTM D6241)	495 LBS MIN.
AOS (ASTM D4751)	20-45 (U.S. STANDARD SIEVE SIZE)

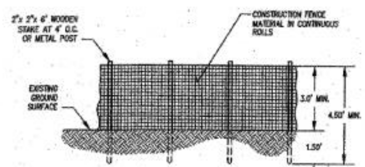
3. DO NOT USE CRUSHED CONCRETE, CEMENT, OR CALCIUM CHLORIDE FOR CONSTRUCTION ENTRANCE STABILIZATION BECAUSE THESE PRODUCTS RAISE PH LEVELS IN STORMWATER AND CONCRETE DISCHARGE TO SURFACE WATERS OF THE STATE IS PROHIBITED.
4. HOG FUEL (WOOD BASED MULCH) MAY BE SUBSTITUTED FOR OR COMBINED WITH QUARRY SPALLS IN AREAS THAT WILL NOT BE USED FOR PERMANENT ROADS. THE EFFECTIVENESS OF HOG FUEL IS HIGHLY VARIABLE, BUT IT HAS BEEN USED SUCCESSFULLY ON MANY SITES. IT GENERALLY REQUIRES MORE MAINTENANCE THAN QUARRY SPALLS. HOG FUEL IS NOT RECOMMENDED FOR ENTRANCE STABILIZATION IN URBAN AREAS. THE INSPECTOR MAY AT ANY TIME REQUIRE THE USE OF QUARRY SPALLS IF THE HOG FUEL IS NOT PREVENTING SEDIMENT FROM BEING TRACKED ONTO PAVEMENT OR IF THE HOG FUEL IS BEING CARRIED ONTO PAVEMENT. HOG FUEL IS PROHIBITED IN PERMANENT ROADBEDS BECAUSE ORGANICS IN THE SUBGRADE SOILS CAUSE DIFFICULTIES WITH COMPACTION.
5. FENCING (SEE SECTION D.2.1.1) SHALL BE INSTALLED AS NECESSARY TO RESTRICT TRAFFIC TO THE CONSTRUCTION ENTRANCE.
6. WHENEVER POSSIBLE, THE ENTRANCE SHALL BE CONSTRUCTED ON A FIRM, COMPACTED SUBGRADE. THIS CAN SUBSTANTIALLY INCREASE THE EFFECTIVENESS OF THE PAD AND REDUCE THE NEED FOR MAINTENANCE.

MAINTENANCE STANDARDS

1. QUARRY SPALLS (OR HOG FUEL) SHALL BE ADDED IF THE PAD IS NO LONGER IN ACCORDANCE WITH THE SPECIFICATIONS.
2. IF THE ENTRANCE IS NOT PREVENTING SEDIMENT FROM BEING TRACKED ONTO PAVEMENT, THEN ALTERNATIVE MEASURES TO KEEP THE STREETS FREE OF SEDIMENT SHALL BE USED. THIS MAY INCLUDE STREET SWEEPING, AN INCREASE IN THE DIMENSIONS OF THE ENTRANCE, OR THE INSTALLATION OF A WHEEL WASH. IF WASHING IS USED, IT SHALL BE DONE ON AN AREA COVERED WITH CRUSHED ROCK, AND WASH WATER SHALL DRAIN TO A SEDIMENT TRAP OR POND.
3. ANY SEDIMENT THAT IS TRACKED ONTO PAVEMENT SHALL BE REMOVED IMMEDIATELY BY SWEEPING. THE SEDIMENT COLLECTED BY SWEEPING SHALL BE REMOVED OR STABILIZED ON SITE. THE PAVEMENT SHALL NOT BE CLEANED BY WASHING DOWN THE STREET, EXCEPT WHEN SWEEPING IS INEFFECTIVE AND THERE IS A THREAT TO PUBLIC SAFETY. IF IT IS NECESSARY TO WASH THE STREETS, A SMALL SUMP MUST BE CONSTRUCTED. THE SEDIMENT WOULD THEN BE WASHED INTO THE SUMP WHERE IT CAN BE CONTROLLED. WASH WATER MUST BE PUMPED BACK ONTO THE SITE AND CANNOT DISCHARGE TO SYSTEMS TRIBUTARY TO SURFACE WATERS.
4. ANY QUARRY SPALLS THAT ARE LOOSENED FROM THE PAD AND END UP ON THE ROADWAY SHALL BE REMOVED IMMEDIATELY.
5. IF VEHICLES ARE ENTERING OR EXITING THE SITE AT POINTS OTHER THAN THE CONSTRUCTION ENTRANCE(S), FENCING (SEE SECTION D.2.1.1) SHALL BE INSTALLED TO CONTROL TRAFFIC.

CONSTRUCTION ENTRANCE DETAIL

NOT TO SCALE



MAINTENANCE STANDARDS:

1. IF THE FENCE HAS BEEN DAMAGED OR VISIBLY REDUCED, IT SHALL BE REPAIRED OR REPLACED IMMEDIATELY AND VISIBILITY RESTORED.
2. DISTURBANCE OF A CRITICAL AREA, CRITICAL BUFFER, NATIVE GROWTH RETENTION AREA, OR ANY OTHER AREA REQUIRED TO BE LEFT UNDISTURBED SHALL BE REPORTED TO THE COUNTY FOR RESOLUTION.

PROTECTION FENCE NOTES:

1. THE FENCE SHALL DESIGNED AND INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
2. THE FENCE SHALL BE AT LEAST 3 FEET HIGH AND MUST BE HIGHLY VISIBLE.
3. THE FENCE SHALL NOT BE WIRED OR STAPLED TO TREES.
4. THE FENCE SHALL BE REMOVED UPON THE COMPLETION OF THE WORK AND THE SITE IS STABILIZED.

PROTECTION FENCE DETAIL

NOT TO SCALE

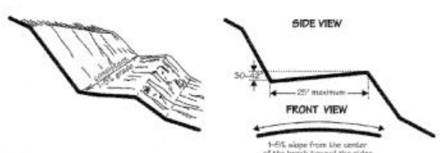


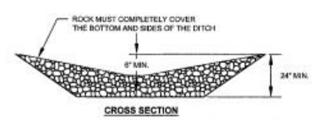
Figure 2.4. Benching and terracing of unconsolidated material to control runoff. Benches cut in overburden or other material likely to erode should be sloped into the hillside (side view) and away from the center of the bench (1–5% slope or grade) to allow drainage to either side (front view). (Modified from Law, 1984. Copyright © 1984 by Van Nostrand Reinhold Company Inc. Used by permission of the publisher.)

BENCHING AND TERRACING DETAIL

NOT TO SCALE

ACCESS ROAD AND ACCESS POINT NOTES

ACCESS ROADS AND ACCESS POINTS SHALL BE A MINIMUM OF 15' WIDE WITH A MAXIMUM OF A 2% CROSS SLOPE, 15% DOWNWARD/UPWARD SLOPE, AND SHALL BE CONSTRUCTED AND SUBSEQUENTLY RECLAIMED AS TRENCH FILLING DICTATES, ENSURING NO ROAD REMAINS LONGER THAN NECESSARY.



CROSS SECTION

CHECK DAM SPACING

ROCK CHECK DAMS

NOT TO SCALE

DATE	BY	DESCRIPTION	REVISION

CONTOUR ENGINEERING · LLC
CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourpllc.com

SHEET TITLE: T.E.S.C. NOTES & DETAILS

RAVENSDALE TRENCH FILLING

CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328

CONTACT: KURT ERICKSON PHONE:(253) 606-6060

DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6E WM
DATE: 2019.12.31
REVISED:

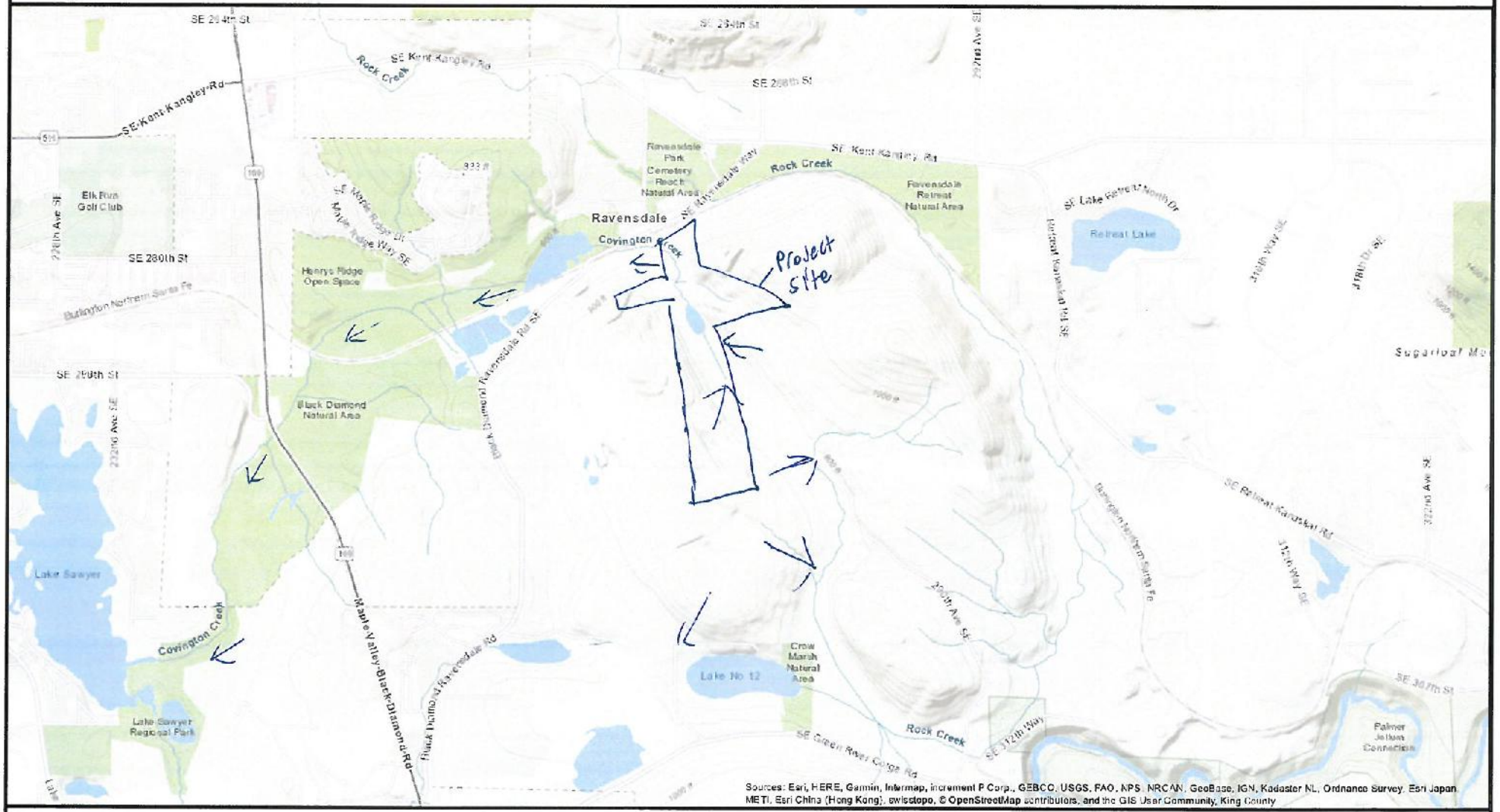
PROJECT: 09-040
DWG NAME: 09-040-C

SHEET	REV.
C4	△
4 OF 33	

APPENDIX C

Downstream Analysis

Downstream System



Date: 5/31/2018

Notes:

N

King County GIS Center