Chapter Five Potential Environmental Impacts

This chapter describes the potential environmental impacts associated with the proposed construction and operation of the Build Alternative. Chapter Six presents recommended mitigation measures.

Impacts have been differentiated as construction impacts, permanent physical impacts, and operation impacts. Construction impacts are usually temporary and are resolved or mitigated by the end of construction activities. Permanent physical impacts involve permanent changes to the landscape or environment as a result of project construction. Operational impacts are those that occur as a result of railroad operations or maintenance activities.

Air Quality

Would the Build Alternative result in any potential impacts to air quality?

The proposed project would be constructed in Grant County, Washington, which is in attainment for all of the criteria pollutants. For this reason, the Build Alternative does not require a General Conformity Determination.[1]

Air quality impacts were identified by comparing the projected rail operations to the Surface Transportation Board's (STB) thresholds[2] for analyzing the anticipated effects of a proposed rail project on air emissions.

The air quality impact assessment conducted for the Build Alternative considered the STB's air quality impact thresholds of an increase of at least eight trains per day, an increase in rail traffic of at least 100 percent (measured in gross ton-miles annually), or an increase in rail yard activity of at least 100 percent (measured by carload activity).[3]

Because rail operations were estimated assuming two trains per day (one round trip) for the foreseeable future, the proposed project would not meet or exceed the STB's threshold of an increase of at least eight trains per day (the level that would require a quantitative analysis of air quality impacts). However, eventually increasing rail traffic on the existing rail line (Segment 3) to two trains per day (one round trip) would effectively increase current rail traffic by 100 percent or more; therefore, emissions from rail traffic were quantified as described below.

---

[1] Under 40 CFR 93, Subpart A, Transportation Conformity rules apply to projects funded or approved by the Federal Highway Administration or the Federal Transit Administration. If a project is not subject to Transportation Conformity, it is then covered under General Conformity rules (40 CFR 93, Subpart B). As discussed above, the proposed project is in an attainment area for all criteria pollutants; therefore, the conformity requirements do not apply to the proposed project.

[2] 49 Code of Federal Regulations (CFR) 1105.7(e)(5).

[3] See 49 CFR 1105.7(e)(5)(A) and (B).

Construction Effects

Construction of the Build Alternative would result in minor changes to air quality in the project area. Potential air quality impacts from rail line construction include fugitive dust from grading and cut-and-fill operations; dust from construction vehicles traveling on gravel roads; and emissions from construction vehicles and equipment.

Effects from construction activities would be short-term and localized in the immediate vicinity of the construction activity. In addition, emissions would be dispersed by wind, preventing them from becoming concentrated. Construction vehicles operating on local gravel roads could also stir dust from the roadways, but fugitive dust suppression controls such as spraying water, covering loaded trucks, and employing best management practices would minimize impacts to air quality. Accordingly, if the mitigation measures in Chapter Six are implemented, the STB's Section of Environmental Analysis (SEA) and the Washington State Department of Transportation (WSDOT) determined that the proposed construction would not cause significant air quality impacts, either locally or regionally.

Physical Effects

There would be no physical effects to air quality as a result of the proposed project.

Operational Effects

Rail operations can affect air quality through emissions of air pollutants from locomotive engines, including emissions of Mobile Source Air Toxics (MSATs) (compounds present in diesel fuel that are emitted to the air when the fuel evaporates or passes through the engine unburned).

The proposed rail operations were estimated assuming two trains per day (one round trip), 365 days per year, consisting of up to ten cars pulled by one locomotive operating at 25 mph. Each train would travel a round trip distance of approximately 22 miles (11 miles in each direction).[4] Locomotive emissions were then estimated using emission factors published by the U.S. Environmental Protection Agency (USEPA).[5] Under these conservative operational assumptions, annual emissions would be as follows:

- Hydrocarbons (HC) – 0.648 tons per year
- Carbon monoxide (CO) – 1.73 tons per year

[4] The proposed 11.5 mile long rail route includes the acquisition of approximately 0.5 miles of existing track for which no construction or rehabilitation is planned. Through traffic would not traverse this part of the proposed line. Accordingly, this 0.5 mile segment was not included in the round trip distance used in the air quality analysis.

[5] U.S. Environmental Protection Agency (USEPA), Office of Transportation and Air Quality. *Technical Highlights – Emission Factors for Locomotives (EPA 420-F-97-051).* December 1997.

- Nitrogen Oxides (NOx) – 17.51 tons per year
- Particulate matter (PM) – 0.435 tons per year

This analysis evaluated emissions from locomotives traveling along the project line. Since it is assumed that there would be a maximum of two trains per day, it is unlikely that an individual train would idle for such a period of time that emissions from idling would be substantial.

Under this operating scenario, operation of the proposed project would have a minor effect on overall air quality in the project area. Emissions associated with this volume of train traffic would be low.

While no general conformity analysis is required, the proposed implementation of the Build Alternative has the potential to increase localized concentrations of several criteria pollutants, including particulates and carbon monoxide. MSATs, including volatile organic compounds (VOCs), associated with the low volume of future train traffic would be negligible. Although VOCs are considered precursors to ozone, another criteria pollutant, the low volumes generated would not result in a significant impact.

In March 2008, the USEPA adopted more stringent emission standards for diesel locomotives, which apply to newly manufactured locomotives and re-manufactured locomotives that were originally manufactured after 1972. The USEPA estimates that the rule will cut PM emissions from these engines by as much as 90 percent and NOx emissions by as much as 80 percent when fully implemented. Implementation of these standards begins in 2008 with re-manufactured engines, and will be fully implemented by 2015. Accordingly, as these locomotives are placed into service on rail lines, it will substantially reduce locomotive emissions compared with those from locomotive engines that met the prior standards.[6]

Conclusion

Air emissions associated with the proposed rail line construction and operation would not be expected to affect Grant County's air attainment status. The existing air quality attainment status of the region, the low volume of train traffic expected from the proposed project, and the USEPA's more stringent emission standards for diesel locomotives all indicate that the proposed project would have no significant air quality impacts. As discussed in Chapter Six, mitigation would be implemented to reduce the short-term impacts of any construction activities.

No Build Alternative

Under the No Build Alternative, no rail line construction would take place. However, if the existing line (Segment 3) is rehabilitated in the future, then

[6] See 40 CFR Part 92 - Control of Air Pollution From Locomotives and Locomotive Engines.

that rehabilitation could involve minor impacts to air quality. In addition, in the national rail system, rail transportation – with limited stops, lack of traffic congestion, and greater efficiency per gallon – is approximately three times more energy efficient than hauling freight by truck.[7] As a result, if this area is developed without the proposed project, the resulting truck traffic would likely consume greater amounts of fuel and would generate greater levels of emissions compared with moving the same amount of freight by rail.

Cultural, Historic, and Archaeological Resources

Would the Build Alternative affect cultural, historic, or archaeological resources?

Following initial consultations with the Washington State Department of Archaeology and Historic Preservation (State Historic Preservation Office or SHPO), 20 potentially historic resources were identified in the project area.[8] One of those resources, the Columbia Basin East Low Canal Feeder Canals system (specifically Canals EL20, EL20U1, and RCD 180+182) has been determined to be eligible for listing in the National Register of Historic Places (NRHP).

As explained in more detail below, the Build Alternative would not be expected to affect cultural, historic, or archaeological resources in the Area of Potential Effect (APE).

Construction Effects

Construction of the Build Alternative would create noise and dust in the project area. Such temporary impacts are not expected to affect the canals because they would not diminish the characteristics of the property that make it eligible for the NRHP.

Because there are certain land parcels in the project area that the project team was unable to evaluate, the SHPO has recommended that SEA and WSDOT develop a programmatic agreement (PA) to address the proper identification, evaluation, and handling of historic, cultural, and archeological resources on these parcels. Accordingly, the project team is preparing a PA pursuant to the requirements of Section 106 of the National Historic Preservation Act, 16 U.S.C. 470f (NHPA), and SEA and WSDOT will require the Port's participation in the PA as a signatory.

Although not expected, buried cultural artifacts such as chipped or ground stone, historic refuse, building foundations, or human bone could be

[7] American Association of Railroads (AAR). 2008. AAR News, *Railroad Fuel Efficiency Sets New Record*. May 21, 2008.

[8] As of the date of this EA, there have been no responses from any Tribes indicating concerns about cultural resources within the project area.

discovered during construction excavation. The Confederated Tribes of the Warm Springs Reservation of Oregon has requested that it be notified if ancestral remains are found. Accordingly, SEA and WSDOT have included a mitigation measure that addresses unanticipated discoveries of historic or cultural resources or ancestral remains (See Chapter Six).

Physical Effects

Columbia Basin East Low Canal Feeder Canals: EL20; EL20 Extension, EL20U1; and RCD 180+182

This historic resource is part of the NRHP-eligible Columbia Basin Project historic district and appears to be part of the original design of the Columbia Basin Project. As described below, the Build Alternative would not be expected to have an adverse effect on any of the three canals within the APE.

RCD (Rocky Coulee Diversion) Canal 180+182:

The proposed project would involve the construction of a bridge across RCD Canal 180+182; no piers would be sunk into the canal and the abutments would be constructed clear of the water channel. Therefore, the proposed project would not be expected to have an adverse effect on this canal.

EL (East Low) Canal 20U1:

The proposed project would involve construction of a culvert to allow the irrigation water in this canal to flow beneath the railroad tracks. The culvert would replace the concrete-lined canal, but because the existing concrete lining had previously altered the historic integrity of the original earth-lined canal, the proposed project would not be expected to have an adverse effect on EL Canal 20U1.

EL (East Low) Canal 20:

The proposed project would construct a bridge to span the canal; no piers would be sunk into the canal and the abutments would be constructed clear of the channel. Therefore, the proposed project would not be expected to have an adverse effect on EL Canal 20.

Operational Effects

Operation of the rail line, including vibration, would not be expected to cause adverse effects to historic resources.

Conclusion

The proposed project would not be expected to have any adverse effect on historic, cultural, or archaeological resources, including the NRHP-eligible canals. However, pending completion of the Section 106 process of the

NHPA, SEA and WSDOT recommend that none of the NRHP-eligible sites in the project area be disturbed.

Because there are certain land parcels in the project area that the project team was unable to evaluate, SEA and WSDOT are preparing a PA pursuant to the requirements of Section 106 of the NHPA to ensure that cultural resources would be assessed on these parcels prior to initiation of construction. The Port would be required to participate in the PA as a signatory and will be required to adhere to the stipulations of the PA. In addition, in the event that any unanticipated historic or cultural properties, archaeological sites, human remains, funerary items, or assorted artifacts were discovered during the proposed construction activities, the Port would be required to cease work and notify the SHPO, SEA, WSDOT, interested federally-recognized Tribes, and consulting parties, if any, in order to coordinate, as appropriate, to protect those resources. (See Chapter Six, Mitigation Measures).

No Build Alternative

Under the No Build Alternative, no rail line construction would take place within the project area. Accordingly, the No Build Alternative would have no adverse effect on any historic, cultural, or archaeological resources within the project area.

Energy

Would the Build Alternative affect energy resources?

SEA and WSDOT evaluated the potential for the proposed rail project to affect energy resources and overall energy efficiency. Energy consumption is projected to increase in the project area during the proposed rail construction activities and operations; however, as explained below, it would not be significant enough to impact regional energy supplies.

The commodities to be shipped on the proposed rail line would vary depending on the specific industries along the route and future market demand, but the applicants have indicated that commodities would likely consist of steel, manufactured parts, and specialty chemicals, such as trimethylamine. Steel is a recyclable commodity but the proposed project would have a positive impact on the transportation of steel. Accordingly, the proposed project would not be expected to have an adverse impact on the movement of energy resources or recyclable commodities.[9]

Construction Effects

The amount of energy that would be consumed during the proposed construction was estimated by using guidelines developed by the California

[9] See 49 CFR 1105.7(e)(4).

Department of Transportation (Caltrans).[10] Energy consumption during construction is proportional to the project's size, and is estimated at 8,430 British thermal units (BTUs) per dollar of construction cost (expressed as 2005 dollars). The preliminary cost estimate for the proposed project is approximately $25 million in Year 2007 dollars, excluding costs for right of way acquisition and mitigation.[11] Using the Caltrans construction energy factor, the project team calculated that construction activity would require an estimated 2,107 million BTUs (MBTUs) of energy over the entire construction period (equivalent to 15,050 gallons of diesel fuel). This rate accounts for energy consumed in the manufacture of materials, fuel to transport those materials to the job site, and fuel to operate the on-site machinery and equipment during construction.

These temporary energy impacts resulting from the proposed construction would be relatively minor and would not significantly reduce regional energy supplies. There are sufficient energy supplies (electricity and diesel fuel) serving the project area.

Physical Effects

There would be no permanent physical effects to energy other than the operational effects discussed below.

Operational Effects

Energy consumption associated with projected train operations for the proposed project was predicted based on the length of track, speed, and the number of trains per day.

Trains operating along the project would travel approximately 10.6 miles if Segment 2 is selected, and approximately 11.0 miles if Alternative 2A is selected. (See Chapter Three, Exhibit 3.5). The project includes acquisition of 0.5 miles of short rail lines at the southern end of Segment 2, but these are located to the side of the proposed construction and would not be part of the "through" rail traffic from the eastern end of Segment 1 to the northern end of Segment 2. Therefore, the 0.5 miles is not included in the round trip distance used in the energy analysis. Under the Build Alternative, current train traffic is projected to increase to a maximum of two trains per day (one round trip) for the foreseeable future. Accordingly, the overall fuel consumption would be greater under the Build Alternative compared with the No Build Alternative. The project team determined that the Build Alternative would use approximately 4,650 gallons of diesel fuel per month compared with the 246 gallons that are used on the existing route **(Exhibit 5.1)**. Energy consumption is projected to increase in the project area during rail operations, but would not be expected to impact regional energy supplies.

[10] California Department of Transportation (Caltrans). *Energy and Transportation Systems Manual.* 1983.
[11] The project team notes that this cost is a preliminary estimate.

The following information was used to develop an estimate of fuel consumption by vehicles delayed by train traffic at rail crossings:

- Vehicle delay and queue length predictions for the main at-grade crossings (calculations are provided in the Traffic and Transportation section of this chapter).[12]

Exhibit 5.1
Current and Projected Energy Consumption

Freight Train Fuel Consumption (in Gallons)			
Description	**Daily**	**Monthly**	**Annually**
Current Route	N/A	246	2,954
Proposed Route (if Segment 2 is selected)[13]	155	4,650	55,800
Proposed Route (if Alternative 2A is selected)	161	4,830	57,960

- Based on Bureau of Transportation Statistics,[14] gasoline engines and diesel engines consume approximately one gallon of fuel per hour while idling, depending on the size of the engine, the idle speed, and accessory loads.
- There are 28 at-grade train crossings of public streets or private driveways along the proposed route.

Delays for vehicular traffic at the proposed at-grade crossings would have negligible effect on energy consumption in the project area, since the delay would be approximately 70 seconds, twice per day for the foreseeable future.

Conclusion

The proposed project would not be expected to affect the movement of energy resources and it would have a positive effect on the transportation of recyclable commodities. Although current energy consumption is projected to increase in the project area during the proposed rail construction activities and operations, it would not be significant enough to impact regional energy supplies. Accordingly, no mitigation would be necessary.

[12] The complete *Traffic Technical Memorandum* may be obtained from the Washington State Department of Transportation (WSDOT) Rail & Marine Office. Contact information is provided on the back of the title page.
[13] Because Segment 1 and Alternative 1A are the same length, the amount of fuel used would vary only with the selection of Segment 2 or Alternative 2A.
[14] Bureau of Transportation Statistics. *National Transportation Statistics 2006*. http://www.bts.gov. 2006.

No Build Alternative

Under the No Build Alternative, there would be no rail line construction, and if the existing rail line (Segment 3) was rehabilitated in the future, impacts to energy associated with that rehabilitation would be expected to be minor.

When averaged over the national rail system, rail transportation – with limited stops, lack of traffic congestion, and greater efficiency per gallon – is approximately three times more energy efficient than hauling freight by truck.[15] As a result, if the area around the Grant County International Airport (GCIA) was developed without the proposed rail project, the resulting truck traffic would consume more fuel than hauling the same quantity of freight by rail.

Fish, Wildlife, and Vegetation

How would the project affect biological resources including fish, wildlife, and vegetation?

The project team assessed the biological resources and the potential for the Build Alternative to affect species or to otherwise modify habitat in the project area. Biological resources include vegetation and wildlife habitat, wildlife, and fish.

Construction impacts are usually temporary and are resolved or mitigated by the end of construction activity. Permanent physical impacts from the proposed rail project would be direct or indirect impacts that could result in the loss of habitat. Direct impacts to biological resources would be those caused by implementation of the proposed project and would usually be immediate and site-specific. Indirect impacts would be any reasonably foreseeable impacts that could occur as a result of the proposed project but that would occur later in time or farther removed in distance. Operational impacts involve those impacts incurred by railroad operations, including use and maintenance of the right of way.

The project team used the following evaluation criteria for assessing the potential harm or loss to biological resources:

- Harm or loss to an individual or population of species that is listed by either federal or state agencies as rare, threatened, or endangered, or is a state priority species.
- Loss or degradation of habitat, sanctuaries, refuges, use areas, or migration corridors for species that are listed by either federal or state agencies as rare, threatened, or endangered or are state priority species.

[15] American Association of Railroads (AAR). 2008. AAR News, *Railroad Fuel Efficiency Sets New Record*. May 21, 2008.

Construction Effects

The proposed construction activities, staging, and equipment turnaround areas would be contained within the project right of way to minimize habitat impacts.

The proposed construction activities have the potential to disturb fish or wildlife within the study area through either the presence of the equipment and crews or through impacts from construction noise.[16] Noise from construction activities could also extend outside the study area. Project activities could cause wildlife to leave the area during construction. Impacts might be less severe on populations that utilize the habitat within the project area because they may be habituated to human activity, including impacts from the construction, maintenance, and operation of SR 17. Construction impacts would be minimal for the refurbishment of the existing rail line (Segment 3).

Construction impacts, staging areas (typically 0.75 acres [32,670 square feet]), and equipment turnaround areas (typically 0.05 acres [2,200 square feet]) would be contained within the project right of way or within previously disturbed areas to minimize habitat impacts. Habitat loss could be permanent within the right of way and in construction or earthwork staging areas, if such areas had not been previously disturbed.

During construction, would there be any effects to rare, threatened, or endangered species?

There would be no effects to any wildlife, fish, or plant species listed as rare, threatened, or endangered under the federal Endangered Species Act or by the state of Washington because there are no such species in the study area.

Would there be any effects to state priority fish species from construction?

Degradation of water quality could adversely impact priority fish species within Parker Horn. Extremely high levels of turbidity associated with activities that could occur during project construction have been linked to stress in some species of fish.[17,18] Other potential effects of turbidity include reducing the levels of dissolved oxygen in the affected area, altering the suitability of spawning areas, and smothering benthic organisms[19] and

[16] WDFW (Washington Department of Fish and Wildlife). *Priority Habitat and Species Maps and Polygon Reports for Townships T20R28E, T19R28E, and T19R29E.* August 24, 2007.

[17] Berg, L. and T.G. Northcote. Changes in territorial, gill-flaring, and feeding behavior in juvenile coho salmon (*Oncorhynchus kisutch*) following short-term pulses of suspended sediment. *Canadian Journal of Aquatic Sciences* 42:1410-1417. 1985.

[18] Servizi, J. A. and D. W. Martens. Sublethal responses of coho salmon *(Oncorhynchus kisutch)* to suspended sediments. *Canadian Journal of Aquatic Sciences* 49:1389-1395. 1992.

[19] Benthic organisms are macroinvertebrates (such as aquatic insects, snails, and shellfish) that live in the sediment at the bottom of a water body. Benthic organisms are an important part of the food chain and are used by scientists as an indicator of water quality and the overall health of an aquatic ecosystem.

communities.[20,21,22] While it is unlikely that turbidity within the proposed project area would reach such high levels, turbidity could still impact priority fish species present during construction. If the mitigation measures described in Chapter Six are implemented during construction, adverse impacts to state priority fish species would be minimized or avoided.

Petroleum-based products contain polycyclic aromatic hydrocarbons (PAHs), which can cause acute toxicity to fish at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms.[23] Such impacts could occur if fuel products were accidentally spilled during construction into the aquatic environment and priority fish species or their prey were exposed to these products. Mitigation measures described in Chapter Six would help protect water quality and habitat for state priority fish.

If the proposed project required pile driving for bridge piers or abutments at the Parker Horn crossing for Segment 1 or the Crab Creek crossing for Alternative 1A, fish could be disturbed, injured, or killed by underwater sound pressure from pile driving operations. Fish might vacate the area during in-water construction activities, and any fish that did not vacate could be injured during in-water work. The potential magnitude of this impact would depend on many factors including size and number of piles driven, material used, water depth where pile driving occurred, duration of the activity, and time of year when the activity occurred.

Apart from the impacts of pile driving, disturbance impacts to aquatic species would be limited to occasions of in-water construction work, such as bridge piers and abutment construction.

Walleye are more sensitive to disturbance during the spring spawning run (April through May). Parker Horn has been recognized as an important area for walleye spawning. Therefore, as stated in Chapter Six, construction activities would be restricted at Parker Horn or Crab Creek to avoid work in the water between April 1 and May 30.

---

[20] Martin, D. J., E. O. Salo, and B. P. Snyder. *Field bioassay studies on the tolerances of juvenile salmonids to various levels of suspended solids. Final Report, FRI-UW-7713.* Fisheries Research Institute, University of Washington, Seattle, WA. 1977.

[21] Carrasquero, Jose. *White Paper – Over-water structures: freshwater issues.* Prepared by Herrera Environmental Consultants. Submitted to Washington Department of Fish and Wildlife, Washington Department of Ecology, and Washington Department of Transportation. April 12, 2001.

[22] Mulvihill, E.L., C.A. Francisco, J.B. Glad, K.B. Kaster, and R.E. Wilson. *Biological impacts of minor shorelines structures on the coastal environment: State of the art review. Volume II, data printout. FWS/OBS-77/51.* Prepared by BEAK Consultants, Inc., Portland, Oregon, with O. Beeman, for National Coastal Ecosystems Team, Office of Biological Services, Fish and Wildlife Service, U.S. Department of the Interior. 1980.

[23] Neff, J. M. Polycyclic aromatic hydrocarbons. In: Rand, G.M., Petrocelli, S.R. (eds.): *Fundamentals of aquatic toxicology, methods and applications*. Hemisphere Publishing Corporation (McGraw-Hill International Book Company), Washington, DC. pp. 416-454. 1985.

Would there be any effects to priority wildlife species from construction?

Visual or auditory disturbance could adversely affect the following state priority species: bald eagles (*Haliaeetus leucocephalus*), burrowing owls (*Athene cunicularia*), Yuma myotis (*Myotis evotis*), Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), northern leopard frog *(Rana pipiens*), western grebe (*Aechmophorus occidentalis*), great blue heron (*Ardea herodias*), and mink (*Mustela vison*).

Bald eagles, a state sensitive species and a federal species of concern, winter in the area of Parker Horn, which is where the Segment 1 crossing would be located and, to a lesser extent, bald eagles may winter in the area of Crab Creek, which is where the crossing for Alternative 1A would be located. Alternative 1A is approximately half a mile upstream from Parker Horn. Any construction activities within 400 feet of a winter roosting site during the wintering season between October 31 and March 31 could disturb bald eagles utilizing Parker Horn.[24] The associated stress and forced activity could result in reduced health and reduced foraging success for affected bald eagles.

Burrowing owls in the area of Segments 1, Alternative 1A, 2 and Alternative 2A could be disturbed by construction activities that occurred within 0.5 miles of their nesting sites between February 15 and September 25. Disturbance could cause owls to vacate the area, and reproductive success of individuals nesting within construction sites is significantly lower than individuals nesting nearby.[25]

Construction noise could cause Yuma myotis and Townsend's big-eared bats to vacate any roosts located near construction activities. Foraging would not likely be affected because bats are nocturnal and would forage at night when construction would not normally take place. If any nursery sites were present within the project area, they could be affected by construction activities from April 1 to September 15.[26]

Northern leopard frogs could be affected by temporary ground disturbance during construction activities for the bridge and in the wetland areas of Segments 1 and Alternative 1A. These activities could cause frogs present in the project area to vacate the area immediately surrounding construction. If the proposed construction activities took place during the winter hibernation season, any northern leopard frogs hibernating within aquatic habitats

[24] Watson, J.W. and E.A. Rodrick. Bald Eagle. In E. Larsen, J. M. Azerrad, N. Nordstrom (eds.): *Management Recommendations for Washington's Priority Species. Volume IV: Birds.* pp. 9-1 – 9-15. Washington Department of Fish and Wildlife, Olympia, WA. 2000.

[25] Nordstrom, N. 2003. *Burrowing Owl.* In E. Larsen, J. M. Azerrad, N. Nordstrom (eds.): Management Recommendations for Washington's Priority Species. Volume IV: Birds, pp. 23-1 – 23-6. Washington Department of Fish and Wildlife, Olympia, WA.

[26] Woodruff, K. and H. Ferguson. *Townsend's big-eared bat.* In E. Larsen, J. M. Azerrad, N. Nordstrom (eds.): Management Recommendations for Washington's Priority Species. Volume V: Mammals, pp. 1-13. Washington Department of Fish and Wildlife, Olympia, WA. 2005.

impacted by the proposed project would not vacate the area and could be killed or injured by fill placement or in-water work.

Construction noise could cause foraging grebes, herons, and mink to leave the area of disturbance. The proposed project area is not the only suitable foraging habitat for great blue heron in the area and is outside of the area of most intensive usage by breeding great blue herons. Any disturbance to great blue herons would likely cause them to seek other suitable foraging areas. Project construction could have similar effects to western grebes and other avian species that utilize the area for foraging. If the proposed construction activities took place during the nesting season for these species, the impacts to foraging habitat could result in reduced reproductive success, such as smaller clutches or nestlings not successfully fledging.

Because the proposed project would have the potential to disrupt or impact certain vegetation, habitat, and wildlife in the project area, SEA and WSDOT incorporated mitigation measures, including restrictions on when construction activities could take place, to minimize or avoid potentially adverse impacts to state priority species and their habitats (See Chapter Six).

Physical Effects

How would the Build Alternative permanently affect habitat?

In terrestrial habitats, the majority of habitat loss would occur in current or fallow agricultural fields or in areas of degraded former shrub-steppe habitat. These areas have limited value as habitat and their loss would not be significant.

Both Segment 1 and Alternative1A would cross aquatic habitat and adjacent moist site (riparian and wetland) vegetation, as listed in **Exhibit 5.2.** For both Segment 1 and Alternative 1A, the bridge itself would be located over water, and would cover aquatic habitat. Over-water and in-water structures, such as bridges, can degrade aquatic habitat by modifying flow hydraulics and sediment transport. Over-water structures can also have shading impacts, which can degrade aquatic habitats.

In Segment 1, the bridge over Parker Horn would be 16 feet wide and a total of 865 feet long, with 21 spans either 35 or 45 feet long. Of the 21 piers, 19 would be in the floodplain, with 14 of those in the water area of Parker Horn. Stormwater falling on the bridge would be collected within the bridge; it would not be allowed to run off the bridge and would not flow directly into Parker Horn.

Exhibit 5.2
Habitat Loss at Parker Horn or Crab Creek

Habitat Type	Segment 1	Alternative 1A
Moist Site Vegetation (wetland and riparian)	0.86 acre	0.52 acre
Aquatic Habitat (direct loss – fill)	0.57 acre	none
Aquatic Habitat (indirect loss – beneath bridge)	0.07 acre	0.04 acre
Overwater shading	0.08 acre or less	0.08 acre or less

Note: includes bridge and approaches

Alternative 1A was developed in part to reduce the impacts associated with the bridge length, the number of piers in the floodplain, and water and wetland impacts. In Alternative 1A, the bridge over Crab Creek would be 16 feet wide and a total of 475 feet long, with 11 total spans either 35 or 45 feet long. Ten piers would be in the floodplain, with four of those in the active channel of Crab Creek. As with the bridge in Segment 1, stormwater falling on the bridge in Alternative 1A would be collected within the bridge and conveyed to treatment facilities (ditches) on either side of Crab Creek.

Construction of the proposed crossing for Alternative 1A would impact a substantially smaller area than construction of the proposed crossing for Segment 1 because Crab Creek is less than half as wide as Parker Horn.

How would the Build Alternative permanently affect sensitive plants?

Piper's daisy is the only state sensitive plant that might grow in the vicinity of the study area, at the east end of Segment 1. None were found during field investigation by the project team in June 2007. Because the existing habitat is already heavily disturbed, it was determined that any loss of habitat for Piper's daisy as a result of the proposed project would not be significant.

How would the Build Alternative permanently affect priority fish?

Aquatic and riparian habitat loss would adversely impact priority fish species within the project area by removing areas used by priority fish and their prey species for foraging, rearing, or spawning. Additionally, the loss of heavily utilized walleye spawning habitat in Parker Horn would have an adverse impact on the local population of the species. Loss attributable to the project would be only a small part of the overall walleye spawning habitat in Parker Horn. Suitable habitat for foraging, spawning, and rearing would still be available and accessible within the proposed project vicinity, and the impact,

although adverse, would not be significant. Chapter Six includes a measure to restrict any in-water construction to avoid walleye spawning season.

How would the Build Alternative permanently affect sensitive wildlife?

Both Segment 1 and Alternative 1A would cause the loss of riparian, aquatic, and wet meadow habitat in the vicinity of Parker Horn or Crab Creek. Both Segment 1 and Alternative 1A would result in the loss of wet meadows just to the east, particularly Wetland A, which provides habitat to the northern leopard frog. Approximately 4.13 acres of Wetland A would be affected by direct and indirect effects resulting from the proposed project. Other wetlands along the project corridor are farther away from the Parker Horn and Crab Creek riparian and aquatic areas and would not provide the same type of riparian and aquatic habitat as Wetland A (See Wetlands section later in this chapter). Northern leopard frogs could reasonably be expected to use wet meadow habitat in either Segment 1 or Alternative 1A, and habitat loss could have an adverse effect on individuals in the project area. This would require mitigation for wetland effects (discussed in further detail in the Wetlands section and in Chapter Six).

Degradation of water quality could also adversely impact any northern leopard frogs present within Parker Horn or Crab Creek. This frog is identified as a highly aquatic species, and deterioration in water quality, especially as tied to urban runoff, has been identified as playing a major role in the decline of the species.[27] To prevent potential impacts to leopard frogs, the bridge for either of the alternatives would be designed to prevent fluid leakage and runoff from entering Parker Horn.

The Washington Department of Fish and Wildlife (WDFW) expressed concerns regarding the burrowing owl, and loss of habitat used by burrowing owls for foraging and nesting would occur due to the proposed project. The loss of habitat due to human activity is one of the major limiting factors for burrowing owls, and the direct loss of a burrow could have a substantial adverse impact on individuals in the project area.[28] Two such burrows in the study area, active during the WDFW's last survey,[29] are near the project right of way in Segment 1 and Alternative 1A and could be destroyed by project activities. Although owls were not seen near Segment 1 or Alternative 1A during field visits, an owl was observed within the study area for Segment 2 near the GCIA. The loss of any foraging habitat could also reduce the fitness and survival of burrowing owls in the area of Segment 1, Alternative 1A,

[27] Nordstrom, N. 1997. *Northern Leopard Frog*. In E. Larsen, J. M. Azerrad, N. Nordstrom (eds.): Management Recommendations for Washington's Priority Species. Volume III: Amphibians and Reptiles, pp. 5-1 to 5-10. Washington Department of Fish and Wildlife, Olympia, WA.

[28] Nordstrom, N. 2003. *Burrowing Owl.* In E. Larsen, J. M. Azerrad, N. Nordstrom (eds.): Management Recommendations for Washington's Priority Species. Volume IV: Birds, pp. 23-1 – 23-6. Washington Department of Fish and Wildlife, Olympia, WA.

[29] WDFW. 2007. *Priority Habitat and Species Maps and Polygon Reports for Townships T20R28E, T19R28E, and T19R29E.* August 24.

Segment 2, or Alternative 2A. Accordingly, to minimize or avoid potential impacts to nesting burrowing owls, SEA and WSDOT are recommending that any construction work within 0.5 miles of the nesting sites be restricted during the time period between February 15 and September 25. In addition, the Port could minimize disturbance to wildlife by restricting construction activities to the smallest area possible within the right of way (See Chapter Six).

Would the Build Alternative affect migration corridors, refuges, and/or sanctuaries in the study area?

Crab Creek connects Moses Lake with the Gloyd Seeps Wildlife Area, which is located approximately five miles to the north of Moses Lake. The Build Alternative would not have a direct effect on the Gloyd Seeps Wildlife Area. Nevertheless, the project would decrease the amount of habitat available and establish new disturbances to wildlife that use the project area for survival or as a migratory corridor between the Gloyd Seeps Wildlife Area and Moses Lake.

Operational Effects

Noise and visual disturbance impacts could occur during track maintenance and train operations. These impacts would be similar to the impacts associated with construction noise and disturbance. Some species could become somewhat accustomed to long-term disturbance impacts.

Wildlife could also be killed or injured if struck by a train. The risk of this is low because trains are expected to operate up to 25 miles per hour and trains would produce noticeable noise and vibration during their approach, allowing many animals to avoid the hazard.

Conclusion

The proposed project would not be expected to result in any adverse impacts to federally-listed threatened and endangered species or critical habitats. On August 28, 2008, SEA and WSDOT submitted a letter to the U.S. Fish and Wildlife Service requesting a concurrence with this determination.

The proposed project does have the potential to adversely affect several state priority species: bald eagles, burrowing owls, Yuma myotis, Townsend's big-eared bat, and northern leopard frog. However, through design measures and the implementation of mitigation measures recommended by SEA and WSDOT in Chapter Six, these impacts would be minimized or avoided.

Construction of the proposed crossing for Alternative 1A would impact a substantially smaller area than construction of the proposed crossing for Segment 1 because Crab Creek is less than half as wide as Parker Horn. Alternative 1A would therefore have fewer impacts on biological resources.

No Build Alternative

Under the No Build Alternative, there would be no rail line construction within the project area. Therefore, there would be no construction-related impacts to vegetation and wildlife habitats, wetlands, or special status species.

Impacts from current rail operations include existing visual and auditory disturbance to any wildlife in the vicinity, which could lead to periodic avoidance of the area by sensitive species. Wildlife could also be struck and killed by a train in operation, although this would be unlikely due to the slow speed (10 mph) of the trains operating on the existing tracks. Maintenance activities and the potential rehabilitation of the existing rail line (Segment 3) would not be expected to result in significant wildlife, plant, or habitat impacts.

Hazardous Materials

How would the Build Alternative affect hazardous materials sites or the transportation of hazardous materials?

The project team evaluated the proposed project, as well as known and potential hazardous materials sites in the project area, to determine if the Build Alternative would have any of the following effects:

- Increase in generation or release of hazardous waste.
- Increase in quantity of hazardous materials transported.
- Potential disturbance of existing hazardous materials sites.

Construction Effects

Segment 1 and Alternative 1A

The potential for the proposed construction of Segment 1 or Alternative1A to disturb existing hazardous materials sites was identified at Site 11 (see **Exhibit 4.5**) on the southwest corner of Broadway and Road 4 NE (Cherokee Road) (Grant County Parcel Number 170543000, owned by Bernard Cattle Company). The project proposes excavation in the general vicinity of this site that could be as deep as 12 feet (see **Exhibit 5.6**). Therefore, this site could pose a risk to construction workers on the project. SEA and WSDOT recommend additional investigation of the Bernard Cattle Company site, and coordination with the USEPA and Ecology (see Chapter Six).

Construction of Segment 1 (but not Alternative 1A) has the potential to affect one additional site: the Grant County Road District No. 2 facility (Site 5, **Exhibit 4.5**) located on the south side of Wheeler Road (Road 3 NE) (between RP 1 and RP 2). The project proposes excavation in the general vicinity of the Grant County Road District No. 2 facility of up to five feet deep (see **Exhibit 5.6**). This site could pose a risk to construction workers on the project.

Therefore, SEA and WSDOT recommend additional investigation of the Road District site and coordination with the USEPA and Ecology (see Chapter Six).

Segment 2 and Alternative 2A

Because the alignments for Segment 2 and Alternative 2A lie within the bounds of the Moses Lake Wellfield Superfund site, the potential exists for the proposed project to impact two hazardous materials sites identified along this segment. The two sites that pose a high risk to both Segment 2 and Alternative 2A are located along Randolph Road: the Randolph Road Base Dump (Site 14A, **Exhibit 4.5**), and the Paint Hangar Leach Pit (Site 14B, **Exhibit 4.5**). The project proposes excavation in the area of Site 14A as deep as six feet, and in the area of 14B of up to seven feet deep. Therefore, these sites could pose a risk to construction workers.

Coordination with the U.S. Environmental Protection Agency's (USEPA's) Superfund office is recommended for any construction activities to prevent interference with planned investigation or remedial activities. In addition, construction specifications for any areas located on the west side of Randolph Road where cuts are planned should include provisions for worker health and safety, along with sampling and appropriate disposal of potentially contaminated soils.

In the vicinity of the Boeing polychlorinated biphenyl cleanup area located on Tyndall Road close to the northern end of Segment 2 (Site 19, **Exhibit 4.5**), the project proposes excavation up to 8.5 feet deep. This site could pose a risk to construction workers. SEA and WSDOT recommend that coordination with USEPA and Ecology (see Chapter Six).

For Alternative 2A, the Grant County Public Utility District Diesel Generating Facility located on Tyndall Road NE (Site 16, **Exhibit 4.5**) and the County shooting range located east of Randolph Road that is used by law enforcement officers for firearms training (Site 18, **Exhibit 4.5**) could be disturbed by the project. Proposed excavation in the area around the Diesel Generating Facility is up to 11 feet deep, and in the area around the County shooting range could also be up to 11 feet deep. These hazardous materials sites could pose risks for construction workers. For both sites, implementation of the mitigation measures recommended in Chapter Six would minimize potential risks and adverse impacts associated with disturbing hazardous materials sites during construction.

Segment 3

No hazardous materials sites were identified in Segment 3.

Physical Effects

Effects related to existing hazardous materials sites would occur primarily from disturbance during the construction phase of the project and are discussed above. If the mitigation measures in Chapter Six are implemented, the proposed project would not have any long-term impacts related to existing hazardous materials sites.

Operational Effects

The commodities to be shipped on the proposed rail line would be determined in the future by market demand, but the applicant has indicated that commodities could include steel, manufactured parts, and specialty chemicals, such as trimethylamine. If hazardous materials or chemicals were shipped over the proposed line, it is possible that an accidental release could occur. According to statistics compiled by the U.S. Department of Transportation-Federal Railroad Administration (FRA) and analyzed by the Association of American Railroads, hazardous materials transported by railroad are much less likely to be involved in an accidental release than hazardous materials transported by truck. Analysis found that despite roughly equal amounts of ton-mileage (about 110 billion ton-miles in 2003), railroads had hazardous material incidents equal to about six percent of such incidents related to truck transport.[30]

The Port and the rail line operator would coordinate to put in place contingency plans in the event of a hazardous materials release related to emergencies, such as derailments and natural disasters. The plans would identify personnel who would respond to any incidents in the project area involving the actual or potential accidental release of hazardous materials. In addition, the plans would be circulated to police and firefighting service providers in Grant County. (See Chapter Six, Mitigation Measures).

Conclusion

Construction activities associated with implementation of the proposed project have the potential to impact known sites of contamination, and hazardous materials might be shipped over the line. However, implementation of mitigation measures, such as coordination with the USEPA and preparation of emergency response plans, would help avoid or minimize potential risks and adverse impacts associated with encountering or disturbing hazardous materials.

[30] U.S. Department of Transportation, Pipeline & Hazardous Materials Safety Administration. Hazardous Materials Incidents By Year & Mode, from http://hazmat.dot.gov/pubs/inc/data/10yearfrm.htm for 1995 through 2004. USDCO, 2002 Commodity Flow Survey (CFS), Table 1a for truck ton-mi. FHWA Highway Statistics.ICC/STB Waybill Sample for rail ton-miles. In 2003, trucks hauled an estimated 110 billion ton-miles of hazardous materials, while railroads also hauled an estimated 110 billion ton-miles of hazardous materials.

No Build Alternative

Under the No Build Alternative, no rail line construction would take place. Therefore, any existing hazardous materials sites would not be disturbed and impacts would not be anticipated.

Land Use

How would the Build Alternative affect land uses?

Typically, land use impacts due to the construction of any rail line result from land acquisition for the right of way. In addition, impacts may occur to properties adjacent to the right of way due to such things as restriction of land access.

The Build Alternative would result in the following direct effects to existing land uses: acquisition of land to accommodate the proposed improvements to the rail corridor; relocation of a commercial property; changes in existing land uses; and extension, realignment, and reconstruction of small segments of area roadways.

The project team considered the following criteria to assess the Build Alternative's potential to impact land uses:

- Interference with the normal functioning of adjacent land uses.
- Consistency and/or compatibility with local land use plans and policies.
- Permanent loss of any farmland of prime, unique, or state or local significance.

Construction Effects

Impacts to land use as a result of the proposed construction activities would be expected to be minimal and involve the temporary use of land for such activities as construction easements. In addition, there might be temporary inconveniences to adjacent land uses from dust, noise, or construction traffic. The proposed construction activities would be consistent with current land use plans and policies for the study area. Although some of these activities might impact lands currently being used for agricultural purposes, there are no lands zoned for agricultural use in the study area.

Physical Effects

What physical effects would the Build Alternative have on existing land uses?

The project would be located within three miles of the GCIA and the Moses Lake Municipal Airport. The project would not construct any structures that would be taller than existing buildings in the airport area, and would not

interfere with airport operations. The Federal Aviation Administration requires notification of proposed construction to ensure that any construction not adversely affect airport operations.

Right of way would need to be acquired for the portions of the rail line where new track construction is proposed (Segment 1, Alternative 1A, Segment 2, and Alternative 2A). Accordingly, the Build Alternative would have permanent physical impacts on existing land uses along any of those segments, since acquisition of the right of way would require the permanent use and conversion of land. The Port also plans to acquire Segment 3 from CBRW; however, there would be no change to land use on that segment. For all segments, the rail line would be located within a 100-foot-wide right of way, with one exception at the west end of Segment 1, where the ground is steeper and the right of way would need to be widened to 120 feet so all grading could be contained within the right of way.[31]

Properties that would be converted from their current use as the result of acquisitions along the proposed line include agricultural, retail trade/general merchandise, residential, aircraft transportation, government services, and undeveloped/unused property. Details of these conversions are discussed below. Land acquisitions would change the use of the lands acquired and might affect how the property owners used remaining portions of the parcels or adjoining properties. No residences would be acquired by the proposed project. The conversion of land uses of any acquired properties would be consistent with current land use plans and policies for the study area.

How much land would be needed for the Build Alternative?

As stated above, land would need to be acquired for the portions of the rail line where new track construction is proposed (Segment 1, Alternative 1A, Segment 2, and Alternative 2A).. Because Segment 1 and Alternative 1A are the same length, the total acreage required would be the same for that portion of the project. Because Segment 2 is approximately 0.4 mile shorter than Alternative 2A, the total acreage required for Alternative 2A would be greater than for Segment 2. As stated above, the Port plans to acquire Segment 3 from CBRW. The estimate of acquisitions required for the proposed project was based on a review of parcel information, geographic information system data, aerial photos, and the alignment of the proposed rail line.

Exhibit 5.3 provides a summary of parcels that would be affected by right of way acquisition. Segment 1 would be expected to require the acquisition, in total or in part, of 21 separate tax lots, for a total acquisition of approximately 55 acres. Alternative 1A, if selected, would be expected to require the acquisition, in total or in part, of 19 separate tax lots, for a total acquisition of

[31] For analytical purposes, the project area for land use impacts was identified as the proposed right of way.

approximately 55 acres. Several property owners own multiple tax lots in the affected area.

Segment 2 would be expected to require the acquisition, in total or in part, of 17 separate tax lots, for a total acquisition of approximately 38 acres. Alternative 2A, if selected, would be expected to require the acquisition, in total or in part, of 18 separate tax lots, for a total acquisition of approximately 45 acres. Several property owners own multiple tax lots in the affected area.

Exhibit 5.3
Summary of Parcels Affected by Right of Way Acquisition

Alternative	Number of Parcels Affected	Approx. Acres Acquired
Segment 1	21	55
Alternative 1A	19	55
Segment 2	17	38
Alternative 2A	18	45

Would any businesses or residences need to be relocated?

Relocation along Segment 1 would be projected for one commercial enterprise, which is a small cattle operation called Cows R Us. Accessory structures such as storage trailers and sheds on four other properties[32] along Segment 1 would also likely be displaced. No relocations would be projected along Segments 2 or 3. As stated above, no residences would be affected by land acquisition.

Where land acquisition would cause the relocation of business activities on the properties, the extent of this impact would be considered in the relocation services and payments made under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601 et seq).

Would the project affect any farmland of prime, unique, or state or local significance?

No farmland of prime, unique, or state or local significance is found in the study area. The Natural Resources Conservation Service concurred with this determination on August 20, 2008. (See Appendix A.)

In addition, there is no land zoned for agricultural use in the study area. As discussed in more detail below, conversion of land used for agricultural purposes to other uses is anticipated by the City of Moses Lake and Grant

[32] Potentially affected accessory structures are located on Grant County Parcel numbers 190479000, 190481000, 170543000, and 170543000.

County regardless of whether this proposed project is approved and implemented.

Is the Build Alternative in conformance with land use plans and policies of the City of Moses Lake and Grant County?

The purpose of the Build Alternative is to promote economic development in the Moses Lake area by attracting new rail-dependent businesses to those areas designated for industrial development. Such development could result in changes to existing land uses in the study area. For example, land currently used for agricultural purposes could change to industrial uses. Much of the land in the study area is currently used for growing crops; however, most of the land in the project area is zoned for industrial uses. Increased development of industrial uses in the study area would be consistent with City and County land use plans and policies.[33, 34]

The Build Alternative would involve some in-water work and potential impacts to shorelines along Parker Horn for Segment 1 or Crab Creek for Alternative 1A. Both crossings would be designed to comply with the City of Moses Lake Shorelines Management Master Plan, as well as state and federal regulations and/or permitting requirements.

Operational Effects

The proposed rail operations would not conflict with existing land uses in the study area. The proposed project would provide rail service to land zoned for industrial uses along Segments 1 and 2 (or Alternative 2A), which is consistent with City and County land use plans and policies. Alternative 1A is an alternate bridge crossing and would not change the location of the majority of Segment 1 with respect to zoning.

The existing track at the southeast end of Segment 3 passes between Longview Elementary School, which is located to the north of the track, and the Longview neighborhood, which is located to the south of the track (near RP 5). The Longview neighborhood is located within the Moses Lake city limits and is zoned for Single and Multi-Family Residential uses. The portion of the existing track passing between the residential area and the school poses a safety concern, in part because train speeds on the rail line would increase from 10 mph to 25 mph. Accordingly, the railroad safety program, Operation Lifesaver, would be used to educate the community, specifically students at Longview Elementary School, about railroad safety issues. Mitigation measures to address safety concerns are discussed in Chapter Six, Mitigation Measures.

[33] City of Moses Lake. 2002. *Moses Lake Comprehensive Plan 2002 Amendment*.
[34] Grant County. 2006. Grant County Municipal Code Title 23 Zoning (current ordinance December 2006). Accessed October 30, 2007. http://municipalcodes.lexisnexis.com/codes/grantco/.

Conclusion

Although there are lands in the project area that are currently used for agricultural purposes, the land is primarily zoned for industrial use and the proposed project would be consistent with existing land use plans and policies.

The proposed project would result in the permanent conversion of 93 to 100 acres of land, depending on the alternative selected. This includes approximately 55 acres for Segment 1 (or Alternative 1A), plus approximately 38 acres for Segment 2 or 45 acres for Alternative 2A. In the event that the proposed project was approved, land acquisition for Segment 1 would cause the relocation of one commercial enterprise, a small cattle operation called Cows R Us. However, no residences would be affected by land acquisition. Where relocations would be necessary, appropriate mitigation would be offered in accordance with federal law, thereby ensuring that there would not be any significant impacts to land use.

No Build Alternative

The No Build Alternative would not include rail line construction and would not require the use of any public or private property. Accordingly, there would be no land acquisitions or relocations as a result of the No Build Alternative, and there would be no impact to existing land use.

Without the proposed project, the areas that are designated for industrial development along Wheeler Road (Road 3 NE) and next to the GCIA would not be served by rail. Industries that require rail access to be profitable would not be likely to locate in these designated areas, although it would be possible for the land to be developed with industries that use trucks to transport products or materials.

Noise and Vibration

How would the Build Alternative affect noise levels?

The noise analysis for the proposed project followed the STB's noise impact criteria[35] for assessing the potential for adverse environmental noise effects. A description of the key acoustical terms used to describe noise effects is provided in **Exhibit 5.4**.

The STB applies a threshold level of rail traffic increase for determining whether to quantify noise that would be generated by rail traffic over a new rail line proposed for construction. The STB regulations state that for projects where an increase in rail traffic of eight trains per day or an increase in rail traffic of at least 100 percent (measured in average annual gross ton-miles)

[35] 49 CFR 1105.7(e)(6).

would occur, the project should be evaluated to determine whether it would result in the following conditions:

- An incremental increase in noise levels of 3 A-weighted decibels (dBA) or more in community noise exposure as measured by the Day-Night Sound Level (Ldn).

- An increase to an overall noise level of 65 dBA Ldn or greater.

If the estimated noise increase at a location exceeds these criteria, the number of affected noise-sensitive receptors (i.e., schools, libraries, hospitals, residences, retirement communities, and nursing homes) should be identified and the noise increase for these receptors should be quantified.

Exhibit 5.4
Key Acoustical Terms

Term	Description / Meaning
A-Weighted Level (dBA)	Environmental noise is almost always characterized using the A-weighted sound level in decibels. The weighting is intended to approximate the response of the human ear to sound. Sound amplitude is expressed in decibels, which is a logarithmic scale that compresses the wide range of pressure amplitudes that humans can hear to a more manageable range.
Energy Equivalent Level (Leq)	Leq is a method of characterizing fluctuating sounds over a period of time. It represents a constant sound that has the same energy as the fluctuating sound.
Day-Night Average Level (Ldn or DNL)	Ldn is basically an Leq over a 24-hour period with an adjustment added to sounds between 10 PM and 7 AM to account for people being more sensitive to nighttime noise.

Under the Build Alternative, an increase of two trains per day (one round trip) is projected. The current traffic on Segment 3, an existing line, is approximately two trains per month (one round trip). Accordingly, if the proposed project is authorized, Segment 3 would experience an increase of greater than 100 percent, and is therefore subject to the STB regulations. The STB regulations also state that for a project where a new line is constructed, only the eight trains per day provision would apply. Since Segments 1 and 2 would consist of new construction, no noise analyses of those segments would be required for this project with respect to the STB's thresholds for noise impact assessment. However, SEA applies this threshold with flexibility, finding it a useful guide in a preliminary assessment of the need for more detailed analysis. When circumstances warrant, SEA will examine noise impacts of a proposed rail line construction even though proposed traffic levels do not exceed the threshold noted here. Because of the public interest in this proposed project, a noise analysis was performed for all three segments.

Construction Effects

The proposed construction would require use of equipment such as bulldozers, front-end loaders, dump trucks, generators, and compressors. As for any infrastructure project, noise from construction of the proposed project could affect residents of the communities near the construction sites. To minimize noise, the Port or its contractor would be required to do the following: (1) install manufacturer-recommended mufflers on all diesel-powered equipment used on the project, and (2) keep all equipment in good operating condition (See Chapter Six).

The City of Moses Lake Municipal Code addresses noise issues in Chapter 8.28 – Noise Control. According to Section 8.28.050B of the code, construction noise is considered exempt from the provisions of the chapter. The only specific limits placed on construction noise are that construction should not occur between 10 PM and 7 AM without prior approval by the City Council.

The STB noise criteria do not include specific criteria for assessing potential impacts from construction noise. However, the FRA and the Federal Transit Administration (FTA) do provide the guidelines shown in **Exhibit 5.5**. The guidelines are based on an average Leq over a typical eight-hour work day.

Exhibit 5.5
FRA / FTA General Assessment Construction Noise Guidelines[36]

Land Use	Noise Limit, 8-Hour Leq (dBA)	
	Daytime	Nighttime
Residential	80	70
Commercial	85	85
Industrial	90	90

Construction noise levels depend on the number of and type of equipment, the general condition of the equipment, the amount of time each piece of equipment operates per day, the presence of any noise-attenuating features (such as walls and berms), and the location of the construction activities relative to the sensitive receptors. The proposed project would be constructed in stages, but more than one stage might be under construction concurrently. Because construction activities would be located in one area for a limited period of time, extended noise impacts would be expected only if staging areas

[36] U.S. Department of Transportation, Federal Transit Administration. *Transit Noise and Vibration Impact Assessment, FTA report FTAVA-90-1003-06.* May 2006.

and access points to the project area were in close proximity to residential properties.

Physical Effects

As discussed below, the only physical effects from noise would be related to the proposed increase in train operations in the project area.

Operational Effects

Potential noise impacts associated with the operations of the Build Alternative were determined from application of FRA/FTA noise criteria shown above in **Exhibit 5.5**. The project team used the following assumptions in the noise analysis:

- Two trains per day (one round trip), seven days a week;
- Average train speed of 25 mph; and
- A train length of one locomotive and a maximum of ten railcars.

Noise generated by train operations along the Build Alternative would include crossing warnings (horns or audible signals), locomotive noise, wheel/rail rolling noise, wheel/rail impact noise, and wheel squealing. The noise assessment evaluated the noise from all of these sources and determined that noise would be greater than the STB's criteria of 65 dBA only within 20 feet of the tracks and within 750 linear feet of grade crossings. This area is entirely within the right of way for the proposed project.

Based on the land use information and mapping, there are no residences or other sensitive receptors located within the noise impact area (within 20 feet of the tracks) for any of the project segments. The Longview Elementary School and the Longview neighborhood are both located near the right of way along Segment 3, and they currently experience train noise from the existing rail operations. However, the school is approximately 190 feet away from the existing tracks and residences in the Longview neighborhood are at least 45 feet away from the existing tracks. Residences in the Millerville neighborhood, near Segment 1, would be at least 210 feet away from the tracks. Since no residences or sensitive receptors would experience noise levels that exceeded 65 dBA, according to the STB criteria, the 3-dBA incremental increase threshold would not be applicable. Therefore, rail operations under the Build Alternative would not have the potential to cause significant adverse noise impacts.

What vibration impacts would result from the Build Alternative?

Ground-borne vibration is generated by the interaction of steel wheels rolling on steel rails. Ground-borne vibration is strongly influenced by a number of

factors including local geology, tie spacing, track fastening system, vehicle dynamics, and condition of the wheels and rails. The project team evaluated vibration impacts following the FTA/FRA General Vibration Assessment procedures.[37, 38] For this analysis, the vibration assessment used the generalized vibration formula per the FTA/FRA procedures, but adjusted it for a train speed of 25 mph, the maximum expected train speed in the project area.

The applicable FRA impact threshold for residences is 80 vibration decibels (VdB), which would occur at a distance of 40 feet from the track for a 25-mph locomotive-powered freight train. The threshold for institutional land uses (such as schools) is 83 VdB, which would occur at a distance of less than 30 feet from the track. For both residential and institutional land uses, the limit of significant vibration would be within the right of way. As stated above, the closest sensitive receptors to the project corridor are located along Segment 3 (the Longview neighborhood and the Longview Elementary School), but in all cases, these residences and the school are located outside the 40-foot impact area.

Conclusion

The closest sensitive receptors to the proposed project corridor are the Longview neighborhood and the Longview Elementary School, which are located near the existing line (Segment 3). For both noise and vibration, the closest sensitive receptor in the Longview neighborhood is at least 45 feet from the proposed track and would therefore be outside the area of impact. Accordingly, SEA and WSDOT determined that there would not be any significant adverse noise or vibration impacts from operation of the proposed project. Potential adverse impacts from construction noise would be mitigated by measures described in Chapter Six.

No Build Alternative

Under the No Build Alternative, there would be no new rail line construction and there would be no change in the existing noise and vibration conditions. If the existing line (Segment 3) was rehabilitated at some point in the future, the current volume of trains could increase and the noise and vibration associated with train operations could increase.

[37] U.S. Department of Transportation, Federal Transit Administration. *Transit Noise and Vibration Impact Assessment, FTA report FTAVA-90-1003-06*. May 2006.
[38] U.S. Department of Transportation, Federal Railroad Administration. *High-Speed Ground Transportation Noise and Vibration Impact Assessment, Final Report*. October 2005.

Social Elements and Environmental Justice

How would the Build Alternative affect social characteristics of the community?

Potential project impacts were identified by evaluating how the local community, including minority and low-income populations, would be affected by the proposed construction activities, changes to the physical environment, and proposed operations.

Because there are no recreational facilities within 500 feet of the proposed project, there would be no recreational impacts and a Section 4(f) analysis would not be required.[39] In addition, there would be no impacts to public services because the proposed project would not prevent or adversely alter the community's access to emergency services, education, or medical care.

There are no residences within 200 feet of the proposed project along Segment 1, Alternative 1A, Segment 2, or Alternative 2A. In Segment 3, the Longview neighborhood is located immediately south of the existing track (the closest residence is 45 feet from the track) and the Longview Elementary School is located approximately 190 feet north of the track. Potential impacts to the community, including minority and low-income populations, in the area of Segment 3 are discussed below.

Construction Effects

During the proposed construction, the Build Alternative would have temporary impacts on neighborhoods and businesses adjacent to the railroad corridor. There would be short-term construction impacts at the roadways on both sides of the railroad crossings from construction traffic and crossing improvements. Roadways that cross the track could be temporarily or partially closed during track construction. Although closures would likely occur overnight or on weekends to minimize impacts on traffic, these impacts could temporarily affect local traffic circulation and access to neighborhoods and businesses, as well as create noise and dust.

Construction traffic might increase delays along existing roadways. Construction trucks and equipment are much larger than regular vehicles, require a longer distance to accelerate and decelerate, and would be more likely to block regular traffic and sight distance.

Temporary positive economic impacts might occur in the project area during the proposed construction phase. The proposed project would provide temporary employment opportunities and local merchants could experience a

[39] Section 4(f) is a federal transportation policy enacted by the Department of Transportation Act of 1966 to preserve the integrity of publicly owned public parks and recreation areas, waterfowl and wildlife refuges, and historic sites considered to have national, state or local significance.

temporary increase in sales with the increase of construction workers in the area. Construction activities associated with the proposed project would not result in a permanent increase in population within the local community. If construction workers were drawn from outside the local area, they would likely commute from areas around the region or stay in local hotels. Population would not be affected on a regional scale.

Physical Effects

How would the Build Alternative affect the neighborhoods in the study area?

Effects to neighborhoods in the study area would not occur along Segments 1, Alternative 1A, Segment 2, or Alternative 2A because the proposed project would not divide or separate any community or population groups and there are no residences within 200 feet of the above-listed segments. In addition, the proposed physical changes would not affect access to neighborhoods or public services and would not separate residential areas from retail, service, or employment centers.

Along Segment 3, the existing rail line serves as a physical barrier between the Longview neighborhood and Longview Elementary School. Refurbishing this existing line and increasing train traffic from two trains per month (one round trip) to two trains per day (one round trip) might increase the feeling of separation between the residences and the school. The extent of this impact would be limited because the rail line already exists in this location, and because the proposed project would increase train traffic by a maximum of two trains per day (one round trip) for the foreseeable future.

How would the project comply with Executive Order 12898 on environmental justice?

The project team analyzed the potential effects of the proposed project on low-income and minority populations in accordance with the procedures established in Executive Order 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.* The analysis was conducted for the following reasons: (1) to determine whether low-income or minority populations were present in the project corridor, and (2) if such a community was present, to determine whether the project would have disproportionately high and adverse human or environmental effects on the citizens of that community.

According to 2000 Census block group data, low-income and minority populations are found in the census groups in the eastern portion of Segment 3 and the whole of Segment 2 and Alternative 2A. Along Segment 2 and Alternative 2A, there are very few residences in the vicinity of the proposed line, and none within 500 feet of the right of way. Along Segment 3, however,

minority and low-income populations are present in the Longview neighborhood between RP 5 and RP 6.

The Longview neighborhood is situated immediately adjacent to the existing rail line along Segment 3, and residences in that neighborhood are at least 45 feet away from the existing tracks. The proposed project would not involve the construction of additional lines, widen the right of way, or require any land acquisition along Segment 3. Although train traffic would increase from current levels, the increase would depend on the addition of new customers and would be likely to happen gradually. Due to the fact that the rail line already exists in this location and because train traffic would increase by a maximum of two trains per day (one round trip) for the foreseeable future, SEA and WSDOT determined that the impact to the Longview neighborhood would be negligible.

To ensure meaningful community representation and participation, a Public Involvement Plan was developed to meet specific public and project needs, incorporating the Hispanic population and Limited English Proficiency requirements under Presidential Executive Order 13166. The following outreach activities were conducted to be responsive to the Spanish-speaking residents: (a) a bilingual fact sheet was distributed that announced the proposed project and invited people to the Public Open House that was held on July 19, 2007; (b) 17 announcements were aired on the La Nueva radio station (a popular Spanish-language radio station in the study area); and (c) a certified Spanish language interpreter was available during the Public Open House.

Air quality impacts associated with the proposed project would be adverse, but not high, and would not disproportionately affect the low-income and minority populations in the study area, including the Longview neighborhood and Longview Elementary School.

Relocation along Segment 1 is projected for one commercial enterprise, and no residential dwellings would be needed for right of way acquisition. Since minority and low-income populations are not present along Segment 1 at greater than regional averages, impacts associated with the relocation of one business along Segment 1 would not be disproportionately high and adverse to environmental justice populations.

Operational Effects

How would the project affect safety?

Under the Build Alternative, the projections of increased train traffic and vehicular traffic, combined with new at-grade crossings, would increase train exposure for both vehicles and pedestrians. Therefore, the proposed design includes upgrading the existing crossing gate structures and signs in Segment 3 to help provide better advance warnings of approaching trains for pedestrians and drivers.

Public concerns about the safety of students who attend Longview Elementary School, which is located adjacent to Segment 3 (the existing line), were raised during the July 2007 Public Open House and the October 2007 presentations to the Port of Moses Lake and the Moses Lake City Council. The increased train traffic would result in safety concerns for children in the Longview neighborhood who must cross the tracks to access Longview Elementary School. Accordingly, the railroad safety program Operation Lifesaver, would be used to educate the community, specifically students at Longview Elementary School, about railroad safety issues. Mitigation measures to address safety concerns are discussed in Chapter Six, Mitigation Measures.

What socioeconomic impacts would be anticipated in connection with the rail operations?

Positive economic impacts would be anticipated in connection with the Build Alternative and increased rail operations. Maintenance and operation of the rail line would provide employment opportunities and the rail line would provide the opportunity for additional businesses to locate along the line, with potential to create more employment opportunities in Grant County.

Conclusion

Although construction of the Build Alternative would disrupt traffic flow at the road crossings, these effects would be temporary and would not significantly impact the local communities. In addition, the proposed project would require the relocation of one business that is located in Segment 1; however, no residences would be acquired. The proposed project would provide the opportunity for additional businesses to locate along the line, with potential to create more employment opportunities in Grant County.

The Longview neighborhood, which includes minority and low-income populations, is located near Segment 3. This rail segment already exists and the proposed project would not involve the construction of additional lines, widen the right of way, or require any land acquisition along Segment 3. Train traffic is expected to increase by a maximum of two trains per day (one round trip) for the foreseeable future, and the increase would depend on the addition of new customers and would likely happen gradually. Accordingly, SEA and WSDOT determined that the impact to the Longview neighborhood would be negligible. The proximity of Longview Elementary School to the existing rail line (Segment 3) is a safety concern, but SEA and WSDOT have developed mitigation measures to address safety concerns.

For the reasons stated above, SEA and WSDOT have determined that the Build Alternative would have no significant adverse socioeconomic or community impacts. In addition, the Build Alternative would have no disproportionately high or adverse (temporary or permanent) impact on minority or low-income communities.

No Build Alternative

Under the No Build Alternative, the existing social environment would not be altered and the local community, including minority and low-income populations, would not be affected.

Soils and Geology

How would the Build Alternative affect soils and geology in the study area?

The project team examined the potential for the Build Alternative to impact topography, soils, and geology within the project area. The Build Alternative would involve earthwork in Segment 1 (or Alternative 1A) and Segment 2 (or Alternative 2A) to allow for the construction of track with the necessary grade.

No grading would be needed for the refurbishment of the existing line in Segment 3.

Construction Effects

Construction activities for the project would include the following:

- Clearing and grubbing the existing ground of vegetation where new fill would be placed.
- Cutting into the existing ground surface to accommodate track grades.
- Excavating ditches and installing culverts to allow for drainage of surface water and near-surface groundwater.
- Placing fill for new embankments and widening existing embankments.
- Hauling away and stockpiling, or disposing of, excavated material.
- Driving piles for bridge supports at Parker Horn (for Segment 1) or Crab Creek (for Alternative1A).

The construction activities for the proposed project would result in short-term soils and geology-related impacts to the study area.

Erosion and Sediment Control

In areas of proposed new construction, soil beneath proposed fills and structures would be cleared and grubbed of all vegetation and debris, and stripped of all organic topsoil. No grading work would be required for the proposed rehabilitation of Segment 3.

The coarse, granular nature of the dominant soil types along the proposed project indicates that the likelihood of erosion problems is small, because most surface water would infiltrate quickly and the coarse sediment is resistant to

movement. However, soils exposed in slope excavations or fills might be susceptible to erosion locally until vegetation was established.

Fine-grained deposits, such as those found near the ground surface along Segment 1 (or Alternative 1A), are susceptible to wind erosion when disturbed. In addition, the surface water flow across exposed soil could remove sediment and deposit it in areas farther down the slope.

Any areas that were disturbed during the proposed construction would be subject to increased erosion if proper erosion control measures were not implemented. The amount of erosion and sedimentation would depend on soil type, the amount of soil exposed and disturbed, weather conditions, groundwater conditions, and the erosion control measures implemented. The eroded soils could be carried into stormwater drains, existing culverts, adjacent streets, or adjacent properties. During construction, the tires of construction vehicles could also carry soil onto roadways when leaving construction areas, which could then be carried into ditches or stormwater drains.

Cuts into Existing Slopes

Construction of a low-gradient rail bed would require cuts to construct embankments and drainage ditches, and to install culverts. During construction, soils exposed in cut slopes might be susceptible to erosion until vegetation was established. Cuts for track construction and culvert installation could result in shallow landslides and sloughing, specifically along Segment 1 (or Alternative 1A), where cuts as deep as 20 feet high into gravel would be expected and where relatively shallow groundwater might exist.

The heights of anticipated cuts into slopes would vary along the proposed project. Proposed cut slopes along much of Segment 1 would generally be between two and seven feet high, but could be 18 to 20 feet high between RP 2.2 and RP 3.0. Segment 2 cut slopes would typically range between three and eight feet, but would be as high as 11 feet along Alternative 2A. The higher the cut slope, the more susceptible the slope is to failure and the greater is the potential impact. No grading work would be required for the refurbishment of the existing line in Segment 3. Proposed cut heights are summarized in **Exhibit 5.6**.

Fill Embankments

Generally, the proposed project is underlain by sand and gravel; however, soft or weak foundation soils might be present in localized areas, chiefly the Parker Horn or Crab Creek crossing. The heights of anticipated fill slopes would vary along the proposed project. Proposed fill slopes along Segment 1 are typically between about two and 14 feet high, but are as much as 20 feet at the east end of the segment. At the bridge crossing, Segment 1 proposes fill slopes to a maximum of 13 feet at the west end of the bridge over Parker Horn, while

Alternative 1A proposes a maximum of 25 feet in the vicinity of the bridge over Crab Creek.

Exhibit 5.6
Summary of Proposed Cut-and-Fill Heights

Segment Number	Approximate Reference Point (RP)	Height in Feet	
		Cut	Fill
1	0.0 - 1.2	Typically < 5 feet	Typically 3.5 to 14 feet
			Maximum 20 feet
	1.2 - 2.2	Typically 2 to 5 feet	Typically 1 to 5.5 feet
			Maximum 10 feet
	2.2 - 3.0	Typically 3 to 20 feet	None
		Maximum 20 feet	
	3.0 - 4.3 (includes bridge)	Typically 7 to 10 feet	Typically 2 to 4 feet
		Maximum 12.5 feet	Maximum 13 feet at west end of bridge
1A	3.8 - 3.9	Typically 6 to 7 feet	Typically 6 to 7 feet
			Maximum 12 feet
	3.9 - 4.2 (includes bridge)	Typically 5 to 6 feet	Typically 10 to 22 feet
		Maximum 7 feet	Maximum 25 feet
	4.2 - 4.7	Typically 3-10 feet	Typically 5 to 6 feet
		Maximum 11 feet	Maximum 17 feet
2	7.6 - 8.5	Typically 3.5 to 6 feet	Typically 3 to 11 feet
		Maximum 6 feet	Maximum 14 feet
	8.5 - 9.3	Typically 3 to 5 feet	Typically 2 to 3 feet
		Maximum 6 feet	Maximum 8 feet
	9.3 - 10.2	Typically 6 to 7 feet	Typically 5 to 8 feet
		Maximum 7 feet	Maximum 11 feet
	10.2 - 10.7	Typically 3 to 8.5 feet	Typically 2.5 to 6 feet
		Maximum 8.5 feet	Maximum 10 feet
2A	9.6 - 10.4	Typically 4.5 to 10 feet	Typically 3 to 15.5 feet
		Maximum 11 feet	Maximum 19 feet
	10.4 - 11.1	Typically 4.5 to 7 feet	None
		Maximum 7 feet	

Segment 2 fill slopes would typically range between two and 11 feet but would be as much as 19 feet high along Alternative 2A. Although the sand and gravel subgrade[40] soils present along nearly the entire proposed project route

[40] Subgrade is the prepared earth surface on which a pavement or the ballast of a railroad track is placed.

are not densely packed, settlement of these soils would occur rapidly and would have little impact on train operations. Fill embankments constructed over localized areas of soft, compressible soil could experience settlement. Although unlikely, instability and long-term settlement could occur and interrupt train service (either requiring repair of failed embankments, or repeated rebuilding of the track structure where settlement was ongoing).

The sand and gravel deposits that dominate along the proposed project are likely to be suitable for use as fill during construction, unless they locally contain a relatively high percentage of silt, clay, or organic material.

Cold/Wet Weather Work

Because the Moses Lake area incurs freezing weather for three to four months each year, with an average frost penetration of about 18 inches, earthwork could be impacted if subgrade soils or embankment fill layers became frozen. Construction could be delayed, or fill material could be wasted because fill cannot be placed over frozen soil.

Although Moses Lake has a relatively dry climate, thunderstorms or frontal cells can produce significant precipitation volumes. If silt or clay soils were used as embankment fill, the wetting of those soils could cause them to become unsuitable for placement and compaction without time-delaying drying and reworking.

Drainage in Construction Areas

During construction, poor drainage practices could result in drainage of surface water into foundation subgrades or onto slopes, resulting in landslides, erosion, or other adverse impacts to adjacent properties. Throughout most of the study area, surface water would be likely to infiltrate into the permeable soils with little runoff. Areas of the proposed project most prone to impacts from poor drainage practices are located along Segment 1, between RP 2.9 and RP 4.3, where groundwater is shallow and the surface soils are fine grained and often saturated with water.

Areas disturbed during the proposed construction would be subject to increased erosion and soil impacts. Accordingly, erosion control measures and mitigation, such as revegetating the project area with native grasses, are included in Chapter Six.

Physical Effects

The cut-and-fill slopes described above would remain following the completion of construction activities, and therefore would be considered permanent physical effects. However, once cut-and-fill slopes were completed and stabilized as described in Chapter Six, there would be no adverse physical effects.

If an earthquake occurred during the life of the proposed project, the stability of bridges and culverts, cut slopes, and fill embankments could be affected. The Build Alternative would generally be underlain by sandy gravel and gravelly sand, which are not typically subject to liquefaction[41] during earthquakes.

Operational Effects

There would be no operational effects to soils and geology.

Conclusion

For most of the area that would be disturbed, the erosion potential is relatively low. However, soils exposed in slope excavations or fills could be susceptible to local erosion until vegetation was established. With the implementation of the mitigation measures described in Chapter Six for areas that would be disturbed during the proposed construction activities, there would be no significant impacts.

No Build Alternative

Under the No Build Alternative, no rail line construction would take place and there would be no geologic or soil impacts. While rehabilitation of the existing line (Segment 3) is possible, it would not be expected to result in significant geologic or soil impacts.

Traffic and Transportation

How would the Build Alternative affect traffic?

The project team evaluated the effects of the proposed construction and operation of the Build Alternative on rail, roadway, and pedestrian traffic, as well as traffic delays and safety conditions at the proposed at-grade crossings.

Construction Effects

Construction duration would be approximately 12 months for Segment 1 and eight months for Segment 2. Track rehabilitation would require approximately six months for the existing rail in Segment 3. The time periods for the proposed construction and rehabilitation activities could and likely would overlap.

Existing freight service would be affected only during the proposed refurbishment of Segment 3 and while upgrading the existing road crossings along Segment 3. Trains would need to slow when passing through any construction zones, but it is unlikely that the service would need to be

[41] Liquefaction is a phenomenon in which the strength and stiffness of soil is reduced by earthquake shaking. Liquefaction commonly occurs in loose soils that are saturated with water.

disrupted completely because the volume of freight traffic on the existing line is low.

The proposed rehabilitation of Segment 3 would result in short-term impacts to vehicular traffic, particularly during any work on the existing road crossings, and roadways that cross the existing track could be temporarily closed during track rehabilitation. Construction of the new rail line segments at road crossings might result in temporary road closures on minor roads. On major roads, such as Wheeler Road, the road would remain open, but some lanes might be closed during construction activities. A typical track construction vehicle list was assumed to be the following: trucks, skid steer loaders, front-end loaders, air compressors, a spiker, a ballast regulator, and tampers.

Construction equipment would access the proposed project using public roads, as well as an access road that would be constructed alongside the proposed rail bed within the right of way. Construction vehicles and equipment would travel primarily along this access road with minimal use of public roadways. Use of public roads would be primarily to move equipment and materials to and from the work area. Because of the relatively low number of construction vehicles that would be on the roads in the project vicinity at any time and the short duration of their use on the roadway, the impact to local traffic would not be significant. Nevertheless, traffic mitigation measures are included in Chapter Six.

Physical Effects

How would the road network change in the study area?

The roadway network would not change within the study area, but the intersections on both sides of the railroad crossing would receive minor improvements. These road improvements would occur at the seven new crossings in Segments 1 and 2. These crossings would be located in the common part of each segment and would therefore be required regardless of which alternative was selected:

Road L NE	Turner Road NE
Wheeler Road (Road 3 NE)	Graham Road NE
Road K NE	Tyndall Road NE
Randolph Road	

Along Segment 3, existing gates and signals at Stratford Road (RP 4.8) and Loring Drive (RP 6.1) would be upgraded and modified to allow for the proposed 25-mph train traffic. To ensure safety under the proposed operations, new signs, more visible crossing gates, and flashing lights would be installed. These devices would be more visible and prominent than the existing protective measures.

Operational Effects

How would the Build Alternative affect rail traffic?

The proposed project would allow improved rail operations, with better track and locations close to potential customers (the industrially-zoned land along Wheeler Road [Road 3 NE] and to the east of GCIA). The project team assumed that the trains would be a maximum of ten cars, or approximately 1,000 feet long, and would be traveling at a maximum speed of 25 mph. This would be faster than the existing trains, which operate at about 10 mph due to the condition of the existing track.

How would road traffic be affected by trains?

Traffic impacts would be considered significant if the Build Alternative resulted in excessive delay as characterized by "queue length," which is the number of cars that stop while the crossing gates are down. Traffic delays were calculated both for the proposed year of opening (2010) and for the design year (2030).

Queue lengths were calculated based on the estimated number of vehicles stopped during the passage of a single train during the peak hours. This number was then multiplied by an average vehicle length of 20 feet to arrive at an average queue length.

The schedule of future trains is not known; thus, to be conservative, the project team evaluated the situation where one freight train passed along the route when traffic was greatest, during the evening peak hours (between 4:00 PM and 6:00 PM). During the evening peak hours, the Wheeler Road (Road 3 NE) (Segment 1) and Stratford Road (Segment 3) crossings would experience the longest queue of 15 cars, or 300 feet in each direction (20 feet per car). Vehicles at the end of the queue would experience the longest delay time, because they would be required to wait for the cars in front of them to move once the gates rose.

The freight trains would have a maximum speed of 25 mph through the study area, but the normal operating train speed would be 15 to 20 mph. To be conservative in determining impacts, the project team used a slower average train speed of 15 mph. With an average speed of 15 mph and a freight train length of 1,000 feet, the time that a road crossing would be blocked was estimated to be 70 seconds, including the raising and lowering time of the crossing gates.

In 2030, if road traffic increased by three percent per year as predicted, the same two crossings at Wheeler Road and Stratford Road would experience the longest queue of 23 cars, or 460 feet, in each direction if a train passed during the evening peak hours. Accordingly, delay and queue length would increase

slightly, but these would not be substantially greater than the values for the analysis described above.

As a result of the at-grade crossings, vehicles traveling along each of the study roadway segments would be required to come to a complete stop when a train was crossing the roadway. Any impacts related to limited stopping sight distance (SSD) were examined within the project area. SSD is the sum of two distances: (a) the distance traversed by a vehicle from the instant the driver sights an object, necessitating a stop, to the instant the brakes are applied, and (b) the distance required to stop the vehicle from the instant the brake application begins.[42]

Field observations revealed no horizontal or vertical sight distance concerns because the roadways are flat and relatively straight at all of the existing and proposed at-grade crossings.

The line of vehicles stopped at the at-grade crossings waiting for a train to pass would not be long enough to back up onto other nearby roads, even if the train passed during the most congested time of day (evening peak hour). The SR 17 and Wheeler Road (Road 3 NE) intersection would be about 2,500 feet away from the railroad crossing of Wheeler Road (Road 3 NE) (Segment 1). The SR 17 and Stratford Road intersection would be more than 1,000 feet away from the railroad crossing of Stratford Road (Segment 3). In both cases, the longest queue would be considerably shorter than the distance between the crossing and SR 17.

Would the Build Alternative deter or slow down emergency vehicles?

Fire, police, and emergency medical response vehicles rely on the ability to use at-grade crossings to respond to emergencies. Because blocked road crossings can delay emergency response vehicles, the project team evaluated the extent to which increased train traffic would block roads. The proposed project would not greatly increase the travel time for emergency vehicles, because no more than two trains per day (one round trip) would be expected for the foreseeable future.

Occasionally, there is a problem in the eastern part of the study area at the eastern end of Segment 1, where existing trains can cause delays as they move to and from existing track around Wheeler Road (Road 3 NE) and Road 0 NE. However, even in this area, with a train length of 1,000 feet or less, it is unlikely that the proposed train operations would block more than one intersection at a time.

If an emergency vehicle arrived at the same time that a freight train was approaching, the emergency vehicle would need to wait the full 70 seconds for

[42] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highway and Streets,* pp. 110-112 (2004).

the freight train to clear the crossing. If for any reason the train became stationary at the crossing, the train would be short enough to clear adjacent intersections. Two intersections would not be blocked simultaneously.

Conclusion

Construction of the Build Alternative would result in some temporary traffic delays due to construction at road crossings and the movement of construction equipment on public roads. Mitigation for these delays is proposed in Chapter Six. Although traffic delays from the proposed rail operations would increase to a maximum of 70 seconds at certain road crossings, these delays would generally not be likely to occur during peak hours due to the low volume of train traffic. In addition, there is sufficient sight distance to allow vehicles to stop safely, and, due to the low volume of vehicles on the roads, the line of cars waiting at a crossing would not be long enough to block more than one intersection at a time. Accordingly, there would be no significant impacts to traffic or transportation as a result of the proposed project.

No Build Alternative

Under the No Build Alternative, there would be no new rail line construction or associated traffic and transportation impacts. There could be temporary traffic delays at road crossings if the existing line (Segment 3) was rehabilitated in the future, but such delays would not be significant.

Visual Quality

Would the Build Alternative affect visual quality?

The project team evaluated the impact that the Build Alternative would have on the surrounding visual and aesthetic environment. Although there are no specific federal criteria for evaluating visual or aesthetic impacts under the National Environmental Policy Act (NEPA), federal agencies are required to consider the impacts to these resources that may result from any proposed action. The Council on Environmental Quality regulations also require an evaluation of impacts on visual and aesthetic resources arising from federal projects. Because neither WSDOT nor the STB have set forth detailed guidelines for assessing impacts to visual and aesthetic resources, this analysis uses a methodology based upon guidelines established by the Federal Highway Administration (FHWA).

Determination of visual impacts began by assessing existing visual resources and predicting viewer response to changes in the landscape resulting from implementation of the Build Alternative. Changes to visual resources were determined by assessing the compatibility of the Build Alternative with the visual character of the existing landscape. In addition, changes to visual resources included the comparison of the existing visual quality with projected

visual quality after implementation of the proposed project. Visual quality was evaluated by rating vividness, intactness, and unity.[43]

The resulting level of visual impact was determined by combining the severity of the resource change with the degree to which people are likely to oppose the change.

Construction Effects

Most construction impacts to visual resources would be temporary or relatively short-term. The proposed construction activities would temporarily reduce the visual quality in the project area due to the presence of construction equipment, materials, signs, and staging locations, as well as clearing and grading and utility relocation activities. Although most of the construction would be expected to occur during the day, temporary lighting might be employed for construction during the hours of darkness for some project elements.

The primary visual effects would occur during clearing and grading activities. Grading of the existing natural ground surface, the top of existing track grade, side slopes, and ditches would be conducted during implementation of the proposed project. Clearing of vegetation and grading for rehabilitation would not be needed along Segment 3, where railroad tracks already exist. During construction, driver attention would likely be focused on detours or lane shifts due to construction rather than on views.

Distant views, such as those from Viewpoint 2, located on Wheeler Road, and Viewpoint 7, located on Randolph Road, would not be affected by construction since emissions during construction would generally be consistent with those currently present in the project area (that is, fugitive dust from agricultural operations, wind-blown dust, and vehicle emissions). Residents who live near the proposed project, users of adjacent transportation corridors where crossings would be constructed, and individuals who frequent stores and schools in the vicinity of the proposed project would experience the greatest temporary visual impacts due to construction because of their close proximity and the length of time (duration) they would be exposed to the construction. Because these effects would be temporary, the impact would not be significant.

Physical Effects

Following the proposed rail construction, overall visual quality along the length of the proposed rail corridor would return to near pre-existing conditions. Although there would be changes to the landscape in a few localized areas, these changes would not be substantial enough to change the visual quality of the corridor as a whole, or substantially reduce the visual quality from most of the representative viewpoints.

[43] The terms vividness, intactness, and unity are discussed in more detail in the Visual Quality section of Chapter Four, Affected Environment.

Where would adverse visual quality impacts occur?

There would be no adverse visual quality impacts in Segment 2, Alternative 2A, or Segment 3 (see **Exhibit 5.7**). Three viewpoints along Segment 1 (and Alternative 1A) would be degraded, according to the FHWA methodology for visual assessment:

- Views along Wheeler Road (Road 3 NE) (Viewpoint 2; **Exhibit 4.13a**) would be affected by the proposed project. Creating a new rail corridor through land parcels largely used for agricultural purposes would affect the general pattern of the landscape and the visual relationship between natural and human-made elements. Bisecting crop fields along the proposed alignment would decrease the overall intactness and vividness. Effects would be the same for both Segment 1 and Alternative 1A.

- Views from the western side of the Millerville neighborhood (Viewpoint 4; **Exhibit 4.13b**) would be affected. Earthwork in this area would be minor, but the new tracks would reduce the harmony of the landscape by running through the generally uniform foreground. The proposed changes to the existing natural landscape would add human-made encroachment (tracks, ties, and other rail-related materials) in the landscape. In addition, these elements would be in the foreground of the Millerville residents' views. Effects would be similar for both Segment 1 and Alternative 1A.

- Views of the existing SR 17 bridge (Viewpoint 9; **Exhibit 4.13c**) would also be degraded. The Build Alternative would include excavation, the placement of fill into the waters of Parker Horn or Crab Creek, and the construction of a bridge, bridge piers, and abutments. All of these elements would be added to the existing view, increasing the human-made landscape and structural elements in an overall natural setting. Because the Segment 1 crossing would be longer than the Alternative 1A crossing, effects would be greater for Segment 1 than for the Alternative 1A.

Would the Build Alternative affect the Coulee Corridor Scenic Byway?

SR 17 is part of the Coulee Corridor Scenic Byway.[44] The Coulee Corridor Scenic Byway is noted for its "geological wonders," which include canyons, cliffs, lakes, and sand dunes; its archaeological history; and prevalent avian wildlife. The urbanized segment of SR 17 along the proposed Build Alternative does not reflect the distinct characteristics that led these highway segments to be designated as a national scenic byway.

Travelers on SR 17 might be able to view portions of the proposed line in Segment 1 and its Alternative 1A and would definitely be able to view the

[44] National scenic byways are roads designated by the U.S. Secretary of Transportation as distinct based on archaeological, cultural, historical, natural, recreational and scenic qualities. The National Scenic Byways Program was established to help recognize, preserve and enhance selected roads throughout the U.S.

bridge crossings for both alternatives. The proposed line is closest to SR 17 at RP 3 (common to both Segment 1 and Alternative 1A). At this location the distance between the highway and the proposed line is approximately 1,000 feet (middle ground). In addition, the view of the proposed rail line would be partially obscured by existing structures and vegetation. The proposed line would not be expected to have an adverse impact to views from SR 17 in this location.

Exhibit 5.7
Viewpoints and Summary of Visual Impact Parameters

Viewpoint	Existing Visual Quality[1]	Projected Visual Quality[1]	Degree of Resource Change	Principal Viewer Group(s)	Viewer Sensitivity	Duration of Exposure	Potential Visual Impact[2]
1	3.6	3.5	0.1	Local Roadway Users	Low	Short	No Significant Impact
2	5.3	4.3	1.0	Local Roadway Users	Low	Short	Potential Impact
3	1.3	1.3	0	Local Roadway Users, Retail Customers and Workers	Low	Medium	No Impact
4	3.6	2.6	1.0	Millerville Neighborhood Residents	High	Long	Potential Impact
5	1.2	1.2	0	Local Roadway Users, Retail Customers and Workers	Low	Medium	No Impact
6	3	2.25	0.75	Local Residents	High	Long	No Significant Impact
7	3.8	3.6	0.3	Industrial Workers	Low	Medium	No Significant Impact
8	3.2	3.2	0	Local Roadway Users	Low	Short	No Impact
9	4.2	3.2	1.0	SR 17 Users	Low	Short	Potential Impact

[1] Rating Scale: 7 = very high; 6 = high; 5 = moderately high; 4 = average; 3 = moderately low; 2 = low; 1= very low

[2] For this report, the project team defined a visual quality rating change of one point or more to describe a potential impact due to project implementation. A visual quality rating change of less than one point was considered to describe a "no significant impact scenario," while no change in score indicated "no impact."

The bridge over Parker Horn in Segment 1 would be close to SR 17 (approximately 150 feet). The proposed bridge would be in the foreground and would be clearly visible to travelers on SR 17 in both directions. The bridge for Alternative 1A would be located farther away from the highway (approximately 2,000 feet). While travelers on the highway would still be able to see the bridge for Alternative 1A, the proposed bridge would be in the middle ground rather than the foreground as for Segment 1, and would therefore have less of an impact on the view from the highway.

Portions of the existing rail line in Segment 3 are already visible from SR 17. The highway crosses the existing tracks at the western side of Parker Horn close to RP 4.5. An existing railroad bridge, which is not a part of the project, is clearly visible to westbound travelers on SR 17. After the highway travels eastward from its crossing with the existing rail line, the highway curves southward and away from the existing tracks. To the west of the crossing, the highway and existing rail line gradually move farther away from each other. At RP 5, they are approximately 1,800 feet apart, and by RP 6, the distance is approximately one mile.

Highway user sensitivity to change in visual quality is usually considered low when compared to that of other viewer groups, and the Build Alternative (any of the segments and alternatives) would not be expected to have significant visual quality impacts to the scenic byway. This section of SR 17 runs through the City of Moses Lake, and the land adjacent to the highway in this area is predominantly zoned for Heavy Industrial, Light Industrial, General Commercial, and Business use, with small pockets of land zoned for Multi-family Residential and Single-family Residential use.

The Coulee Corridor Scenic Byway's total length is approximately 150 miles, and only a limited section of the scenic byway would have views of the proposed project. Less than three miles of the proposed project could be seen from SR 17, and the overall visual quality of the scenic byway would remain unaltered.

How would the Build Alternative impact views from the SR 17 bridge over Parker Horn?

Of the areas from SR 17 where the Build Alternative would be visible, the location with the greatest potential for visual quality impact would be the highway bridge crossing Parker Horn. As described above, the bridge for Segment 1 would be approximately 150 feet from the highway (foreground), while the bridge for Alternative 1A would be approximately 2,000 feet from the highway (middle ground).

Viewer sensitivity is partially a function of distance. Sensitivity increases as the distance between the viewer and the visual resource decreases; if the changes were the same, viewers traveling across the SR 17 bridge would be

more sensitive to changes that occurred in the foreground than in the middle ground. If the configuration of the two bridge structures were similar, a greater impact to visual quality would occur if Segment 1 was constructed than Alternative 1A due to its proximity to viewers on SR 17.

Operational Effects

Minor operational impacts to visual quality might occur in localized areas adjacent to all segments of the proposed project. Because Segment 3 is an existing rail line, adding the proposed trains would not change visual quality along the segment. Along Segment 1 (or Alternative 1A), the closest residential viewers would be in the Millerville neighborhood, and the closest residence is located approximately 210 feet away from the proposed track. In Segment 2 (or Alternative 2A), there would be no residential viewers closer than 500 feet of the line. The operation of two trains per day (one round trip) would not be a significant visual impact.

In March 2008, the USEPA adopted more stringent emission standards for diesel locomotives that apply to newly manufactured locomotives and remanufactured locomotives that were originally manufactured after 1972. The USEPA estimates that the rule will cut particulate matter (PM) emissions from these engines by as much as 90 percent and nitrogen oxide (NOx) emissions by as much as 80 percent when fully implemented. Implementation of these standards begins as early as this year, 2008, with remanufactured engines and will be fully implemented by 2015. Accordingly, as these locomotives are placed into service on rail lines, it will substantially reduce locomotive emissions compared with those from locomotive engines that met the prior standards. The reduction of emissions resulting from these more stringent standards will reduce potential effects on visual impairment and regional haze.

Conclusion

Because the visual impacts of the proposed construction activities would be localized and temporary, they would not be considered significant. Views from Viewpoints 2 and 4 in the common portion of Segment 1 / Alternative 1A, and Viewpoint 9 close to the Segment 1 bridge would be degraded by the addition of the proposed rail line, but this would not be a significant impact because these views already include urban and transportation elements. Views from SR 17 (part of the Coulee Corridor Scenic Byway) would not be significantly affected because that portion of SR 17 does not reflect the distinct characteristics that led it to be designated as a national scenic byway. However, it should be noted that the bridge crossing in Segment 1 would be noticeably closer to SR 17 than the bridge for Alternative 1A. Overall, SEA and WSDOT determined that there would be minimal adverse effects to the visual character of the project area, which could be mitigated by revegetation of disturbed areas (See Chapter Six).

No Build Alternative

Under the No Build Alternative, there would be no new rail line construction within the project area. Other than temporary construction impacts that could result from any future rehabilitation of the existing rail line (Segment 3), there would be no significant impacts to visual resources within the project area.

Water Resources

How would the project affect water resources?

Construction and operation of the proposed rail line could alter water resource functions by impeding or diverting surface water flows or disrupting groundwater recharge and discharge. Water resources could be degraded through the discharge of pollutants or by introducing physical changes that alter natural water flows and thereby introduce additional sediments or other material to the water body.

The project team analyzed the effects of the Build Alternative on water resources and water quality, including potential effects on Parker Horn, Crab Creek, and Moses Lake. The analysis was primarily based on whether the proposed project would have any of the following impacts:

- **Increase in the amount of pollution within nearby surface water bodies** – Impact to surface waters would be considered significant if water quality standards were violated as a result of the proposed project.
- **Increase in flooding** – Impact to surface water would be considered significant if the project raised flood elevation levels of the 100-year floodplain at Parker Horn, Crab Creek or Moses Lake.
- **Change in the flow direction of surface water in the study area** – Impact to surface water would be considered significant if the flow direction or pathway of surface water was substantially changed.

Construction Effects

Impacts to water resources during the proposed construction could include the following:

- Increased turbidity[45] and sediment in water downstream from the proposed project.
- Increased pH if water came into contact with curing concrete during the proposed bridge construction and was spilled into nearby surface waters.

[45] Turbidity is a condition in water or wastewater caused by the presence of suspended material, resulting in scattering and absorption of light rays.

- Contamination from spills of hazardous materials used during construction.
- Increased flooding from encroachment on the floodplain at Parker Horn and Crab Creek.
- Greater peak flows from increased impervious surfaces.

What impacts to water quality could be generated at the proposed bridge over Parker Horn or Crab Creek?

The location with the greatest potential for impacts to water resources during the proposed construction would be the bridge site. The bridge would cross either Parker Horn for Segment 1 or the mouth of Crab Creek for Alternative 1A. Impacts to water resources from both Segment 1 and Alternative 1A would occur in Parker Horn; Alternative 1A would not have water quality impacts to Crab Creek because the bridge would be located at the mouth of the creek and potential water quality impacts would occur downstream.

A crossing at Parker Horn or Crab Creek would be susceptible to impacts from sedimentation due to the relatively greater amounts of fill/excavation, the need for in-water work, and the presence of a natural waterway. Both bridge crossing alternatives would likely require work below the Ordinary High Water Mark, but the Alternative 1A crossing would have less potential for impacts from sedimentation and turbidity because the channel is narrower.

There would also be work over the water to construct the bridge. Because of its high pH, uncured concrete would be toxic to aquatic life if it came into contact with the receiving water during bridge and culvert construction. The mitigation measures described in Chapter Six would prevent this from occurring.

What other water quality impacts could result from the Build Alternative during construction?

In addition to a new bridge at Parker Horn or at the mouth of Crab Creek, smaller bridges and culverts would be constructed to cross the irrigation canals along Segment 1 east of its divergence with Alternative 1A **(Exhibit 5.8).** In-water work associated with culvert construction could temporarily increase suspended sediment concentrations and turbidity levels downstream of the culverts.

Impacts to water resources along Segment 2 (and Alternative 2A) would not be as likely because less cut-and-fill would be required and because there are fewer water resources. The proposed project would have no effect on water resources along Segment 3 because no earthwork would be required for refurbishment of the existing line.

Construction of the proposed project would require the use of several common petroleum products (e.g., fuels, lubricants, and hydraulic fluids) that could be toxic to fish and other aquatic organisms. Small quantities of these materials might be stored along the right of way or in staging areas, in accordance with the requirements of federal, state, and local agencies.

Exhibit 5.8
Surface Water Bodies and Irrigation Canals Crossed by the Proposed Project

No.	Water Body	Owner	Water Body Type	Reference Point (RP)	Characteristics	Proposed Structure
1	Rocky Coulee Drain	ECBID[1]	Wasteway Canal	1.0	Earthen open channel approx. 6 feet wide	Bridge
2	Private Irrigation Canal	Private	Irrigation Canal	1.2	Earthen open channel approx. 2 feet wide	Culvert
3	Private Canal	Private	Irrigation Canal	1.2	Earthen open channel approx. 2 feet wide	Culvert
4	Private Canal	Private	Irrigation Canal (Concrete-Lined)	1.4	Concrete open channel	Culvert
5	Canal EL 20UI	ECBID	Irrigation Canal	1.5	Earthen open channel approx.1.5 feet wide	Culvert
6	Canal EL 20	ECBID	Irrigation Canal	2.1	Earthen open channel, approx.10 to 12 feet wide	Bridge
7	Parker Horn at mouth of Crab Creek – north alternative (1A)	Public	Lake	4.0	Channel – approx. 170 feet wide	Bridge
8	Parker Horn – south alternative (1)	Public	Lake	4.3	Channel – approx. 500 feet wide	Bridge

[1] East Columbia Basin Irrigation District

Construction vehicles would be close to the water during bridge construction, and fuel, hydraulic lubricants, or engine coolant could be washed off construction equipment or spilled, although permit conditions and mitigation measures would prevent this from occurring within 200 feet of the water. Any spills of hazardous contaminants could degrade surface and groundwater, harming fish and other aquatic life if any pollutants reached the water. If the mitigation measures in Chapter Six were implemented, such impacts to water quality would be minimized or avoided. In addition, any fill placed into surface water for this proposed project would be tested for pollutants as a mitigation measure.

Would the Build Alternative affect the floodplain at Parker Horn or Crab Creek?

Segment 1 would cross the 100-year floodplain of Parker Horn, while Alternative 1A would cross the floodplain of Crab Creek. According to the City of Moses Lake Flood Hazard Areas Code (Chapter 18.53), projects may not encroach on the floodplain unless it can be demonstrated that the project would not increase flood levels.[46]

The northern crossing (Alternative 1A) would be a bridge designed to minimize fill in floodplain and wetland areas. Piers and abutments to support the bridge would be necessary within the 100-year floodplain area, and would be needed within the waterway itself.

Because the area of water and 100-year floodplain would be wider for the southern crossing (Segment 1), this crossing would be a bridge combined with fill **(Exhibit 5.9)**. Fill would be placed within the 100-year floodplain on the western side of Parker Horn, and piers and abutments to support the bridge would be needed within the waterway.

Any project elements within waterways or the 100-year floodplain would be designed to meet City of Moses Lake requirements. Preliminary engineering studies show that, given the size of Moses Lake and the limits of the designated floodplain, the placement of fill and piers would not create any changes in the flood elevation or increase flood potential of Moses Lake, Crab Creek or Parker Horn. The Port would be required to demonstrate this to the satisfaction of the City of Moses Lake prior to commencement of any construction activities. In addition, the U.S. Army Corps of Engineers and Ecology would address water quality impacts and permit requirements.

Exhibit 5.9
Estimated Excavation and Fill Quantities in Segments 1, 1A, 2, and 2A

Segment	Approximate Length (Miles)	Disturbed Areas (Acres)[1]	Excavation (Cubic Yards)	Fill (Cubic Yards)
1	4.5	29.7	192,000	76,000
1A	4.5	29.3	190,000	88,000
2	3.1	18.4	85,000	15,000
2A	3.5	21	96,000	45,000

[1] Disturbed areas are the land within the proposed project that would be graded or cleared.

[46] City of Moses Lake. *Municipal Code Chapter 18.53 – Flood Hazard Areas*. August 2005.

Physical Effects

Would there be an increase in the quantity of stormwater runoff from increased impervious (paved or hard) surfaces?

Any ballast needed to accommodate the new track would be pervious (that is, allowing water to soak into it instead of running off). There would be no increase in impervious surface areas at the at-grade crossings since the roads are already in place. Construction of the bridge would involve placing fill for new embankments and bridge approaches and widening existing embankments; the embankments and approaches would be pervious.

Increases in the amount of impervious surface can lead to changes in hydrology, degrade water quality and habitat within streams, and reduce groundwater recharge. Stormwater runoff from impervious surfaces flows at higher velocities than runoff from natural surfaces, which can increase erosion and sedimentation to receiving waters and impede infiltration of runoff into soils. Surface water quality can be impaired because accumulated pollutants are quickly washed off during storms and rapidly delivered to the receiving water bodies. However, rail projects create minimal amounts of impervious surfaces, and the increased runoff volumes and pollutant loading to receiving waters are considered to be negligible.

Along most of the proposed rail line, stormwater would run off from the rails and ties and flow into the ballast or ground adjacent to the line, and would be absorbed into these pervious surfaces. Water might infiltrate through the ground to irrigation canals or to Parker Horn. Because the bridge for Alternative 1A would be located at the mouth of Crab Creek, water infiltration effects would not be found in the creek. However, infiltration could occur downstream from the bridge in Parker Horn.

Where the proposed rail line would cross directly over irrigation canals with bridges, stormwater might run directly from the rails, ties, and bridge structure into the water below. However, the quantity of stormwater runoff flowing directly into canals would be minimal, and would be no different from existing rail structures crossing the irrigation canals in the vicinity. The bridge over Parker Horn for Segment 1 (or the bridge at the mouth of Crab Creek for Alternative 1A) would be designed to prevent runoff into that water body.

Operational Effects

Operation of the Build Alternative would not cause any significant impacts to water resources. Contingency plans developed by the Port of Moses Lake and the operator of the rail line would include actions to follow in the event of a hazardous materials spill near or in surface water.

Conclusion

The proposed construction activities have the potential to impact water quality. In comparison with the Segment 1 bridge crossing, the Alternative 1A bridge crossing would result in fewer impacts to floodplain and wetland areas and would have fewer impacts to water quality.

To minimize or avoid potentially adverse impacts to water quality, SEA and WSDOT incorporated the mitigation measures described in Chapter Six. For example, while the effects of stormwater runoff to the irrigation canals would be considered minimal, the bridge over Parker Horn for Segment 1 (or the bridge over Crab Creek for Alternative 1A) would be designed to prevent stormwater runoff and would be designed to avoid impacts to the 100-year floodplain. In addition, prior to commencement of any construction activities, the Port would be required to consult with the Corps, Ecology and the City of Moses Lake to address potential impacts to waters of the U.S. and permit requirements.

No Build Alternative

Under the No Build Alternative, there would be no new rail line construction. Accordingly, there would be no water quality impacts to Parker Horn, Crab Creek, or other waters in the project area.

Wetlands

How would the Build Alternative affect wetlands?

Impacts to wetlands and streams would occur only in Segment 1 or Alternative 1A. The majority of impacts would occur where the proposed rail line would cross Parker Horn (Segment 1) or Crab Creek (Alternative 1A) and where the proposed rail line would traverse wetland areas between Road 4 NE (Cherokee Road) and Wheeler Road (Road 3 NE). Other impacts to aquatic resources would occur south of Wheeler Road (Road 3 NE) where the proposed rail alignment would cross several irrigation ditches and canals.

Construction Effects

Construction effects include those temporary impacts that would occur only during and immediately after earth disturbance. Permanent impacts, such as permanent placement of fill in wetlands, are discussed in Physical Effects, below.

All construction activities would occur within the right of way or in nearby areas that have previously been disturbed. In addition to impacts from placement of fill in wetlands (discussed below), impacts to wetlands might result from sediment being eroded or washed into wetlands from disturbed

areas during construction. Mitigation measures included in Chapter Six would minimize impacts to wetlands.

Physical Effects

Permanent physical impacts are described as either:

- Permanent direct impacts from the filling or excavating of wetlands to construct the proposed project or from permanent new shading of streams or other waters; or
- Permanent indirect impacts to wetlands resulting from habitat fragmentation or degradation of the existing hydrologic regime.

Wetlands and other waters within the right of way would be affected by the proposed project, as listed in **Exhibit 5.10**. Impacts to wetlands within the proposed right of way but outside the area of actual construction activities might not result in the complete loss of function and are, therefore, considered separately from impacts associated with wetland filling.

All or part of up to six wetlands would be permanently lost as a result of the proposed project, depending on which alternative (Segment 1 or Alternative 1A) was selected, as shown in **Exhibit 5.11**. As a result of filling wetlands to construct the Build Alternative, a total of approximately 3.02 acres for Segment 1 (or approximately 2.14 acres for Alternative 1A) would be directly impacted.

In addition to direct permanent effects, the crossing over Parker Horn for Segment 1 or the crossing at the mouth of Crab Creek for Alternative 1A would result in indirect effects where the wetland would be affected to such an extent that the remainder would suffer a loss of some of its functions. These effects could be related to fragmentation, where the proposed project would divide a wetland into two parts, or shading, where the bridge would not require direct fill into a wetland but would shade the vegetation during some or all of the day. Minimization of the bridge footprint during design would reduce shading impacts.

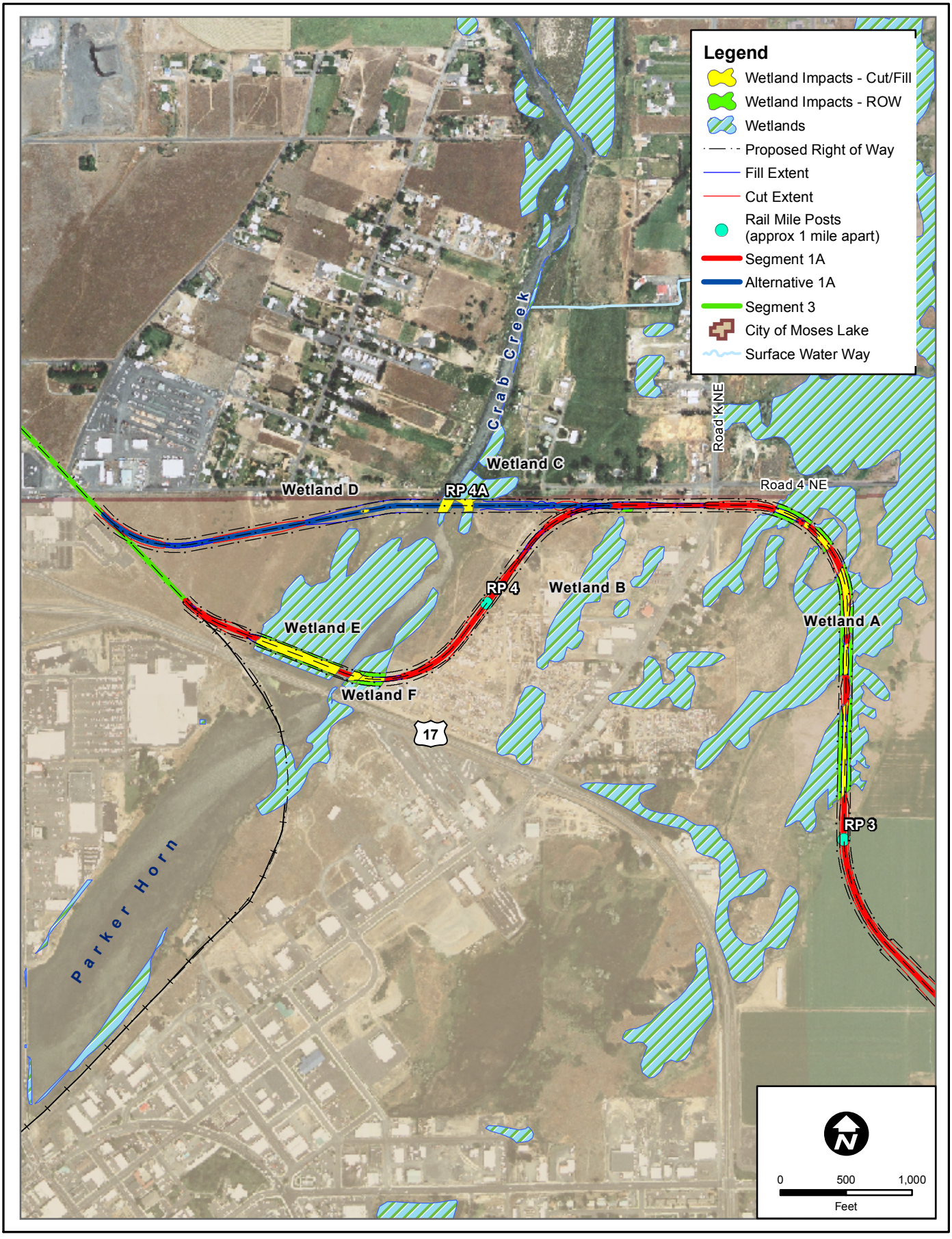
Operational Effects

Effects to wetlands from the proposed rail line operation and maintenance would be indirect but could limit their function. These effects would occur within 50 feet of the centerline of the proposed rail line. This area is equivalent to the 100-foot-wide right of way, which would be maintained for safety and efficiency, possibly including vegetation removal close to the tracks. In addition to vegetation removal, wetlands within 50 feet of the proposed track would be subject to potential introduction of weeds, incidental litter, and fluid leakage from train traffic and operation. Vegetation removal, if required, would contribute to habitat fragmentation by potentially widening the

gaps between various habitats. All the above-described activities might affect the function of wetlands. The total area of wetlands within 50 feet of the proposed track that might suffer indirect effects is approximately 3.25 acres for Segment 1 and 2.514 acres for Alternative 1A.

Exhibit 5.10
Wetland and Water Impact Summary (Physical Impacts)

Wetland/ Water Body	Direct Impacts (Fill)	Type of Indirect Impacts	Indirect Impacts and Area within 50 Feet of Track	Direct + Indirect Impacts
Segment 1				
Wetland A	1.67 acres	Fragmentation	2.46 acres	4.13 acres
Wetland B	0.01 acres	None	0.05 acres	0.06 acres
Wetland E	1.07 acres	Fragmentation	0.42 acres	1.49 acres
Wetland F	0.27 acres	Fragmentation	0.32 acres	0.59 acres
Parker Horn/ Crab Creek	None	Shading	None	None
Stream C	None	None	None	None
Ditches/Canals	None	None	None	None
Impact Total	**3.02 acres**		**3.25 acres**	**6.27 acres**
Alternative 1A				
Wetland A	1.67 acres	Fragmentation	2.46 acres	4.13 acres
Wetland B	0.01 acres	None	0.05 acres	0.06 acres
Wetland C	0.43 acres	Fragmentation	0.004 acres	0.434 acres
Wetland D	0.03 acres	None Identified	None	0.03 acres
Crab Creek	None	Shading	None	None
Stream C	None	None	None	None
Ditches/Canals	None	None	None	None
Impact Total	**2.14 acres**		**2.514 acres**	**4.654 acres**



Washington State Department of Transportation

Surface Transportation Board

Approximate Location of Wetland Impacts
Exhibit 5.11

Northern Columbia Basin Railroad Project

Conclusion

Construction of the proposed project would impact wetlands in the project area. Segment 1 would have a direct or indirect effect on approximately 6.27 acres of wetlands and Alternative1A would have a direct or indirect effect on approximately 4.654 acres of wetlands. Accordingly, Alternative 1A would have substantially fewer impacts on wetlands. Measures implemented during the proposed rail line construction, including the restoration of wetlands, would mitigate construction impacts. Wetlands in the right of way might also suffer from operational impacts; these impacts are included in the indirect effects described above. Any major impacts to wetlands resulting from physical impacts would be mitigated as outlined in Chapter Six and pursuant to requirements of the U.S. Army Corps of Engineers and Ecology.[47]

No Build Alternative

Under the No Build Alternative, there would be no impacts to wetlands or other jurisdictional waters. If the existing rail line in Segment 3 was refurbished at some point in the future, there would be no impacts because there are no wetlands in Segment 3.

Cumulative Effects

The Council on Environmental Quality's (CEQ's) regulations for implementing NEPA require agencies to consider three types of impacts: direct, indirect, and cumulative. Direct and indirect impacts are caused by an action either in the present or future,[48] whereas a cumulative impact is "the impact on the environment which results from the incremental impact of an action when added to past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.[49]

Cumulative impacts result when the impacts of different actions combine to cause greater impacts on a particular resource than the impacts that would be caused solely by the proposal before the agency. While project effects may be minor when viewed in the individual context of direct and indirect effects, they can add to the effects of other actions and eventually lead to a measurable environmental change. Because cumulative effects can be separated from a proposed project in time and location, their measurement can be more difficult

[47] In Washington State, the USEPA has delegated responsibility for water quality standards to the Washington State Department of Ecology.
[48] See 40 CFR 1508.8, Protection of Environment, Council on Environmental Quality.
[49] See 40 CFR 1508.7, Protection of Environment, Council on Environmental Quality, Cumulative Impact.

to quantify and assess. CEQ recommends that a cumulative effects analysis accomplish the following:[50]

- Focus on the effects and resources within the context of the proposed action.
- Present a concise list of issues that have relevance to the anticipated effects of the proposed action or eventual decision.
- Reach conclusions based on the best available data at the time of the analysis.
- Rely on information from other agencies and organizations on reasonably foreseeable projects or activities that are beyond the scope of the analyzing agency's purview.
- Correlate the analysis to the geographic scope of the proposed project.
- Correlate the analysis to the time period of the proposed project.

A proposed project can affect certain environmental resources negatively, and other resources positively. Cumulative effects can also have a positive or negative effect, depending on the environmental resource being evaluated.

What geographic boundaries and time period are considered in this cumulative effects analysis?

When evaluating cumulative or combined effects, the project team must consider expanding the geographic area beyond the proposed project and expanding the time limits to consider past, present, and future actions that may affect the environment.

Wetlands, stormwater, and greenhouse gases (GHGs) are included in this cumulative effects analysis.[51] Impacts to wetlands and stormwater runoff are addressed for proposed projects where proximity might result in cumulative impacts to wetlands or the natural flow regimen. Greenhouse gases are addressed because of concern over cumulative increases in GHGs in the area, Washington State, and throughout the world.

Geographic Boundaries

The geographic boundaries for the cumulative effects analysis are based on the length and linear nature of the proposed project, agency consultations, and the potential for freight hauling to affect the global climate. The geographic

[50] Council on Environmental Quality, Executive Office of the President. *Considering Cumulative Effects Under the National Environmental Policy Act*. 1997.

[51] None of the other elements of the environment are expected to cause a combined, adverse effect to the environment and are therefore not considered in this section.

boundaries for the wetlands and surface waters analyses were set at 0.5 miles from the track. The GHG analysis considers the entire central Washington area.

Time Period

The time period is determined by identifying time limits that are both relevant to the project and reasonable. Although the proposed Northern Columbia Basin Railroad (NCBR) Project is expected to operate beyond the foreseeable future, the cumulative effects analysis sets the time period from present through 2030 as a reasonable time frame for the evaluation. Beyond 2030, planning level data loses accuracy and becomes speculative.

What projects are included in the cumulative effects analysis?

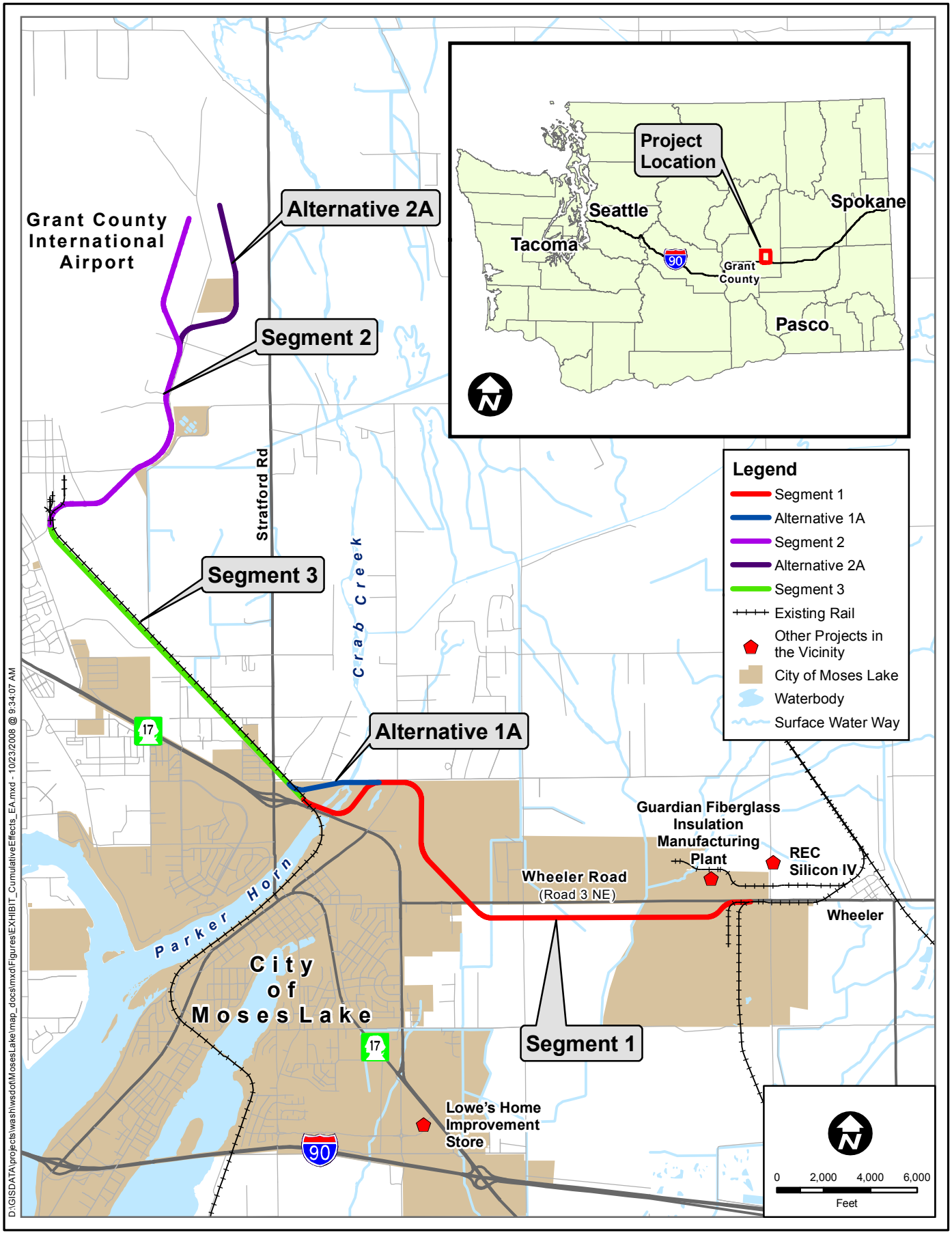
There are three projects in the vicinity of the proposed NCBR Project (See Project Vicinity map, **Exhibit 5.12**) that are reasonably foreseeable and could affect one or more of the environmental resources examined in the cumulative effects analysis:

- Lowe's Home Improvements Store
- Guardian Fiberglass Insulation Manufacturing Plant
- REC Silicon IV

Two of these projects (Guardian Fiberglass Insulation Manufacturing Plant and REC Silicon IV) are within one-half mile of the proposed NCBR Project and are considered part of this cumulative effects analysis. The Lowe's Home Improvement Store is beyond the boundary for this cumulative effects area and is not considered in this analysis.[52]

The recently completed Guardian Fiberglass Insulation Manufacturing Plant project consists of construction of 620,000 square feet of manufacturing space in multiple buildings. Approximately 100,000 cubic yards of material were graded on the site. Although there are several wetlands on the site, none of the buildings or parking lots is closer than 200 feet to a wetland or within 150 feet of a wetland buffer. The project is located north of Wheeler Road (Road 3 NE) and east of Road N. The City of Moses Lake issued a state environmental determination that concluded that an in-depth study of potential environmental impacts was not required for the Guardian Fiberglass Insulation Manufacturing Plant project. The City did require that the project include measures to address the type of fill material to be used on the project site, and replanting requirements where the soil was exposed. The REC Silicon IV project is under construction and expected to be completed in 2008. The REC Silicon IV project expands the existing REC Silicon plant located at 3322 Road N. The

[52] The Lowe's store is currently under construction and is scheduled to open in December 2008.



Washington State Department of Transportation

Surface Transportation Board

Reasonably Foreseeable Development in the Project Vicinity
Exhibit 5.12

Northern Columbia Basin Railroad Project

expansion includes grading earth; constructing new buildings, including a temporary lunchroom building; and relocating 12 office trailers. The City of Moses Lake issued a state environmental document that concluded that an in-depth evaluation would not be required for the proposed REC Silicon IV project. The City did require that the project not put water into the U.S. Bureau of Reclamation treatment facilities, and that erosion be controlled.

What impacts are associated with the projects in the cumulative effects analysis?

Stormwater and Wetlands

Stormwater control is a primary concern for the three projects (the NCBR Project, Guardian Fiberglass Insulation Manufacturing Plant project, and the REC Silicon IV project) addressed in this cumulative effects analysis. The state document for the Guardian Fiberglass plant identified wetlands on the site, but concluded that there would be no effect to wetlands or wetland buffers. Wetlands are not present at the REC Silicon IV site. The proposed NCBR Project, as well as the Guardian Fiberglass Insulation Manufacturing Plant and REC Silicon IV, would need to comply with current stormwater regulations to ensure little or no negative effect. REC Silicon IV and the Guardian Fiberglass Insulation Manufacturing Plant appear to be hydrologically connected to the proposed NCBR Project. However, stormwater runoff does not appear to be a significant cumulative effect.

The proposed NCBR Project would increase the amount of impervious surface, including the surface of a proposed bridge over Parker Horn. Stormwater would be managed through implementation of Best Management Practices and permit conditions.[53] At the bridge over Parker Horn for Segment 1 (or the bridge over Crab Creek for Alternative 1A), stormwater would be captured and prevented from running directly from the rails, ties, and bridge structure into the water below. In addition, a bridge maintenance plan would be developed in compliance with FRA regulations.

Some of the alignment would occur in wetlands, as detailed in other sections in this chapter. Mitigation measures for effects to wetlands and water resources are described in Chapter Six.

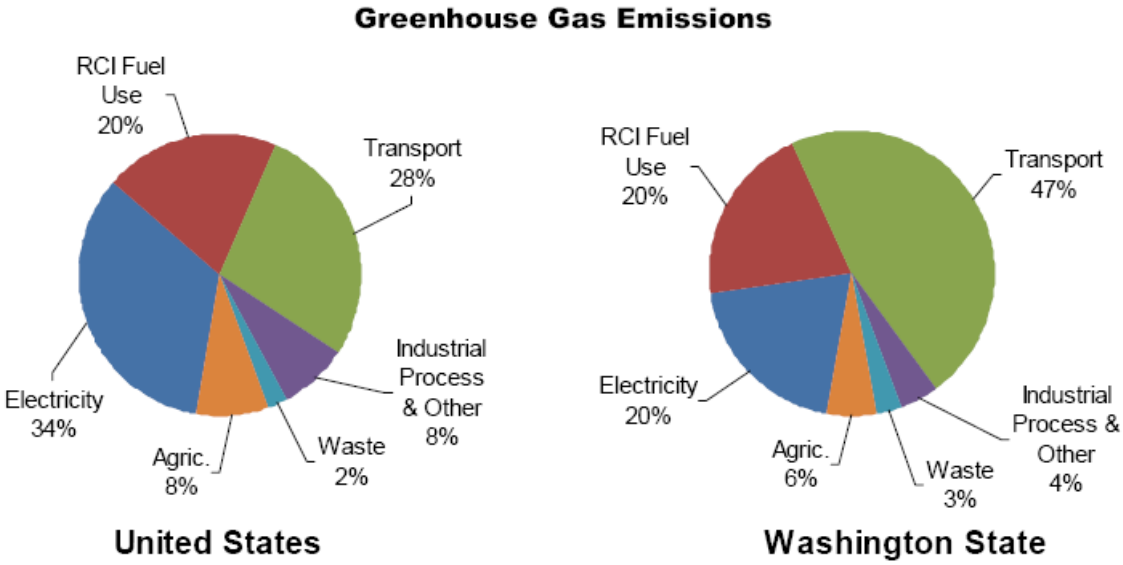
Climate Change and Greenhouse Gas Emissions

Greenhouse gases come in several forms. The gases associated with transportation are mainly water vapor, carbon dioxide (CO_2), methane (also known as "marsh gas"), and nitrous oxide. Carbon dioxide makes up the bulk of the GHG emissions from transportation sources. Any process that burns fossil fuel releases carbon dioxide into the air.

[53] Stormwater mitigation measures are detailed in Chapter Six and in the *Water Resources Technical Memorandum*. The *Water Resources Technical Memorandum* may be obtained from the WSDOT Rail & Marine Office. Contact information is provided on the back of the title page.

Motor vehicles are a significant source of GHG emissions and contribute to global climate change primarily through the burning of gasoline and diesel fuels. Transportation sources account for nearly half of the GHG emissions in Washington State.[54] Other large contributors to GHG emissions in Washington are fossil fuel combustion in the Residential, Commercial, and Industrial (RCI) sectors and in electricity production. **Exhibit 5.13** below shows the gross GHG emissions by sector, nationally and in Washington State.

Exhibit 5.13
GHG Emissions by Sector, 2005, U.S. and Washington State[55]



What efforts are underway to reduce GHG emissions in Washington State?

In February 2007, the Governor of Washington State issued Executive Order 07-02 requiring state agencies to find ways to reduce GHG emissions and adapt to the future that climate change may create.

On May 3, 2007, the Washington State Legislature passed Senate Bill 6001 which, among other things, adopted the Governor's climate change goals as state law. The law aims to achieve 1990 GHG levels by 2020, a 25 percent reduction below 1990 levels by 2035, and a 50 percent reduction by 2050.

While the goals are clear, the technical guidance and regulations to implement these goals are currently in development and will not be sufficiently

[54] GHG emissions for power generation are lower than in other states due to Washington's use of hydropower.
[55] Ecology (Washington State Department of Ecology). 2008. *Leading the Way on Climate Change: The Challenge of Our Time*. Publication #08-01-008. February 2008.

determined before project environmental documentation is completed for this proposed project.

At this time, the main way to reduce GHG emissions resulting from transportation is to reduce the amount of fuel consumed by motor vehicles. This can be achieved by:

- Creating more efficient driving conditions (reducing traffic congestion),
- Introducing more fuel-efficient vehicles, and
- Reducing the amount of driving (through a variety of methods including telecommuting, public transit options, carpooling, and more efficient movement of goods and services).

Washington State has made some progress toward each of the three efforts listed above. The Governor and Legislature funded a 16-year plan to meet Washington State's most critical transportation needs, most of which are focused on roads, highways, and cars or trucks. WSDOT and its transportation partners, including federal, city, county, and transit agencies, are in various stages of developing a specific list of projects to move people and goods more efficiently.

How would operation of the proposed project change GHG emissions?

The proposed project would provide a link between the existing rail system and land zoned for industrial development in the City of Moses Lake and Grant County. The proposed project would allow the use of freight trains to transport materials to and from existing and future industrial facilities, and would be expected to reduce the number of trucks on the local roadway network. This shift would reduce the amount of roadway traffic and improve the efficient movement of goods and services. In the national rail system, freight trains emit approximately one-fourth the amount of GHGs that diesel trucks emit for each ton of freight moved.[56] Although the specific quantity of reduction is not known for a short train such as the 10-car trains proposed for the project, the proposed project would generate fewer emissions than if the same amount of freight were hauled by truck. An estimate of these reductions is provided in **Exhibit 5.14**.

Operation of the proposed rail line would be expected to reduce CO_2 emissions by approximately 1,854 tons per year compared with shipping the same amount of materials by truck. This calculation is a "ballpark" estimate of project-related energy consumption and GHG emissions. There is no single, industry-accepted, universal conversion factor, and actual fuel consumption and GHG emissions are highly dependent upon specific operational practices of freight and trucking companies. The emission conversion factor used in this analysis comes from the American Association of Railroads, an industry trade

[56] AAR News, *Railroad Fuel Efficiency Sets New Record*, May 21, 2008.

group that represents major railroads in the U.S., Canada, and Mexico. This estimate does not include construction effects, nor does it consider the possibility that trucks might be needed to move goods between the end of the line and individual businesses.

Exhibit 5.14
Change in Potential Emissions of Carbon Dioxide (CO_2)

Description of Activity	Annual Fuel Used (gallons)	Annual Energy Used (MBtu[1])	Emission Factor Diesel Fuel Input (lbs/MBtu)	Annual CO_2 Emissions (tons)
Freight Trains Current Route (2 trains/ month)[2]	2,954	405	164	33
Freight Trains Proposed Route (2 trains/day)[2]	57,960	7,940	164	651
Freight Trains Net Increase	N/A	N/A	N/A	618
Savings From Avoided Trucking[3]	N/A	N/A	N/A	2,472
Total Net Savings	N/A	N/A	N/A	1,854

[1] Million British thermal units
[2] Operation-related emissions do not include any maintenance activities.
[3] Based on a 4.0 multiplier obtained from AAR News, *Railroad Fuel Efficiency Sets New Record*, May 21, 2008.

How would emissions be minimized during project construction?

Emissions during construction would generally be consistent with those currently present in the project area, such as windblown dust and vehicle emissions. Emissions would be minimized through the measures described in Chapter Six, including fugitive dust suppression controls, revegetation of disturbed areas, and reduced idling.

Construction of the rail line would not adversely affect traffic flow, except for short-term effects during construction of the at-grade crossings. Construction areas, staging areas, and material transfer sites would be designed in a way that reduced standing wait times for equipment, engine idling, and the need to block the movement of other activities on the site. These measures would reduce fuel consumption by reducing wait times and ensuring that construction equipment operated at more efficient levels.

What changes to project design would be needed to minimize impacts that contribute to climate change?

The Governor of Washington committed the state to preparing for and adapting to the impacts of climate change as part of Executive Order 07-02.[57,58] Key areas in which Washington State is likely to experience changes over the next 50 years include:

- Increased temperature (heat waves and poor air quality);
- Changes in volume and timing of precipitation (reduced snow pack, increased erosion, and flooding);
- Ecological effects of change (spread of disease, altered plant and animal habitats, and human health and well-being); and
- Rising sea levels and coastal erosion.

Expected temperature increases for Grant County and Central Washington range from roughly 1 to 2.5 degrees Fahrenheit (F) by 2029. Although exact information is not available, indications are that spring runoff would occur earlier and river levels would be higher. Summer flows are expected to be lower due to a lack of snow pack. The elevation of Moses Lake is not expected to be an issue because the lake level is managed and not subject to the fluctuations of a natural system.

The Moses Lake area is in the Central Basin Climate Division within Washington State. The period of record precipitation and temperature plots for this Division, as obtained from the Western Regional Climate Center (WRCC) website are provided below in **Exhibits 5.15 and 5.16**. The red lines represent 12-month mean values (one value plotted per year) and the blue dots represent the 10-year running mean. A 10-year mean is used to describe the normal, yearly changes in precipitation. The green lines represent one standard deviation above and below the period of record mean and show the expected variation in rainfall between years.

The temperatures show that there may be a recent slight increase in average temperature (up to 0.5 degrees F) above the maximums in earlier high temperature cycles, based on the 10-year running means. However, the information for the past 30 years may also be skewed slightly by urban developments near some of the sensors, which can increase temperature. The

[57] A new focus sheet entitled "Preparing for Impacts" is available online at http://www.ecy.wa.gov/climatechange/index.htm.

[58] The United Nations' recent Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, *IPCC Fourth Assessment Report: Climate Change 2007,* (http://www.ipcc.ch/ipccreports/assessments-reports.htm), defines adaptation as the "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities." The effectiveness of any specific adaptation requires consideration of the expected value of the avoided damages against the costs of implementing the adaptation strategy.

Exhibit 5.15
Average Precipitation in the Central Basin (vicinity of Moses Lake)[59]

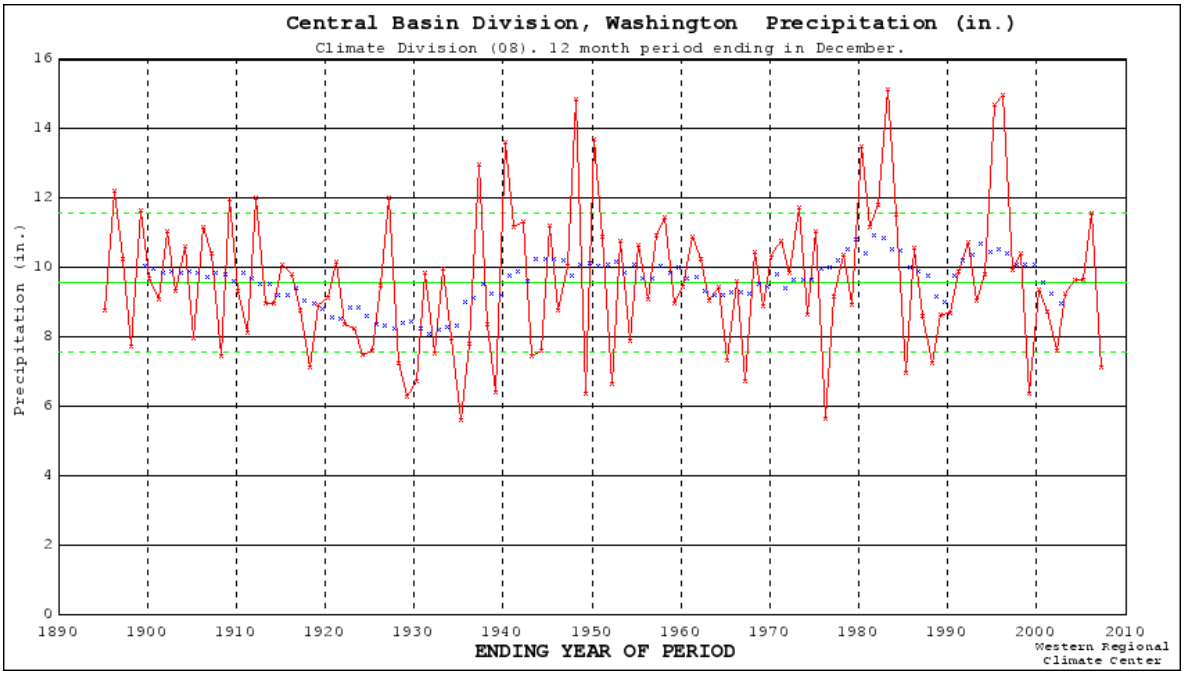
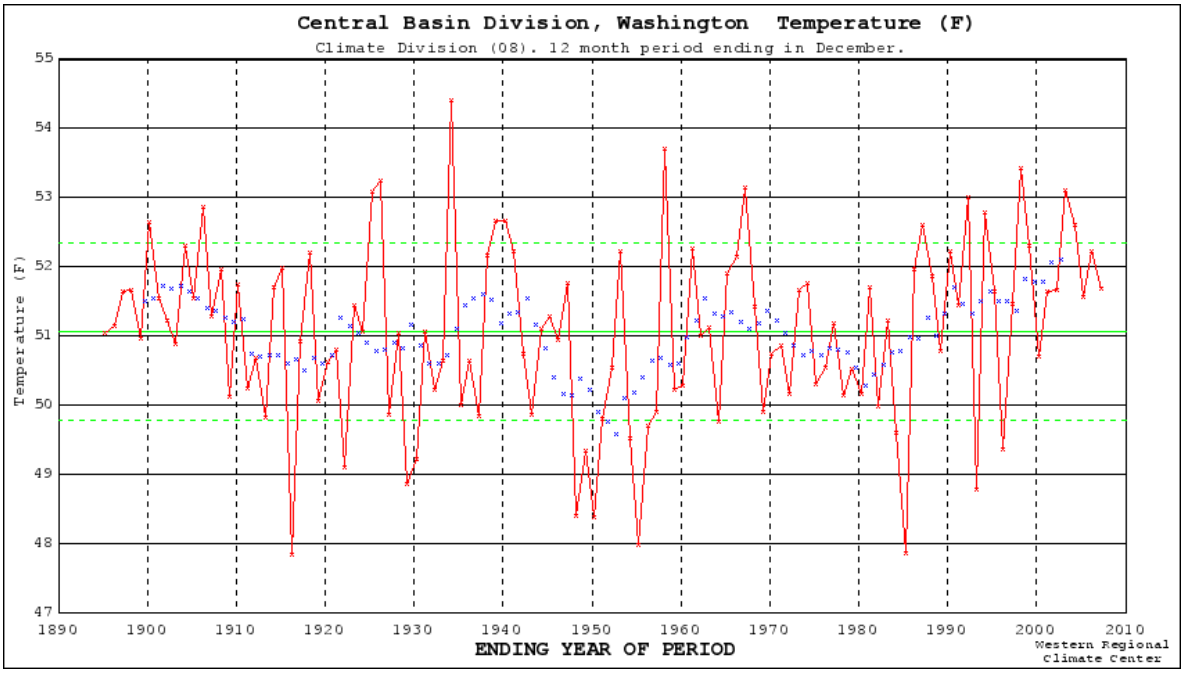


Exhibit 5.16
Average Temperature in the Central Basin (vicinity of Moses Lake)[60]



[59] Western Regional Climate Center (WRCC) website. http://www.wrcc.dri.edu/cgi-bin/divplot1_form.pl?2102.

[60] Western Regional Climate Center (WRCC) website. http://www.wrcc.dri.edu/cgi-bin/divplot1_form.pl?2102.

rainfall plot shows no major recent trend, although a drought during the 1920s and 1930s is plainly evident.

Rail lines can be viewed as "permanent" structures expected to last indefinitely with appropriate maintenance. The proposed NCBR Project is designed to last at least 70 years. The proposed project has incorporated features, as part of its standard design, which would provide greater resilience and function with thepotential effects brought on by climate change. These features include increasing the capacity of the on-site stormwater treatment system to handle increased stormwater runoff. The project must also comply with temporary stormwater design and treatment procedures required by the National Pollutant Discharge Elimination System guidelines, which are administered by Ecology. The project must comply with the Ecology *Stormwater Management Manual for Eastern Washington*.[61] WSDOT procedures require approval of a Stormwater Site Plan and a Temporary Erosion and Sediment Control Plan (TESC) prior to construction.

Given the year-to-year variability of temperature and precipitation, and a modest trend of increasing temperatures and higher peak stormwater runoff, it does not appear that the project design would need to be modified for "climate adaptation" purposes. This is conditioned on adequately designing the project for the variable temperature and precipitation conditions observed in the region over the past century.

How would the project contribute to cumulative GHG emissions?

The projects included in this cumulative effects analysis are being planned as a result of increased human activity in Grant County and Central Washington State, and SEA and WSDOT have determined that the construction and operation of the three projects would each contribute to GHG emissions. Although the proposed construction and operation of the NCBR Project would produce GHG, the project would result in fewer emissions compared with shipping the same amount of freight by truck. As stated in Chapter Two, the purpose of the proposed NCBR Project is to enhance opportunities for economic development and to attract new rail-dependent businesses to lands designated for industrial development in the northern part of the City of Moses Lake as well as to the south and east of GCIA, and any future development of the area would be expected to contribute incrementally to the cumulative GHG emissions in the region.

[61] Ecology (Washington State Department of Ecology). *Stormwater Management Manual for Eastern Washington.*