



November 2022
Cumberland Mine Fish Assessment



Existing Fish and Habitat Conditions Report

Prepared for Segale Properties, LLC

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Prepared for
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ABBREVIATIONS

µg/L	microgram per liter
AESI	Associated Earth Sciences, Inc.
CFS	cubic foot per second
COC	contaminant of concern
D&T	dissolved and total
DNR	Washington Department of Natural Resources
DNR Property	Washington Department of Natural Resources parcels
DO	dissolved oxygen
DPS	Distinct Population Segment
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
ft/mi	foot per mile
IPAC	Information for Planning and Consultation
LiDAR	light detection and ranging
LOCSS	Lake Observations by Citizen Scientists and Satellites
mg/L	milligram per liter
PCC	Pacific Coast Coal
PHS	Priority Habitat and Species
Segale	Segale Properties, LLC
SEPA	State Environmental Policy Act
TDS	total dissolved solids
TPU	Tacoma Public Utilities
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAC	<i>Washington Administrative Code</i>
WDFW	Washington Department of Fish and Wildlife
WRIA	water resource inventory area

1 Project Overview

1.1 Introduction

Anchor QEA, LLC, was retained to evaluate potential impacts to water quality, fish, and fish habitat from effects to surface water and groundwater flows and eventual discharge or seepage into the proximate Green River and nearby lakes and streams from a proposed gravel mine located north of the town of Cumberland in King County, Washington. Segale Properties, LLC (Segale), proposes to develop the site as a mine for gravel extraction. The purpose of this evaluation is to support the regulatory process for the proposed gravel mine, which will include an environmental impact statement (EIS), with King County serving as the lead agency. This evaluation is being conducted in two phases—Phase 1: review of existing conditions to provide a comprehensive characterization of the Affected Environment in anticipation of the EIS, and Phase 2: evaluation and analysis of potential impacts from the proposed gravel mine and identification of appropriate mitigation for identified impacts.

The proposed project includes plans for site development of the Segale Property for sand and gravel extraction. A conceptual development plan prepared by Nv5 Global, Inc., details the proposed mining areas and sequencing of mining (Appendix A). Mining and site development will be done under a staged approach as a “pit mine.” Anticipated mining-related facilities include a processing plant (i.e., crusher, wash plant, and process water control plant) and asphalt plant. The processing plant is anticipated to operate within the northern Segale Property and may be moved during later stages to the western Segale Property to minimize haul distances. The asphalt plant is anticipated to operate near the southeastern corner of the northern Segale Property, based on conceptual development plans (Appendix A). The proposed gravel mining operation is anticipated to occur at an elevation of approximately 120 to 140 feet above the Green River. Overall, mining depths will be limited to within 10 feet of the regional groundwater aquifer. The processing plant and asphalt plant and associated facilities will be self-contained and staged on an asphalt pad such that all process water and stormwater runoff will be captured, preventing contact with the surrounding ground surface. Captured stormwater and process water will be recycled and reused for system processing. Runoff from pit areas will be directed into temporary infiltration ponds located at low points. Because the low point of the pit will vary with mining stages, it is anticipated that infiltration pond locations will be changed as needed to accommodate the extraction schedule.

As part of this Phase 1 review, Anchor QEA reviewed existing material and studies that have been conducted by Associated Earth Sciences, Inc. (AESI) to understand existing conditions for surface water and groundwater flow, surface water and groundwater chemical composition (including contaminants), and how groundwater interacts with the Green River and nearby lakes and streams. This review provides an understanding of how surface water and groundwater flow from the

Segale Property to the Green River and nearby lakes and streams to inform if potential impacts to water quality could occur that could impact fish and their habitat during construction and operation of the gravel mine. The existing conditions review includes a compilation of readily available material related to fish and fish habitat in the Green River and nearby lakes and streams.

The existing conditions review also includes a compilation of readily available documentation of previous and existing gravel mines and coal mines and potential contaminants of concern (COCs) that have been associated with those mines. The review included examination of existing gravel mine permits for nearby gravel mines and identifying any associated water quality violations. This information was used to identify contaminants that should be analyzed in future monitoring activities.

This report summarizes the Phase 1 review of existing conditions and provides a recommendation on the path forward for determining potential impacts on water quality and fish and their habitat in the Green River and nearby lakes and streams. During Phase 2, existing conditions and anticipated conditions during construction and operation of the gravel mine will be used to evaluate potential impacts to fish and their habitat. The Phase 2 evaluation will rely heavily on the evaluation by AESI of the potential impacts from the proposed gravel mine to groundwater and surface water that flows into the nearby water bodies.

1.2 Project Setting

The proposed Segale Property development encompasses approximately 990 acres of land north of the city of Cumberland in unincorporated King County, Washington (Figure 1). The Segale Property surrounds an approximately 599-acre parcel that is owned by the Washington Department of Natural Resources (DNR). An approximately 571-acre parcel also owned by the DNR occupies an area to the southwest of the Segale Property. State-owned lands lie between the northern and western Segale Property and the Green River. These lands include the Kanaskat-Palmer State Park and Recreation Area (AESI 2022). The Green River has deeply incised into the bedrock and overlying unlithified deposits. The valley walls are steep sided along a section of the river known as the Green River Gorge, which stretches from Palmer Junction to Flaming Geyser State Park (AESI 2022). The Segale Property appears to contain a buried erosional valley incised into the bedrock. An ancient river, possibly analogous to the modern Green River, established a course through a bedrock valley in the immediate vicinity of the site (AESI 2022). This paleo-valley was aggraded with sediments derived primarily by fluvial deposition processes and which included fluvial sands and gravels and lacustrine silt/clay (AESI 2022). Glacial sediments in the region of the site are a record of the Vashon-age Puget Lobe, which deposited glacial till, ice-contact deposits, and outwash sand and gravel. Sand and gravel from Vashon outwash deposits and ice contact deposits were, in general, noted to be present from ground surface to bedrock. Bedrock was encountered in the eastern portion of the property, in the vicinity of Lizard Mountain, ranging from approximately 950 to 1,450 feet. With the exception of

the bedrock knob west of B-3, bedrock in the northwest areas of the subject property was identified ranging from 650 to 750 feet (AESI 2022).

Surface water monitoring is performed by AESI at 11 locations on and near the subject property as shown on Figure 2. Monitoring of groundwater is performed by AESI at a minimum of six groundwater monitoring wells, including B-3, B-4, B-5, EB-1W, EB-5W, and EB-7W (Figure 2).

Measurements collected from monitoring wells indicate groundwater elevations ranging from approximately 800 feet on the eastern portion of the subject property to 700 feet on the western portion of the property near the Green River (Figure 3). Perched groundwater was noted to be present on Lizard Mountain greater than 800 feet. As mentioned in Section 1.1, based on the geologic setting, the data demonstrate groundwater mainly flows through the gravel material deposited above the bedrock and enters the Green River at the elevation of the bedrock above the river level and then seeps or falls into the river. Direct discharge of surface water from the Segale Property to the Green River is limited to Stream A. Direct discharge of groundwater flowing off site beneath the Segale Property into the Green River occurs at locations where the aquifer system and the Green River are at grade (Figure 3). Section 2 provides a summary of monitoring results and a description of the surface water and groundwater flows from the Segale Property and interactions with the Green River and nearby lakes and streams.

2 Existing Conditions

A summary of existing conditions relevant to evaluating potential project impacts on the water quality in the Green River and nearby water bodies that could impact fish and their habitat are provided in this section. Most of the summary material included in Sections 2.1 through 2.3 was taken from the AESI *Existing Conditions Hydrogeologic Report* (AESI 2022). This information is summarized to provide an understanding of how groundwater and surface water from the Segale Property flow to nearby sections of the Green River and other water bodies. COCs identified in surface water and groundwater monitoring are discussed in Section 2.3 to understand existing conditions on the Segale Property that could be migrating to the Green River and nearby water bodies. This is important for understanding how water quality in the Green River and other water bodies could be influenced by groundwater and surface water that flow from the Segale Property. A summary of existing fish and fish habitat conditions in the Green River and other water bodies influenced by groundwater and surface water flows from the Segale Property is also provided in Sections 2.5 and 2.6. These existing conditions will be used to evaluate potential proposed project impacts and inform mitigation recommendations as part of the Phase 2 evaluation.

A summary of potential water quality concerns associated with gravel mines and the effects on groundwater and proximate river water quality is provided in Section 3. Although no coal mining is proposed, historical COCs associated with off-site coal mines are compared to applicable water quality standards from site-specific water quality data obtained from surface water flowing from Lizard Mountain.

2.1 Surface Water Resources

This section provides a summary of surface water resources on and adjacent to the Segale Property. The review was performed to develop an understanding of surface water flows from the Segale Property to proximate water bodies where fish are known to occur. The only direct surface water connection from the Segale Property to off-site surface water is via Stream A located in the extreme northern margin of the site. Streams originating on Lizard Mountain infiltrate into the subsurface and do not flow as surface water to any off-site surface water features. The summary of surface water resources presented herein was compiled using information provided in the AESI *Existing Conditions Hydrogeologic Report* (AESI 2022).

2.1.1 Green River

The Green River originates in the high Cascade Mountains. The Segale Property is located proximate to the Green River with state-owned land located between the Segale Property and the Green River. The section proximate to the Segale Property is approximately river miles 55.5 to 51.5. The channel gradient is moderately steep as the river winds its way between narrow, steep-sloped valley walls.

The stream bottom throughout the gorge is composed of boulders, bedrock rubble, and patches of gravel.

The Green River gradient in the gorge averages 80 feet per mile (ft/mi). River stage and discharge are monitored upstream at approximate river mile 60.4 by the U.S. Geological Survey (USGS) at station 12106700 (Palmer gage). The Palmer gage is located approximately 5 miles upstream of the site at the Tacoma Public Utilities (TPU) Green River Filtration Facility. Average discharge ranges from approximately 1,650 cubic feet per second (CFS) measured in January, during the wet season, to 160 CFS measured in August, during the dry season.

River stage and discharge are also monitored downstream at approximate river mile 32.0 by USGS at station 12113000 (Auburn gage). The Auburn gage is located approximately 20 miles downstream of the site. Monthly average discharges range from about 2,390 CFS measured in January, during the wet season, to 310 CFS measured in August, during the dry season. The lowest average monthly flow on record is about 220 CFS. Ultimately, the Green River turns into the Duwamish River near Auburn, Washington.

2.1.2 Deep Creek and Stream G

Deep Creek is approximately 4.8 miles long and is classified as a fish-bearing creek by the DNR forest practices water typing per chapter 222-16-031 of the *Washington Administrative Code* (WAC). Its headwaters are in the bedrock uplands northeast of Cumberland. Stream G is a tributary to Deep Creek upstream of the Segale Property.

Deep Creek ultimately drains into Deep Lake, and to a lesser degree Hyde Lake, as there is a diversion in Deep Creek that diverts some water to Hyde Lake. Seasonal observations indicated a fluctuation of about 2 to 20 CFS. The Stream G tributary lies between Deep Creek monitoring locations DC-328TH and DC-KUZAK and was observed to contribute up to about 0.3 CFS to Deep Creek during an AESI site visit in May 2022.

2.1.3 Deep Lake

Deep Lake is a kettle lake with a surface area of approximately 39 acres, a mean depth of 33 feet, and a maximum depth of 74 feet. Deep Creek terminates at Deep Lake and serves as the primary surface water inflow. Recent measurements performed by AESI indicate that Deep Lake seasonally varies about 8 feet in surface elevation between approximately 765 to 773 feet. Flows into Deep Lake and high flow events in Deep Creek result in short-term elevated water levels in Deep Lake, followed by a rapid decline in the lake to background water levels. The rapid decline of water levels in Deep Lake following high flow events in Deep Creek is a result of surface water groundwater interaction and permeability.

Monitoring data indicate the high lake levels dissipate quickly, about 2 to 3 feet over a couple weeks, while the remainder below approximately 770 feet takes months to drawdown. These dissipation rates suggest that more permeable material, such as sand and gravel, is present near 770 feet and serves as a pathway for surface water to flow in a radial pattern away from the lake and recharge the regional groundwater system. Slower dissipation rates for material deeper than 770 feet are likely related to the presence of lower permeability sediment along the margins of the lake. Based on the 3 years of monitoring data reviewed, Deep Lake reaches its lowest water levels during September. The seasonal fluctuation and water elevation are interpreted to indicate that Deep Lake recharges regional groundwater and is connected to the water table. Therefore, lake levels are interpreted to form a groundwater mound above the regional water table resulting in radial flow away from Deep Lake.

2.1.4 Hyde Lake and Stream F

Hyde Lake (previously referred to as Lake Isabel or Isabella) is a kettle lake located approximately 1/3 mile southwest of the southern Segale Property and about 1/2 mile north of Deep Lake. It has a surface area of about 5 acres. The lake is connected via surface waters to Deep Lake by a surface water inlet from Deep Creek through a small, ditched stream channel (Stream F) and represents only a small fraction of the flow rate observed at Deep Creek at the inlet to Deep Lake in Nolte State Park. Stream F was observed to contain flowing water during an AESI site visit on October 5, 2021. The amount of flow could not be directly observed due to private property and fences. Streamflow monitoring of Deep Creek between DC-KUZAK and DC-NOLTE indicates diversion of water into Stream F and Hyde Lake is limited. Review of surface water flow monitoring data from October 2021 to June 2022 identified similar flow rates at the upstream monitoring location (DZ-KUZAK) and the downstream monitoring location (DC-NOLTE), further suggesting that surface water from Stream F to Hyde Lake is limited.

Hyde Lake was not directly observed by AESI due to restricted lake access due to private property. Lake data such as seasonal fluctuation and depth are not reported in the available literature. The lake level is approximately 795 to 797 feet in elevation estimated from light detection and ranging (LiDAR) imagery. The approximate lake level is higher than groundwater elevations in domestic wells completed around the lake, which range from about 730 to 750 feet in elevation. Therefore, Hyde Lake is interpreted to be hydraulically disconnected from the regional groundwater table and exists as a perched water feature. AESI interprets that low-permeability sediments beneath the lake are able to support lake levels year-round and the lake slowly recharges groundwater.

Hyde Lake is disconnected from the regional aquifer and provides a relatively smaller amount of recharge to the regional aquifer in comparison to Deep Lake. Hyde Lake in part is supported by surface flow in Stream F, which forks off from Deep Creek and may also be supported by a perched

groundwater zone. This perched groundwater zone may rest upon clay sediments described in the well logs south and east of the lake.

2.1.5 Northern Area (Stream A, Spring 3, and Other Unnamed Springs)

A previously unmapped stream (Stream A) is located on a terrace at the northwestern margin of the northern Segale Property (Figure 3). Year-round streamflow is supported from a groundwater spring zone located at approximately 700 feet elevation. The portion of Stream A on Segale Property is primarily a low-flow surface water feature at around 680 feet elevation. A seasonally active spring was observed by AESI to be present in the vicinity of Stream A at 710 to 720 feet elevation.

Stream A flows off of Segale Property to the adjacent State Lands and discharges directly into the Green River. AESI observed flow in Stream A prior to its discharge to the Green River. AESI measured flow rates in Stream A during monthly monitoring events over the period from October 2021 through June 2022 plus one additional event in May 2021. Measured flow rates generally ranged from about 0.08 to 0.6 CFS, although during periods of snowmelt the flow was as high as 1.3 CFS.

Spring 3 is located east of Stream A at around 700 feet elevation. AESI observations indicate that Spring 3 is the second largest spring, after Stream A, on the northern side of the Segale Property. Spring 3 flow was observed to be about 0.07 CFS or less. Groundwater discharges above till and bedrock at Spring 3.

Several other unnamed springs were observed during the AESI geologic reconnaissance and were not observed to be flowing directly into the Green River. In general, these minor springs range from the low 600s to the low 700s in feet of elevation and either discharge above the bedrock surface or above till along the canyon walls of the Green River. Observed flow rates were about 0.03 CFS or less during AESI site visits in May 2021.

2.1.6 Green River Gorge Resort Area (Streams B, B2, and C)

Streams formed from groundwater discharge in the vicinity of the Green River Gorge Resort include Streams B, B2, and C. Stream B flows year-round and is associated with the Group A transient non-community spring known as the Resort Spring. Streams B2 and C are nearby seasonally active streams and show a decrease in flow during the dry season and an increase in flow during the wet season.

AESI obtains Stream B flow measurements at weirs between instream ponds. These measurements show that flow rates in Stream B have ranged from about 1.5 to 5.9 CFS over the monitoring period of record between May 2021 and June 2022. The stream ultimately discharges as a waterfall into the Green River.

Stream B2 is a seasonally active stream that merges with Stream B downstream of the Stream B ponds and upstream of the gorge. It flows through a culvert underneath Enumclaw Franklin Road SE about 400 feet south of Stream B. Stream B2 is the smallest of the three streams observed in the Green River Gorge Resort area estimated at roughly one-half to two-thirds the flow rate of Stream C based on AESI observations.

Stream C is a seasonally active stream with its headwaters formed in the DNR Property. The uppermost spring is located at approximately 710 feet elevation, although significant flow occurs at around 690 feet elevation and below. Based on AESI conversations with the Green River Gorge Resort owner, Stream C is typically dry from early July to December. The stream was dry at the time of the AESI site visits on October 5, 2021; November 18, 2021; and December 10, 2021. Stream C flows through a box culvert underneath the Enumclaw Franklin Road SE roadway and has ranged from 0 to 3.1 CFS, as monitored by AESI during site visits between October 2021 and June 2022. Stream C discharges as a waterfall to the Green River.

2.1.7 Lizard Mountain Area (Streams D, E, H, J, K, L, and M and Other Unnamed Streams)

Streams originating on Lizard Mountain within the Segale Property are relatively small and represent groundwater discharge from groundwater perched on the bedrock surface and, in some cases, discharge from mapped coal mines along Lizard Mountain. Streamflow originates from small springs located on the uphill areas of the mountain which flow downslope above the bedrock channel surface and infiltrate into the outwash terrace at the base of the slope.

Flow rates in these streams are low, about 30 gallons per minute (approximately 0.07cfs) or less. Additional unnamed streams were observed along Lizard Mountain during the AESI geologic reconnaissance and contained very low flow rates, about 0.01 CFS or less. Based on geologic reconnaissance and mapped coal workings, Streams J and L are interpreted to be primarily sourced by coal mine discharge. Coal mine workings supply preferential storage and pathways for groundwater through the relatively impermeable bedrock. The mine workings drain through old portals or other surface openings. Flow rates in Streams J and L were measured to be 0.02 CFS or less. Based on the review of groundwater elevation in this area, streams located on the southern area of Lizard Mountain infiltrate the outwash terrace and potentially supply a small amount of water discharge to groundwater. Groundwater in this area could discharge to Deep Creek and ultimately Deep Lake.

2.2 Groundwater

This section provides a summary of groundwater flows from the Segale Property to proximate water bodies where fish are known to occur. The groundwater summary material presented in this section was compiled using information from the AESI *Existing Conditions Hydrogeologic Report* (AESI 2022).

Based on monitoring data collected by AESI (2022) and their interpretation of that data, groundwater primarily flows through the Vashon ice-contact and pre-Vashon deposits above the contact with the Puget Group bedrock. Flow is controlled by bedrock topography and is largest where the cross-sectional area is greatest. Large lakes such as Deep Lake produce local radial groundwater mounding effects. Bedrock highs produce radial or divergent flow conditions. Groundwater beneath the Segale Property primarily discharges as either spring flow near the Green River Gorge Resort or as subsurface flow to the Green River.

The groundwater data indicate the primary flow directions at the site are to the west-northwest beneath the off-site DNR parcel and the western Segale parcels. Groundwater flow beneath the northern Segale Property is northerly and discharges to the Green River Gorge north of the site. Depth to groundwater measurements and flow directions are being evaluated further on the eastern portion of the property and northeast of monitoring well EB-1W (Figure 3). The primary west-northwest groundwater gradient transports groundwater that ultimately discharges as springs along the Green River Gorge west of the Segale Property. The Green River Resort Spring area is located to the west-northwest of the Segale Property. Flow is radially away from the bedrock knob in the western Segale Property toward the Green River. Bedrock mapped to the west of Deep Lake and in the western area of DNR Property are protrusions that diverge westerly flowing groundwater to the north and south.

Groundwater within the buried ancient valley deposits discharges as subsurface flow to the Green River. Groundwater generally flows toward the north in the northern Segale Property. Groundwater flow is toward the river and, based on AESI observations, is irrespective of the season.

Groundwater discharge in the regional aquifer includes the following: 1) seepage to springs and seeps where the water table intersects the land surface as the aquifer pinches out above the bedrock surface along the margins of the Green River valley; 2) subsurface flow to the Green River or Green River Aquifer where the bedrock surface is below river level such as northeast of the northern Segale Property; 3) limited flow into the very low-permeability tertiary bedrock "aquifer"; and 4) withdrawals from water supply wells, which occur off site to the south of the proposed site.

2.3 Contaminants of Concern

This section summarizes an evaluation of existing data to identify potential COCs and water quality measurements in which exceedances occurred in surface water and/or groundwater during

monitoring activities. The data evaluation was performed using information provided in the AESI *Existing Conditions Hydrogeologic Report* (AESI 2022) and review of nearby mine permits (Section 3). As described in more detail in the following sections, arsenic, iron, and manganese have been identified in surface water or groundwater that is discharging from the Segale Property to the Green River or other nearby water bodies where fish are known to occur.

2.3.1 *Surface Water*

Surface water quality data was evaluated from 10 springs and streams and Deep Creek. Surface water quality in the Green River was not monitored by AESI but has been monitored by the Washington State Department of Ecology (Ecology). The AESI monitoring period began in January 2022. The water quality field parameters measured included temperature, pH, specific conductance, total dissolved solids (TDS), dissolved oxygen (DO), salinity, and turbidity. Chemical testing parameters and results for surface water samples are provided in the AESI *Existing Conditions Hydrogeologic Report* (AESI 2022). Analytical data were compared to surface water quality standards (WAC 173-201A). The surface water quality standards are intended to protect beneficial uses of surface waters, including the protection of aquatic biota. Exceedances of these water quality standards are summarized in the following text by water body. No chemical exceedances of aquatic life criteria (WAC 173-201A) were identified.

Green River. A review of collected 2022 Ecology data identified a slight exceedance of pH measured in the Green River at 8.7 pH units (Ecology 2022). As per WAC 173-201A-200, pH shall be within the range of 6.5 to 8.5 units, with a human-caused variation within this range of less than 0.2 unit.

Lizard Mountain Area. During the January, February, May, and June 2022 reporting periods, DO was detected in streams S-D and S-J at concentrations of 9.6 milligrams per liter (mg/L) to 8.5 mg/L, respectively. These detected concentrations are below the minimum surface water quality standard of 10 mg/L (WAC 173-201A).

2.3.2 *Groundwater*

Washington groundwater quality standards are designed to protect groundwater quality and existing and future beneficial uses through an antidegradation policy (WAC 173-200-030) and definition of groundwater quality standards (WAC 173-200-040). The range of chemistry results were compared to groundwater quality standards. Exceedances were identified for pH, arsenic, iron, and manganese (both total and dissolved). Arsenic, iron, and manganese occur naturally and are commonly present as exceedances in eastern King County. The following is a summary of the groundwater quality standard exceedances that occur under existing conditions:

- **pH.** On at least one occasion, the pH levels of groundwater were outside the water quality criteria in monitoring wells B-5 and EB-5W (Figure 3). The pH level measured in

monitoring well B-5 has typically ranged from 6.29 to 6.53. The pH level of EB-5W has ranged from 5.75 to 7.82 based on the monitoring data. As per WAC 173-201A, the pH range should be between 6.5 and 8.5 pH units. pH is a secondary standard.

- **Arsenic.** Arsenic was elevated in samples collected from groundwater monitoring wells B-3, EB-1W, EB-5W, and EB-7W (Figure 3), with concentrations ranging from 1.03 micrograms per liter (µg/L) (EB-1W) to 75.9 µg/L (B-3). The WAC 173-200-040 groundwater quality standard for arsenic is 0.05 µg/L. The WAC 246-290-300 drinking water standard for arsenic is 10 µg/L. Arsenic is a primary standard.
- **Iron.** Total iron exceeded the groundwater quality standard of 0.3 mg/L (WAC 173-200-040) in B-3 and EB-5W. Dissolved-phase iron concentrations were all below the groundwater quality criteria except for one sample in B-3, where the concentration was 0.837 mg/L. Iron is a secondary standard.
- **Manganese.** Total and dissolved manganese exceeded the groundwater quality standard of 0.05 mg/L (WAC 173-200-040) in groundwater samples collected from monitoring wells B-3, EB-5W, and EB-7W. The dissolved manganese concentration in these monitoring wells has ranged from 0.055 to 0.137 mg/L. Manganese is a secondary standard.

2.4 Fish Species

Anchor QEA reviewed the Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) online database, WDFW SalmonScape online database, list of species protected in the King County Comprehensive Plan and Critical Areas Ordinance (2016), and U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPAC) report (Appendix B; USFWS 2022) for the project area to derive a list of fish species potentially present in the Green River proximate to the Segale Property and nearby lakes, including Deep Lake and Hyde Lake. Fish species documented in the Green River proximate to the proposed project location and Deep Lake are listed in Tables 1 and 2, respectively. No information on fish presence in Hyde Lake was found as it is a private lake. No fish are present on the Segale Property. Only Stream A flows from the northern edge of the northern Segale Property off site to the Green River. There is an impassible fish barrier in the form of a waterfall complex above the Green River. All other surface water features on the Segale Property infiltrate into the permeable sand and gravel terrace deposits and are not directly connected to any off-site surface water.

**Table 1
Listed and Priority Fish Species in the Green River Proximate to Project Location**

Species	Status	Source
Bull trout (<i>Salvelinus confluentus</i>)/Dolly Varden (<i>Salvelinus malma</i>)	Federal threatened; State candidate	WDFW SalmonScape; WDFW PHS mapper

Species	Status	Source
Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	Federal threatened; State candidate	WDFW PHS mapper
Steelhead trout (<i>Oncorhynchus mykiss</i>)	Federal threatened; State candidate; King County protected	WDFW PHS mapper
Coho salmon (<i>Oncorhynchus kisutch</i>)	Federal candidate; State priority; King County protected	WDFW PHS mapper
Chum salmon (<i>Oncorhynchus keta</i>) (fall)	State priority; King County protected	WDFW SalmonScape; WDFW PHS mapper
Sockeye salmon (<i>Oncorhynchus nerka</i>)	State priority; King County protected	WDFW SalmonScape; WDFW PHS mapper
Coastal cutthroat trout (<i>Oncorhynchus clarkii clarkia</i>) (resident)	State priority; King County protected	WDFW SalmonScape; WDFW PHS mapper
Rainbow trout (<i>Oncorhynchus mykiss</i>)	State priority; King County protected	WDFW SalmonScape; WDFW PHS mapper

Table 2
Priority Fish Species in Deep Lake

Species	Status	Source
Rainbow trout (<i>Oncorhynchus mykiss</i>) (stocked)	State priority; King County protected	WDFW Fishing and Shellfishing
Kokanee (<i>Oncorhynchus nerka</i>)	King County protected	WDFW Fishing and Shellfishing
Coastal cutthroat trout (<i>Oncorhynchus clarkii clarkia</i>) (resident)	King County protected	WDFW Fishing and Shellfishing

2.5 Federal and State Listed and Priority Species

Additional information is provided in this section for the federal and state listed fish species and priority fish species included in Tables 1 and 2 in Section 2.5.

2.5.1 Bull Trout

The Coastal Puget Sound Distinct Population Segment (DPS) of bull trout is listed as threatened on the federal Endangered Species Act (ESA) list, and bull trout are a State of Washington candidate species (WDFW 2022a, 2022b). Bull trout are documented in the Green River proximate to the Segale Property, according to the WDFW PHS and SalmonScape online databases (WDFW 2022a, 2022b). Bull trout and Dolly Varden appear physically similar and are the only char in the family *Salmonidae*

native to Washington (King County DNR 2000). Although bull trout and Dolly Varden appear physically similar, mitochondrial DNA analysis has determined that bull trout are more closely related to the white spotted char (*Salvelinus leucomaenis*) of Asia than Dolly Varden (USFWS 2004). Observations of native char in King County have been recorded in the lower Green River and the Duwamish estuary, among other areas, but are not common (King County DNR 2000). These observations do not indicate a self-sustaining population of bull trout in the Green River, as these fish exhibit complex migration strategies, including a marine component that is not widely understood. Unlike anadromous Pacific salmonids, certain bull trout exhibit amphidromous migration patterns. Amphidromous individuals often return seasonally to non-natal freshwater as subadults, sometimes for several years, before returning to their natal streams to spawn (75 *Federal Register* 63897).

Cold, clear streams with complex habitat (i.e., logs and overhanging vegetation) serve as the preferred spawning habitat for these bull trout (Brown 1992). Bull trout typically spawn multiple times from August to November and, as a long-lived species, may spawn repeatedly throughout a lifetime (Brown 1992). Bull trout feed on terrestrial and aquatic insects, and as they grow, their diets include whitefish, sculpins, and other trout species (D'Angelo and Muhlfeld 2013). From May to July, both juvenile and adult anadromous fish migrate downstream to the marine environment (Goetz et al. 2004). Sufficient flows must be present to allow for downstream and upstream migration. Although previous bull trout observations in the Green River do not indicate a self-sustaining population, habitat conditions in the Green River to the north and west of the Segale Property meet habitat criteria, and as such bull trout could potentially be present in the Green River proximate to the Segale Property.

2.5.2 *Chinook Salmon*

The Puget Sound Evolutionarily Significant Unit (ESU) of Chinook salmon is listed as threatened on the federal ESA list, and Chinook salmon is a State of Washington candidate species. Chinook salmon and priority spawning habitat are documented in the section of the Green River proximate to the Segale Property, according to the WDFW PHS and SalmonScape online databases (WDFW 2022a, 2022b). Most Chinook salmon in this ESU exhibit an ocean-type life history. Ocean-type populations typically migrate to sea as subyearlings prior to age one, utilize estuarine and nearshore habitats for extended periods, often spend their entire ocean residence on the continental shelf, and return to their natal stream in the fall immediately before spawning (Schiewe and Kareiva 2001). Chinook salmon in the Green River are from the summer- and fall-run populations (Good et al. 2005). Spring Chinook salmon were historically present in the Duwamish/Green River basin but are now considered extirpated (NMFS 2006).

Adult Chinook salmon typically spawn in the mainstems and larger tributaries of Puget Sound (Wydoski and Whitney 2003). Spawning preferences include clean gravel riffles with moderate water

velocity in the mainstem and the lower reaches of tributaries (Congleton et al. 1982; Rondorf et al. 1990; WDFW and WWTIT 1994). Summer- and fall-run Chinook salmon (the most common in Puget Sound) begin freshwater migration in August and spawn from late September through January (Myers et al. 1998). During a September 2022 site visit, Anchor QEA biologists observed Chinook salmon spawning in the section of the Green River proximate to the Segale Property. Juvenile Chinook salmon rear and begin their downstream migration in late January through early to mid-July (Ruggerone et al. 2006).

2.5.3 *Steelhead Trout*

The Puget Sound DPS of steelhead trout is listed as threatened on the federal ESA list, and steelhead trout are a State of Washington candidate species and a King County protected species (USFWS 2022). The WDFW PHS mapper documents the presence of steelhead trout in the Green River proximate to the project location (WDFW 2022a). Steelhead trout have the most complex life history traits of any of the anadromous salmonids. They may spend anywhere from 1 to 4 years in freshwater (typically 2 to 3 years) and migrate to saltwater for another 1 to 6 years (typically 2 to 3 years) before returning to spawn.

Steelhead trout exhibit two life history types (winter-run and summer-run) that are defined based on the timing of adult returns to their natal spawning streams and by their degree of sexual development at the time they enter freshwater (NMFS 2005). The Puget Sound DPS, including the large Skagit River and Snohomish River populations, is primarily composed of winter-run (ocean maturing) steelhead trout stocks, but it also includes several small stocks of summer-run (stream maturing) steelhead trout occupying limited habitat. The Duwamish/Green River includes both summer- and winter-run stocks. Summer-run steelhead trout are a non-native stock that occur in very low numbers. Winter-run steelhead trout are a native stock with some hatchery and wild production, occurring in much larger numbers. Winter-run steelhead trout enter freshwater between November and April at an advanced stage of maturation and spawn shortly thereafter, usually from March through June. Summer-run steelhead trout enter freshwater in a sexually immature condition, usually between May and October. These summer-run steelhead trout remain in freshwater for several months before reaching maturity and spawn between January and April. Steelhead trout prefer spawning habitat similar to that utilized by Chinook salmon.

Unlike other species of Pacific salmonids, some steelhead trout do not die after spawning and are capable of repeat spawning. Only a small percentage of steelhead trout (an average of 8% overall among West Coast populations [Busby et al. 1996]) return to the spawning grounds for more than 1 year. Those steelhead trout that survive after spawning (mostly females) will out-migrate to the marine environment. These fish can move offshore in marine waters very soon after migrating from the river. Repeat spawners may return after 1 or 2 more years at sea. Habitats including gravel substrate and flow conditions in the Green River proximate to the Segale Property are sufficient to

support spawning steelhead trout, and known occurrences documented in the WDFW databases indicate steelhead trout presence in this area.

2.5.4 *Coho Salmon*

Coho salmon are a federal candidate species for the ESA list, a State of Washington priority species, and a King County protected species. The WDFW PHS and SalmonScape mapping tools document Coho salmon presence in the project vicinity (WDFW 2022a, 2022b). These fish prefer to spawn in cool streams in areas of mid-velocity with small- to medium-sized gravel substrates (Quinn 2018). Coho use small streams, tributaries, and side channels preferentially over the mainstem when spawning (Quinn 2018). Because of this, space is limited and they must use many small streams to successfully reproduce.

Like Chinook salmon and steelhead trout, coho salmon migrate to marine environments, spending adult years feeding on plankton and fish species, before returning to natal streams to spawn (Congelton et al. 1982). Coho salmon returning to their natal streams in the fall to spawn are known to gather at the mouths of streams and wait for a rain event that increases the water flow before heading upstream. The higher flows and deeper water enable the fish to pass obstacles. In the Middle Green River, coho salmon return to tributaries to spawn from approximately late October to mid-January (WDFW 1992). Upon emergence, juveniles prey on plankton and aquatic macroinvertebrates, preferring to remain in tributaries and side channels with slightly lower flow velocities than those frequented by Chinook salmon (Johnson and Ringler 1980; Lister and Genoe 1970). Coho salmon fry emerge from the gravel the spring following spawning, and migrate to the ocean about 18 months after spawning and emergence. Coho fry are usually found in the pools of small coastal streams and the tributaries of larger rivers.

Based on habitat conditions in the Green River proximate to the Segale Property and known occurrences, the presence of coho salmon is likely.

2.5.5 *Chum Salmon*

Chum salmon are a State of Washington priority species and a King County protected species. WDFW Salmonscape and PHS mappers document the presence of fall-run chum salmon in the Green River proximate to the Segale Property (WDFW 2022a, 2022b). As Chum salmon approach sexual maturity, they migrate to coastal waters and return to natal rivers to spawn. Chum preferentially spawn over gravel riffles in the side channels, sloughs and tributaries off of the main river (Quinn 2018; Congleton et. al. 1982). They spawn from late summer to March, with peak spawning concentrated in early winter when the river flows are high. They usually spawn in areas in the lowermost reaches of rivers and streams, within 60 miles of the ocean. Chum salmon do not reside in fresh water for an extended period, which is different from Coho salmon, Chinook salmon, and

Sockeye salmon. Young chum salmon (fry) typically migrate directly to estuarine and marine waters soon after they are born.

Observations of habitat in the Green River proximate to the Segale Property and known occurrences documented in WDFW databases support the potential presence of Chum salmon.

2.5.6 *Sockeye Salmon*

Sockeye salmon are a State of Washington priority species and a King County protected species. The WDFW SalmonScape and PHS mappers identify the presence of sockeye salmon in the Green River proximate to the Segale Property (WDFW 2022a, WDFW 2022b). Sockeye salmon spawn in cool, clear streams and lakes with gravel substrate (ADFG 2022). Sockeye salmon are unique in that they require a lake to rear in as fry, so the river they choose to spawn in must have a lake in the system. This seems to be the most important criteria for choosing a spawning ground, as sockeye salmon adapt to a range of water velocities and substrates. Juvenile sockeye salmon are primarily planktivorous, also feeding on small insects (Chigbu and Sibley 1994), and rear for 1 or 2 years in a lake, although they are also found in the inlet and outlet streams of lakes.

Although there are no lakes accessible from the section of the Green River proximate to the Segale Property, there are known occurrences of sockeye salmon documented in the WDFW databases.

2.5.7 *Coastal Cutthroat Trout*

Coastal cutthroat trout are a State of Washington priority species and a King County protected species. WDFW and PHS mappers identify the presence of coastal cutthroat trout in the Green River proximate to the Segale Property, as well as in Deep Lake (WDFW 2022a, 2022b).

Coastal cutthroat trout prefer to reside in clear, cool, well-oxygenated streams; shallow rivers; and lakes of shallow to moderate depth (D'Angelo and Muhlfeld 2013; Hilderbrand et al. 2000; Schrank and Rahel 2004). Coastal cutthroat trout spawn in both streams and lakes and consume a varied diet ranging from planktonic organisms and macroinvertebrates to amphibians and small fishes (D'Angelo and Muhlfeld 2013).

Based on known occurrences documented in the WDFW databases and habitat conditions in the Green River proximate to the Segale Property, including shallow gravel riffles and cool temperatures, it is likely that coastal cutthroat trout are present in this area. As a moderately shallow lake with aquatic vegetation and prey habitat, Deep Lake likely constitutes suitable habitat for coastal cutthroat trout.

2.5.8 *Rainbow Trout*

Rainbow trout are a State of Washington priority species and a King County protected species. WDFW and PHS mappers identify the presence of rainbow trout in the Green River proximate to the Segale Property, as well as in Deep Lake (WDFW 2022a, 2022b). Additionally, WDFW lists rainbow trout as a stocked species in Deep Lake.

Rainbow trout prefer cool, well-oxygenated water and typically spawn in riffles ovetop abundant gravel substrate (Quinn 2018). Rainbow trout are also found in cool, productive lakes. These fish consume a varied diet, preying on plankton and macroinvertebrates (Quinn 2018). They prefer sufficiently productive lake habitats, habitat complexity, and submerged aquatic vegetation sufficient to support food sources. A sign posted near the lakeshore during a September 2022 site visit indicates that these fish are commonly caught by anglers in the area. Known occurrences documented in the WDFW databases and habitat conditions indicate that these fish are likely present in the Green River proximate to the Segale Property and in Deep Lake.

2.5.9 *Kokanee Salmon*

The WDFW Fishing and Shellfishing portal identifies the presence of Kokanee salmon in Deep Lake. A sign posted near the lakeshore also lists Kokanee salmon among fish commonly caught in the water body. This non-anadromous salmon species is a land-locked form of sockeye salmon that spends the entirety of its life cycle in freshwater, often migrating from streams to lakes, and spawns both in tributaries and along shorelines (King County 2014; Quinn 2018). Known WDFW occurrences and substrate and flow conditions in Deep Lake support potential utilization by this species (Whitlock et al. 2014).

2.5.10 *Additional Species in Deep Lake*

The WDFW Fishing and Shellfishing Portal provides a list of fish species documented in Deep Lake, including those that are stocked by WDFW. During a September 2022 site visit, Anchor QEA observed a sign detailing the fish species commonly targeted by anglers in Deep Lake. The species listed were in concurrence with those documented as priority species for the area and with the WDFW Fishing portal, with the addition of yellow perch (*Perca flavescens*), which were not included in any of the databases reviewed. Additional information on the non-priority species in Deep Lake is provided in the following sections.

2.5.10.1 **Black Crappie**

WDFW identifies black crappie (*Pomoxis nigromaculatus*) presence in Deep Lake south of the Segale Property. This species prefers low-flow habitat and abundant cover, including submerged aquatic vegetation (Pope and Willis 1997; Reed and Pereira 2009). Black crappie construct nests on the substrate of littoral zones, preferring protected areas with firm substrate for spawning

(Reed and Pereira 2009). The habitat conditions documented in Deep Lake, as well as a nearby sign listing commonly fished species in this water body, suggest that these fish are likely present (Pope and Willis 1997; Reed and Pereira 2009).

2.5.10.2 Brown Bullhead

King County identifies brown bullhead (*Ameiurus nebulosus*) presence in Deep Lake. These fish utilize a variety of habitats, preferring lower-flow habitats such as lakes, pools, and slower-moving creeks, and are often associated with the water bottom. These fish are widespread throughout North America and target a varied diet (Scott and Crossman 1973). This species prefers low-flow habitat, utilizing lakes and still pools, and abundant cover, including submerged aquatic vegetation (Scott and Crossman 1973). Brown bullhead are commonly found over silty or muddy bottoms but also utilize a variety of substrates. The habitat conditions documented in Deep Lake, as well as a nearby sign listing commonly fished species in this water body, suggest that these fish are likely present.

2.5.10.3 Largemouth Bass

The WDFW Fishing and Shellfishing portal lists the presence of largemouth bass (*Micropterus salmoides*) in Deep Lake. Adult bass are piscivorous, preying on other fish species and invertebrates (Pope and Willis 1997). These fish construct nests for spawning, utilizing debris from the bottom of a water body to create cover for their nests (Pope and Willis 1997). Bass typically prefer gravel, muck, or sand substrates and shallow, low-flow habitats with abundant vegetation, logs, or other in- or over-water cover (Annett et al. 1996; Miller and Kramer 1971). Habitat conditions in Deep Lake, as well as the presence of prey species such as perch, suggest that these fish are likely present.

2.5.10.4 Yellow Perch

WDFW maps the presence of yellow perch in Deep Lake. In lakes, perch tend to utilize nearshore habitats with gravel, mud, and sandy bottoms. They also tend to utilize aquatic vegetation and associated cover for egg laying (Fullerton et al. 2006). In the western United States, yellow perch are an introduced species and may serve as a food source for predatory species targeted by anglers, such as bass. These fish are often found in productive environments with plentiful zooplankton, macroinvertebrates, and small fishes. Yellow perch prefer low-flow habitats, including deep or still pools, and abundant nearshore cover. Habitat conditions in Deep Lake, including shallow littoral zones and submerged aquatic vegetation, as well as a sign near the lake listing perch as a species caught by anglers in the area, suggest the presence of yellow perch in this lake.

2.6 Existing and Priority Habitats

Anchor QEA reviewed existing documentation and compiled information from existing databases (e.g., WDFW PHS and SalmonScape) to identify existing habitat, including priority habitats, in the

Green River proximate to the Segale Property and in Deep Lake. Any critical or specialized habitats, potential spawning grounds, deep pools, or vegetative cover were compiled and summarized. In addition to publicly available documents and databases, information from a Plants and Animal Assessment memorandum and Critical Areas and Wildlife memorandum prepared by Raedeke and Associates (2022a and 2022b, respectively) was synthesized for this review.

A site visit was conducted by Anchor QEA scientists on September 29, 2022, to document the existing fish habitat, general flow and groundwater conditions in an accessible section of the Green River proximate to the north of the Segale Property. Biologists observed the existing site environment and documented habitat and general flow conditions. During this visit, Anchor QEA observed groundwater and surface water connectivity as groundwater was discharged above the Green River water level and seeped into the river and habitat features including a range of substrate types from sand and gravel to large boulders and in-water cover such as snags, woody debris, submerged aquatic vegetation, and undercut banks.

The remainder of this section documents the identified priority habitats and existing habitat conditions in the Green River proximate to the Segale Property and Deep Lake.

2.6.1 *Priority Habitats*

WDFW and King County list the following priority habitats in the vicinity of the project area (WDFW 2020; Table 3).

**Table 3
Listed and Priority Habitats in the Vicinity of the Project Area**

Habitat	Status	Source
Spawning area: fall-run Chinook salmon	State priority	WDFW SalmonScape; WDFW PHS mapper
Spawning area: summer-run steelhead trout	State priority	WDFW SalmonScape; WDFW PHS mapper
Spawning area: winter-run steelhead trout	State priority	WDFW SalmonScape; WDFW PHS mapper
Freshwater forested/shrub/ riverine wetlands	State priority/King County Habitats of Local Importance	WDFW PHS mapper, King County Habitats of Local Importance
Biodiversity areas and corridors	State priority/King County Habitats of Local Importance	WDFW PHS mapper; King County Habitats of Local Importance
Freshwater wetlands and fresh deep water	State priority/King County Habitats of Local Importance	WDFW PHS mapper; King County Habitats of Local Importance

Habitat	Status	Source
Instream	State priority/King County Habitats of Local Importance	King County Habitats of Local Importance
Snags and logs	State priority/King County Habitats of Local Importance	King County Habitats of Local Importance
Riparian	State priority/King County Habitats of Local Importance	King County Habitats of Local Importance

2.6.2 Existing Habitat Conditions

2.6.2.1 Green River

The section of the Green River within water resource inventory area (WRIA) 9, north and west of the project site, from approximately river mile 55.5 to 51.5 was included in this review, as it is where the surface water and groundwater from the Segale Property discharges. This section of the river is within the Middle Green River subwatershed, which represents some of the highest-quality salmonid habitat remaining in the Green/Duwamish River watershed (Green/Duwamish and Central Puget Sound Watershed and WRIA 9 Steering Committee 2020; King County DNR 2011). The WDFW PHS mapping tool documents the presence of Chinook salmon, steelhead trout, and coho salmon spawning grounds in this area (WDFW 2022a). Chinook salmon utilize the mainstem Green River for spawning, while coho salmon preferentially spawn in off-channel or tributary streams (Salmon Conservation and Restoration 2011). Habitat conditions observed within this section of the river during the September 2022 site visit include a range of substrate types from sand and gravel to large boulders and bedrock. Habitat types including riffles, glides, and pools were observed in the area to the north of the Segale Property (Photographs 1a through 1d). Riparian vegetation consisting of a mix of conifers and hardwoods is present along both sides of the Green River (Photographs 1a through 1c). This portion of the river is within the Green River Gorge, so the river is confined by steep banks with large conifer trees providing complex habitat. Photographs 2a and 2b show the section to the west of the Segale Property, close to the Green River Gorge Resort.

Photograph 1a

Habitat Conditions in the Green River to the North of the Segale Property



Photograph 1b
Habitat Conditions in the Green River to the North of the Segale Property



Photograph 1c

Habitat Conditions in the Green River to the North of the Segale Property



Photograph 1d
Habitat Conditions in the Green River to the North of the Segale Property



Photograph 2a
Green River Gorge to the West of the Segale Property



Photograph 2b
Green River Gorge to the West of the Segale Property



2.6.2.2 Deep Lake

Located South of the Segale Property, Deep Lake is a kettle lake with a surface area of approximately 39 acres, a mean depth of 33 feet, and a maximum depth of 74 feet (AESI 2022; Brown and Caldwell 1989). Deep Creek (to the northeast) provides the primary surface water inflow to the lake. Measurements collected beginning in 2019 from a surface gage maintained by Lake Observations by Citizen Scientists and Satellites (LOCSS) indicate that Deep Lake seasonally varies about 8 feet in surface elevation between approximately 765 to 773 feet (Appendix J). A September 2022 site visit by Anchor QEA indicated that Deep Lake includes shallow gravel-based substrate, including low-flow, sheltered littoral zones of the habitat type preferred by many fish species listed as present in this water body (Photographs 3a through 3c). The lake appeared productive, with plentiful submerged aquatic vegetation.

Photograph 3a
Deep Lake



Photograph 3b
Deep Lake



Photograph 3c
Deep Lake



2.6.2.3 Hyde Lake

Hyde Lake is a kettle lake with a surface area of approximately 5 acres located roughly 1/3 mile southwest of the southern Segale Property and about 1/2 mile north of Deep Lake (AESI 2022).

A small, ditched stream channel (Stream F) running from Deep Creek connects surface water from Deep Lake to Hyde Lake but represents only a small fraction of the flow rate observed at Deep Creek. An AESI site visit on October 5, 2021, documented flowing water through Stream F (AESI 2022). Hyde Lake is located on private property and was inaccessible due to property boundaries and fence lines on an AESI site visit in October 2021 and a September 2022 site visit by Anchor QEA. A 2007 proposal to plant triploid (sterile) grass carp in Hyde Lake was approved by WDFW (2007). WDFW sanctioned the planting of triploid grass carp to control aquatic vegetation in the lake, which had no public access. No additional information about Hyde Lake was found to be publicly available.

3 Review of Existing Mines

A review of existing coal and gravel mines, including any permit violations, was conducted to identify COCs that could be present in the vicinity of the Segale Property that should be analyzed in future monitoring activities. This section provides a summary of the most relevant information found during the review.

AESI identified three coal mines targeting bituminous coal in the vicinity of Lizard Mountain: Occidental Mine (northern side), the Old Carbon Mine (southern side), and the Carbon Fuel Co. Mine No. 4 (on the southern side; AESI 2022; Figure 4). Three additional mines located near the project facility, also within the Middle Green River watershed, were reviewed for this report. These included the Black Diamond Coal Mine, operated by Pacific Coast Coal (PCC) company, and two gravel mines, Franklin Ridge Sand and Gravel and the Palmer Junction Gravel Pit, operated by Watson Asphalt. At the time of this report, only the Palmer Junction Gravel Pit held current permits for active mining. A summary of each of these mines, associated permits, and potential COCs is provided in the following sections.

3.1 Coal Mines

This section provides a summary of the most relevant information on coal mines found during the review.

3.1.1 Occidental Mine

The Occidental Mine, also known as the Gibbons Mine, operated as one drift mine and two slope mines from 1899 to 1913. During this time, the mine produced about 307,000 tons of coal. The mine worked eight of the ten coal seams located during operations. In September 1910, the slope that opened onto the No. 14 bed encountered groundwater and flooded a section of the mine, leading to a closure in 1924. The mine reopened briefly after this event, before being closed permanently in 1945 (AESI 2022). No additional information related to potential COCs was identified for this mine.

3.1.2 Old Carbon Mine

As the first documented coal in the area, operations at the Old Carbon Mine began in 1895. Before closing, it operated as a drift mine for 3 years (AESI 2022). Strip mining also occurred in the Old Carbon bed west of the Old Carbon drift mine. Because mine operations ceased before implementation of state coal mining reporting requirements, limited information is available on mine workings, and no record exists in DNR map records (AESI 2022). No additional information related to potential COCs was identified for this mine.

3.1.3 Carbon Fuel Co. Mine No. 4

A coal mine workings map shows the Carbon Fuel Co. Mine No. 4 on the western side of Lizard Mountain opposite the Old Carbon Mine (AESI 2022). While the mine was not mentioned in any reports reviewed by AESI, the location was confirmed in a site and verified using LiDAR imagery (AESI 2022). No additional information related to potential COCs was identified for this mine.

3.1.4 John Henry No. 1 Coal Mine

The John Henry No. 1 Coal Mine, located in Black Diamond, Washington, was owned and operated by PCC company. Stormwater from the mine property drains into Lake Sawyer, Rock Creek, Ginder Lake, and Lake 12, which flow into Big Soos Creek and Covington Creek, then into the Green River. The mine has not operated actively since 1999 and was closed in 2021 after violating permit requirements and discharging stormwater into the Green River and nearby tributaries. Puget Soundkeeper brought a lawsuit against the mine claiming that these discharges, which included exceedances of copper, manganese, and phosphorous, constituted a violation of the Clean Water Act. The resulting settlement led to a final shutdown of the mine and a payment to the Mid Sound Fisheries Enhancement Group to improve water quality in the Soos Creek Basin. Although the mine had not been operating, PCC had previously preserved the option to reopen the mine. The following three warning letters were issued in violation of the mine's National Pollutant Discharge Elimination System wastewater discharge permit:

- A January 2012 warning letter documented exceedances of phosphorous at two monitoring locations.
- An April 2019 warning letter documented copper exceedances at two monitoring locations in October 2018 and at one monitoring location in November 2018.
- A March 2020 warning letter was issued after reported exceedance of phosphorous in one monitoring location in December 2019.

Multiple warning letters were also issued after failure to submit discharge monitoring reports, although it is unclear if these were dated after active mining operations had ceased.

3.2 Gravel Mines

This section provides a summary of the most relevant information on gravel mines found during the review.

3.2.1 Watson Asphalt-Palmer Junction Gravel Pit

Watson Asphalt-Palmer Junction Gravel Pit is a surface sand and gravel mine specializing in construction sand and gravel operated by Watson Asphalt Paving Company, Inc. The mine proposed an expansion in the early 1990s and area neighbors filed an appeal of the State Environmental Policy

Act (SEPA) threshold determination in July 1993 alleging that the expansion of the mine would cause contamination in the Green River and nearby wetlands; adversely affect air quality; and impact traffic, nearby forests, streams, and property values. In a 1994 SEPA appeal, area neighbors voiced concerns surrounding groundwater impacts, while the Muckleshoot Tribe raised the possibility of impacts to the geologic stability of the area. A public hearing was held to address these concerns. In this hearing, it was documented that a stream across the northwest corner of the site provided drinking water to the town of Palmer. A 100-foot buffer was established on either side of the mainstem. Because of this, King County wetland scientists surveyed and observed minor sediment deposition but concluded mining operations and expansion would have insignificant impacts on the wetland. Retention and settling ponds were intended to infiltrate surface water runoff on site (King County 1994). A 1996 SEPA appeal did not extend the timeline for the Phase 1 EIS submittal, so the expansion never moved forward (King County 1996).

3.2.2 Franklin Ridge Sand and Gravel Franklin Pit

Franklin Pit is a sand and gravel mine owned and operated by Franklin Ridge Sand and Gravel, located along the Green River in Enumclaw, Washington, to the southwest of the Segale Property. The property is located close to the Clarence F. Pautzke Salmon Ponds Park, an active satellite location of the Soos Creek hatchery. The mine operates under Permit No. WAG503365, which was issued February 17, 2021; the permit expires on March 31, 2026. The mine failed to submit discharge monitoring reports in 2021 (Ecology 2021); however, it was unclear if discharges were occurring during this period. With the exception of discharge monitoring reports, no additional enforcement actions are listed under this permit number.

3.3 Potential Existing Contaminants of Concern in the Vicinity of the Segale Property

Anchor QEA reviewed available literature concerning potential COCs that could be present on the Segale Property from past coal mine operations. A summary of this information is presented in this section.

Selenium, copper, and phosphorous have been identified as COCs associated with coal mining activity in the Cascade Mountains, and could be present based on past coal mine operations on the Segale Property. Iron, manganese, arsenic, and decreases in pH have also been associated with coal mining operations in the vicinity of the Segale Property (AESI 2022). However, the following analytes are included in the monitoring program for surface water and groundwater to document existing conditions: selenium (dissolved and total [D&T]), copper (D&T), total phosphorus, iron (D&T), manganese (D&T), and arsenic (D&T).

4 Summary and Recommendations

This section provides a summary of Anchor QEA's understanding of surface water and groundwater flows from the Segale Property to proximate water bodies, including the Green River and nearby lakes where fish and fish habitat are present. This section also provides recommendations on additional monitoring needed to fill data gaps to confirm the potential impacts on water quality and fish in the Green River and site vicinity. Section 4.1 of the AESI *Existing Conditions Hydrogeologic Report* identifies future work to be performed (AESI 2022). The additional characterization activities outlined by AESI in the report are deemed warranted to further evaluate the potential impacts of the proposed surface mining operations. Some of the AESI and additional recommendations are presented in the following sections.

4.1 Monitoring Summary

This section is a summary of Anchor QEA's understanding of groundwater flow and data gaps based on our review of the monitoring data collected by AESI.

Surface Water. Surface water features in the vicinity of the site include the Green River, Deep Creek, Deep Lake, Hyde Lake, and several springs and streams near the proposed site. Review of surface water flow data indicates the only surface water source from the Segale Property that reaches the Green River is from Stream A near the northern portion of the property. Stream A flows off site and cascades as a waterfall complex to the Green River. Off-site surface water flow from Stream B and Stream C also cascade as waterfalls and are located near the Green River Gorge Resort. Deep Creek was noted to discharge to Deep Lake with a limited volume flowing to Stream F and Hyde Lake. The discharge points and elevations of the northern area springs have been located in the field, and most have been surveyed. Streams located on the south side of Lizard Mountain could supply a small amount of recharge to groundwater that could discharge to Deep Creek and be conveyed to Deep Lake. Existing data indicate no impacts to Deep Creek surface water quality (AESI 2022).

Groundwater. Groundwater discharges to the regional aquifer as seeps and springs and subsurface flow to the Green River or Green River Aquifer where the bedrock surface is below river level. The discharge points have been mapped by AESI, and elevations of groundwater seeps and springs flowing to the Green River are summarized in AESI 2022. Groundwater elevations where the Regional Aquifer discharges into the Green River Aquifer are directly related to the elevation of the river.

Contaminants. Chemical contaminants in groundwater and surface water have been evaluated as part of the monitoring program. Results indicated groundwater exceedances for arsenic, iron, and manganese (both total and dissolved). However, arsenic, iron, and manganese are common water quality exceedances in eastern King County (Turney et al. 1995) indicating naturally occurring conditions. Surface water quality results indicated no exceedances of chemical aquatic life criteria

(WAC 173-201A-240). As such, there are no indications of contaminants from Lizard Mountain coal mining operations in the surface water or groundwater monitored throughout the Segale Property. The existing chemical surface water quality conditions in the Green River adjacent to the Segale Property, Deep Lake, and Hyde Lake are unknown.

4.2 Continued Monitoring

Field measurements and chemical testing of surface water and groundwater at locations identified in the AESI *Existing Conditions Hydrogeologic Report* (AESI 2022) should be continued to document current water quality conditions. Based on the review of coal mines in the vicinity of the Segale Property in Section 3, metals appear to be the main COCs. Metals are already being analyzed as part of AESI's monitoring program. For surface water monitoring, results should continue to be compared to the surface water quality standards, as per WAC 173-201A. Monitoring of major springs (S-A, S-B, S-B2, and S-C) should be continued, and Deep Creek. Groundwater level measurements should continue to be monitored from the existing network wells and newly installed wells to assess seasonal groundwater gradients and fluctuation across the site. It is recommended that water level measurements be collected and water quality monitoring be performed throughout the hearings and appeals process to confirm groundwater flow directions and verify COCs, if any.

4.3 Additional Monitoring

Based on our review and understanding of the surface water and groundwater flows in and around the Segale Property, Anchor QEA recommends the following additional evaluation to better understand the connections and interactions between surface water and groundwater flows and the Green River where fish and fish habitat are present:

- **Surface Water**
 - Additional monitoring of the streams located on the south side of Lizard Mountain and their connection to groundwater and interaction with Deep Creek and Deep Lake
 - As recommended by AESI (2022), Anchor QEA agrees that flow monitoring for Stream F and Hyde Lake and water level monitoring of Hyde Lake (if possible due to access issues) should occur.
- **Groundwater**
 - As recommended in AESI (2022), Anchor QEA agrees that additional characterization of the lacustrine deposits in the southern Segale Property area (i.e., area of EB-10W) appears warranted. This would include additional exploration to delineate the extent and elevation of the deposits and potential hydraulic continuity between shallow perched groundwater identified in this area and Deep Creek.

- As recommended in AESI (2022), Anchor QEA agrees that a water-balance and groundwater flow model should be used to evaluate the magnitude and timing of changes in groundwater recharge to simulate potential mining impacts on groundwater elevations and spring discharge.
- **Contaminants**
 - Arsenic concentrations in groundwater are elevated in monitoring well B-3 likely because it is located along the bedrock structural feature known as the Lawson Anticline, which is associated with arsenic bearing ore deposits formerly mined at the Royal Reward mine situated north of the well. It is recommended that groundwater samples continue to be collected and analyzed from monitoring well B-3 for total and dissolved arsenic. It is Anchor QEA's understanding that AESI plans to evaluate the elevated arsenic groundwater concentrations in vicinity of the B-3 monitoring well area as part of future site evaluation. As part of this evaluation, an assessment should be performed of potential environmental impacts associated with former ore stockpiling and processing in the vicinity of the former ore processing plant located on the bedrock knob located west of monitoring well B-3.
 - Surface water quality of the Green River adjacent to the Segale Property and Deep Lake should be collected to document current baseline conditions in those water bodies. It is recommended that some of the samples be collected in areas where surface water and groundwater are suspected to discharge above the river and seep into the river from the Segale Property and from accessible areas on the north and west sides of the Green River and above and below the property. If possible, due to property access restrictions, it is recommended that surface water samples also be collected and analyzed from Hyde Lake. Parameters for Green River, Deep Lake, and Hyde Lake should include those listed in Appendix O of the AESI *Existing Conditions Hydrogeologic Report* (AESI 2022).

4.4 Key Findings

Key findings of this review include the following:

- No fish bearing streams or waterbodies are present on the Segale Property.
- One stream (Stream A) flows from the extreme northwestern margin of the Segale Property off site via a waterfall complex to the Green River and is a barrier to fish passage.
- All other surface water infiltrates into the terrace outwash sands/gravels, and no other surface water flows directly from the Segale Property to any off-site streams, lakes, or wetlands.

- Groundwater flow beneath the Segale Property ultimately discharges off site as seeps/springs on the valley walls adjacent to the Green River or discharges directly to the Green River Aquifer.
- Mining operations will be limited to within 10 feet of the regional groundwater aquifer.
- The processing plant and asphalt plant and associated facilities will be self-contained and staged on an asphalt pad such that all process water and stormwater runoff will be captured, preventing contact with the surrounding ground surface.
- An extensive water quality monitoring program has been implemented to obtain baseline data from on-site and off-site streams, and a network of on-site groundwater monitoring wells.
- Analysis of the water quality data indicates a limited number of analytes exceed the maximum contaminant levels for groundwater and aquatic life criteria for surface water. None of the exceedances are indicative of contamination from historical coal mining operations and are interpreted to be naturally occurring and typical for the region (e.g., arsenic).
- The water quality monitoring program should continue as planned with the addition of new stations to obtain data from the Green River; Deep Lake; and, if feasible, Hyde Lake.
- The available data and ongoing monitoring program are expected to provide a sound basis for evaluation of potential impacts on aquatic resources due to the proposed mining operations.

Based on these findings, it is expected that the gravel mining operation, as currently proposed, will have limited to no impact on fish in the Green River. This is based on mining operations being limited to 10 feet above the regional groundwater aquifer and avoiding the bedrock knob near well location B-3, where naturally occurring arsenic levels in the groundwater are above water quality standards, and site-specific avoidance and minimization measures are developed and followed (e.g., spill prevention control, countermeasure plan, contaminated media plan, etc.) during construction and operations.

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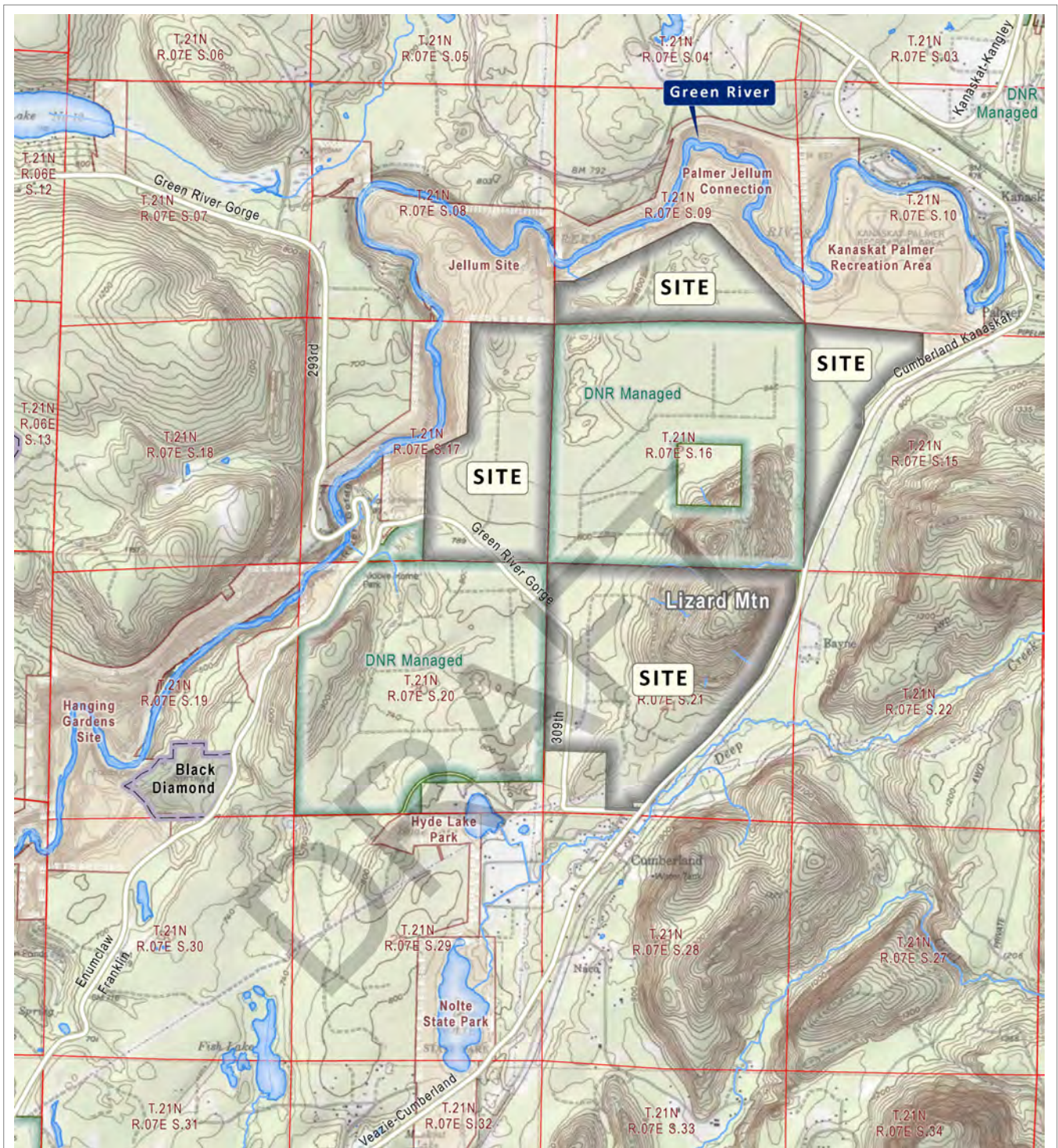
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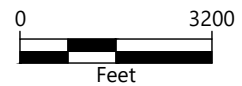
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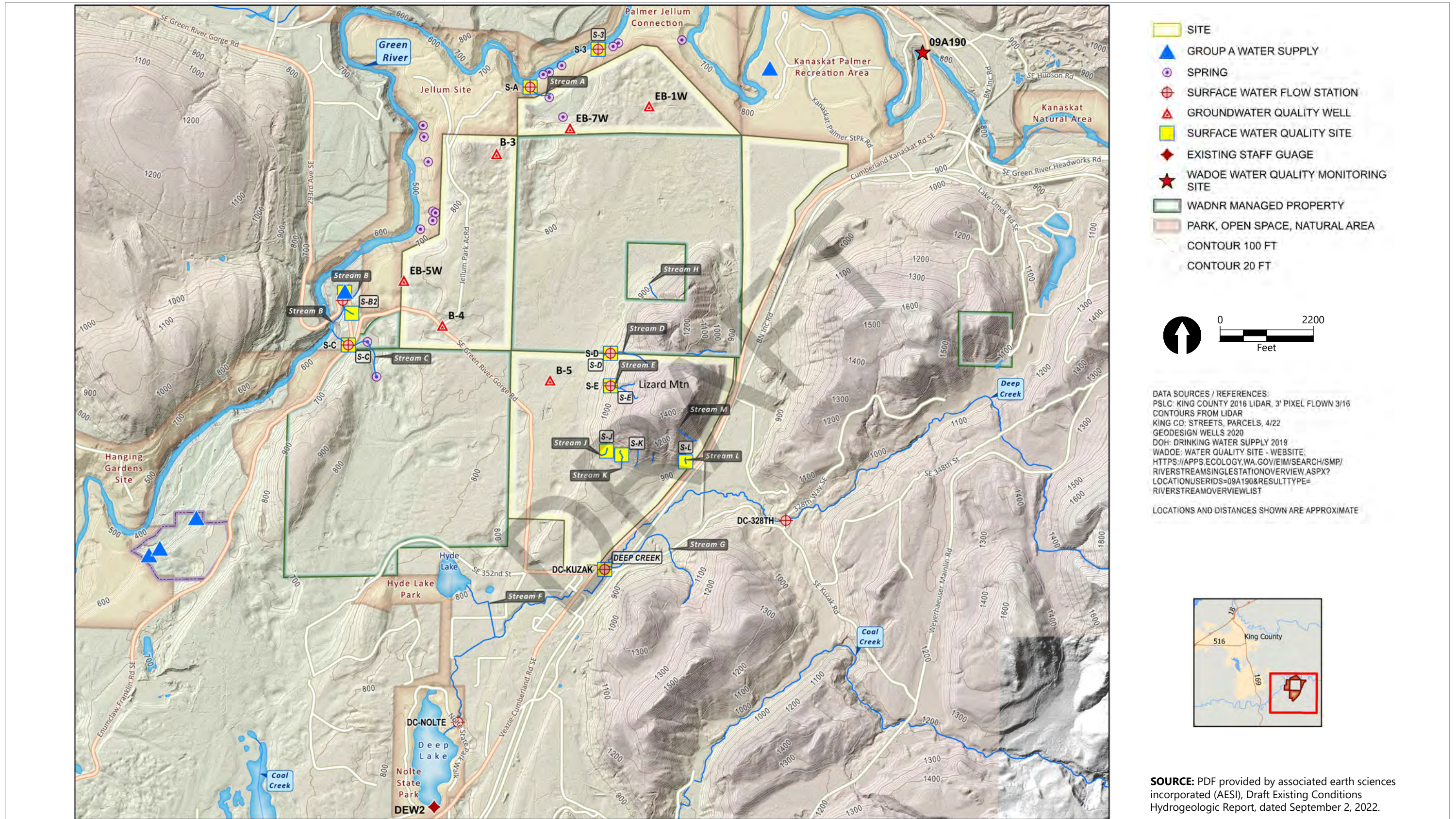
Figures



DATA SOURCES / REFERENCES:
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 KING CO: STREETS, CITY LIMITS, PARCELS, PARKS 9/21
 LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE

SOURCE: PDF provided by associated earth sciences incorporated (AESI), Draft Existing Conditions Hydrogeologic Report, dated September 2, 2022.



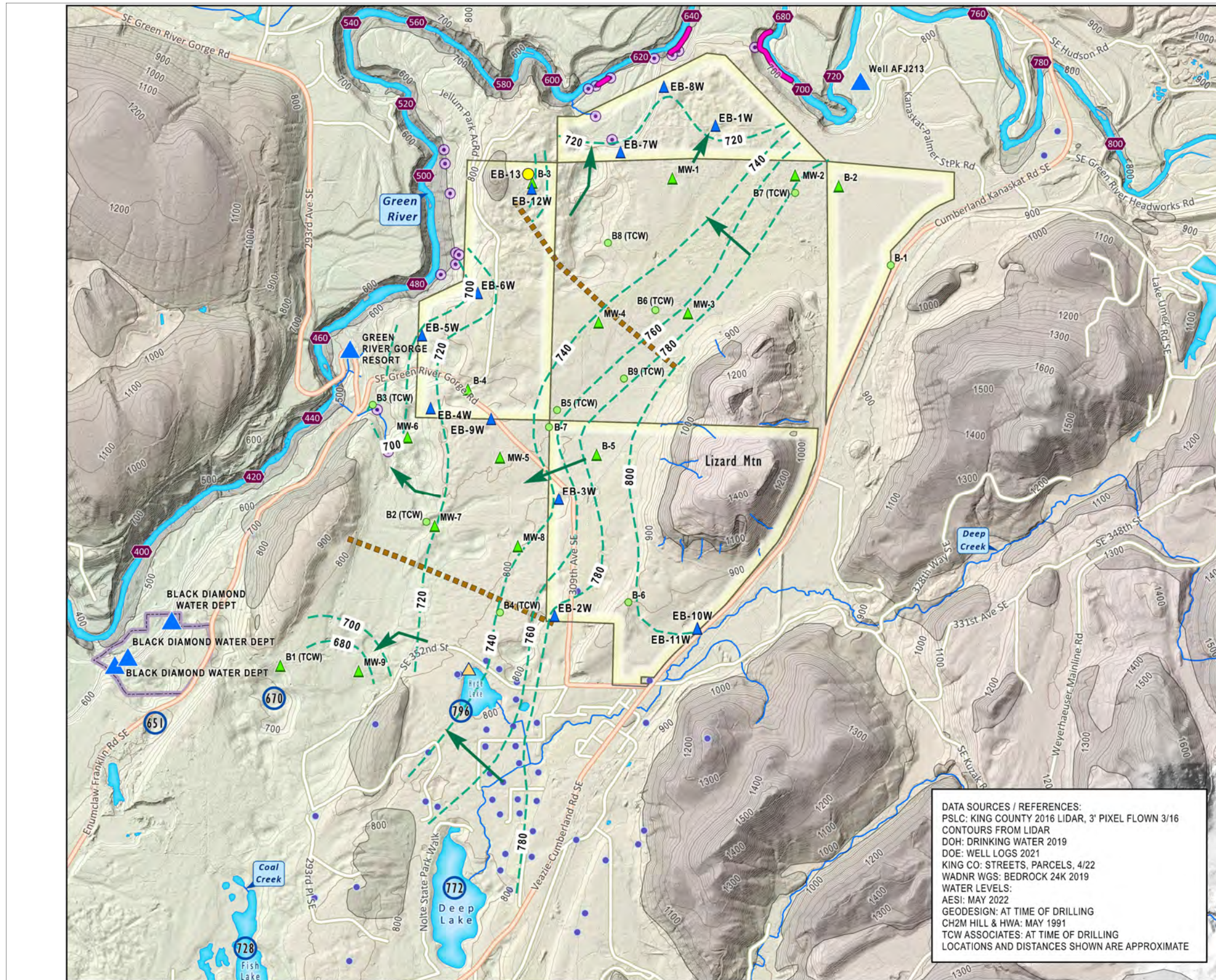


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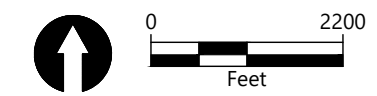


Figure 2
Flow Monitoring and Water Quality

Fish Assessment
 Cumberland Mine



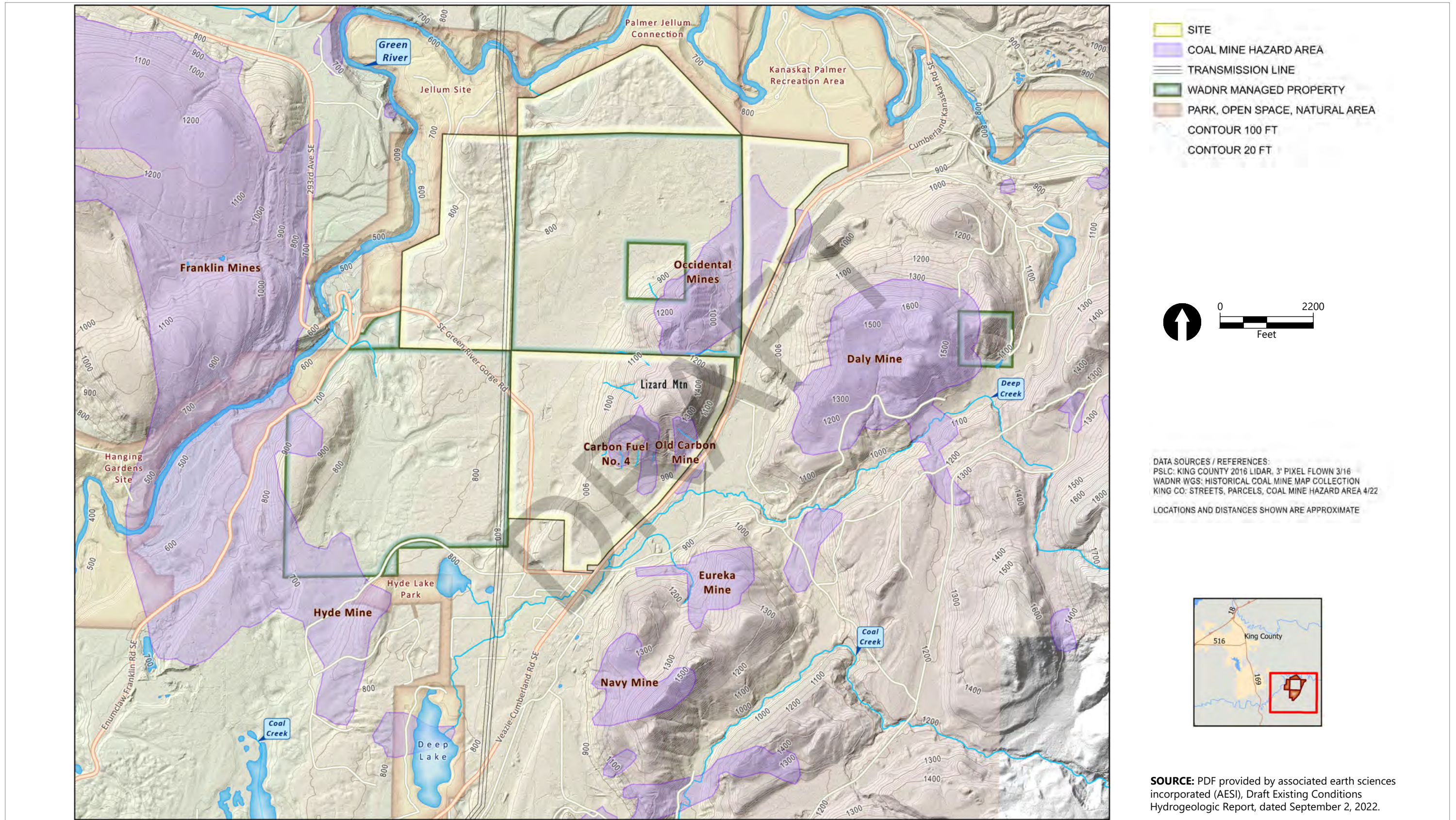
- SITE
- EXPLORATION BORING
- MONITORING WELL (AESI)
- PREVIOUS EXPLORATIONS BY OTHERS
- MONITORING WELL
- EXPLORATION BORING
- GROUP A WATER SUPPLY
- GROUP B WELL, PWSID 52236D
- WELL
- SPRING
- DIRECT GROUNDWATER DISCHARGE TO RIVER
- GROUNDWATER FLOW
- CAPTURE ZONE LIMIT
- GROUNDWATER CONTOUR
- APPROXIMATE LAKE ELEVATION
- NEAR SURFACE BEDROCK
- CONTOUR 100 FT
- CONTOUR 20 FT
- RIVER ELEVATION IN FT



SOURCE: PDF provided by associated earth sciences incorporated (AESI), Draft Existing Conditions Hydrogeologic Report, dated September 2, 2022.



Figure 3
Groundwater Elevation and Flow



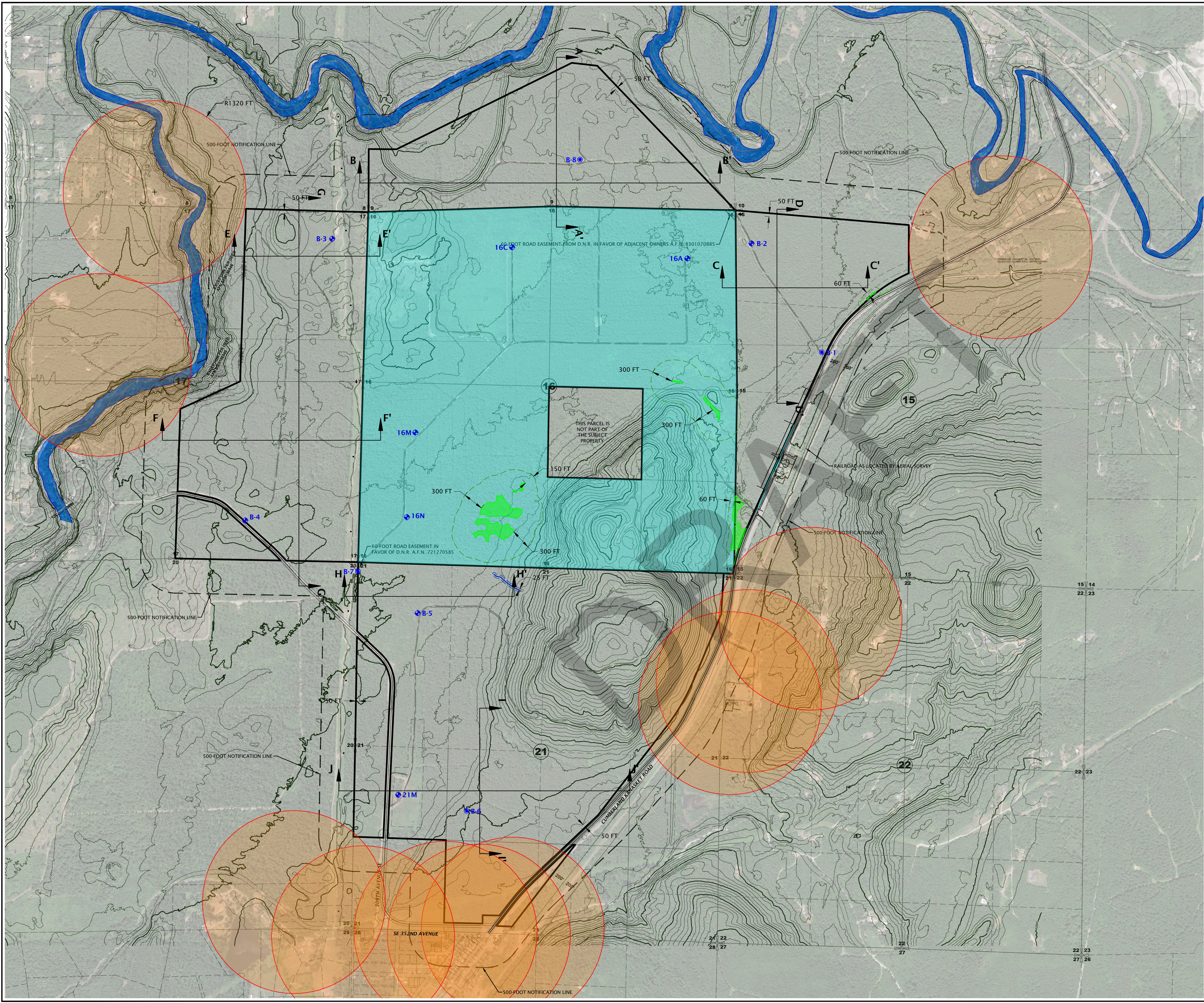
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Figure 4
Regional Coal Mine and Hazard Areas

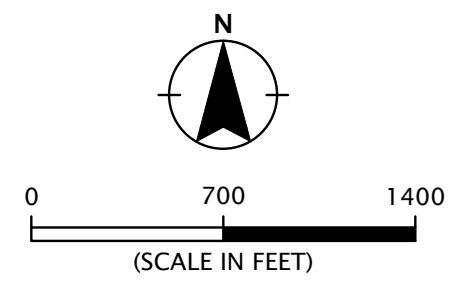
Fish Assessment
 Cumberland Mine

Appendix A
Development Plan



LEGEND:

- PROPERTY BOUNDARY
- EXISTING TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
- BORING
- WELL
- SEGALE PROPERTIES LLC OWNERSHIP
- DNR OWNERSHIP
- GREEN RIVER (APPROXIMATE)
- WETLAND
- WETLAND BUFFER
- STREAM
- STREAM BUFFER
- 1/4-MILE-RADIUS FROM APPROXIMATE CENTER OF RESIDENCE (LOCATED WITH GOOGLE EARTH PRO)
- CROSS SECTION



- NOTES:**
1. SITE PLAN BASED ON DRAWINGS PROVIDED BY SEGALE PROPERTIES, LLC.
 2. AERIAL PHOTOGRAPH (JULY 13, 2017) OBTAINED FROM GOOGLE EARTH PRO.
 3. EXISTING TOPOGRAPHY (LIDAR 2016) OBTAINED FROM WADNR.

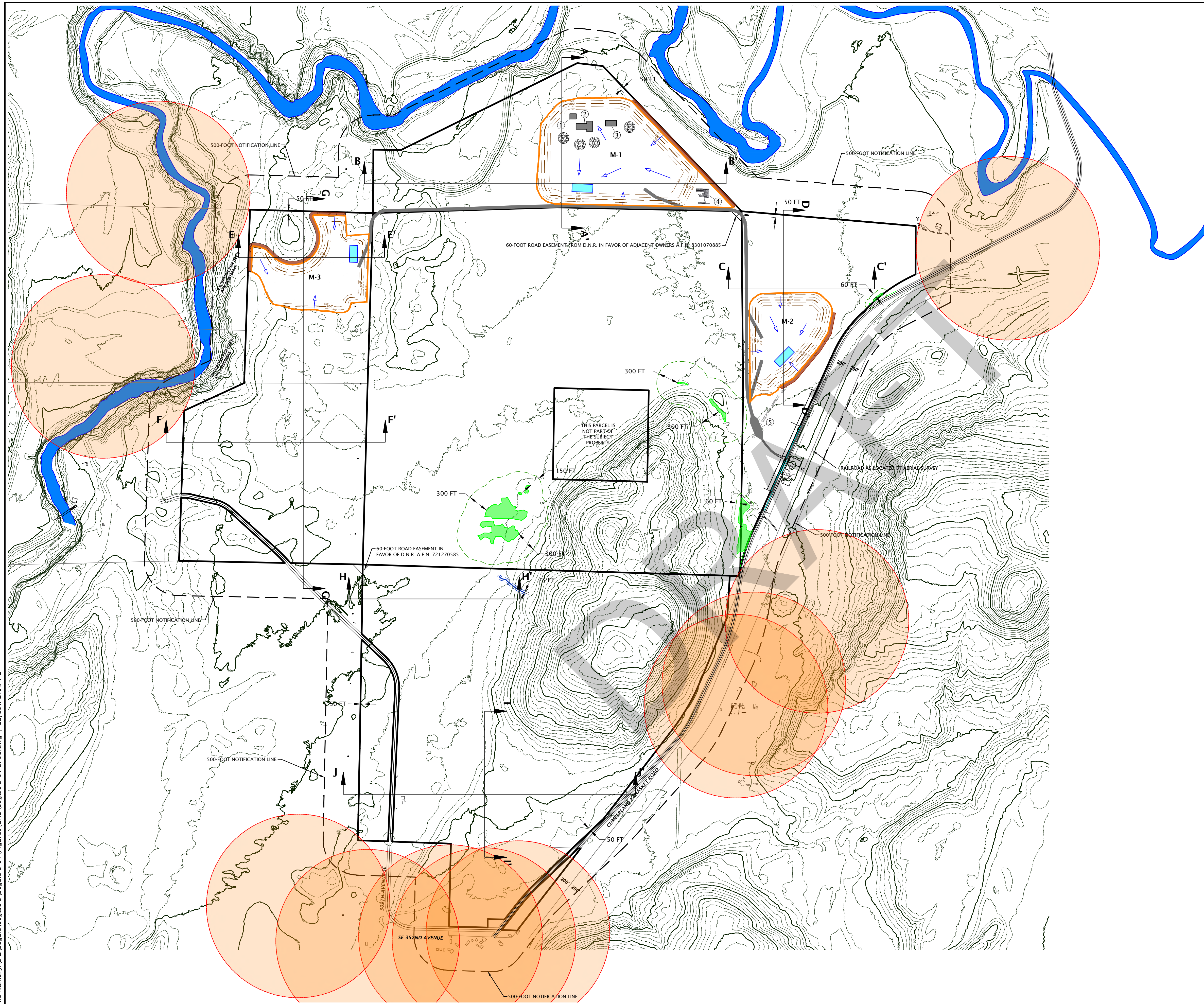
CONCEPTUAL DEVELOPMENT PLAN EXISTING CONDITIONS MAP	DRAFT 1
SEGALE-3-01	JULY 2022
CUMBERLAND GRAVEL OPERATION KING COUNTY, WA	

SEGALE PROPERTIES

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 5811 SEGALE PARK DRIVE, C. TUKWILA, WA 98188
 O: 206 575-2000
 www.segaleproperties.com

NIV5

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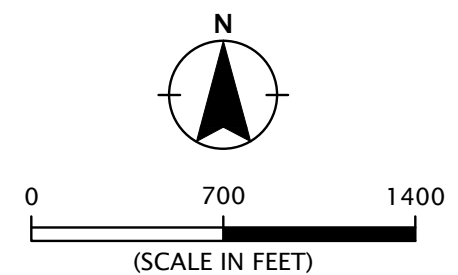
LEGEND:

- PROPERTY BOUNDARY
- LIMITS OF MINING - STAGE 1
- - - STAGE CUT TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
- - - EXISTING TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
- GREEN RIVER (APPROXIMATE)
- WETLAND
- - - WETLAND BUFFER
- STREAM
- - - STREAM BUFFER
- M-1 MINING SEGMENT
- PRODUCT STOCKPILE
- TOPSOIL STOCKPILE/BERM
- DRAINAGE PATTERNS
- STORMWATER INFILTRATION BASIN
- ACCESS ROAD
- 1/4-MILE-RADIUS FROM APPROXIMATE CENTER OF RESIDENCE (LOCATED WITH GOOGLE EARTH PRO)

A A' CROSS SECTION

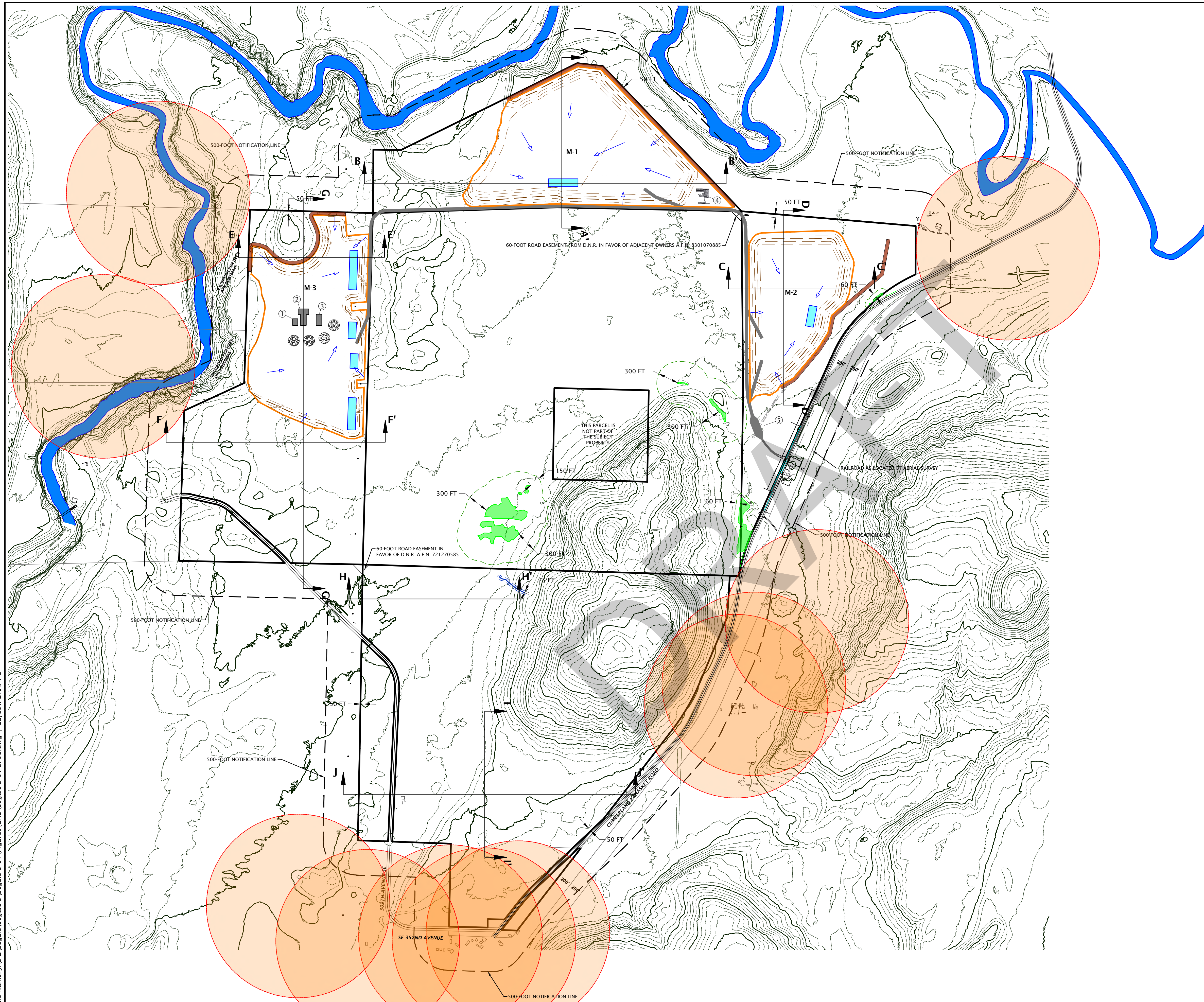
- ① PROCESS WATER CONTROL PLANT
- ② WASH PLANT AND SCREENS
- ③ CRUSHER
- ④ ASPHALT PLANT
- ⑤ SCALES LOCATION

NOTES:
 1. SITE PLAN BASED ON DRAWINGS PROVIDED BY SEGALE PROPERTIES, LLC.
 2. EXISTING TOPOGRAPHY (LIDAR 2016) OBTAINED FROM WADNR.



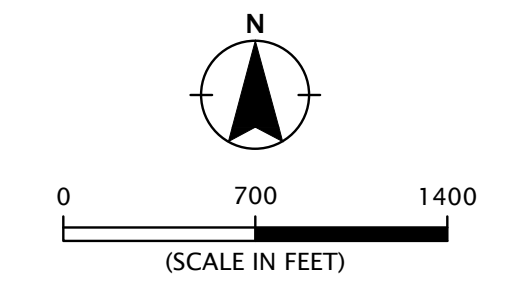
CONCEPTUAL DEVELOPMENT PLAN STAGE 1	DRAFT 2
SEGALE-3-01	JULY 2022
COMMERCIAL • INDUSTRIAL • AGRICULTURAL • NATURAL RESOURCES P.O. BOX 88028, TUKWILA, WA 98138 5811 SEGALE PARK DRIVE, C. TUKWILA, WA 98188 O: 206.575-2000 www.segaleproperties.com	
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- LEGEND:**
- PROPERTY BOUNDARY
 - LIMITS OF MINING - STAGE 2
 - - - STAGE CUT TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
 - - - EXISTING TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
 - GREEN RIVER (APPROXIMATE)
 - WETLAND
 - - - WETLAND BUFFER
 - STREAM
 - - - STREAM BUFFER
 - M-1 MINING SEGMENT
 - PRODUCT STOCKPILE
 - TOPSOIL STOCKPILE/BERM
 - DRAINAGE PATTERNS
 - STORMWATER INFILTRATION BASIN
 - ACCESS ROAD
 - 1/4-MILE-RADIUS FROM APPROXIMATE CENTER OF RESIDENCE (LOCATED WITH GOOGLE EARTH PRO)

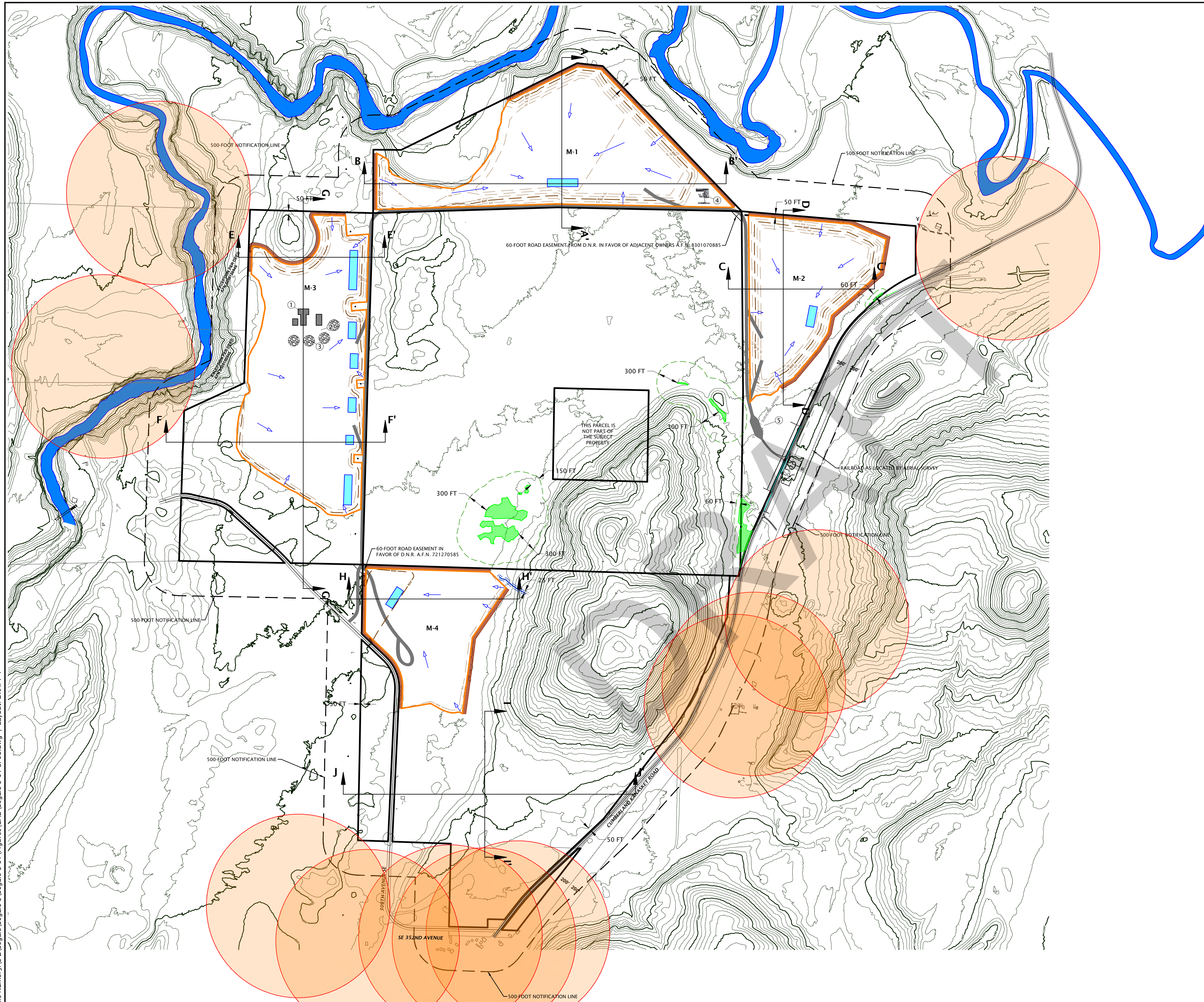
- A A' CROSS SECTION
- ① PROCESS WATER CONTROL PLANT
 - ② WASH PLANT AND SCREENS
 - ③ CRUSHER
 - ④ ASPHALT PLANT
 - ⑤ SCALES LOCATION



NOTES:
 1. SITE PLAN BASED ON DRAWINGS PROVIDED BY SEGALE PROPERTIES, LLC.
 2. EXISTING TOPOGRAPHY (LIDAR 2016) OBTAINED FROM WADNR.

CONCEPTUAL DEVELOPMENT PLAN STAGE 2	DRAFT 3
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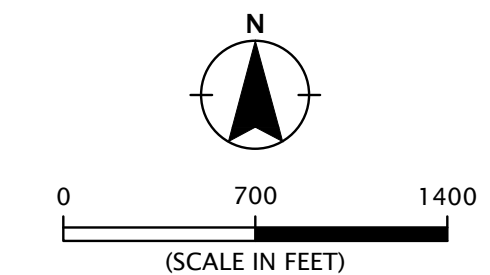


LEGEND:

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- - - EXISTING TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
- GREEN RIVER (APPROXIMATE)
- WETLAND
- - - WETLAND BUFFER
- STREAM
- - - STREAM BUFFER
- M-1 MINING SEGMENT
- PRODUCT STOCKPILE
- TOPSOIL STOCKPILE/BERM
- DRAINAGE PATTERNS
- STORMWATER INFILTRATION BASIN
- ACCESS ROAD
- ¼-MILE-RADIUS FROM APPROXIMATE CENTER OF RESIDENCE (LOCATED WITH GOOGLE EARTH PRO)

A A' CROSS SECTION

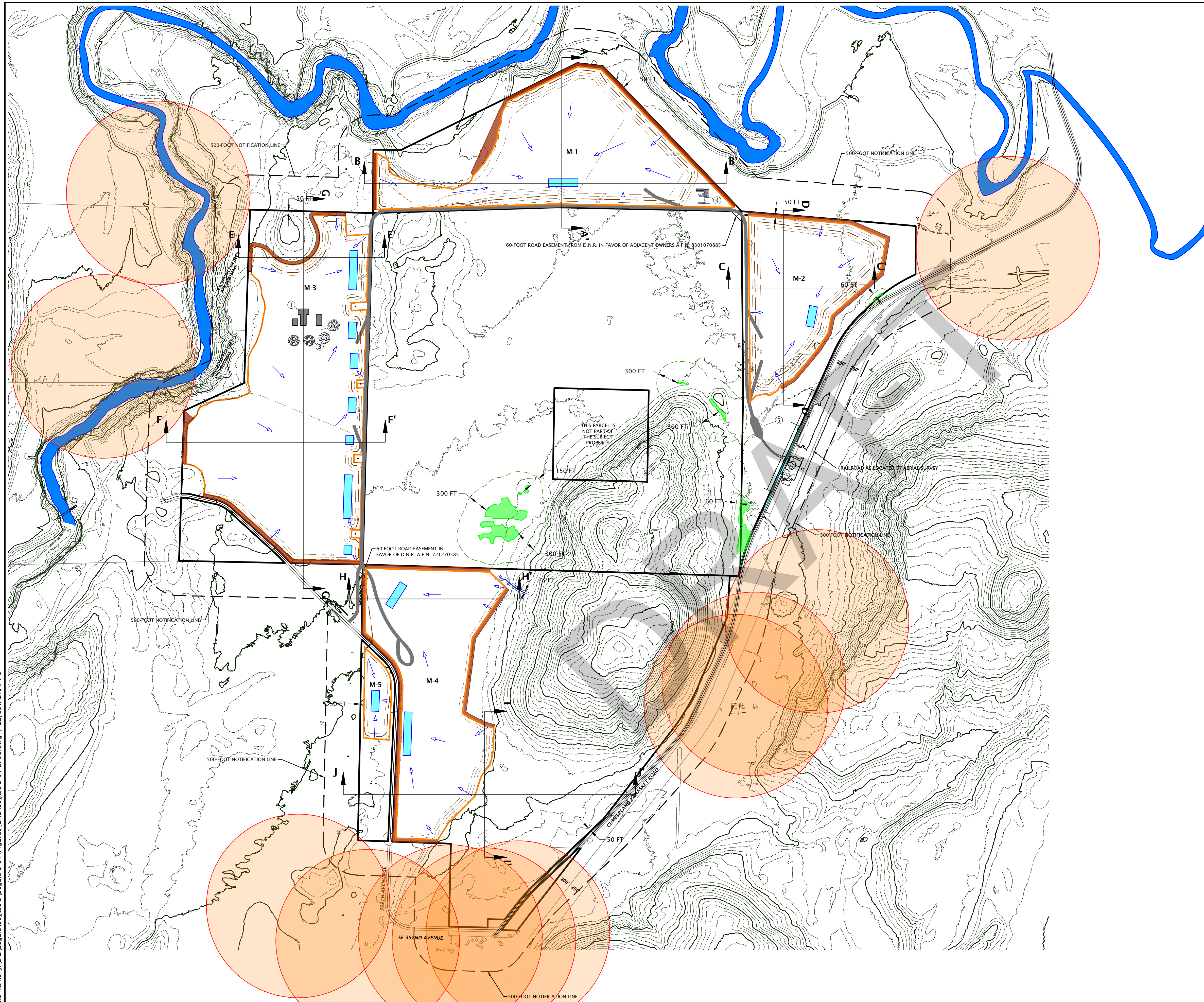
- ① PROCESS WATER CONTROL PLANT
- ② WASH PLANT AND SCREENS
- ③ CRUSHER
- ④ ASPHALT PLANT
- ⑤ SCALES LOCATION



NOTES:
 1. SITE PLAN BASED ON DRAWINGS PROVIDED BY SEGALE PROPERTIES, LLC.
 2. EXISTING TOPOGRAPHY (LIDAR 2016) OBTAINED FROM WADNR.

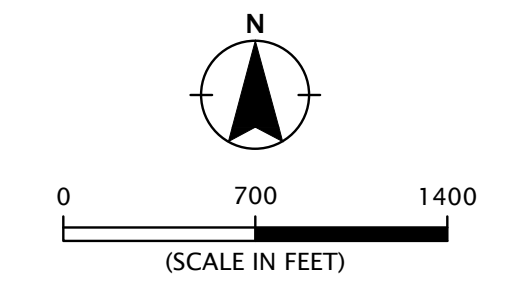
CONCEPTUAL DEVELOPMENT PLAN STAGE 3	DRAFT 4
SEGALE-3-01	JULY 2022
COMMERCIAL • INDUSTRIAL • AGRICULTURAL • NATURAL RESOURCES P.O. BOX 88028, TUKWILA, WA 98138 5811 SEGALE PARK DRIVE, C. TUKWILA, WA 98188 O: 206.575-2000 www.segaleproperties.com	
NIV5	
DRAFT	

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- LEGEND:**
- PROPERTY BOUNDARY
 - LIMITS OF MINING - STAGE 4
 - - - STAGE CUT TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
 - - - EXISTING TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
 - GREEN RIVER (APPROXIMATE)
 - WETLAND
 - - - WETLAND BUFFER
 - STREAM
 - - - STREAM BUFFER
 - M-1 MINING SEGMENT
 - PRODUCT STOCKPILE
 - TOPSOIL STOCKPILE/BERM
 - DRAINAGE PATTERNS
 - STORMWATER INFILTRATION BASIN
 - ACCESS ROAD
 - ¼-MILE-RADIUS FROM APPROXIMATE CENTER OF RESIDENCE (LOCATED WITH GOOGLE EARTH PRO)

- A—A' CROSS SECTION
- ① PROCESS WATER CONTROL PLANT
 - ② WASH PLANT AND SCREENS
 - ③ CRUSHER
 - ④ ASPHALT PLANT
 - ⑤ SCALES LOCATION



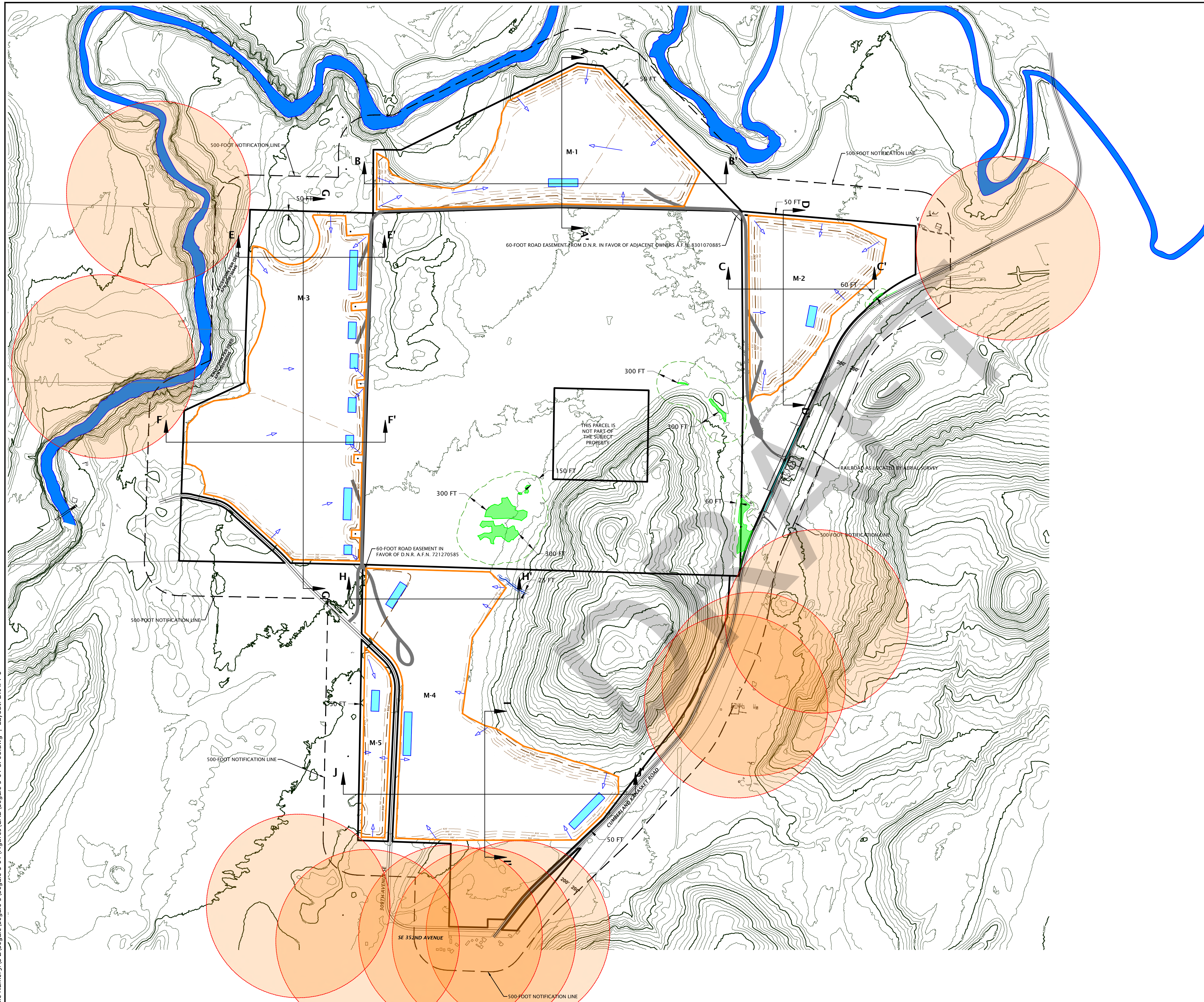
NOTES:
 1. SITE PLAN BASED ON DRAWINGS PROVIDED BY SEGALE PROPERTIES, LLC.
 2. EXISTING TOPOGRAPHY (LIDAR 2016) OBTAINED FROM WADNR.

CONCEPTUAL DEVELOPMENT PLAN STAGE 4	DRAFT 5
SEGALE-3-01	CUMBERLAND GRAVEL OPERATION KING COUNTY, WA
JULY 2022	

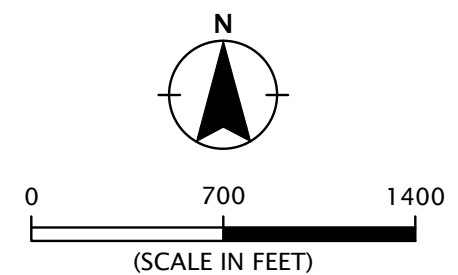
COMMERCIAL • INDUSTRIAL • AGRICULTURAL • NATURAL RESOURCES
 P.O. BOX 88028, TUKWILA, WA 98138
 5811 SEGAL PARK DRIVE, C. TUKWILA, WA 98188
 TEL: 206.575-2000
 www.segaleproperties.com

NIV5

DRAFT



- LEGEND:**
- PROPERTY BOUNDARY
 - LIMITS OF MINING
 - - - FINAL TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
 - - - EXISTING TOPOGRAPHY (20-FOOT INTERVALS; 100-FOOT INDEX CONTOURS)
 - GREEN RIVER (APPROXIMATE)
 - WETLAND
 - - - WETLAND BUFFER
 - STREAM
 - - - STREAM BUFFER
 - DRAINAGE PATTERNS
 - STORMWATER INFILTRATION BASIN
 - 1/4-MILE-RADIUS FROM APPROXIMATE CENTER OF RESIDENCE (LOCATED WITH GOOGLE EARTH PRO)
- A A' CROSS SECTION



- NOTES:**
1. SITE PLAN BASED ON DRAWINGS PROVIDED BY SEGALE PROPERTIES, LLC.
 2. EXISTING TOPOGRAPHY (LIDAR 2016) OBTAINED FROM WADNR.

CONCEPTUAL DEVELOPMENT PLAN FINAL TOPOGRAPHY MAP	DRAFT 6
SEGALE-3-01	JULY 2022
COMMERCIAL • INDUSTRIAL • AGRICULTURAL • NATURAL RESOURCES P.O. BOX 88028, TUKWILA, WA 98138 5811 SEGALE PARK DRIVE, C. TUKWILA, WA 98188 O: 206.575-2000 www.segaleproperties.com	
NIV5	
DRAFT	

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Appendix B

IPAC Species List



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Washington Fish And Wildlife Office
510 Desmond Drive Se, Suite 102
Lacey, WA 98503-1263
Phone: (360) 753-9440 Fax: (360) 753-9405

In Reply Refer To:
Project Code: 2023-0006575
Project Name: Cumberland Mine

October 19, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/birds/policies-and-regulations.php>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Washington Fish And Wildlife Office

510 Desmond Drive Se, Suite 102

Lacey, WA 98503-1263

(360) 753-9440

Project Summary

Project Code: 2023-0006575

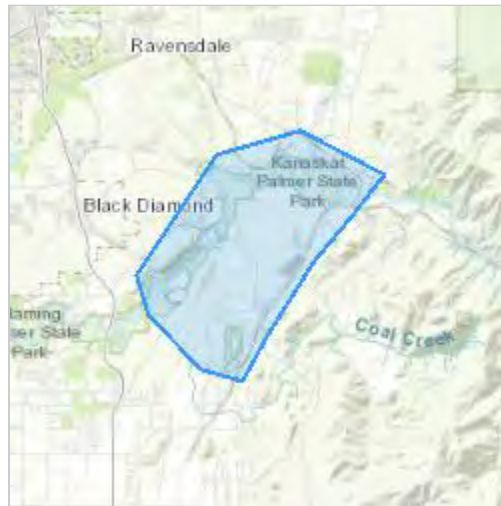
Project Name: Cumberland Mine

Project Type: New Constr - Above Ground

Project Description: Evaluation of existing habitat conditions surrounding parcel.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@47.2976732,-121.94046476421587,14z>



Counties: King County, Washington

Endangered Species Act Species

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Gray Wolf <i>Canis lupus</i> Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, IA, IN, IL, KS, KY, LA, MA, MD, ME, MI, MO, MS, NC, ND, NE, NH, NJ, NV, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WI, and WV; and portions of AZ, NM, OR, UT, and WA. Mexico. There is final critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/4488	Endangered
North American Wolverine <i>Gulo gulo luscus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5123	Proposed Threatened

Birds

NAME	STATUS
Marbled Murrelet <i>Brachyramphus marmoratus</i> Population: U.S.A. (CA, OR, WA) There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Yellow-billed Cuckoo <i>Coccyzus americanus</i> Population: Western U.S. DPS There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Bull Trout <i>Salvelinus confluentus</i> Population: U.S.A., conterminous, lower 48 states There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8212	Threatened

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Bull Trout <i>Salvelinus confluentus</i> https://ecos.fws.gov/ecp/species/8212#crithab	Final

IPaC User Contact Information

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City: Seattle
State: WA
Zip: 98101
Email: tbersin@anchorqea.com
Phone: 9169964600
