Final

Appendix 2-C
Portal 19 Screening Level 3 Documentation

August 2003

Prepared for King County by
HDR Engineering, Inc.
Bellevue, WA

For more information:
Brightwater Project
201 South Jackson Street, Suite 503
Seattle, WA  98104-3855
206-684-6799 or toll free 1-888-707-8571

Alternative formats available upon request
by calling 206-684-1280 or 711 (TTY)
Table of Contents

Introduction ........................................................................................................................................ 1
Purpose .......................................................................................................................................... 1
Project Background .......................................................................................................................... 2
Relationship to Final Environmental Impact Statement ................................................................. 3
Level 3 Screening Process ............................................................................................................. 4
  Candidate Sites ............................................................................................................................. 4
  Evaluation Methodology .............................................................................................................. 4
  Evaluation Factors ...................................................................................................................... 6
Outfall Factors ............................................................................................................................... 14
  Key factors .................................................................................................................................. 14
  Secondary Factors ..................................................................................................................... 17
Summary of Level 3 Portal Screening Results ............................................................................. 30

List of Tables

Table 1. Portal 19 Candidate Sites for Route 9–195th Street Conveyance System ................. 4

List of Figures

Figure 1-A. Portal Siting Area 19 with Candidate Sites
Figure 1-B. Portal Siting Area 19 with Candidate Sites

List of Appendices

Appendix A. Evaluation Factors used in Level 3 Screening Process for Portal 19
Appendix B. Level 3 Screening Matrix for Portal 19
Appendix C. Evaluation Summary of Portal 19 Level 3 Candidate Sites
**Introduction**

King County has prepared a Draft Environmental Impact Statement (Draft EIS) and Final Environmental Impact Statement (Final EIS) on the Brightwater Regional Wastewater Treatment System. The Final EIS is intended to provide decision-makers, regulatory agencies and the public with information regarding the probable significant adverse impacts of the Brightwater proposal and identify alternatives and reasonable mitigation measures.

King County Executive Ron Sims has identified a preferred alternative, which is outlined in the Final EIS. This preferred alternative is for public information only, and is not intended in any way to prejudge the County’s final decision, which will be made following the issuance of the Final EIS with accompanying technical appendices, comments on the Draft EIS and responses from King County, and additional supporting information. After issuance of the Final EIS, the King County Executive will select final locations for a treatment plant, marine outfall and associated conveyances.

The County Executive authorized the preparation of a set of Technical Reports, in support of the Final EIS. These reports represent a substantial volume of additional investigation on the identified Brightwater alternatives, as appropriate, to identify probable significant adverse environmental impacts as required by the State Environmental Policy Act (SEPA). The collection of pertinent information and evaluation of impacts and mitigation measures on the Brightwater proposal is an ongoing process. The Final EIS incorporates this updated information and additional analysis of the probable significant adverse environmental impacts of the Brightwater alternatives, along with identification of reasonable mitigation measures. Additional evaluation will continue as part of meeting federal, state and local permitting requirements.

Thus, the readers of this Technical Report should take into account the preliminary nature of the data contained herein, as well as the fact that new information relating to Brightwater may become available as the permit process gets underway. It is released at this time as part of King County's commitment to share information with the public as it is being developed.

**Purpose**

The purpose of this report is to document the Level 3 portal screening process and evaluation results for the Portal 19 candidate sites. The Level 1 and 2 portal screening processes were used to identify and evaluate suitable candidate sites within the portal siting areas that were identified in the Brightwater Draft EIS. A Technical Report is available that describes the Level 1 and 2 portal screening. Portal siting areas are the 72-acre siting circles which were selected based on the engineering requirements for the design and construction of conveyance. In the Level 3 screening process, a detailed evaluation of the candidate sites identified in the Level 2 screening was performed to identify the most suitable portal site within each portal siting area. Identification of the site for Portal 19 was critical for designing the outfall for the proposed Route 9 conveyance alternatives so the selection of the preferred site was accelerated. Level 3 evaluation results for the other four primary portal sites for the Preferred Alternative will be conducted at a later date and results will be included in a subsequent report.

This report provides:

- Project background on the Brightwater Wastewater System
• Methodology used in the Level 3 portal screening process
• Factors used to evaluate the candidate sites within proposed Portal 19 and the reason for inclusion of these factors
• Evaluation data and summary results of each candidate site for proposed Portal 19

Project Background

The Brightwater Regional Wastewater Treatment System Project (Brightwater Project) was initiated to implement the regional policy mandate (contained in the Regional Wastewater Services Plan [RWSP]) for development of a new regional wastewater treatment system in north King County or south Snohomish County by 2010. The RWSP and this regional policy mandate are intended to address continued growth throughout King County and Snohomish County (and the corresponding demand for additional wastewater infrastructure) and to protect human health and the environment by providing high-quality wastewater treatment and conveyance services to this region. The Brightwater System will include a treatment plant to provide secondary treatment of wastewater, pipelines to convey wastewater to and from the plant (conveyance), and a marine outfall to discharge the treated wastewater to Puget Sound.

The Brightwater alternative analysis began with a comprehensive siting study that identified and screened potential sites, evaluated associated conveyance systems, and investigated potential marine outfall locations. The adopted siting process was a three-phase approach involving extensive research, geographical information system analysis, field investigation, public involvement and stakeholder input, and consultation with local municipalities. The goal of Phase I was to use King County Council-adopted policy siting criteria to identify a small group of potential sites for the treatment plant from a pool of over 100 potential sites. King County completed Phase I in May 2001, having identified six candidate sites for the treatment plants and eight candidate outfall zones in Puget Sound. On May 14, 2001, the King County Council accepted the candidate sites for the treatment plant and outfall zones for further evaluation, as well as a set of refined policy criteria for use in narrowing the number of sites under Phase II.

Phase II considered complete “candidate systems” for each of the six candidate sites; each system included a conceptual treatment plant layout, two construction options for the conveyance pipes serving the plant, and two options for where the marine outfall would be located. One conveyance construction option involved burying the pipes at relatively shallow depths using surface trenching, and the other involved tunneling the pipes deep underground.

On September 17, 2001, the King County Executive transmitted a recommendation to the King County Council to advance two alternative treatment plant sites to Phase III for environmental review in an Environmental Impact Statement (EIS). Three system alternatives based on those sites are evaluated in the Draft EIS. One system alternative is based on siting the Brightwater Treatment Plant at the Unocal site in Edmonds. Two system alternatives are based on siting the Brightwater Treatment Plant at the Route 9 site in unincorporated Snohomish County just north of the City of Woodinville.
Based on the results of the Phase III evaluation, three action alternatives and a no action alternative were identified and evaluated in the Draft EIS. The Draft EIS was released on November 6, 2002 for public comment. The action alternatives were:

- **Route 9–195th Street System (Preferred Alternative)** - A treatment plant at the Route 9 site with conveyance pipelines in deep tunnels primarily under 195th and 205th Streets and a marine outfall off Point Wells to Outfall Zone 7S.

- **Route 9–228th Street System** - A treatment plant at the Route 9 site with conveyance pipelines in deep tunnels primarily under 228th Street SE and a marine outfall off Point Wells to Outfall Zone 7S.

- **Unocal System** - A treatment plant at the Unocal site with an influent pipeline to carry untreated wastewater from King County’s existing pipelines near SR-405 in Bothell through Kenmore and Lake Forest Park to Edmonds and a marine outfall located off Point Edwards in Outfall Zone 6.

The King County Executive identified the Route 9–195th Street System as the preferred alternative because of its relative efficiencies and flexibility over the others.

**Relationship to Final Environmental Impact Statement**

The conveyance facilities for each of the three system alternatives in the Draft EIS consisted of 1000-foot wide corridors with portal siting areas identified approximately every 10,000 feet. A total of 22 portal siting areas were identified along the conveyance corridors for all of the alignments. Portal siting areas consisted of 2,000-foot diameter (72 acre) areas within which one to two acres would be used for portal construction. Portals would be designed as an access point for the tunnel boring equipment to be launched and received during the construction of the tunnel.

Subsequent to the Draft EIS, an identification and screening process was applied to the 72-acre portal siting areas to identify multiple candidate sites for portal construction. The screening process consisted of Level 1 and Level 2 screening. In Level 1 screening, sensitive areas such as wetlands, streams, critical habitat, high quality uplands, and known cultural and historical resources, were identified within the 72-acre portal siting area. Multiple candidate sites were selected from the remaining area to avoid or minimize impacts to sensitive areas, wherever possible. Level 2 screening consisted of evaluating the multiple candidate sites and narrowing the list to two to four candidates per portal siting area.

During Level 2 portal screening, multiple candidate sites were evaluated within each portal siting area. Candidate sites were evaluated based on criteria from four categories: engineering, community and environment, land acquisition, and financial. These criteria were used to determine the relative suitability of the candidate sites so the preferred site could be selected.

The Level 2 candidate sites (two to four per portal) will be included in the Final EIS for each of the portal siting areas. For Portal 19, a preferred candidate portal site was identified to evaluate and design the outfall for the Route 9 conveyance system alternatives. If the preferred Route 9-195th System alternative is selected for construction, then Level 3
screening results will be released for the other four primary portals on the Route 9–195th Street System after the Final EIS is issued.

**Level 3 Screening Process**

The Level 3 screening process was designed to evaluate the two to four Level 2 candidate sites in detail and identify the best apparent site within the 72-acre siting areas identified in the Draft EIS.

Portal 19 has design considerations that required acceleration of the selection of the best apparent portal site since the outfall would begin at Portal 19. Identification of the preferred site for Portal 19 was performed in support of the outfall planning and design for the preferred Route 9–195th Street System. If the preferred Route 9 – 195th System alternative is selected for construction, then the Level 3 screening will be used to identify the best apparent portal sites for the other four primary portal sites on the Route 9–195th Street Conveyance System at a later date.

**Candidate Sites**

Level 3 screening process was performed for proposed Portal 19 for the preferred Route 9-195th Street System. Portal 19 candidate sites are shown on Figures 1A and 1B. Table 1 includes a list of the candidate sites, their size, and current use for Portal 19.

**Table 1. Portal 19 Candidate Sites for Route 9–195th Street Conveyance System**

<table>
<thead>
<tr>
<th>Site</th>
<th>Size (Acres)</th>
<th>Current Use</th>
<th>Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.9</td>
<td>Undeveloped (Vacant) Land</td>
<td>Woodway</td>
</tr>
<tr>
<td>C</td>
<td>4.6</td>
<td>Petroleum Refining</td>
<td>Snohomish County</td>
</tr>
<tr>
<td>E</td>
<td>3.4</td>
<td>Utility - Public</td>
<td>Shoreline</td>
</tr>
</tbody>
</table>

**Evaluation Methodology**

The Level 3 screening process was intended to evaluate the candidate sites for Portal 19 in detail. A list of 64 evaluation factors was developed. These factors consist of broad categories including engineering, outfall, community and environment, permitting, land acquisition, financial and mitigation potential. These factors were used to test the relative suitability of candidate sites and were based on measurable physical properties. The technical group initially identified the important issues pertinent to construction and operation at the portal sites under each broad category. These issues or factors were addressed by an evaluation question. For example, the ability of a candidate site to provide adequate vehicle access was assessed through an evaluation factor with the following question: “What improvement would be needed for access to the site?”

To establish a systematic response that would allow comparison among the candidate sites, a relative rating scale was used for each evaluation question. Some scales are quantitative based on specific measurement such as length of the tunnel from the tunnel corridor to the
portal site; however, most of the scales are qualitative involving best professional judgments. For example, in relation to the above stated question, the scale was developed based on required access road improvement. The scale developed to assess condition for construction access to the candidate sites was:

- High – New access road needs to be constructed, difficult construction with high cost.
- Medium – New access road needs to be constructed with lower construction cost or improvement on existing access-way required.
- Low – Existing access-way is adequate with minor improvement.
- No – No improvement required.

Some scales were used to assess potential constraints or disadvantages, while others assessed potential opportunities or benefits. With respect to a scale that measured a potential constraint, a ‘high’ would indicate a highly-constrained candidate site; whereas on a scale that measured potential benefits, a ‘high’ would represent a benefit associated with the candidate site.

To reflect the relative importance among the evaluation factors, candidate sites were evaluated using the factors with a tiered approach. Twenty-three of the factors were given high priority in determining the relative ranking of candidate sites because they were found to be the most distinguishing factors in the screening process and allowed the team to determine the differences between candidate sites. These were classified as the ‘key factors’ and were given higher weighting in the evaluation process. Nineteen factors were considered as ‘primary’ and these were given intermediate priority in the evaluation process. Twenty-two factors were considered to be secondary and the study team determined that these would have lower weightings in Level 3 screening. The evaluation factors used in Level 3 screening process for proposed Portal 19 are listed in Appendix A.

Each candidate site was subjected to 64 evaluation factors, forming a matrix. The specific questions, scales, and ratings used to evaluate each candidate site are compiled into an evaluation matrix table contained in Appendix B. After completion of the evaluation matrix, the ratings were loaded into a numerical decision model used to compile the overall relative performance of candidate sites.

**Criterium Decision Plus & Weightings of Evaluation Factors**

A commercially available decision software, known as Criterium Decision Plus, was used to organize the performance criteria, manage the large volume of data, and produce an analytical perspective of which candidate sites perform the best within each of the portal siting areas. The model was designed to establish the relative contribution of factors from technical (engineering), community and environment, land acquisition, and financial evaluations. The model was a tabulation tool.

The evaluation factors were assigned weights by the project screening team to reflect the relative importance of the broad categories of engineering, outfall, community and environment, permitting, land acquisition, and financial. These weights were used in the model and assisted in understanding the sensitivity of the results to the weights and relative number of factors.
The evaluation factors specifically related to the outfall category were considered the most important for proposed Portal 19 since the location of the portal site impacts the location, design, and construction methods for the outfall. The outfall category, comprised of nine evaluation factors, was given a weighting of 50 percent. Impacts to the community and environment during construction and operation at proposed Portal 19 were considered and assigned a critical weight of 30 percent which included 22 evaluation factors. Engineering was assigned a weight of 10 percent, since issues included in this category can add cost and construction impacts to the project. A total of 19 evaluation factors were included in this category. Land acquisition was assigned 10 percent, which contained ten evaluation factors. Two evaluation factors were included in the Permitting category. Mitigation opportunity and financial categories had one evaluation factor each. Since the evaluation factors for the permitting, mitigation opportunity and financial categories were less critical than other categories such as outfall, and community and environment, and there were fewer factors, a small weight of less than 1 percent was assigned to these categories.

Weighting for each evaluation factor under each broad category was estimated based on the total assigned weight of that category and the relative importance among the evaluation factors within that category. Key factors addressed the most important issue and, therefore, were assigned a high weighting. Primary factors addressed important issues but not as critical as key factors and, therefore, were assigned a lower weight. Secondary factors addressed other less important issues and were assigned a base weight. A base weight for secondary factors was determined such that the sum of the weight of all evaluation factors under each category equals the assigned weight of that category.

A score was generated for each of the candidate sites using the model. The score is the cumulative representation of how well the candidate site performed relative to the performance criteria. If a candidate site performed perfectly on all criteria, its score would be 1.00.

**Evaluation Factors**

The evaluation factors selected by the technical group to evaluate the candidate sites in the Level 3 screening process addressed the issues from broad categories of engineering, community and environment, land acquisition, outfall, permitting, financial and mitigation potential. In this section the evaluation factors are discussed under each category.

**Engineering Factors**

The engineering category is comprised of 19 evaluation factors that focused on engineering and construction criteria. Eight factors were considered as key factors and were assigned higher weights to reflect the greater importance in evaluating the candidate sites. Seven factors were assigned as primary factors with intermediate weight. The remaining four factors were considered secondary factors with lower weight. The details of each evaluation factor of this category are discussed in this section.

**Key factors**

The eight key factors for engineering include: construction access, vehicle access improvement, existing system connections, tunnel depth, connecting pipeline, tunneling...
distance, power, and site groundwater and surface water pretreatment and disposal. These are described as follows:

**Construction Access (Key Factor ENG-1)**

This factor was evaluated with the question, “What is the ease of access (type and distance) to the freeway from the site and are alternative access routes available for construction?”

Access to the candidate site is important since a large number of trucks with heavy equipment and construction materials is expected to travel to and from the site during construction activities. High truck traffic flow would have significant impact on the regional arterial roads and local streets. Also, narrow and inadequate access roads can delay traffic movement and hence affect the construction at the portal sites.

A qualitative scale based upon the relative difficulty of entering and exiting the candidate site was used to evaluate this factor. The factor was evaluated using the following scale:

- **High:** Two lane and greater than three miles to freeway or through private property or residential neighborhood with narrow streets and only one access route available.
- **Medium:** Two lane and less than three miles to freeway or four lane and greater than three miles to freeway and access from one direction only.
- **Low:** Four lane or larger, and less than three miles to freeway and more than one access route available and access from both directions.

**Vehicle Access Improvement (Key Factor ENG-2)**

This factor was evaluated with the question, “What improvements would be needed for access to the site?”

This question addressed the degree of improvements that would be required to provide adequate access for the truck with heavy equipment and construction materials into the candidate sites. Sites with inadequate or no access may require construction of new access roadways, which may require additional easements and would involve significant construction cost.

A qualitative scale based upon the relative degree of access improvement required for vehicle access during construction and operational activities at the portal sites was developed to evaluate this factor. The factor was evaluated using the following scale:

- **High:** New access road needs to be constructed, difficult construction with high cost.
- **Medium:** New access road needs to be constructed with lower construction cost or improvement on existing access way required.
- **Low:** Existing access way is adequate with minor improvement.
- **No:** No improvement required.
Existing System Connections (Key Factor ENG-3)

This factor was evaluated with the question, “What is the difficulty of connecting the existing conveyance system to the influent tunnel at the site?”

The existing conveyance system would be connected with the proposed influent tunnel at the portal sites. Depending on the location of the site, these connections can be complex and would require additional pipeline. This question assessed the candidate sites for their suitability to connect to the local conveyance system.

A qualitative scale based upon the relative difficulty of making existing piping connections to the tunnel was developed to evaluate this factor. The factor was evaluated using the following scale:

- **High**: Connections difficult and complex.
- **Medium**: Connections of average difficulty.
- **Low**: Connections less complex than typical.

Tunnel depth (Key Factor ENG-4)

This factor was evaluated with the question, “How much deeper does the tunnel need to be relative to another candidate site within the portal siting area?”

This question addressed the relative cost and construction impacts associated with tunnel depth at the candidate portal sites. The deeper the tunnel is, the higher the cost and construction impact at the portal site. Site topography and presence of other utilities may also necessitate complex design and construction.

A quantitative scale based on the relative depth of tunnel at the candidate site was used to evaluate this factor.

Connecting Pipeline (Key Factor ENG-5)

This factor was evaluated with the question, “What is the length of connection pipeline required to divert flows to the influent tunnel?”

Depending on the location of the site, additional pipeline connection would be required to divert flows to the influent tunnel. The longer the length of the pipeline, the higher would be the cost and construction impacts. The factor was evaluated using a relative quantitative scale based on the length of the connection pipeline for each of the candidate sites.

Tunneling Distance (Key Factor ENG-6)

This factor was evaluated with the question, “Does the site lie in the preferred path of the tunnel alignment?”

The distance between the tunnel and the candidate site is important in terms of cost and number of private easements needed for the tunnel. The further the candidate site is from the tunnel centerline, typically the greater the cost and number of private easements needed.
A quantitative scale based on the length of the tunnel from the tunnel corridor to the portal site was used to evaluate this factor.

**Power (Key Factor ENG-7)**

This factor was evaluated with the question, “Does the local utility have adequate power service available on site?”

Construction and operation at the portal sites could require high electric power. Significant investment and cost are associated with any new power line or expansion of existing capacity. This question evaluated the candidate sites on the availability of required power at the portal sites for operation and construction activities.

The qualitative scale based upon relative cost to provide adequate electric power to the candidate site was developed to evaluate this factor. The factor was evaluated using the following scale:

- **High:** None available, high cost to bring in.
- **Medium:** Power is available but requires significant investment to upgrade to three-phase power at required voltage.
- **Low:** Three-phase power is available at required voltage on-site.
- **No:** Significant investment required.

**Site Ground/Surface Water Pretreatment and Disposal (Key Factor ENG-8)**

This factor was evaluated with the question, “What is the degree of pretreatment and pipeline construction required to dispose dewatered groundwater at the portal site during construction activities?”

Construction of portals and tunnel near and below groundwater could require dewatering. Dewatered groundwater could be disposed into local sewer, storm drain or nearby surface water body according to state and local county or district regulations. Additional pretreatment may be required to meet the discharge requirements. In the absence of a suitable sewer line or storm drain on the site, additional pipelines may also be required which may have significant construction impacts. This question evaluated the candidate sites on the apparent ease and availability of disposal options at the sites during construction. The factor was evaluated using the following scale:

- **High:** Major pipeline construction would likely be required.
- **Medium:** Both storm drain and sanitary sewer are available and minor pipeline construction and/or pretreatment would likely be required.
- **Low:** Storm drain, sanitary sewer and natural surface drainage all are available and adjacent to the site and minor pretreatment may be required.

**Primary Factors**

The seven primary factors in the engineering category were used to evaluate the candidate sites. They are described as follows.
Alternative Transport (Primary Factor ENG-1)

This factor was evaluated with the question, “Is there a potential for alternative means of transport to the site other than vehicular for construction?”

Availability of an alternative mode of transportation for heavy equipment and construction materials to the portal site would allow more flexibility and ease of construction activities. Based on number of alternative access modes adjacent to site (alternatives include rail and/or barge), the factor was evaluated using the following scale:

- **High**: Neither rail nor barge.
- **Medium**: Either rail or barge.
- **Low**: Both rail and barge.

Connecting Structures (Primary Factor ENG-2)

This factor was evaluated with the question, “How many connecting structures (drop, diversion) are required to divert flows to the influent tunnel?”

Connecting structures are required to divert flows from the existing conveyance system to the influent tunnel. Depending on the site’s topographic features and existing local conveyance system near the candidate sites, connection from the portal to the influent tunnel can be complex and may require multiple connecting structures. The higher the number of connecting structures, the more complex the construction would be at the portal sites. This question assessed the candidate sites in terms of number of structures required to connect to the influent tunnel from the portal.

The factor was evaluated using a quantitative value based on number of structures required for connection to the influent tunnel.

Tunneling - Staging Flexibility (Primary Factor ENG-3)

This factor was evaluated with the question, “Does the size and shape of the site allow for flexibility of the site for various tunneling activities (working portal, retrieval portal)?”

Construction of the tunnels will require construction of both temporary and permanent structures at the portal sites. The extent of temporary structures at the portal sites will depend on whether or not the site is used for a working or receiving portal. The extent of permanent structures will depend largely on the site’s location (within a given alignment), but will also depend on the size of the site. A larger site of suitable shape would facilitate construction staging and would provide greater flexibility of construction and operational activities at the site. A larger site supports launching or retrieval of a tunnel boring machine as well as the full range of permanent facilities. This question assessed the candidate sites in terms of their relative suitability for allowing flexibility for various tunneling activities.

The factor was evaluated using the following scale:

- **High**: Supports retrieval of tunnel boring machine only, and underground permanent facilities only.
Medium: Supports launching or retrieval of tunnel boring machine with some limits to contractor staging and permanent facilities.

Low: Supports launching or retrieval and permanent facilities with contractor flexibility for construction staging.

Tunneling - Settlement (Primary Factor ENG-4)

This factor was evaluated with the question, “What is the sensitivity of the surrounding site to settlement?”

Tunneling can induce varying degrees of settlement at the ground surface that can be potentially damaging to surface improvements. Tunnel depth and horizontal proximity to the tunnel centerline are important when determining the sensitivity of a site to settlement; however, the type of improvements present on the site is more often the critical factor. Undeveloped land or public space is not particularly sensitive to tunneling induced settlement because any movement is generally not damaging, or noticeable to the public. Public roadways and railroads are more sensitive to settlement because they can potentially be impacted; however, the magnitude of such impact and the mitigation or repair measures for these facilities are understood and the costs are relatively straightforward to estimate. Residential and commercial structures are typically the most sensitive to tunneling-induced settlement due to the difficulty in estimating the extents of potential damage, the difficulty in estimating potential mitigation costs, and the negative public perception.

The factor was evaluated using the following scale:

Scale: Based upon type of land use adjacent to portal siting area in 'Direction of Tunnel'

High: Residential and commercial development

Medium: Washington State Department of Transportation or railroad-type corridor

Low: Public space / undeveloped land

Use of Existing Structures (Primary Factor ENG-5)

This factor was evaluated with the question, “To what extent can existing structures on the site be used for construction?”

Construction of the tunnels will require that facilities be in-place at each working portal to support the work. These facilities include offices for both contractor and construction management staff, crew showers/changing buildings, equipment supply sheds, and a repair shop (most often covered). A site with a high density of existing structures that would not serve any of these functions will require extensive demolition followed by new temporary construction in order to prepare the site for construction activities. Conversely, a site with existing structures in favorable locations, or no structures at all, could reduce the amount of site preparation required. Based on relative use of existing structures on the site, the factor was evaluated using the following scale:

High: Structures exist which must be removed
Medium: Temporary structures will be required for site work
Low: Site has existing structures, which can be used for construction

Use of Existing King County Facilities (Primary Factor ENG-6)
This factor was evaluated with the question, “Does the location of the site support the use of existing King County facilities?”
Depending on the location of the sites, existing King County facilities could be used during construction and operation at the portals. This factor assessed the candidate sites for the opportunity to use existing King County facilities during construction and operation at the portal sites. The factor was evaluated using the following scale:

Scale: Based on relative use of existing King County facilities
High: No potential for use.
Medium: Site allows some reuse of existing King County facilities.
Low: Site allows extensive reuse of existing King County facilities.

Civil Site Work (Primary Factor ENG-7)
This factor was evaluated with the question, “To what degree is site alteration required to accommodate the construction?”
Some civil work may be required to prepare the site for construction of the portal. A site with undulating topography may require major civil site work, which would add cost and significant construction impacts. This factor was evaluated using a relative degree of civil site work required to accommodate the construction of portals at the site. The following scale was used to evaluate this factor:

Scale: Qualitative scale based on amount of site alteration required.
High: Significant alteration, major earthwork to remove hillside, and retaining wall construction required.
Medium: Moderate earthwork required to create level construction area.
Low: Little or no alteration required.

Secondary Factors
Four factors were classified as secondary and these are discussed as follows:

Maintenance Access (Secondary Factor ENG-1)
This factor was evaluated with the question, “What is the ease of access to the facility for maintenance?”
Access to the candidate site from the nearest major roadway is important for both truck traffic entering and leaving the site during construction and long-term operation for any permanent facilities.
A qualitative scale based upon the relative difficulty of entering and exiting the candidate site was used to evaluate this factor. The factor was evaluated using the following scale:

Scale: Based upon the relative difficulty of entering and exiting the portal site.

High: Access through private property or residential neighborhood with narrow streets.

Medium: Access from one direction only.

Low: Access from both directions.

Flooding (Secondary Factor ENG-2)

This factor was evaluated with the question, “Would the site be located in an area with a known flooding problem?”

Flooding potential can impact the facility long-term in addition to during construction. Areas with flooding potential may require specialized construction procedures for stormwater control and design. Available topographic and flood maps and aerial photographs were used to rate this factor. The factor was evaluated using the following scale:

High: Located in designated flood-problem area.

No: Not located in flood-problem area.

Unknown: Insufficient information available.

Geohazard (Secondary Factor ENG-3)

This factor was evaluated with the question, “What is the degree of geohazard potential (landslide, soil liquefaction) on the site?”

Land areas with steep slopes or areas of high landslide potential would require substantial site preparation including excavation and retaining walls to stabilize shoring and foundations and long-term maintenance to protect permanent facilities from landslide hazard. Steep slopes can also complicate construction traffic access.

The scale for determining the extent of geohazard was based on the area of the site subject to soil liquefaction potential or landslide potential. Available topographic and landslide maps and aerial photographs were used to rate this factor. The factor was rated using the following scale:

Scale: Based on amount of area subject to landslide potential or soil liquefaction.

High: More than 30 percent of the site has landslide potential and/or has moderate to deep liquefiable soils.

Medium: Less than 30 percent of the site has landslide potential and/or has moderate to deep liquefiable soils.

Low: None of the site has moderate to deep liquefiable soils.
Utilities (Secondary Factor ENG-4)

This factor was evaluated with the question, “Are there utilities available (sewer, telephone, water) on or adjacent to the site?”

Availability of utilities such as sewer, telephone, and water supply is essential for construction and operation at the portal sites. To add these utilities or extend from the adjacent sites in case of unavailability at the candidate sites may require significant cost. The factor was evaluated using the following qualitative scale:

- **High**: None available, high cost to bring in.
- **Medium**: Some utilities are available on or adjacent to the site.
- **Low**: All utilities are available on or adjacent to the site.

Outfall Factors

The outfall category is comprised of nine factors that focused on construction issues and impacts to the environment and tribal fisheries. Four factors were considered key factors and were assigned higher weights to reflect the greater importance in evaluating the candidate sites. Three factors were assigned primary factors with intermediate weight. The remaining two factors were considered secondary factors with a lower weight. The details of each evaluation factor of the outfall category are discussed in this section.

**Key factors**

The four key factors for the outfall include: onshore construction, construction method feasibility, and eelgrass habitat disturbance for both tunnel and trench construction. These key factors are described as follows:

**Onshore Construction (Key Factor Out-1)**

This factor was evaluated with the question, “What is the relative complexity of construction from the portal location to the waterline along the proposed outfall alignment?”

Access to the shoreline is important since construction machinery, equipment, and materials must travel between the shoreline and the portal site during construction. Unfavorable or difficult access would increase the time and expense of onshore construction. Increased length or complexity of onshore construction due to railroad crossings and/or steep slopes would also increase time and expense of construction. Based on difficulty of construction access to the shoreline and onshore construction complexity (length, railroad crossings, and/or steep slopes), the factor was evaluated using the following scale:

- **High**: Shoreline not directly accessible and more complex onshore construction.
- **Medium**: Favorable shoreline access and more complex onshore construction.
- **Low**: Favorable shoreline access and less complex onshore construction.
**Construction Method Feasibility (Key Factor Out-2)**

This factor was evaluated with the question, “Does the portal site location and its proposed alignment limit the flexibility to utilize multiple construction methods?”

The use of either tunnel or trench construction methods from the portal site locations may be limited by the length of the proposed outfall alignment (beyond standard range of construction method) or the presence of dense environmental resources such as eelgrass. The flexibility to utilize multiple construction methods along the proposed outfall alignment is desirable in order to avoid or minimize disturbance to environmental resources and potential areas of contaminated soil and/or groundwater. Based on the extent of limitations imposed on the use of construction methods by portal location and proposed alignment, the factor was evaluated using the following scale:

- **High**: Portal location and nearshore environment limit both tunnel and trench construction methods.
- **Medium**: Portal location and nearshore environment limit either tunnel or trench construction methods.
- **Low**: Portal location and nearshore environments do not limit construction methods.

**Eelgrass Habitat Disturbance – Tunnel Construction (Key Factor Out-3)**

This factor was evaluated with the question, “To what extent would a tunnel alignment from this portal location disturb eelgrass habitat?”

Tunnel construction might require excavation of access shaft(s) along the proposed alignment to remove obstructions or repair tunneling equipment. The presence of eelgrass habitat along the outfall alignments from the proposed portal locations is considered a key constraint to portal siting because of the high resource value of eelgrass habitat and the extensive permitting and mitigation that would be required if eelgrass habitat were disturbed. Based on the extent of potential disturbance to eelgrass habitat, the factor was evaluated using the following scale:

- **High**: High potential to disturb known eelgrass habitat.
- **Medium**: Low potential to disturb known eelgrass habitat.
- **Low**: No known eelgrass habitat along tunnel alignment

**Eelgrass Habitat Disturbance – Trench Construction (Key Factor Out-4)**

This factor was evaluated with the question, “To what extent would a trench alignment from this portal location disturb eelgrass habitat?”

Trench construction would require excavation of a surface trench and removal of eelgrass habitat along the proposed alignment. The presence of eelgrass habitat along the outfall alignments from the proposed portal locations is considered a key constraint to portal siting because of the high resource value of eelgrass habitat and the extensive permitting and mitigation that would be required if eelgrass habitat was disturbed. The factor is quantified
based on the anticipated area of eelgrass habitat disturbance in square feet. The factor was evaluated using the following scale:

*This factor is evaluated quantitatively in terms of the anticipated area of eelgrass disturbance in square feet rather than using a high, medium, or low designation.*

**Primary Factors**

Three primary factors in the outfall category were used to evaluate the candidate sites.

**Nearshore Construction (Primary Factor Out-1)**

This factor was evaluated with the question, “What is the pipeline length from the shoreline to a water depth of –80 feet mean lower low water (MLLW) along the proposed outfall alignment?”

The length of outfall construction in the nearshore has a direct impact on cost and duration of construction. Environmental resources and habitat areas are concentrated in the nearshore. The extent of potential environmental impacts and the required mitigation for nearshore construction would increase as length of construction within the nearshore increases. The factor was quantified based on the pipeline segment length, in feet, from the shoreline at MLLW to the –80 foot depth contour. The factor was evaluated using the following scale:

- **High:** > 1,500 feet
- **Medium:** 500 to 1,500 feet
- **Low:** < 500 feet

**Tribal Fisheries (Primary Factor Out-2)**

This factor was evaluated with the question, “Are tribal fisheries present along the proposed outfall alignment from this portal location?”

Established fisheries are an important tribal resource. The physical presence of the outfall pipeline could snag, damage, or impair the use of fishing gear. The factor was evaluated using the following scale:

- **Scale:** Based on presence and proximity of tribal fisheries along proposed outfall alignment.
  - **High:** Known concentrated area of active fishery within 1,000 feet of proposed outfall alignment.
  - **Medium:** Known area of active fishery near outfall zone.
  - **Low:** No known active fishery.

**Tribal Spot Prawn Areas (Primary Factor Out-3)**

This factor was evaluated with the question, “Are tribal spot prawn fisheries present along proposed outfall alignment from this portal location?”

Established spot prawn areas are an important tribal resource. The physical presence of the outfall pipeline could impair spot prawn harvesting. Location of the outfall pipeline on the...
seafloor could displace preferred harvesting areas. The factor was evaluated using the following scale:

Scale: Based on presence and proximity of tribal spot prawn area along proposed outfall alignment.

High: Known spot prawn area within 1,000 feet of proposed outfall alignment.

Medium: Known spot prawn area near outfall zone.

Low: No known spot prawn area.

Secondary Factors
Two secondary factors in the outfall category were used to evaluate the candidate sites and are discussed as follows:

Forage Fish Habitat Disturbance – Tunnel Construction (Secondary Factor Out-1)

This factor was evaluated with the question, “To what extent would a tunnel alignment from this portal location disturb forage fish spawning habitat?”

Tunnel construction would require excavation of access shaft(s) along the proposed alignment to remove obstructions or repair tunneling equipment. The presence of forage fish spawning habitat along the outfall alignments from the proposed portal locations is considered a secondary constraint to portal siting due to the potential permitting and mitigation that may be required if forage fish spawning habitat was disturbed. Known/suspected forage fish spawning habitat areas are ubiquitous along the shoreline in the vicinity of the potential portal sites. The factor was evaluated using the following scale:

Scale: Based on extent of potential disturbance to forage fish spawning habitat.

High: High potential to disturb known/suspected forage fish spawning habitat.

Medium: Low potential to disturb known/suspected forage fish spawning habitat.

Low: No known forage fish-spawning habitat along tunnel alignment.

Forage Fish Habitat Disturbance – Trench Construction (Secondary Factor Out-2)

This factor was evaluated with the question, “To what extent would a trench alignment from this portal location disturb forage fish spawning habitat?”

Trench construction would require excavation of a surface trench and removal of forage fish spawning habitat along the proposed alignment. The presence of forage fish spawning habitat along the outfall alignments from the proposed portal locations is considered a secondary constraint to portal siting due to the potential permitting and mitigation that may be required if forage fish spawning habitat was disturbed. Known/suspected forage fish spawning habitat areas are ubiquitous along the shoreline in the vicinity of the potential portal sites. The factor was evaluated using the following scale:

Scale: Based on extent of potential disturbance to forage fish spawning habitat.
High: High potential to disturb known/suspected forage fish spawning habitat.

Medium: Low potential to disturb known/suspected forage fish spawning habitat.

Low: No known forage fish-spawning habitat along trench alignment.

**Community and Environment Factors**
The Community and Environmental category is comprised of 22 evaluation factors that focus on construction issues and impacts to community and environment. Nine factors were considered key factors and were assigned higher weights to reflect the greater importance in evaluating the candidate sites. Four factors were assigned as primary factors with intermediate weight. The remaining nine factors were considered secondary factors with a lower weight. The details of each evaluation factor in this category are discussed in this section.

**Key Factors**
The nine key factors of community and environment category are described as follows:

**Endangered Species Act Compliance (terrestrial) – Conveyance (Key Factor ENVR – 1)**
This factor was evaluated with the question, “Would construction of the portal disrupt or cross habitat areas that support terrestrial wildlife species listed as threatened / endangered / candidate / or state species of concern?”

The presence of special status species or their habitat on a candidate site was seen as a potential constraint as it may lead to impacts on sensitive environmental resources. The presence of special status species or their habitat could also result in significant permitting and mitigation requirements for the project.

Federal, state and local regulations require avoidance of these resources as a top priority; therefore, it was considered one of the key factors for the candidate site evaluation process. The presence of special status species was determined from surveys published by fish and wildlife agencies. Project biologists who made field observations of each of the candidate sites from public rights-of-way identified habitat for special status species. Based on this information, each candidate site was given a qualitative high, low, or no answer regarding the potential for temporary or permanent impacts to special status species or their habitat. The factor was evaluated using the following scale:

**High:** Documented presence of special status species or their suitable habitat on the site or up to 0.25 mile from the site.

**Medium:** Documented presence of special status species or their suitable habitat between 0.25 mile and 0.5 mile from the site.

**Low:** Documented presence of special status species or their suitable habitat 0.5 mile or more from the site.

**No:** Lack of documented special status species or suitable habitat 1 mile or more from the site.
Endangered Species Act Compliance (aquatic) – Conveyance (Key Factor ENVR – 2)

This factor was evaluated with the question, “Would construction of the portal disrupt or cross habitat areas that support aquatic species listed as threatened/endangered/candidate/ or state species of concern?”

Various sensitive aquatic species (such as Puget Sound chinook salmon and bull trout) are legally protected in accordance with the Endangered Species Act and/or the Washington Administrative Code. The construction of candidate portal sites has potential to adversely affect fresh water habitat for sensitive aquatic species. This evaluation factor considered the proximity of construction and potential for impact to habitat that are documented as supporting or have high potential of supporting sensitive aquatic species. The factor was evaluated using the following scale:

High: It is likely that the construction at the portal site would generate impacts onsite to a stream/buffer or convey impacts downstream to habitats that support listed fish species.

Low: It is unlikely that the construction of the portal would generate impacts onsite to a stream/buffer or convey impacts downstream to habitats that support listed fish species.

No: The construction of the portal would not generate impacts onsite to a stream/buffer or convey impacts downstream to habitats that support listed fish species.

Wetlands (Key Factor ENVR - 3)

This factor was evaluated with the question, “Would construction of the portal affect wetlands or their buffers?”

Avoidance of wetlands (CORPS has concerns re: all wetlands) is a key consideration for federal, state, and local permitting agencies. The presence of wetlands is considered a substantial constraint to portal siting because of their resource value and extensive permitting, buffering, and mitigation requirements.

The scale for determining the presence of high-quality wetlands was based on review of available mapped wetland areas with limited site-specific evaluation. This key factor was evaluated based on the potential temporary or permanent impact to wetlands or their associated buffers within the candidate site.

High: The portal site construction would impact a Class 1 or 2 wetland or adjacent buffer.

Medium: The portal site construction would impact a Class 3 or 4 wetland.

Low: The portal would impact a Class 3 or 4 wetland buffer.

No: The portal would not impact a buffer or have an impact on wetlands or buffers.
Stream Impacts (Key Factor ENVR - 4)

This factor was evaluated with the question, “Would the construction of portals disrupt streams or their buffers?”

The question evaluated the potential to affect natural surface waters or their buffers. Direct impacts to surface water could reduce existing and long-term fish and/or wildlife habitat. Activities at the candidate site can substantially impact adjacent streams and, therefore, it is considered one of the key factors in the portal site selection process.

The evaluation was based on the potential of temporary or permanent impacts to streams, lakes, Puget Sound, and/or associated buffers or shoreline zones. Temporary or permanent impacts could include loss of vegetation, discharge or dewatering water, lower water levels due to nearby dewatering, land erosion, site erosion, and transport of sediment to surface water, etc. The following scale was used to evaluate this factor:

- **High**: It is likely that the construction at the portal site would impact a stream or its buffer.
- **Low**: It is unlikely that the construction of the portal would impact a stream or its buffer.
- **No**: The construction of the portal would not impact a stream or its buffer.

Natural Environment (Key Factor ENVR - 5)

This factor was evaluated with the question, “Would the construction of portals permanently affect wetlands, streams, and/or their buffers, high quality upland habitat, or habitat for special status species?”

This factor is important because it evaluates the cumulative impact to regulated sensitive habitats including wetlands, streams, buffers, and habitat that supports sensitive species. The evaluation is based on a quantitative estimate of area of permanent effects on regulated resources and their buffers or high quality upland habitat. The factor was evaluated using the following scale:

- **High**: Greater that 0.2-acre impact.
- **Medium**: Between 0.1 and 0.2-acre impact.
- **Low**: Less than 0.1-acre impact.
- **No**: No permanent impact.

Traffic Disruption – Truck Haul Routes (Key Factor ENVR - 6)

This factor was evaluated with the question, “To what extent would the truck haul routes utilize residential streets?”

Traffic disruption is a frequently stated concern of residents. The question was aimed at assessing the potential impacts on local traffic during construction at the candidate site. The following scale was used for determining traffic disruption:
High: Uses significant amount of residential streets.

Medium: Uses arterials with only minor use of residential streets.

Low: No residential streets utilized.

Noise (Key Factor ENVR - 7)
This factor was evaluated with the question, “How discernible would construction noise be in the vicinity of the portal site?”

Noise due to construction could be a disruption to neighboring properties. The same noise emitted from a parcel where existing background noise is already significant would likely be less noticeable/disturbing than the same noise propagated from a parcel with low existing background noise. The factor was evaluated using the following scale:

High: Low existing ambient noise.

Medium: Moderate existing ambient noise.

Low: High existing ambient noise.

Land Use (Key Factor ENVR - 8)
This factor was evaluated with the question, “Would there be potential for public shared uses of the portal site after construction?”

Shared use can be a benefit to the community, especially in situations where existing public land or the potential for shared public use is limited. The factor was evaluated using the following scale:

Scale: Yes or No?

Dewatering (Key Factor ENVR - 9)
This factor was evaluated with the question, “Would dewatering discharge at the portal site result in impacts to water bodies (e.g., wetlands, streams, lakes)?”

Discharging to the natural water bodies adjacent to the portal site is one of the potential options for disposing dewatered groundwater generated during construction activities at the portal sites. Discharge may impact the nearby water bodies if it is classified as sensitive to high flow rate or discharge quality. The factor was evaluated using the following scale:

Scale: Qualitative Assessment: High, Medium, or Low

Primary Factors
Archeological and Cultural Resources (Primary Factor ENVR-1)
This factor was evaluated with the question, “Are archeological/cultural resources likely to be present at portal site?”

This question addressed the likelihood of documented or known archeological or historical resources to be present within the candidate site. It is preferable to avoid the presence of
archeological or historical resources on the site because of their inherent value. Significant construction delays could occur if cultural resources are disturbed.

The qualitative scale based on review of available information and discussions with tribal or other cultural/historic experts was as follows:

- **Scale**: Archeological/cultural resources present at proposed portal site.
- **High**: Archeological/cultural resources likely.
- **Medium**: Archeological/cultural resources possible.
- **Low**: Archeological/cultural resources unlikely.

**High-Quality Upland Habitat (Primary Factor ENVR – 2)**

This factor was evaluated with the question, “Would construction of the portal affect high-quality upland habitat?”

High-quality upland habitat is defined as mature forest in natural condition. The presence of high-quality upland habitat on a candidate site was seen as a potential constraint as it may lead to impacts on sensitive environmental resources.

The question was developed to determine whether any high-quality upland habitat would be affected by the construction of the portal. Assessment was performed using the following scale:

- **Yes**: Construction of the portal is likely to displace high-quality upland habitat areas.
- **No**: Construction of the portal would not displace high-quality upland habitat areas.

**Traffic Disruption - Duration Period (Primary Factor ENVR-3)**

This factor was evaluated with the question, “What would be the duration of disruption due to construction at the portal?”

The question was aimed at assessing the potential impacts on local traffic during construction at the candidate site. Traffic disruption is a frequently-stated concern of residents. The factor was evaluated using the following scale:

- **High**: Construction of portal would require long-term (construction period) detours or blocked local access.
- **Medium**: Construction of portal would result in short-term (a few days) detours or blocked access.
- **Low**: Construction of portal would not require detours or blocked access.

**Bicycle/Pedestrian (Primary Factor ENVR-4)**

This factor was evaluated with the question, “Is there regular bicycle or pedestrian traffic near this site because of an established trail or commute route?”
The presence of pedestrian and/or bicycle traffic can have overall safety implications as well as the potential for impacts to individual recreation and transportation needs. The factor was evaluated using the following scale:

- **High**: Frequent bicycle and pedestrian traffic.
- **Medium**: Low or infrequent levels of bicycle and pedestrian traffic, or easily detoured or redirected.
- **Low**: No elevated levels of bicycle/pedestrian traffic.

**Secondary Factors**

**Visual Resources – Construction (Secondary Factor ENVR-1)**

This factor was evaluated with the question, “Would construction on the portal site cause visual impacts?”

Construction equipment and activities can be perceived by some to be scars on the landscape. The factor was evaluated using the following scale:

- **High**: Site in highly visible location; minimal opportunities for screening or visual enhancement.
- **Medium**: Site in highly visible location; opportunities available for screening or visual enhancement.
- **No**: Site not located in highly visible location.

**Visual Resources – Permanent Facilities (Secondary Factor ENVR-2)**

This factor was evaluated with the question, “Would permanent facilities at the portal site cause visual impacts?”

Man-made structures can be perceived by some to be scars on the landscape. The factor was evaluated using the following scale:

- **High**: Site in highly visible location; minimal opportunities for screening or visual enhancement.
- **Medium**: Site in highly visible location; opportunities available for screening or visual enhancement.
- **Low**: Site not located in highly visible location.

**Visual Resources – Night Light Glare (Secondary Factor ENVR-3)**

This factor was evaluated with the question, “Would construction be in line-of-sight (night light glare)?”

Light pollution can be perceived by some observers as a nuisance. The factor was evaluated using the following scale:

- **Scale**: Qualitative scale based on neighboring facilities.
**High**: Residence in line-of-sight.

**Medium**: Business (day use only) in line-of-sight.

**Low**: Nothing in line-of-sight.

**Air Quality (Secondary Factor ENVR-4)**

This factor was evaluated with the question, “Would construction at the portal impact the air quality of receptors?”

Construction activities have the potential to result in air pollution in the form of dust or construction vehicle emissions. The degree of impact was assumed to be directly proportional to the distance of receptors from the site. The factor was evaluated using the following scale:

**High**: Receptors immediately adjacent to portal site, impacts possible.

**Medium**: Receptors more than 500 feet from portal site, impacts not likely.

**Low**: No receptors in immediate vicinity of portal site, no impacts anticipated.

**Air Quality (Secondary Factor ENVR-5)**

This factor was evaluated with the question, “Would operation of the facilities at the portal impact the air quality of receptors?”

The potential for air quality impacts to neighboring properties during operation would depend on the permanent facilities to be located at the portal site. Regardless, the degree of impact was assumed to be directly proportional to the distance of receptors from the site. The factor was evaluated using the following scale:

**High**: Receptors immediately adjacent to portal site, impacts possible.

**Medium**: Receptors more than 500 feet from portal site, impacts not likely.

**Low**: No receptors in immediate vicinity of portal site, no impacts anticipated.

**Landmarks (Secondary Factor ENVR-6)**

This factor was evaluated with the question, “Would any officially-designated local landmark (building, object, or structure) be impacted by construction or the completed portal?”

The factor was evaluated using the following scale:

**High**: A local officially-designated landmark would be permanently impacted during construction or by the completed project.

**Medium**: A local officially-designated landmark would be temporarily impacted during construction - there would be no impact by the completed portal.

**Low/No**: There would be no impacts either by construction or the completed portal.
Land Use (Secondary Factor ENVR-7)

This factor was evaluated with the question, “Would the use of the site after construction be the same as the existing use?”

This factor simply answered the question of whether or not the land use would change as a result of the proposed facilities. The factor was evaluated using the following scale:

Scale: Yes or No?

Dewatering (Secondary Factor ENVR-8)

This factor was evaluated with the question, “Is there a receiving water (e.g., wetland, stream, lake) in sufficient proximity to the portal site to receive dewatering water, if the dewatering water cannot all be discharged to a storm or sanitary sewer?”

Direct discharge to the surface water bodies adjacent to the candidate site is another alternative to disposal of dewatered groundwater. This question addressed the availability of natural surface water bodies adjacent to the candidate site. The factor was evaluated using the following scale:

Scale: Yes or No?

Contamination (Secondary Factor ENVR-9)

This factor was evaluated with the question, “What would be the potential for encountering contaminated soils and/or groundwater?”

The presence of contamination on the portal site could complicate the construction of the proposed facilities and have the potential to significantly increase the costs of construction. The factor was evaluated using the following scale:

High: The site has historical or current uses that could contribute to soil/groundwater contamination.

Medium: Parcels in the vicinity of the land have historical or current uses that could contribute to soil/groundwater contamination of the subject property.

Low: Known/documentd contamination not on or immediately adjacent to portal site.

Permitting

The Permitting category was comprised of two factors, both of which were considered to be secondary in terms of importance.

Secondary Factors

Land Use (Secondary Factor PER-1)

This factor was evaluated with the question: “Would the project facilities on the portal site be allowed under the existing development regulations?”

Compatibility with existing development regulations can be an indicator of the complexity of the permitting process, and can thus potentially affect both schedule and cost. The factor was evaluated using the following scale:
Scale: Yes or No?

**Land Use (Secondary Factor PER-2)**

This factor was evaluated with the question: “Would construction or operation require a shoreline permit?”

The need for a shoreline permit would add an additional permitting requirement. The factor was evaluated using the following scale:

Scale: Yes or No?

**Land Acquisition and Jurisdictional Factors**

The Land Acquisition and Jurisdictional category is comprised of ten evaluation factors that focused on issues related to land acquisition. Three factors were Key factors and were assigned higher weights to reflect the greater importance in evaluating the candidate sites. Four factors were assigned as Primary factors with intermediate weight. The remaining three factors were Secondary factors with the lowest weight. The details of each evaluation factor within the Land Acquisition and Jurisdictional category are discussed in this sub-section.

**Key Factors**

**Legal Restrictions on Title (Key Factor LAND-1)**

This factor was evaluated with the question: “Are there existing legal restrictions to title in the portal acquisition site which would prevent or limit planned construction?”

It is important that any legal restriction on title be identified and addressed in the evaluation process since it can pose significant delay in the acquisition of the sites. The question was asked to assess any restriction on title that would affect construction and operation at the candidate sites. The factor was evaluated using the following scale:

- **High:** Title restrictions severely limit available useable land area and are difficult or impossible to remove.
- **Medium:** Some title restrictions exist but can be removed with some effort or project can be adapted to accommodate.
- **Low:** Title restrictions do not limit available useable land.

**Required Surface Easements (Key Factor LAND-2)**

This factor was evaluated with the question, “What is the estimate of private subsurface property interests (not in public right-of-way) that must be acquired to join subject portal site to the proposed conveyance corridor?”

Acquisition of surface easements can require an effort and have an effect on use similar to the acquisition of fee title. The analysis of this cost and complexity is important in a siting decision. The factor was evaluated using the following scale:

Scale: Quantitative number of easement properties.
Adjacent Subsurface Easements (Key Factor LAND-3)

This factor was evaluated with the question, “What is the estimate of private subsurface property interests (not in public right-of-way) that must be acquired to join subject portal site to the proposed conveyance corridor?”

Subsurface easements near portal sites are expected to have a smaller effect on use of property than the acquisition of surface easements or fee title; however, acquisition may take the same amount of time and complex issues may arise. An assessment of the cost and complexity is an important element of the siting decision. The factor was evaluated using the following scale:

Scale: Quantitative number of easement properties.

Primary Factors

Relative Number of Acquisition Parcels (Primary Factor LAND-1)

This factor was evaluated with the question, “What is the estimated total number of private property acquisitions in the portal site?”

The evaluation question was designed to address the issues related to time and complexity associated with potential acquisition of property rights for candidate sites. Higher numbers of parcels may be considered a constraint. The evaluation was based on the number of parcels within the candidate site. The factor was evaluated using the following scale:

Scale: Quantitative number of easement properties.

Complexity of Relocations - Conveyance (Primary Factor LAND-2)

This factor was evaluated with the question, “How difficult and time-consuming will it be for occupants in the portal site areas to relocate?”

This is aimed at determining the degree of complexity for relocating the occupants in the candidate sites. Assessment was based on the type and intensity of land use at the candidate site. The factor was evaluated using the following scale:

High: Relocations include unique businesses with unique site requirements.

Medium: Relocations are likely to be complex and disruptive, but occupants appear to be reasonably able to relocate.

Low: Relative level of complexity in occupant relocations appears to be low.

Residential Construction Disruption - Permanent (Primary Factor LAND-3)

This factor was evaluated with the question, “What is the permanent construction disruption on residential property uses adjacent to portal site areas?”

The assessment of permanent construction disruption on residential property uses adjacent to portal site areas looks at the type and extent of projected permanent change due to the portal placement and is therefore an important factor in the siting process.
This question was developed to evaluate the impact of the construction at the candidate site to the adjacent residential land use. The factor was evaluated using the following scale:

*High*: Appear to have the highest levels of permanent residential disruption in potential portal areas.

*Medium*: Appear to have mid-level impacts of permanent residential disruption in potential portal areas.

*Low*: Appear to have the lowest levels of permanent residential disruption in potential portal areas.

**Commercial Construction Disruption - Permanent (Primary Factor LAND-4)**

This factor was evaluated with the question, “What is the permanent construction disruption on commercial property uses adjacent to portal site areas?”

The assessment of permanent construction disruption on commercial property uses adjacent to portal site areas looks at the type and extent of projected permanent change due to the portal placement and is therefore an important factor in the siting process. This question was developed to evaluate the impact of the construction at the candidate site to the adjacent residential land use. The factor was evaluated using the following scale:

*High*: Appear to have the highest levels of permanent commercial disruption in potential portal areas.

*Medium*: Appear to have mid-level impacts of permanent residential disruption in potential portal areas.

*Low*: Appear to have the lowest levels of permanent residential disruption in potential portal areas.

**Secondary Factors**

**Relative Level of Property Development (Secondary Factor LAND-1)**

This factor was evaluated with the question, “What is the relative level of development and known permitted development on the portal site?”

The factor was designed to assess the relative time, complexity and disruption associated with development density on the candidate site. It is assumed that higher development density would result in more complicated acquisitions and relocations and therefore would require more time and resources. The factor was evaluated using the following scale:

*High*: Highest existing structures.

*Middle*: Middle permitted and masterplans, level of development.

*Low*: Lowest – unimproved property or lowest level of improvements.

**Residential Construction Disruption - Temporary (Secondary Factor LAND-2)**

This factor was evaluated with the question, “What is the temporary construction disruption on residential property uses adjacent to portal site areas?”
Temporary construction disruption on residential property uses adjacent to portal site areas is a consequence that King County is seeking to minimize or buffer and is therefore an important factor to evaluate in the siting process. This question addressed one of the constraints imposed by the construction at the candidate site to the adjacent residential land use. The factor was evaluated using the following scale:

- **High**: Appear to have the highest levels of temporary residential disruption in potential portal areas.
- **Medium**: Appear to have mid-level impacts of temporary residential disruption in potential portal areas.
- **Low**: Appear to have the lowest levels of temporary residential disruption in potential portal areas.

**Commercial Construction Disruption - Temporary (Secondary Factor LAND-3)**

This factor was evaluated with the question, “What is the temporary construction disruption on commercial property uses adjacent to portal site areas?”

Temporary construction disruption on commercial property uses adjacent to portal site areas is a consequence that King County is seeking to minimize or buffer and is therefore an important factor to evaluate in the siting process. This question was designed to address the impacts of construction at the candidate site to the adjacent commercial land use. The factor was evaluated using the following scale:

- **High**: Appear to have the highest levels of temporary commercial disruption in potential portal areas.
- **Medium**: Appear to have mid-level impacts of temporary commercial disruption in potential portal areas.
- **Low**: Appear to have the lowest levels of temporary commercial disruption in potential portal areas.

**Financial Factors**

**Secondary Factors**

**Relative Cost of Site Acquisition and Relocation (Secondary Factor FIN-1)**

This factor was evaluated with the question, “What is the estimated total relative cost of private property acquisitions and relocations in the portal site area?”

Responsibility to the ratepayers and best practices in project management require that financial aspects including the relative price of land acquisitions and relocations be considered as an important factor in comparing the candidate sites. The factor was evaluated using the following scale:

- **High**: Highest cost.
- **Medium**: Moderate cost.
Low: Lowest cost.

**Mitigation Opportunities**
**Secondary Factors**

**Onsite Compensatory Natural Resource Mitigation Potential (Secondary Factor MIT-1)**

This factor was evaluated with the question, “What is the level of acreage that exists to provide onsite compensatory natural resource mitigation for impacts in the portal site area?”

Onsite compensatory natural resource mitigation for impacts was considered to help mitigate local impacts resulting from the construction. Area for buffers and natural resource restoration or improvement opportunities were considered. The factor was evaluated using the following scale:

- **High**: Relatively highest level of acreage exists to provide onsite natural resource mitigation for identified impacts.
- **Medium**: Relatively medium level of acreage exists to provide onsite natural resource mitigation for identified impacts.
- **Low**: Relatively low level of acreage exists to provide onsite natural resource mitigation for identified impacts.

**Summary of Level 3 Portal Screening Results**

The Level 3 portal screening included a review of engineering, environmental, community, finance, and land acquisition criteria and other data as well as input from local jurisdictions. Summary of the Portal 19 screening results is included in Appendix C. Based on the Level 3 screening process for proposed Portal 19, Site E19-C is the preferred location for proposed Portal 19.

For proposed Portal 19, Site E19-C is the preferred site because the proposed outfall alignments from the site would minimize or avoid potential disturbance to environmental resources, limit onshore and nearshore segment lengths, and provide favorable shoreline access. Additionally, Site E19-C is a large, relatively level area with flexibility for construction staging and minimum civil site work required. It also offers the shortest tunnel length. Site E19-C combines the outfall tunnel and portal area into one property and minimizes overall property needs.
Appendix A

Evaluation Factors used in Level 3 Screening Process for Portal 19
<table>
<thead>
<tr>
<th>#</th>
<th>Factor Code</th>
<th>Key Word</th>
<th>Description</th>
<th>Relative Weight</th>
<th>Criteria Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ENGINEERING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>KEY FACTOR ENG - 1</td>
<td>Construction Access</td>
<td>Determine the ease of access (type and distance) to the freeway from the site and availability of alternative access routes for construction</td>
<td>3</td>
<td>0.66%</td>
</tr>
<tr>
<td>2</td>
<td>KEY FACTOR ENG - 2</td>
<td>Vehicle Access Improvement</td>
<td>Determine the relative improvements needed to provide access to the site</td>
<td>3</td>
<td>0.66%</td>
</tr>
<tr>
<td>3</td>
<td>PRIMARY FACTOR ENG-1</td>
<td>Alternative Transport</td>
<td>Assess the potential for alternative means of transport to the site other than vehicular for construction</td>
<td>2</td>
<td>0.44%</td>
</tr>
<tr>
<td>4</td>
<td>SECONDARY FACTOR ENG-1</td>
<td>Maintenance Access</td>
<td>Assess the degree of ease of access to the facility for maintenance</td>
<td>1</td>
<td>0.22%</td>
</tr>
<tr>
<td>5</td>
<td>KEY FACTOR ENG - 3</td>
<td>Existing System Connections</td>
<td>Assess the degree of difficulty for connecting the existing conveyance system to the influent tunnel at the site</td>
<td>3</td>
<td>0.66%</td>
</tr>
<tr>
<td>6A</td>
<td>PRIMARY FACTOR ENG-2</td>
<td>Connecting Structures</td>
<td>Estimate the number of connecting structures (drop, diversion) required to divert flows to the influent tunnel</td>
<td>2</td>
<td>0.44%</td>
</tr>
<tr>
<td>6B</td>
<td>KEY FACTOR ENG-5</td>
<td>Connecting Pipeline</td>
<td>Estimation of the length of connection pipeline required to divert flows to the influent tunnel</td>
<td>3</td>
<td>0.66%</td>
</tr>
<tr>
<td>7</td>
<td>KEY FACTOR ENG - 4</td>
<td>Tunnel Depth</td>
<td>Determines the relative depth of the tunnel need to be based on site selection relative to another candidate site within the portal selection area</td>
<td>3</td>
<td>0.66%</td>
</tr>
<tr>
<td>8</td>
<td>KEY FACTOR ENG-6</td>
<td>Tunneling Distance</td>
<td>Likelihood of the site to lie in the preferred path of the tunnel alignment</td>
<td>3</td>
<td>0.66%</td>
</tr>
<tr>
<td>9</td>
<td>PRIMARY FACTOR ENG-3</td>
<td>Tunneling - Staging Flexibility</td>
<td>Determine whether the size and shape of the site allow flexibility for various tunneling activities (launching portal, retrieval portal)</td>
<td>2</td>
<td>0.44%</td>
</tr>
<tr>
<td>10</td>
<td>PRIMARY FACTOR ENG-4</td>
<td>Tunneling - Settlement</td>
<td>Assess the sensitivity of the surrounding site to settlement</td>
<td>2</td>
<td>0.44%</td>
</tr>
<tr>
<td>11</td>
<td>PRIMARY FACTOR ENG-5</td>
<td>Use of Existing Structures</td>
<td>Determine the extent to which the existing structures on the site can be used for construction</td>
<td>2</td>
<td>0.44%</td>
</tr>
<tr>
<td>12</td>
<td>PRIMARY FACTOR ENG-6</td>
<td>Use of Existing King County Facilities</td>
<td>Determine the feasibility of using the existing King County facilities</td>
<td>2</td>
<td>0.44%</td>
</tr>
<tr>
<td>13</td>
<td>SECONDARY FACTOR ENG-2</td>
<td>Flooding</td>
<td>Determine whether the site is located in an area with a known flooding problem</td>
<td>1</td>
<td>0.22%</td>
</tr>
<tr>
<td>14</td>
<td>SECONDARY FACTOR ENG-3</td>
<td>Geohazard</td>
<td>Determine the degree of geohazard potential (landslide, soil liquefaction) on the site</td>
<td>1</td>
<td>0.22%</td>
</tr>
<tr>
<td>15</td>
<td>PRIMARY FACTOR ENG-7</td>
<td>Civil Site Work</td>
<td>Determine the degree of site alteration required to accommodate the construction</td>
<td>2</td>
<td>0.44%</td>
</tr>
<tr>
<td>16</td>
<td>KEY FACTOR ENG - 7</td>
<td>Power</td>
<td>Identify whether the local utility has adequate power service available onsite</td>
<td>3</td>
<td>0.66%</td>
</tr>
<tr>
<td>17</td>
<td>SECONDARY FACTOR ENG-4</td>
<td>Utilities</td>
<td>Identify the availability of the utilities (sewer, telephone, water) at the sites</td>
<td>1</td>
<td>0.22%</td>
</tr>
<tr>
<td>18</td>
<td>KEY FACTOR ENG-8</td>
<td>Site Ground/Surface Water Pretreatment and Disposal</td>
<td>Determine the degree of pretreatment and pipeline construction required to dispose dewatered groundwater at the portal site during construction activities</td>
<td>3</td>
<td>0.66%</td>
</tr>
<tr>
<td></td>
<td>OUTFALL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>KEY FACTOR OUT-1</td>
<td>Onshore Construction</td>
<td>Determine the relative complexity of construction from the portal location to the waterline along the proposed outfall alignment</td>
<td>3</td>
<td>7.50%</td>
</tr>
<tr>
<td>20</td>
<td>PRIMARY FACTOR OUT-1</td>
<td>Nearshore Construction</td>
<td>Estimate the pipeline segment length from the shoreline to a water depth of -80 feet MLLW along the proposed outfall alignment</td>
<td>2</td>
<td>5.00%</td>
</tr>
<tr>
<td>21</td>
<td>KEY FACTOR OUT-2</td>
<td>Construction Method Flexibility</td>
<td>Determine whether the portal site location and its proposed alignment limit the flexibility to utilize multiple construction methods</td>
<td>3</td>
<td>7.50%</td>
</tr>
<tr>
<td>22</td>
<td>SECONDARY FACTOR OUT-1</td>
<td>Forage Fish Habitat Disturbance - Tunnel Construction</td>
<td>Determine the extent to which the tunnel alignment from this portal location disturbs forage fish spawning habitat</td>
<td>1</td>
<td>2.50%</td>
</tr>
<tr>
<td>#</td>
<td>Factor Code</td>
<td>Key Word</td>
<td>Description</td>
<td>Relative Weight</td>
<td>Criteria Weight</td>
</tr>
<tr>
<td>----</td>
<td>----------------</td>
<td>--------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>23</td>
<td>SECONDARY FACTOR OUT-2</td>
<td>Forage Fish Habitat Disturbance - Trench Construction</td>
<td>Determine the extent to which a trench alignment from this portal location disturbs forage fish spawning habitat</td>
<td>1</td>
<td>2.50%</td>
</tr>
<tr>
<td>24</td>
<td>KEY FACTOR OUT-3</td>
<td>Eelgrass Habitat Disturbance - Tunnel Construction</td>
<td>Determine the extent to which a tunnel alignment from this portal location disturbs eelgrass habitat</td>
<td>3</td>
<td>7.50%</td>
</tr>
<tr>
<td>25</td>
<td>KEY FACTOR OUT-4</td>
<td>Eelgrass Habitat Disturbance - Trench Construction</td>
<td>Determine the extent to which a trench alignment from this portal location disturbs eelgrass habitat</td>
<td>3</td>
<td>7.50%</td>
</tr>
<tr>
<td>26</td>
<td>PRIMARY FACTOR OUT-2</td>
<td>Tribal Fisheries</td>
<td>Determine whether the tribal fisheries are present along proposed outfall alignment from this portal location</td>
<td>2</td>
<td>5.00%</td>
</tr>
<tr>
<td>27</td>
<td>PRIMARY FACTOR OUT-3</td>
<td>Tribal Spot Prawn Areas</td>
<td>Determine whether tribal spot prawn fisheries are present along proposed outfall alignment from this portal location</td>
<td>2</td>
<td>5.00%</td>
</tr>
<tr>
<td>28</td>
<td>PRIMARY FACTOR ENVR-1</td>
<td>Archeological and Cultural Resources</td>
<td>Likely presence of archeological /cultural resources at portal site</td>
<td>2</td>
<td>1.35%</td>
</tr>
<tr>
<td>29</td>
<td>KEY FACTOR ENVR-1</td>
<td>Endangered Species Act Compliance (terrestrial) - Conveyance</td>
<td>Likelihood of disruption to the habitat areas that support terrestrial wildlife species listed as threatened/endangered/candidate/ or state species of concern</td>
<td>3</td>
<td>2.03%</td>
</tr>
<tr>
<td>30</td>
<td>KEY FACTOR ENVR-2</td>
<td>Endangered Species Act Compliance (aquatic) – Conveyance</td>
<td>Likelihood of disruption to habitat areas that support aquatic species listed as threatened/endangered/candidate/ or state species of concern</td>
<td>3</td>
<td>2.03%</td>
</tr>
<tr>
<td>31</td>
<td>PRIMARY FACTOR ENVR-2</td>
<td>High Quality Upland Habitat</td>
<td>Determine the impacts to the high-quality upland habitat</td>
<td>2</td>
<td>1.35%</td>
</tr>
<tr>
<td>32</td>
<td>KEY FACTOR ENVR-3</td>
<td>Wetlands</td>
<td>Determine the impacts to the wetlands or their buffers</td>
<td>3</td>
<td>2.03%</td>
</tr>
<tr>
<td>33</td>
<td>KEY FACTOR ENVR-4</td>
<td>Stream Impacts</td>
<td>Determine impacts to the streams or their buffers</td>
<td>3</td>
<td>2.03%</td>
</tr>
<tr>
<td>34</td>
<td>KEY FACTOR ENVR-5</td>
<td>Natural Environment</td>
<td>Determine whether the construction of portals would permanently affect wetlands, streams, and/or their buffers, high-quality upland habitat, or habitat for special status species</td>
<td>3</td>
<td>2.03%</td>
</tr>
<tr>
<td>35</td>
<td>KEY FACTOR ENVR-6</td>
<td>Traffic Disruption - Truck Haul Routes</td>
<td>Determine the extent to which the truck haul routes utilize residential streets</td>
<td>3</td>
<td>2.03%</td>
</tr>
<tr>
<td>36</td>
<td>PRIMARY FACTOR ENVR-3</td>
<td>Traffic Disruption - Duration Period</td>
<td>Determine the duration of disruption due to construction at the portal</td>
<td>2</td>
<td>1.35%</td>
</tr>
<tr>
<td>37</td>
<td>PRIMARY FACTOR ENVR-4</td>
<td>Bicycle/Pedestrian</td>
<td>Identify whether there is any regular bicycle or pedestrian traffic near this site because of an established trail or commute route</td>
<td>2</td>
<td>1.35%</td>
</tr>
<tr>
<td>38</td>
<td>SECONDARY FACTOR ENVR-1</td>
<td>Visual Resources - Construction</td>
<td>Determine whether construction on the portal site would cause visual impacts</td>
<td>1</td>
<td>0.68%</td>
</tr>
<tr>
<td>39</td>
<td>SECONDARY FACTOR ENVR-2</td>
<td>Visual Resources - Permanent Facilities</td>
<td>Determine whether permanent facilities at the portal site would cause visual impacts</td>
<td>1</td>
<td>0.68%</td>
</tr>
<tr>
<td>40</td>
<td>SECONDARY FACTOR ENVR-3</td>
<td>Visual Resources - Night Light Glare</td>
<td>Determine whether construction would be in line-of-sight (night light glare)</td>
<td>1</td>
<td>0.68%</td>
</tr>
<tr>
<td>41</td>
<td>SECONDARY FACTOR ENVR-4</td>
<td>Air Quality - Construction</td>
<td>Determine whether construction at the portal would impact the air quality of receptors</td>
<td>1</td>
<td>0.68%</td>
</tr>
<tr>
<td>42</td>
<td>SECONDARY FACTOR ENVR-5</td>
<td>Air Quality - Operation of facilities</td>
<td>Determine whether operation of the facilities at the portal would impact the air quality of receptors</td>
<td>1</td>
<td>0.68%</td>
</tr>
<tr>
<td>43</td>
<td>KEY FACTOR ENVR-7</td>
<td>Noise</td>
<td>Determine the extent to which construction noise would be discernible in the vicinity of the portal site</td>
<td>3</td>
<td>2.03%</td>
</tr>
<tr>
<td>44</td>
<td>SECONDARY FACTOR ENVR-6</td>
<td>Landmarks</td>
<td>Determine whether any officially designated local landmark (building, object, or structure) would be impacted by construction or the completed portal</td>
<td>1</td>
<td>0.68%</td>
</tr>
<tr>
<td>45</td>
<td>KEY FACTOR ENVR-8</td>
<td>Land Use</td>
<td>Determine whether there would be potential for public shared uses of the portal site after construction</td>
<td>3</td>
<td>2.03%</td>
</tr>
<tr>
<td>46</td>
<td>SECONDARY FACTOR ENVR-7</td>
<td>Land Use</td>
<td>Determine whether the use of the site after construction would be the same as the existing use</td>
<td>1</td>
<td>0.68%</td>
</tr>
<tr>
<td>47</td>
<td>KEY FACTOR ENVR-9</td>
<td>Dewatering</td>
<td>Determine whether dewatering discharge at the portal site would result in impacts to water bodies (e.g., wetlands, streams, lakes)</td>
<td>3</td>
<td>2.03%</td>
</tr>
<tr>
<td>#</td>
<td>Factor Code</td>
<td>Key Word</td>
<td>Description</td>
<td>Relative Weight</td>
<td>Criteria Weight</td>
</tr>
<tr>
<td>----</td>
<td>--------------------------</td>
<td>-------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>48</td>
<td>SECONDARY FACTOR ENVR-8</td>
<td>Dewatering</td>
<td>Identify whether there is a receiving water (e.g., wetland, stream, lake) in sufficient proximity to the portal site to receive dewatering water, if the dewatering water cannot all be discharged to a storm or sanitary sewer</td>
<td>1</td>
<td>0.68%</td>
</tr>
<tr>
<td>49</td>
<td>SECONDARY FACTOR ENVR-9</td>
<td>Contamination</td>
<td>Determine the likelihood of encountering contaminated soils and/or groundwater</td>
<td>1</td>
<td>0.68%</td>
</tr>
<tr>
<td></td>
<td><strong>PERMITTING</strong></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>0.40%</strong></td>
</tr>
<tr>
<td>50</td>
<td>SECONDARY FACTOR PER-1</td>
<td>Land Use</td>
<td>Determine whether the project facilities on the portal site would be allowed under the existing development regulations</td>
<td>1</td>
<td>0.20%</td>
</tr>
<tr>
<td>51</td>
<td>SECONDARY FACTOR PER-2</td>
<td>Land Use</td>
<td>Determine whether construction or operation would require a shoreline permit</td>
<td>1</td>
<td>0.20%</td>
</tr>
<tr>
<td></td>
<td><strong>LAND ACQUISITION &amp; JURISDICTION</strong></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>9.8%</strong></td>
</tr>
<tr>
<td>52</td>
<td>PRIMARY FACTOR LAND-1</td>
<td>Relative Number of Acquisition Parcels</td>
<td>Estimate the total number of private property acquisitions in the portal site</td>
<td>2</td>
<td>0.98%</td>
</tr>
<tr>
<td>53</td>
<td>SECONDARY FACTOR LAND-1</td>
<td>Relative Level of Property Development</td>
<td>Determine the relative level of development and known permitted development on the portal site</td>
<td>1</td>
<td>0.49%</td>
</tr>
<tr>
<td>54</td>
<td>KEY FACTOR LAND-1</td>
<td>Legal Restrictions on Title</td>
<td>Identify whether there are any existing legal restrictions to title in the portal acquisition site which would prevent or limit planned construction</td>
<td>3</td>
<td>1.46%</td>
</tr>
<tr>
<td>55</td>
<td>PRIMARY FACTOR LAND-2</td>
<td>Complexity of Relocations - Conveyance</td>
<td>Determine the extent to which it would be difficult and time-consuming for occupants in the portal site areas to relocate</td>
<td>2</td>
<td>0.98%</td>
</tr>
<tr>
<td>56</td>
<td>SECONDARY FACTOR LAND-2</td>
<td>Residential Construction Disruption - Temporary</td>
<td>Determine the relative magnitude of temporary construction disruption on residential property uses adjacent to portal site areas</td>
<td>1</td>
<td>0.49%</td>
</tr>
<tr>
<td>57</td>
<td>PRIMARY FACTOR LAND-3</td>
<td>Residential Construction Disruption - Permanent</td>
<td>Determine the relative magnitude of permanent construction disruption on residential property uses adjacent to portal site areas</td>
<td>2</td>
<td>0.98%</td>
</tr>
<tr>
<td>58</td>
<td>SECONDARY FACTOR LAND-3</td>
<td>Commercial Construction Disruption - Temporary</td>
<td>Determine the relative magnitude of temporary construction disruption on commercial property uses adjacent to portal site areas</td>
<td>1</td>
<td>0.49%</td>
</tr>
<tr>
<td>59</td>
<td>PRIMARY FACTOR LAND-4</td>
<td>Commercial Construction Disruption - Permanent</td>
<td>Determine the relative magnitude of permanent construction disruption on commercial property uses adjacent to portal site areas</td>
<td>2</td>
<td>0.98%</td>
</tr>
<tr>
<td>60</td>
<td>KEY FACTOR LAND-2</td>
<td>Required Surface Easements</td>
<td>Estimate the number of private surface property interests (not in public right-of-way) that must be acquired to improve proposed transportation connections to specific portal site</td>
<td>3</td>
<td>1.46%</td>
</tr>
<tr>
<td>61</td>
<td>KEY FACTOR LAND-3</td>
<td>Adjacent Subsurface Easements</td>
<td>Estimate the number of private subsurface property interests (not in public right-of-way) that must be acquired to join subject portal site to the proposed conveyance corridor</td>
<td>3</td>
<td>1.46%</td>
</tr>
<tr>
<td></td>
<td><strong>FINANCIAL</strong></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>0.20%</strong></td>
</tr>
<tr>
<td>62</td>
<td>SECONDARY FACTOR FIN-1</td>
<td>Relative Cost of Site Acquisition and Relocation</td>
<td>Estimated total relative cost of private property acquisitions and relocations in the portal site area</td>
<td>2</td>
<td>0.20%</td>
</tr>
<tr>
<td></td>
<td><strong>MITIGATION OPPORTUNITIES</strong></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>0.20%</strong></td>
</tr>
<tr>
<td>63</td>
<td>SECONDARY FACTOR MIT-1</td>
<td>Onsite Compensatory Natural Resource Mitigation Potential</td>
<td>Estimate the relative amount of land available outside of the facility footprint for onsite mitigation such as creation, restoration, and/or enhancement of uplands, wetlands, stream, and/or buffers</td>
<td>3</td>
<td>0.20%</td>
</tr>
</tbody>
</table>
Appendix B

Level 3 Screening Matrix for Portal 19
Notice:
King County has prepared a Draft Environmental Impact Statement (Draft EIS) on the Brightwater Regional Wastewater Treatment System. A Final Environmental Impact Statement (Final EIS) is scheduled for later in 2003. The Draft EIS and Final EIS are intended to provide decision-makers, regulatory agencies and the public with information regarding the probable significant adverse impacts of the Brightwater proposal and identify alternative, reasonable mitigation measures.

In consultation with Snohomish County and the cities within it, King County has applied adoption criteria to further define the general Brightwater Proposal called for in the Regional Wastewater Services Plan (RWSGP). These criteria have been applied to potential sites for Brightwater facilities in Phase I and of the siting process. Based upon this policy consideration, the County has reduced its proposal and identified in the Draft EIS several alternative Brightwater systems, which could accomplish the County’s overall Brightwater objective.

This delineated alternative is for public information only, and is not intended in any way to prejudge the County’s final decision, which will be made following the preparation of additional analyses, consideration of public input and comments on the Draft EIS and issuance of the Final EIS.

After issuance of the Final EIS, the King County Executive will select final locations for a treatment plant, marine outfall and associated conveyances.

In the interim, and in order to meet the requirement that the Brightwater project be operational in the year 2010, King County is proceeding with preliminary plans and designs and other work necessary to further refine the proposal and develop permit applications for the proposal.

This ongoing preliminary work will not limit the choice of reasonable alternatives to be selected at the end of the EIS process.

Note:
The information used to apply these screening criteria is only that available as of this point in time. The ratings set forth below on specific portal sites do not take into account the specific mitigation measures which would be ultimately developed to further review and eliminate a given impact. The portal site ratings below also do not take into account the extent to which the specific string of Brightwater facilities within the portal sites could also reduce or eliminate the impact.

### Brightwater Conveyance - Portal Site Screening Level 3 Evaluation Matrix - Portal 19

<table>
<thead>
<tr>
<th>#</th>
<th>Component</th>
<th>Code</th>
<th>Topic</th>
<th>Questions</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENG-1</td>
<td>Construction Access</td>
<td>High: Two lane and greater than 3 miles to freeway or through private property or residential neighborhood with narrow streets and one access route available. Medium: Two lane and less than 3 miles to freeway or four lane and greater than 3 miles to freeway and access from one direction only. Low: Four lane or larger, and less than 3 miles to freeway and more than one access route available and access from both directions.</td>
</tr>
<tr>
<td>2</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENG-2</td>
<td>Vehicle Access Improvement</td>
<td>Scale: Based on required access road improvements. High: New access road needs to be constructed. Medium: New access road needs to be constructed with lower construction cost or improvement on existing access route required. Low: existing access way is adequate with minor improvement.</td>
</tr>
<tr>
<td>3</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>PRIMARY FACTOR ENG-1</td>
<td>Alternative Transport</td>
<td>Scale: Based on number of alternative access routes required to site (alternatives include rail and/or barge). High: rail or barge. Medium: Either rail or barge. Low: both rail and barge.</td>
</tr>
<tr>
<td>4</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>SECONDARY FACTOR ENG-1</td>
<td>Maintenance Access</td>
<td>Scale: Based upon the relative difficulty of entering and exiting the portal site. High: Access through private property or residential neighborhood with narrow streets. Medium: Access from one direction only. Low: Access from both directions.</td>
</tr>
<tr>
<td>5</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENG-3</td>
<td>Existing System Connections</td>
<td>Scale: Based upon the relative difficulty of making existing piping connections to the influent tunnel at the site. High: Connections difficult and complex. Medium: Connections of average difficulty. Low: Connections less complex than typical.</td>
</tr>
<tr>
<td>6A</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>PRIMARY FACTOR ENG-2</td>
<td>Connecting Structures</td>
<td>Scale: Quantitative value based on number of structures required for connection to the influent tunnel.</td>
</tr>
<tr>
<td>6B</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENG-5</td>
<td>Connecting Pipelines</td>
<td>Scale: Quantitative value based on length of connection pipeline.</td>
</tr>
<tr>
<td>7</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENG-6</td>
<td>Tunnel Depth</td>
<td>Scale: Quantitative value based on tunnel depth.</td>
</tr>
<tr>
<td>8</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENG-6</td>
<td>Tunneling Distance</td>
<td>Scale: Quantitative value based on the length of the tunnel from the tunnel corridor to the portal site.</td>
</tr>
<tr>
<td>9</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>PRIMARY FACTOR ENG-3</td>
<td>Tunneling - Steepness Flexibility</td>
<td>Scale: Based upon type of land use adjacent to portal site. High: hillside. Medium: Low to moderate. Low: flat.</td>
</tr>
<tr>
<td>12</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>PRIMARY FACTOR ENG-6</td>
<td>Use of Existing King County Facilities</td>
<td>Scale: Based upon relative use of existing structure with reasonable potential for construction. High: None. Medium: Limited. Low: Significant.</td>
</tr>
<tr>
<td>14</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>SECONDARY FACTOR ENG-3</td>
<td>Geohazard</td>
<td>Scale: Based upon use of the site for landslide potential or soil liquefaction. High: More than 35% of the site has landslide potential and/or has moderate to deep soil liquefaction. Medium: Less than 30% of the site has landslide potential and/or has moderate to deep soil liquefaction. Low: None of the site has moderate to deep soil liquefaction.</td>
</tr>
</tbody>
</table>
### Brightwater Conveyance: Portal Site Screening Level 3 Evaluation Matrix - Portal 19

<table>
<thead>
<tr>
<th>#</th>
<th>Component</th>
<th>Screening</th>
<th>Round</th>
<th>Code</th>
<th>Topic</th>
<th>Questions</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Portal Screening</td>
<td>PRIMARY FACTOR</td>
<td>ENG-7</td>
<td>FENS</td>
<td>Civil Site Work</td>
<td>To what degree is site alteration required to accommodate the construction?</td>
<td>Qualitative scale based on amount of site alteration required.</td>
</tr>
<tr>
<td>13</td>
<td>Portal Screening</td>
<td>KEY FACTOR</td>
<td>ENG-7</td>
<td>FENS</td>
<td>Power</td>
<td>Does the local utility have adequate power service available on site?</td>
<td>Qualitative scale based on the availability of required power for operations and construction.</td>
</tr>
<tr>
<td>14</td>
<td>Portal Screening</td>
<td>SECONDARY FACTOR</td>
<td>ENG-8</td>
<td>FENS</td>
<td>Utilities</td>
<td>Are there utilities available (sewer, telephone, water)?</td>
<td>Qualitative scale based on amount of site alteration required.</td>
</tr>
</tbody>
</table>

**Level 3 Portal Screening Criteria**

**Purpose:** To determine the site alteration required for a project to be feasible and to align the site to the project requirements.

**Scale:**
- High: Significant alteration, major earth works to remove fill and retaining wall construction required.
- Medium: Moderate earthworks required to create level construction area.
- Low: Little or no alteration required.

**Questions:**
- Site A
- Site C
- Site E

<table>
<thead>
<tr>
<th>#</th>
<th>Component</th>
<th>Screening</th>
<th>Round</th>
<th>Code</th>
<th>Topic</th>
<th>Questions</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Portal Screening</td>
<td>PRIMARY FACTOR</td>
<td>ENG-7</td>
<td>FENS</td>
<td>Civil Site Work</td>
<td>To what degree is site alteration required to accommodate the construction?</td>
<td>Qualitative scale based on amount of site alteration required.</td>
</tr>
<tr>
<td>16</td>
<td>Portal Screening</td>
<td>KEY FACTOR</td>
<td>ENG-7</td>
<td>FENS</td>
<td>Power</td>
<td>Does the local utility have adequate power service available on site?</td>
<td>Qualitative scale based on the availability of required power for operations and construction.</td>
</tr>
<tr>
<td>17</td>
<td>Portal Screening</td>
<td>SECONDARY FACTOR</td>
<td>ENG-8</td>
<td>FENS</td>
<td>Utilities</td>
<td>Are there utilities available (sewer, telephone, water)?</td>
<td>Qualitative scale based on amount of site alteration required.</td>
</tr>
</tbody>
</table>

**OUTFALL**

**Purpose:** To determine the site alteration required for a project to be feasible and to align the site to the project requirements.

**Scale:**
- High: Major pipeline construction would likely be required.
- Medium: Major pipeline construction would likely be required.
- Low: Major pipeline construction would likely be required.

**Questions:**
- Site A
- Site C
- Site E

<table>
<thead>
<tr>
<th>#</th>
<th>Component</th>
<th>Screening</th>
<th>Round</th>
<th>Code</th>
<th>Topic</th>
<th>Questions</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Portal Screening</td>
<td>PRIMARY FACTOR</td>
<td>OUT-1</td>
<td>FENS</td>
<td>Ozonehore Construction</td>
<td>What is the relative complexity of construction from the shoreline to the waterline along the proposed outfall alignment?</td>
<td>Qualitative scale based on the pipeline segment length, in feet, from the shoreline at MLLW to the -60 foot depth contour.</td>
</tr>
<tr>
<td>20</td>
<td>Portal Screening</td>
<td>PRIMARY FACTOR</td>
<td>OUT-1</td>
<td>FENS</td>
<td>Nearshore Construction</td>
<td>What is the pipeline segment length from the shoreline to a water depth of 40-60 feet at MLLW along the proposed outfall alignment?</td>
<td>Qualitative scale based on the pipeline segment length, in feet, from the shoreline at MLLW to the -60 foot depth contour.</td>
</tr>
<tr>
<td>21</td>
<td>Portal Screening</td>
<td>PRIMARY FACTOR</td>
<td>OUT-2</td>
<td>FENS</td>
<td>Construction Method Flexibility</td>
<td>Does the portal site location and site conditions limit the feasibility for alternative construction methods?</td>
<td>Qualitative scale based on the extent of limitations imposed on the use of construction methods by portal location and proposed alignment.</td>
</tr>
<tr>
<td>22</td>
<td>Portal Screening</td>
<td>PRIMARY FACTOR</td>
<td>OUT-2</td>
<td>FENS</td>
<td>Farshore Habitat Disturbance - Tunnel Construction</td>
<td>To what extent would a tunnel alignment from this portal location disturb farshore fish spawning habitat?</td>
<td>Qualitative scale based on the extent of potential disturbance to farshore fish spawning habitat.</td>
</tr>
<tr>
<td>23</td>
<td>Portal Screening</td>
<td>PRIMARY FACTOR</td>
<td>OUT-2</td>
<td>FENS</td>
<td>Farshore Habitat Disturbance - Trench Construction</td>
<td>To what extent would a trench alignment from this portal location disturb farshore fish spawning habitat?</td>
<td>Qualitative scale based on the extent of potential disturbance to farshore fish spawning habitat.</td>
</tr>
<tr>
<td>24</td>
<td>Portal Screening</td>
<td>PRIMARY FACTOR</td>
<td>OUT-3</td>
<td>FENS</td>
<td>Egdegrass Habitat Disturbance - Tunnel Construction</td>
<td>To what extent would a tunnel alignment from this portal location disturb edgegrass habitat?</td>
<td>Qualitative scale based on the extent of potential disturbance to edgegrass habitat.</td>
</tr>
<tr>
<td>25</td>
<td>Portal Screening</td>
<td>PRIMARY FACTOR</td>
<td>OUT-3</td>
<td>FENS</td>
<td>Egdegrass Habitat Disturbance - Trench Construction</td>
<td>To what extent would a trench alignment from this portal location disturb edgegrass habitat?</td>
<td>Qualitative scale based on the extent of potential disturbance to edgegrass habitat.</td>
</tr>
<tr>
<td>26</td>
<td>Portal Screening</td>
<td>PRIMARY FACTOR</td>
<td>OUT-3</td>
<td>FENS</td>
<td>Tribal Fisheries</td>
<td>Are tribal fisheries present along proposed outfall alignment from this portal location?</td>
<td>Qualitative scale based on the presence and proximity of tribal spotted eelgrass.</td>
</tr>
</tbody>
</table>

**COMMMUNITY-ENVIORNMENTAL**

**Purpose:** To determine the site alteration required for a project to be feasible and to align the site to the project requirements.

**Scale:**
- High: High potential to disturb known/suspected forage fish spawning habitat.
- Medium: Low potential to disturb known/suspected forage fish spawning habitat.
- Low: No known forage fish spawning habitat along alignment.

**Questions:**
- Site A
- Site C
- Site E

<table>
<thead>
<tr>
<th>#</th>
<th>Component</th>
<th>Screening</th>
<th>Round</th>
<th>Code</th>
<th>Topic</th>
<th>Questions</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>Portal Screening</td>
<td>PRIMARY FACTOR</td>
<td>ENVR-1</td>
<td>FENS</td>
<td>Archeological and Cultural Resources</td>
<td>Are archeological and cultural resources likely to be present at portal site?</td>
<td>Qualitative scale based on the presence of archeological and cultural resources.</td>
</tr>
<tr>
<td>29</td>
<td>Portal Screening</td>
<td>PRIMARY FACTOR</td>
<td>ENVR-1</td>
<td>FENS</td>
<td>Endangered Species Act Compliance (terrestrial) - Conveyance</td>
<td>Would construction of the portal disrupt or cross habitat areas that support terrestrial wildlife species listed as threatened/endangered/candidate or state species of concern?</td>
<td>Qualitative scale based on the presence and proximity of terrestrial wildlife species.</td>
</tr>
</tbody>
</table>

**Scale:**
- High: Documented presence of special status species or their suitable habitat on the site or up to 0.25 miles from the site.
- Medium: Documented presence of special status species or their suitable habitat between 0.25 mile and 0.5 mile from the site.
- Low: No documented special status species.

**Notes:**
- Medium (due to potential for contamination)
- Low

**Scale:**
- High: Known presence of special status species or their suitable habitat 0.5 miles or more from the site.
- Medium: Documented presence of special status species or their suitable habitat on the site or up to 0.25 miles from the site.
- Low: No documented special status species.

**Scale:**
- High: Known presence of special status species or their suitable habitat 0.5 miles or more from the site.
- Medium: Documented presence of special status species or their suitable habitat between 0.25 mile and 0.5 mile from the site.
- Low: No documented special status species.

**Scale:**
- High: Known presence of special status species or their suitable habitat 0.5 miles or more from the site.
- Medium: Documented presence of special status species or their suitable habitat between 0.25 mile and 0.5 mile from the site.
- Low: No documented special status species.

**Scale:**
- High: Known presence of special status species or their suitable habitat 0.5 miles or more from the site.
- Medium: Documented presence of special status species or their suitable habitat between 0.25 mile and 0.5 mile from the site.
- Low: No documented special status species.

**Scale:**
- High: Known presence of special status species or their suitable habitat 0.5 miles or more from the site.
- Medium: Documented presence of special status species or their suitable habitat between 0.25 mile and 0.5 mile from the site.
- Low: No documented special status species.

**Scale:**
- High: Known presence of special status species or their suitable habitat 0.5 miles or more from the site.
- Medium: Documented presence of special status species or their suitable habitat between 0.25 mile and 0.5 mile from the site.
- Low: No documented special status species.
<table>
<thead>
<tr>
<th>#</th>
<th>Component</th>
<th>Screening Round</th>
<th>Code</th>
<th>Topic</th>
<th>Questions</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENVR-2</td>
<td>Endangered Species Act Compliance</td>
<td>Would construction of the portal disrupt or cross habitat areas that support aquatic species listed as threatened/endangered/candidate or state species of concern?</td>
<td>High: It is likely that the construction of the portal site would generate impacts onsite to a stream buffer or convey impacts downstream to habitats that support listed fish species. Low: It is unlikely that the construction of the portal would generate impacts onsite to a stream buffer or convey impacts downstream to habitats that support listed fish species.</td>
</tr>
<tr>
<td>31</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>PRIMARY FACTOR ENVR-2</td>
<td>High Quality Upland Habitat</td>
<td>Would construction of the portal affect high-quality upland habitat?</td>
<td>High: It is likely that the construction of the portal is likely to displace high-quality upland habitat areas. Low: It is unlikely that the construction of the portal would displace high-quality upland habitat areas.</td>
</tr>
<tr>
<td>32</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENVR-2</td>
<td>Wetlands</td>
<td>Would the construction of the portal disrupt wetlands or their buffers?</td>
<td>High: The portal site construction would impact a Class 3 or 4 wetland on adjacent buffer. Medium: The portal site construction would impact a Class 3 or 4 wetland on non-adjacent buffer. Low: The construction of the portal would not impact a wetland or have any impact on wetlands or their buffers.</td>
</tr>
<tr>
<td>33</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENVR-4</td>
<td>Stream Impacts</td>
<td>Would the construction of the portal disrupt streams or their buffer?</td>
<td>High: The portal site construction would impact a stream or its buffer. Medium: The portal site construction would result in short-term (a few days) detours or blocked access. Low: The construction of the portal would not impact a stream or its buffer.</td>
</tr>
<tr>
<td>34</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENVR-5</td>
<td>Natural Environment</td>
<td>Would the construction of the portal permanently affect wetlands, streams, and/or their buffers, high quality upland habitat, or habitat for special status species?</td>
<td>High: Greater that 0.2-acre impact. Medium: Between 0.1 and 0.2-acre impact. Low: Less than 0.1-acre impact.</td>
</tr>
<tr>
<td>35</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENVR-6</td>
<td>Traffic Disruption - Truck Haul Routes</td>
<td>To what extent would the truck haul routes utilize residential streets?</td>
<td>High: Uses significant amounts of residential streets. Medium: Uses arterials with only minor use of residential streets. Low: No residential streets utilized.</td>
</tr>
<tr>
<td>36</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>PRIMARY FACTOR ENVR-5</td>
<td>Traffic Disruption - Duration Period</td>
<td>What would be the duration of disruption due to construction at the portal?</td>
<td>High: Construction of portal would require long-term (construction period) detours or blocked local access. Medium: Construction of portal would result in short-term (a few days) detours or blocked access. Low: Construction of portal would not require detours or blocked access.</td>
</tr>
<tr>
<td>37</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>PRIMARY FACTOR ENVR-4</td>
<td>Bicycle/Pedestrian</td>
<td>Is there regular bicycle or pedestrian traffic near this site because of an established trail or commute route?</td>
<td>High: Frequent bicycle/pedestrian traffic. Medium: Low or infrequent levels of bicycle/pedestrian traffic, or rarely detoured or redirected. Low: No elevated levels of bicycle/pedestrian traffic.</td>
</tr>
<tr>
<td>38</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>SECONDARY FACTOR ENVR-1</td>
<td>Visual Resources</td>
<td>Would construction on the portal site cause visual impacts?</td>
<td>High: Site is in highly visible location; minimal opportunities for screening or visual enhancement. Medium: Site is in highly visible location; opportunities available for screening or visual enhancement. Low: Site not located in highly visible location.</td>
</tr>
<tr>
<td>39</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>SECONDARY FACTOR ENVR-2</td>
<td>Visual Resources</td>
<td>Would permanent facilities on the portal site cause visual impacts?</td>
<td>High: Site is in highly visible location; minimal opportunities for screening or visual enhancement. Medium: Site is in highly visible location; opportunities available for screening or visual enhancement. Low: Site not located in highly visible location.</td>
</tr>
<tr>
<td>40</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>SECONDARY FACTOR ENVR-3</td>
<td>Visual Resources</td>
<td>Would construction be in line of sight (right of way)?</td>
<td>High: Residence in line of sight. Medium: Business (city, state only) in line of sight. Low: Nothing in line of sight.</td>
</tr>
<tr>
<td>41</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>SECONDARY FACTOR ENVR-4</td>
<td>Air Quality</td>
<td>Would construction at the portal impact the air quality of receptors?</td>
<td>High: Receptors immediately adjacent to portal site. Impacts possible. Medium: Receptors more than 500 feet from portal site. Impacts possible. Low: No receptors in immediate vicinity of portal site, no impacts anticipated.</td>
</tr>
<tr>
<td>42</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>SECONDARY FACTOR ENVR-5</td>
<td>Air Quality</td>
<td>Would operation of the facilities at the portal impact the air quality of receptors?</td>
<td>High: Receptors immediately adjacent to portal site. Impacts possible. Medium: Receptors more than 500 feet from portal site, impacts possible. Low: No receptors in immediate vicinity of portal site, no impacts anticipated.</td>
</tr>
<tr>
<td>43</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENVR-7</td>
<td>Noise</td>
<td>How discernible would construction noise be in the vicinity of the portal site?</td>
<td>High: Low existing ambient noise. Medium: Moderate existing ambient noise. Low: High existing ambient noise.</td>
</tr>
<tr>
<td>44</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>SECONDARY FACTOR ENVR-6</td>
<td>Landscapes</td>
<td>Would any officially designated local landmark (building, object, or structure) be impacted by construction or the completed portal?</td>
<td>High: An officially designated local landmark would be permanently impacted during construction or by the completed project. Medium: An officially designated local landmark would be temporarily impacted during construction - there would be no impact by the completed project. Low: No: There would be no impacts either by construction or the completed portal.</td>
</tr>
<tr>
<td>45</td>
<td>Portal Screening</td>
<td>FEIS</td>
<td>KEY FACTOR ENVR-8</td>
<td>Local Use</td>
<td>Would there be potential for public shared uses of the portal site after construction?</td>
<td>Scale: Yes or No</td>
</tr>
<tr>
<td>#</td>
<td>Component</td>
<td>Screening Round</td>
<td>Code</td>
<td>Topic</td>
<td>Questions</td>
<td>Scale</td>
</tr>
<tr>
<td>-----</td>
<td>-----------</td>
<td>----------------</td>
<td>--------</td>
<td>-------</td>
<td>---------------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>46</td>
<td>Portal Screening</td>
<td>FES</td>
<td>SECONDARY FACTOR</td>
<td>ENV-1</td>
<td>Land Use</td>
<td>Would the use of the site after construction be the same as the existing use?</td>
</tr>
<tr>
<td>47</td>
<td>Portal Screening</td>
<td>FES</td>
<td>KEY FACTOR</td>
<td>ENV-0</td>
<td>Deveating</td>
<td>Would delevating discharge at the portal site result in impacts to water bodies (e.g., wetlands, streams, lakes)?</td>
</tr>
<tr>
<td>48</td>
<td>Portal Screening</td>
<td>FES</td>
<td>SECONDARY FACTOR</td>
<td>ENV-0</td>
<td>Deveating</td>
<td>Is there a receiving water (e.g., wetland, stream, lake) in sufficient proximity to the portal site to receive delevating water? If the delevating water cannot be discharged to a storm or sanitary sewer?</td>
</tr>
</tbody>
</table>
| 49  | Portal Screening | FES | SECONDARY FACTOR | ENV-0 | Contamination | What would be the potential for encountering contaminated soils and/or groundwater? | High: The site has historical or current uses that could contribute to soil/groundwater contamination. 
Medium: There is in the vicinity of the land have historical or current uses that could contribute to soil/groundwater contamination of the subject property. 
Low: Non-reactive contamination not on or immediately adjacent to portal site. | Scale: Yes | Low | High | Low |
| 50  | Portal Screening | FES | SECONDARY FACTOR | ENV-0 | Land Use | Would the project facilities on the portal site be allowed under the existing development regulations? | Yes/No | No     | Yes    | Yes    |
| 51  | Portal Screening | FES | SECONDARY FACTOR | ENV-0 | Land Use | Would construction or operation require a shoreline permit? | Scale: Yes | No | Yes | Yes |
| 52  | Portal Screening | FES | PRIMARY FACTOR | LAND-1 | Relative Number of Acquisition Parcels | What is the estimated total number of private property acquisitions in the portal site? | Scale: Quantitative value based upon the number of parcels required. | 1 | 1 | 1 |
| 53  | Portal Screening | FES | SECONDARY FACTOR | LAND-1 | Relative Level of Property Development | What is the relative level of development and known permitted development on the portal site? | Scale: High: Highest existing structures. 
Medium: Mostly permitted and masterplans, level of development. 
Low: Lowest impacts. | L | L | L |
| 54  | Portal Screening | FES | KEY FACTOR | LAND-1 | Legal Restrictions on Title | Are there existing legal restrictions to tie in the portal acquisition site which would prevent or limit planned construction? | High: Title restrictions severely limit available usable land area and are difficult or impossible to remove. 
Medium: Some title restrictions exist but can be removed with some effort or project can be adapted to accommodate. 
Low: Title restrictions do not limit available usable land. | L | L | L |
| 55  | Portal Screening | FES | PRIMARY FACTOR | LAND-2 | Complexity of Relocations - Converse | How difficult and time-consuming will it be for occupants in the portal site areas to relocate? | High: Relocations include unique businesses with unique site requirements. 
Medium: Relocations are likely to be complex and disruptive, but occupants appear to be reasonably able to relocate. 
Low: Relocation level of complexity and occupant relocations appear not to be high. | L | L | L |
| 56  | Portal Screening | FES | SECONDARY FACTOR | LAND-2 | Residential Construction Disruption - Temporary | What is the temporary construction disruption on residential property uses adjacent to portal site area? | High: Appears to have the highest levels of temporary residential disruption in potential portal areas. 
Medium: Appears to have mid-level impacts of temporary residential disruption in potential portal areas. 
Low: Appears to have the lowest levels of temporary residential disruption in potential portal areas. | M | L | L |
| 57  | Portal Screening | FES | PRIMARY FACTOR | LAND-3 | Residential Construction Disruption - Permanent | What is the permanent construction disruption on residential property uses adjacent to portal site area? | High: Appears to have the highest levels of permanent residential disruption in potential portal areas. 
Medium: Appears to have mid-level impacts of temporary residential disruption in potential portal areas. 
Low: Appears to have the lowest levels of temporary residential disruption in potential portal areas. | L | L | L |
| 58  | Portal Screening | FES | SECONDARY FACTOR | LAND-3 | Commercial Construction Disruption - Temporary | What is the temporary construction disruption on commercial property uses adjacent to portal site area? | High: Appears to have the highest levels of temporary commercial disruption in potential portal areas. 
Medium: Appears to have mid-level impacts of temporary commercial disruption in potential portal areas. 
Low: Appears to have the lowest levels of temporary commercial disruption in potential portal areas. | L | M | L |
| 59  | Portal Screening | FES | PRIMARY FACTOR | LAND-4 | Commercial Construction Disruption - Permanent | What is the permanent construction disruption on commercial property uses adjacent to portal site area? | High: Appears to have the highest levels of permanent commercial disruption in potential portal areas. 
Medium: Appears to have mid-level impacts of temporary commercial disruption in potential portal areas. 
Low: Appears to have the lowest levels of temporary commercial disruption in potential portal areas. | L | L | L |
| 60  | Portal Screening | FES | KEY FACTOR | LAND-3 | Required Surface Easements | What is the estimate of private subsurface property interests (not in public right-of-way) that must be acquired to provide proposed transportation corridor? | Scale: Quantitative number of easement properties. | 1 | 0 | 0 |
| 61  | Portal Screening | FES | KEY FACTOR | LAND-4 | Adjacent Subsurface Easements | What is the estimate of private subsurface property interests (not in public right-of-way) that must be acquired to provide subject portal site to the proposed conveyance corridor? | Scale: Quantitative number of easement properties. | 1 | 0 | 0 |
| 62  | Portal Screening | FES | SECONDARY FACTOR | FIN-1 | Relative Cost of Site Acquisition and Relocation | What is the estimated total relative cost of private property acquisitions and relocations in the portal area? | Scale: High: Highest cost 
Moderate: Moderate cost 
Low: Lowest cost | M | M | L |
| 63  | Portal Screening | FES | SECONDARY FACTOR | MIT-1 | Create Compensatory Natural Resource Mitigation Potential | What amount of land is available outside of the facility footprint for on-site or off-site mitigation such as creation, maintenance, and/or enhancement of uplands, wetlands, streams, and/or buffers? | High: Relatively highest level of acreage exists to provide onsite natural resource mitigation for identified impacts. 
Medium: Relatively medium level of acreage exists to provide onsite natural resource mitigation for identified impacts. 
Low: Relatively low level of acreage exists to provide onsite natural resource mitigation for identified impacts. | Low | High | Medium |
Appendix C

Evaluation Summary of Portal 19 Level 3 Candidate Sites
**ROUTE 9 Effluent Conveyance - Portal E19**

**Portal Information**

<table>
<thead>
<tr>
<th>Function</th>
<th>Location</th>
<th>Jurisdictions</th>
<th>Permanent Facilities</th>
<th>Port Diameter</th>
<th>Port Depth</th>
<th>Length of Activity</th>
<th>Portal Excavated Volume</th>
<th>Tunnel Excavated Volume</th>
<th>Nearest Substation</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM Launch</td>
<td>Richmond Beach DR NW and NW 205th Street</td>
<td>Woodway, Shoreline, Edmonds</td>
<td>Transition Structure; Sampling Station (below ground)</td>
<td>50 feet (Or 40 ft by 100 ft square excavation)</td>
<td>40 feet</td>
<td>3.5 years</td>
<td>4,000 CY</td>
<td>107,000 CY (for tunnel from portal 5 to 19)</td>
<td>Westgate, Richmond Park</td>
</tr>
</tbody>
</table>

**Portal Sites Comparison**

<table>
<thead>
<tr>
<th>Features</th>
<th>Site E19-A</th>
<th>Site E19-C</th>
<th>Site E19-E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size &amp; Current Use</td>
<td>1.91 acre; Undeveloped (Vacant) Land</td>
<td>8.52 acre; Petroleum Refining</td>
<td>3.40 acre; Utility - Public</td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>New access road needs to be constructed. Improvement on existing access way likely required.</td>
<td>Existing access way is adequate with minor improvement.</td>
<td></td>
</tr>
<tr>
<td>Tunnel</td>
<td>The length of the tunnel from the tunnel corridor to the portal site is estimated to be 300 feet.</td>
<td>The length of the tunnel from the tunnel corridor to the portal site is estimated to be 100 feet.</td>
<td>The length of the tunnel from the tunnel corridor to the portal site is estimated to be 1,200 feet.</td>
</tr>
<tr>
<td>Civil Site Work</td>
<td>Major earthwork to remove hillside and retaining wall construction required. Requires little or no alteration. Moderate earthwork required to create level construction area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stormwater/Groundwater Disposal</td>
<td>Pipeline construction would likely be required to discharge to nearest storm drain or sanitary sewer.</td>
<td>Both storm drain and sanitary sewer are available onsite, however, pretreatment would likely be required due to anticipated contamination of groundwater.</td>
<td>Storm drain, sanitary sewer and natural surface drainage are available adjacent to the site. Groundwater may be disposed of after minor pretreatment.</td>
</tr>
<tr>
<td>Construction</td>
<td>Portal site does not restrict construction method. Onshore pipeline (1,500 ft) requires installation down a steep slope and railroad crossing. Favorable shoreline access and 450 ft nearshore pipeline segment.</td>
<td>Portal site does not restrict construction method. Onshore pipeline (1,000 feet) installation would have no significant obstacles. Favorable shoreline access and 450 ft nearshore pipeline segment.</td>
<td>Trench construction from portal site may be limited by broad, dense areas of eelgrass habitat. Onshore construction would be minimal, but shorelineline is not directly accessible. 1,800 ft nearshore pipeline segment.</td>
</tr>
<tr>
<td>Outfall</td>
<td>Risk of tunnel access shaft in eelgrass habitat is low. Trench alignments from portal site can minimize or avoid potential disturbance to eelgrass habitat.</td>
<td>Risk of tunnel access shaft in eelgrass habitat is low. Trench alignments from portal site can minimize or avoid potential disturbance to eelgrass habitat.</td>
<td>Risk of tunnel access shaft in eelgrass habitat is high due to length of alignment. Large area of eelgrass habitat disturbed by trench alignment, which cannot be avoided.</td>
</tr>
<tr>
<td>Environmental/Community</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endangered Species Act (ESA)</td>
<td>The site is within the Edmonds bald eagle territory designated by WDFW. Three documented bald eagle nests are located approximately 1 mile away. The bald eagle is listed as threatened by USFWS.</td>
<td>The site is within the Edmonds bald eagle territory designated by WDFW. Three documented bald eagle nests are located approximately 1 mile away. The bald eagle is listed as threatened by USFWS.</td>
<td>The site is within the Edmonds bald eagle territory designated by WDFW. Three documented bald eagle nests are located approximately 1 mile away. The bald eagle is listed as threatened by USFWS.</td>
</tr>
<tr>
<td>Wetland / Stream Impacts</td>
<td>Construction at this site would result in approximately 0.18 acres of impact to wetlands, 1 acre of impact to stream and wetland buffers, and 150 linear feet of stream diversion. No impact to streams, wetlands, or buffers.</td>
<td>No impact to streams, wetlands, or buffers.</td>
<td>No impact to streams, wetlands, or buffers.</td>
</tr>
<tr>
<td>Upland Habitat (Forest)</td>
<td>No impact to forested upland habitat.</td>
<td>No impact to forested upland habitat.</td>
<td>No impact to forested upland habitat.</td>
</tr>
<tr>
<td>Traffic Impacts</td>
<td>Impacts would likely be significant because of the need to use residential streets. Access options are limited.</td>
<td>Impacts could be significant if access is limited to the existing road system. However, this site offers the potential to use barge transportation for deliveries as well as shipment of spoil. Rail transport could also be an option.</td>
<td>Impacts would likely be significant because of the need to use residential streets. Access options are limited.</td>
</tr>
<tr>
<td>Contamination</td>
<td>Contamination is likely not present on this site.</td>
<td>The potential for encountering contamination on this site is high due to past and current industrial operations.</td>
<td>The County’s Richmond Beach Pump Station is located on this site. Contamination is likely not present on this site.</td>
</tr>
<tr>
<td>Land Acquisition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal Restriction</td>
<td>Low</td>
<td>Low</td>
<td>Low – King County ownership.</td>
</tr>
<tr>
<td>Required Easements</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Construction Impacts</td>
<td>Higher elevation with distant residential neighboring properties. Appears to be sufficient area and location to buffer construction from other uses.</td>
<td>Location is in view of multiple residential neighbors; however, impact should be small.</td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation of Portal Sites**

**OVERALL EVALUATION**

All three candidate sites are suitable for portal construction. Of the three candidate sites, site E19-A is the only site that would result in construction-related impacts to wetlands, streams, and buffers. Site E19-C is preferred because proposed outfall alignments from the site would minimize or avoid potential disturbance to environmental resources, limit onshore and nearshore segment lengths, and provide favorable shoreline access. Site E19-E provides options to dispose of dewatering groundwater to a nearby storm drain, sanitary sewer, or natural drainage with minor pretreatment. However, the length of tunnel from site E19-E to the tunnel corridor is significantly high.

**ENGINEERING**

All three candidate sites meet engineering criteria and are suitable for portal construction. Site E19-C has the advantage of having a large flat area with flexibility for construction staging and minimum civil site work required. It also offers the shortest tunnel length. Both storm drain and sanitary sewer are available on site E19-C, however extensive pretreatment would likely be required due to anticipated contamination of groundwater. Site E19-A requires complex and extensive civil site work and a new access road. Major pipeline construction would likely be required to discharge to the nearest storm drain or sanitary sewer. Site E19-E provides options to dispose of dewatering groundwater to a nearby storm drain, sanitary sewer, or natural drainage with minor pretreatment. However, the length of tunnel from site E19-E to the tunnel corridor is significantly high.

**ENVIRONMENTAL / COMMUNITY**

All three candidate sites are within the Edmonds bald eagle territory designated by the Washington Department of Fish and Wildlife (WDFW). Within this territory are three bald eagle nests that are approximately 1 mile away from the candidate sites. The bald eagle is listed as threatened by the U.S. Fish and Wildlife Service (USFWS). Of the three candidate sites, site E19-A is the only site that would result in construction-related impacts to wetlands, streams, and buffers. None of the candidate sites would result in impacts to forested uplands. All three sites are located adjacent to a single family residential neighborhood and would be accessed from neighborhood streets.

**OUTFALL**

All three candidate sites are suitable for outfall construction. Site E19-C is preferred because proposed outfall alignments from the site would minimize or avoid potential disturbance to environmental resources, limit onshore and nearshore segment lengths, and provide favorable shoreline access. Outfall construction from site E19-A would require an additional onshore pipeline segment that would traverse a steep slope and require a railroad line crossing. Outfall construction methods from site E19-E may be limited by the length of the nearshore segment and the presence of dense eelgrass habitat. There is no direct shoreline access at site E19-E.

**PERMITTING**

The proposed project facilities would be allowed at each site under existing development regulations. A shoreline substantial permit would be required for construction at portal sites E19-C and E19-E. A shoreline permit may also be required for construction of the outfall pipeline from a portal at site E19-A if an open-trench method is utilized.

**LAND ACQUISITION**

All three candidate sites have sufficient vacant area for projected project needs. Site E19-A will require easements for access improvements and tunnel connection to the outfall. Site E-19-E will require multiple tunnel alignment connection easements and is separated from the outfall by railroad tracks. Site E-19-C combines the outfall tunnel and portal area into one property.