



Introduction

Groundwater is water that collects or flows beneath the Earth's surface filling the porous spaces in soil, sediment, and rock. It is stored in, and moves slowly through, geologic formations of soil, sand, and rock, called aquifers. Groundwater originates from rain and from melting snow and ice and is the source of water for aquifers, springs, and wells. It is used for drinking water, agricultural, and industrial purposes. Changes in the groundwater quality, aquifer elevations, and subsurface flow can affect these uses. This fact sheet summarizes the potential impacts the proposed project would have on groundwater.

What was studied?

The study considered the potential for materials and pollutants to enter groundwater, changes in water quality from stormwater runoff, and changes to groundwater level and flow during construction and operations.

What was the study area?

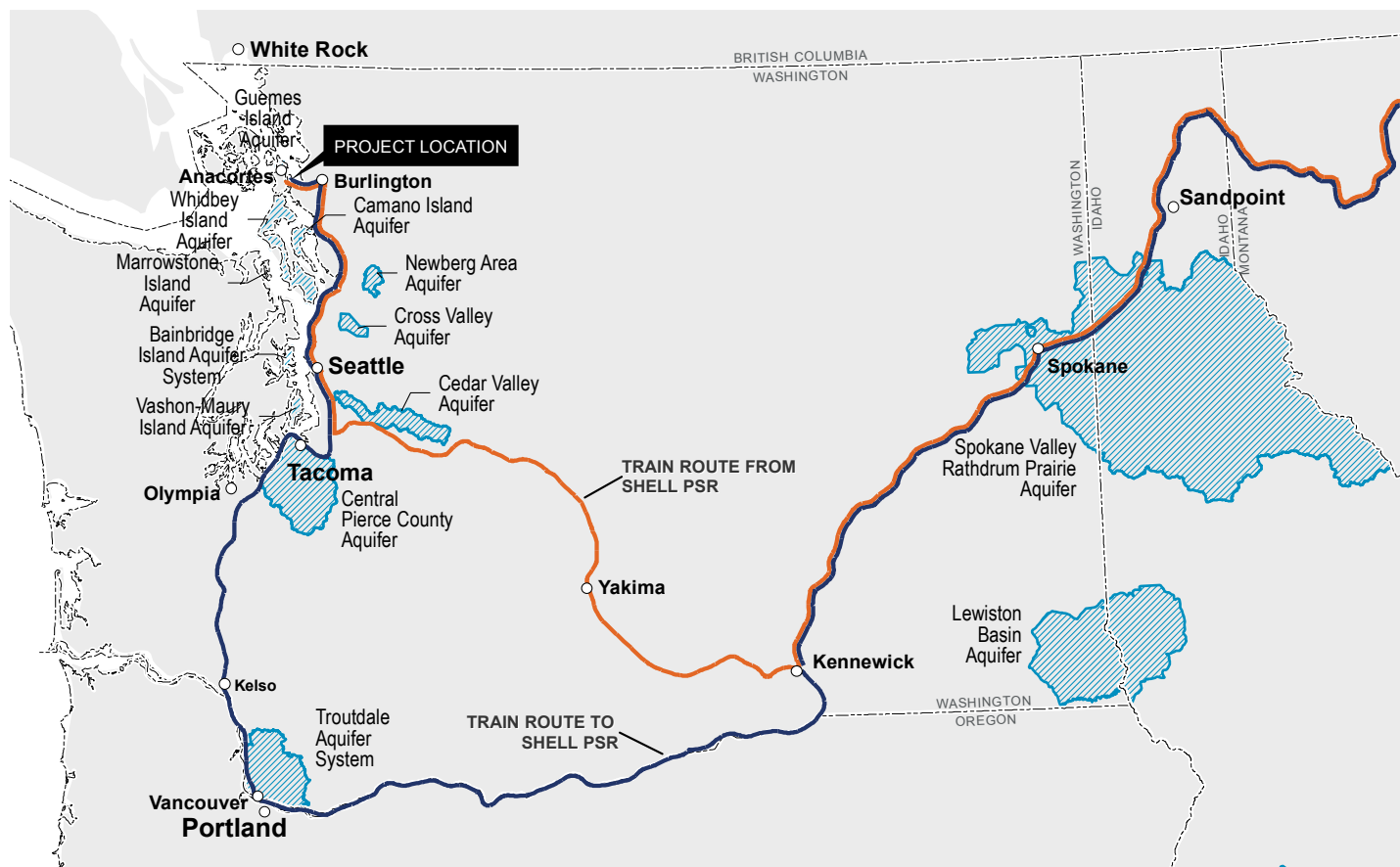
The groundwater within a quarter-mile of:

- Proposed project site
- Proposed wetland mitigation site
- Rail corridor (Anacortes Subdivision)

See the Proposed Project Fact Sheet for a map of the site.

How were impacts analyzed?

Groundwater resources and known areas of groundwater contamination in the study area were mapped and compared to the location of the proposed project and wetland mitigation sites. In addition, sole source aquifers were mapped throughout Washington State and compared to the proposed rail route. Potential construction and operational impacts to groundwater movement, elevation, and quality were characterized by comparing existing conditions with the potential for changes from construction and operations.



Sole source aquifers along proposed train route (see Figure 3.2-2 of the draft EIS). The U.S. Environmental Protection Agency defines a sole source aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer.

What are the potential impacts?

Construction Impacts

Construction impacts to groundwater include the potential release of hazardous materials to groundwater, construction stormwater, and construction dewatering. Construction equipment would require refueling and maintenance that poses a risk of contaminant releases to the ground (e.g., fuel, hydraulic fluid, oil, etc.). Excavation equipment would likely encounter groundwater where cut depths exceed 10 feet along most of the proposed project alignment.

Operation Impacts

Potential impacts to groundwater from proposed project operations could occur from permanent subsurface modifications, stormwater, and oil leaks and spills. Permanent subsurface modifications at the proposed project site would require collection and conveyance of groundwater that seeps into the cut. Stormwater from the proposed project site has the potential to accumulate contaminants and seep into local groundwater. Groundwater seepage in the cut slopes of the proposed project site could indirectly affect local groundwater levels and movement.

Cumulative Impacts

Within the study area, there has been significant agricultural, industrial, commercial, and residential development. It is assumed that with this growth and new construction, groundwater has been affected. In addition, construction and operation of the proposed Tesoro Clean Products Upgrade Project has the potential to impact groundwater. The Tesoro project and the proposed project could have cumulative impacts on groundwater. These impacts would be minimized by construction best management practices (BMPs) and localized to the Tesoro Refinery site and the proposed project and wetland mitigation sites.

What mitigation measures are proposed?

Avoidance and Minimization

Impacts to groundwater would be minimized by implementation of the BMPs required as part of various permitting processes.

PERMITS REQUIRED

- Clean Water Act Section 401 Water Quality Certification
- Clean Water Act Section 404 Individual Permit
- National Pollutant Discharge Elimination System Construction Stormwater Permit
- Shoreline Substantial Development Permit
- Skagit County Grading Permit

For example, all waste oils and machinery fluids would be stored, handled, and disposed of in accordance with appropriate regulations and permit conditions.

In addition, Shell has incorporated engineering and operational measures into the design of the proposed project to avoid and minimize impacts to groundwater. Specific design measures that would minimize the potential for impacts from a release of oil at the proposed rail unloading facility are described in Chapter 3.3 – Surface Water of the draft EIS.

Mitigation

No additional mitigation measures are proposed beyond the avoidance and minimization measures that would be developed and enforced as part of the permitting processes.

Are there unavoidable significant adverse impacts?

No unavoidable significant adverse impacts were identified.

WHERE CAN I FIND MORE INFORMATION ABOUT THIS TOPIC?

Chapter 3.2 – Groundwater of the draft EIS

The information in this fact sheet summarizes content from the draft Environmental Impact Statement; please review the full document for more detailed and complete information.

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