3.15 Wetlands and Jurisdictional Waters

Wetlands perform functions that are valuable to fish, wildlife, environmental quality, and surrounding human communities. They provide flood protection, improve water quality in rivers and streams, recharge groundwater, and provide breeding and rearing habitat for many birds, fish, and other wildlife. Federal and state laws require that any project with the potential to impact wetlands must first avoid and minimize impacts where possible. If impacts are not avoidable, the project must compensate for these impacts by restoring or creating new wetland areas to ensure that the overall environmental functions provided to the area are not diminished.

The federal Clean Water Act gives environmental oversight for waterways and their associated wetlands to the U.S. Army Corps of Engineers (USACE). State governments generally share this jurisdiction. Wetlands and waterways regulated by this law are called jurisdictional waters and wetlands. Adding or removing bridge piers or other structures in a river or filling, excavating, or building in a jurisdictional wetland requires joint federal, state, and local permitting. Many jurisdictions also restrict activities in areas within a certain distance of wetlands, known as buffer zones.

This section addresses impacts within the main project area, the casting and staging areas, and the Ruby Junction Maintenance Facility. Modifications to the Steel Bridge would not substantially impact jurisdictional waters and will have no impact on wetlands. See Chapter 2 for a map of these areas. Impacts to jurisdictional waters will occur as a result of the I-5 bridge replacement. The LPA will not impact any delineated wetlands but will impact the buffers of delineated wetland.

This section describes the existing wetlands and jurisdictional waters that could be affected by the CRC alternatives and the functions that these wetlands and waters currently provide. It also analyzes the effects that each alternative would have on wetlands and jurisdictional waters, including wetland buffer zones and the steps that would be taken to avoid, minimize, or compensate for any adverse effects. A comparison of impacts from the LPA and the DEIS alternatives is summarized in Exhibit 3.15-5. A more detailed description of the impacts of the DEIS alternatives on wetlands and jurisdictional waters is in the DEIS starting on page 3-355.

Section 3.14, Water Quality and Hydrology, and Section 3.16, Ecosystems, in this FEIS provide more information on the relationship between wetlands, fish and wildlife habitat, and water quality. The information presented in this section is based on the CRC Wetlands and Jurisdictional Waters Technical Report, included as an electronic appendix to this FEIS.

Are all wetlands, rivers, and streams "jurisdictional"?

Complex regulations determine which wetlands and waterways are jurisdictional. For the purposes of this FEIS, all wetlands and waterways that are potentially jurisdictional were considered, and this section refers to them all as simply wetlands or waterways. Final determinations of the boundaries and legal status of each would be made by the appropriate agencies.

3.15.1 New Information Developed Since the Draft EIS

Since publication of the DEIS, additional information relevant to the project area has been gathered and analyzed in order to better assess and avoid adverse effects to wetlands and jurisdictional waters. The additional information includes a review of recent literature on wetland resources, including information on existing compensatory wetland mitigation sites.

In addition to new information developed since the DEIS, the FEIS includes refinements in design, impacts and mitigation measures. Where new information or design changes could potentially create new significant environmental impacts not previously evaluated in the DEIS, or could be meaningful to the decision-making process, this information and these changes were applied to all alternatives, as appropriate. However, most of the new information did not warrant updating analysis of the non-preferred alternatives because it would not meaningfully change the impacts, would not result in new significant impacts, and would not change other factors that led to the choice of the LPA. Therefore, most of the refinements were applied only to the LPA. As allowed under Section 6002 of SAFETEA-LU [23 USC 139(f)(4)(D)], to facilitate development of mitigation measures and compliance with other environmental laws, the project has developed the LPA to a higher level of detail than the other alternatives. This detail has allowed the project to develop more specific mitigation measures and to facilitate compliance with other environmental laws and regulations, such as Section 4(f) of the DOT Act, Section 106 of the National Historic Preservation Act, Section 7 of the Endangered Species Act, and Section 404 of the Clean Water Act. FTA and FHWA prepared NEPA re-evaluations and a documented categorical exclusion (DCE) to analyze changes in the project and project impacts that have occurred since the DEIS. Both agencies concluded from these evaluations that these changes and new information would not result in any new significant environmental impacts that were not previously considered in the DEIS. These changes in impacts are described in the re-evaluations and DCE included in Appendix O of this FEIS. Relevant refinements in information, design, impacts and mitigation are described in the following text.

3.15.2 Existing Conditions

This section describes the location and functional values of wetlands, potential wetlands, and waterways that have been field-identified in the main project area. Where access to the site was provided, these resources were "delineated," a process by which the existence of a wetland has been confirmed and its location has been established. Exhibit 3.15-1 shows the locations of these delineated wetlands as well as areas where a wetland may exist or where the location of a wetland is estimated. More detailed maps of wetland areas follow.

In Oregon, there are large wetlands to the west of the project area, remnants of the extensive wetland system that existed on the floodplain of the Columbia River prior to development. Large portions of this system, including areas within the main project area, were altered by humans by building dikes and levees, draining land, and adding fill material to low spots, first for agricultural purposes and then for urban development. Despite the reduction in area from its historic size, the remaining wetlands in the main project area perform important functions and are particularly valuable due to their relative rarity in the urban area.

Exhibit 3.15-1

Location of Potentially Affected Wetlands and Waterways

Dimensions are approximate.

In Washington, wetlands are localized near Burnt Bridge Creek, north of the SR 500 interchange. Topographic position, historic aerial photos, and early descriptions of the area indicate that wetlands were not present in the remainder of the project area in Washington prior to development. The DEIS previously identified additional wetlands immediately to the south of SR 500; however, based on additional research and discussions with regulatory agencies, the project team has determined that they are not in fact wetlands.

Several constructed wetlands, built to manage stormwater runoff, are located near the roadway in the project area in both Oregon and Washington. In general, constructed wetlands are a better stormwater management approach than traditional drainage pipes because wetlands: store water and allow it to infiltrate into the ground, providing better flood control; slow the speed of the water, allowing sediment and many pollutants to settle out; and allow water to percolate into the ground, where it eventually recharges underground aquifers used for water supply.

Exhibit 3.15-2 summarizes the functional assessments of the surveyed wetlands in the project area. The scale ranges from 0 to 32 for water quality and hydrologic functions, and from 0 to 36 for habitat function. Higher numerical values denote higher functions. For comparative purposes, this section describes wetland functions based on the Washington State Wetland Rating System, which consolidates ratings of many individual functions into values for water quality (removing pollutants), hydrological (providing flood control), and habitat (supporting fish and wildlife).

The CRC Wetlands and Jurisdictional Waters Technical Report, included as an electronic appendix to this FEIS, provides more detail on how the functions of each wetland were assessed.

Exhibit 3.15-2
Existing Wetland Conditions

Wetland		Water Quality Function	Hydrologic Function	Habitat Function
Victory Interchange Wetlands				
	West	14	16	9
	North	14	10	4
	East	14	10	6
Schmeer Slough		14	10	10
Vancouver Way Potential Wetland[a]		n/a	n/a	n/a
Walker Slough		10	16	15
Expo Road Wetland		14	16	8
Vanport Wetlands		26	24	22
Kiggins Bowl Wetland		8	4	14
Burnt Bridge Creek Wetlands				
	North	16	18	15
	South	16	18	10
WSDOT Mitigation Site Wetlands		14	16	22

Source: Data compiled from the CRC Wetlands and Jurisdictional Waters Technical Report and Wetland Delineation Report.

a An assessment of this potential wetland area adjacent to Vancouver Way has not been performed due to a lack of permission to enter the property.

Wetlands in Oregon

The main project area in Oregon includes a complex of small wetland systems, some of which are connected by culverts, near the I-5 roadway. These wetlands are remnants of the former slough system that have been modified to increase drainage and convey stormwater from the surrounding area to the Columbia Slough.

The Victory Interchange wetlands consist of three distinct wetland areas located south of Victory Boulevard, between the existing light rail tracks and the I-5 roadway (Exhibit 3.15-3). The northern and eastern portions are flooded during the wet season, and the southwestern part is flooded most of the year. These wetlands support reed canarygrass (*Phalaris arundinacea*), blackberry (*Rubus* sp.), willows (*Salix* sp.), cottonwood and poplars (*Populus* sp.), horsetail (*Equisetum* sp.), and common rush (*Juncus* sp.). This wetland complex has a medium functional value for water quality, a low to medium functional value for flood control, and a low value for habitat.

Schmeer Slough is located on the east side of I-5 and connects (by pipes) to the Expo Road wetland and Walker Slough to the north with the Columbia Slough to the south. Water depths are typically between 2 and 2.5 feet. This wetland supports cottonwood, Pacific willow (*Salix lasiandra*), native blackberry (*Rubus ursinus*), several species of grass (*Graminae*), and horsetail. It has medium functional value for water quality, and low values for flood control, flood storage, and habitat.

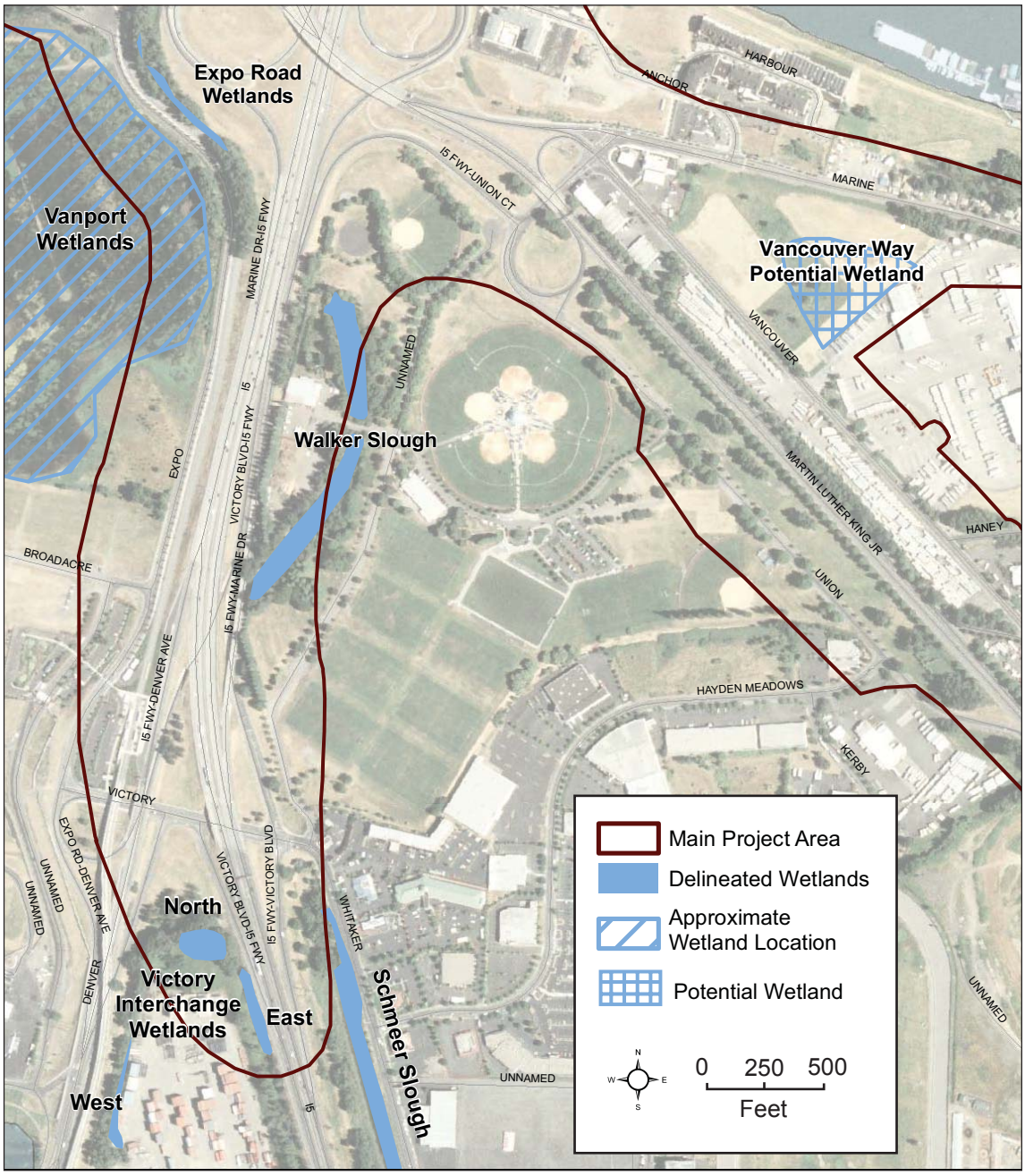
Based on mapped soils, aerial photographs, and observations from the public right-of-way, a wetland may exist between Vancouver Way and Marine Drive (identified as the potential Vancouver Way Wetland on Exhibit 3.15-3). However, because project staff did not receive permission from the property owner to enter this property, the presence of a wetland could not be verified. The City of Portland has not applied habitat protection zoning to this area.

Walker Slough, shown in Exhibit 3.15-3, is a year-round flooded wetland on the east side of I-5 in Delta Park. It supports wooded, shrub, and seasonal grassland areas. It has two stretches of open water connected by a culvert beneath an access road, and connects to Schmeer Slough to the south via underground pipes. Stormwater from the surrounding area is conducted to Walker Slough via several underground pipes. Walker Slough supports Oregon Ash (*Fraxinus latifolia*), cottonwood, willows, slough sedge (*Carex obnupta*), nodding beggarstick (*Bidens cernua*), and reed canarygrass. It has a low value for water quality, and moderate values for flood control, flood storage, and habitat.

The Expo Road wetland is located between the MAX tracks and the Marine Drive interchange. It connects by culvert to Walker and Schmeer sloughs to the southeast and to ditches within the Peninsula Drainage District No. 1 to the northwest. It is forested, and supports plants such as willow, cottonwood, Himalayan blackberry (*Rubus armenicus*), and reed canarygrass. It has moderate values for water quality and flood control functions, and a low value for habitat.

The Vanport Wetlands is a large wetland area managed by the Port of Portland as a mitigation site. It includes areas of forest, shrubs, grassland, and seasonal open water. It has the highest overall values for functions of any of the wetlands in the project area. It has high values for water quality, flood storage, and flood control, and a moderate to high value for habitat.

Exhibit 3.15-3
Wetlands in Oregon



Dimensions are approximate.

Wetlands in Washington

No wetlands were identified in the south Vancouver portion of the project area. There are several natural and constructed wetland sites around the northern portion of the project area near Burnt Bridge Creek, north of SR 500 (Exhibit 3.15-4).

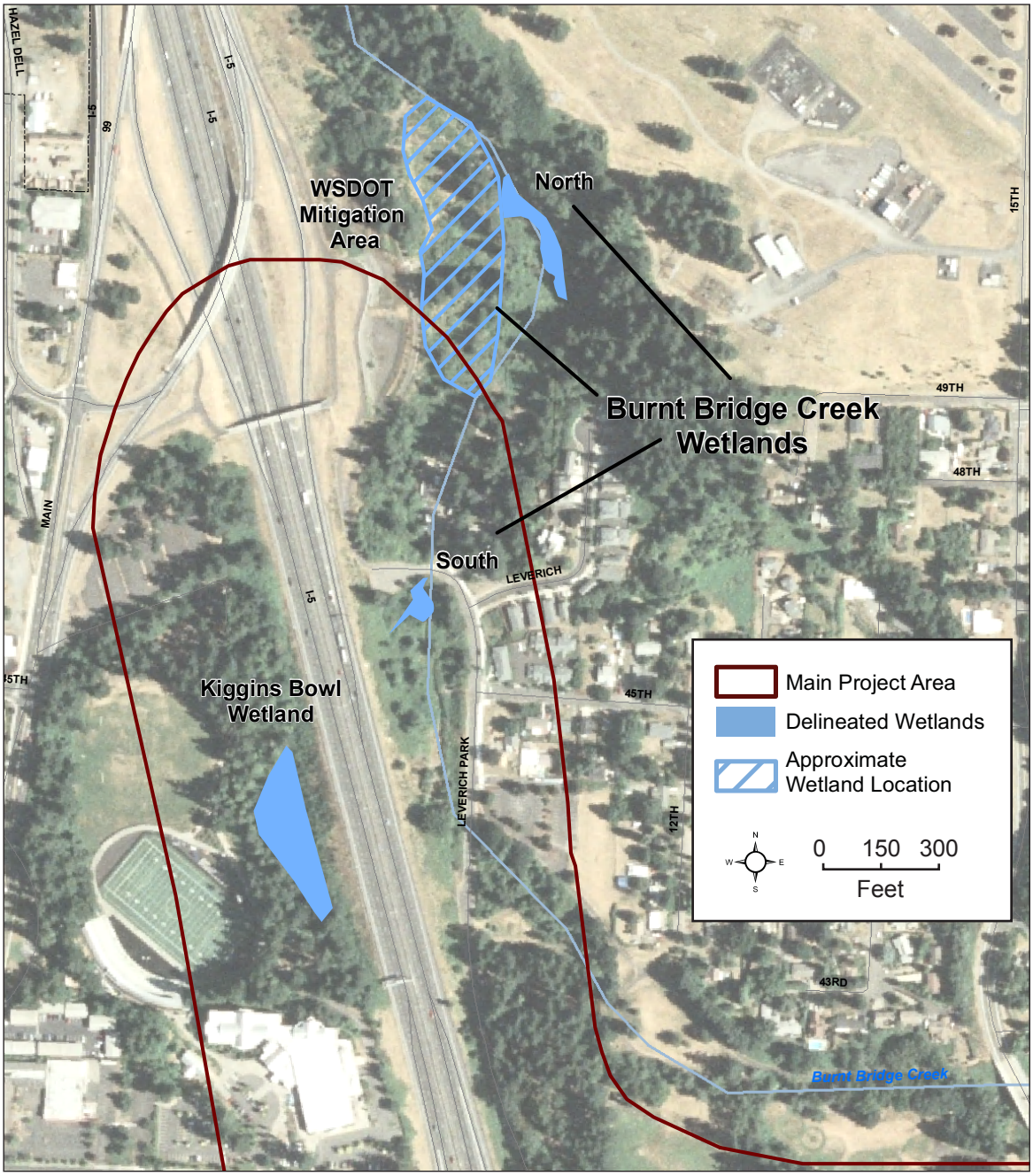
The Kiggins Bowl wetland is located at the base of steep slopes separating I-5 from Kiggins Bowl. This wetland is located in an area classified as Critical Lands and as a Non-Riparian Habitat Conservation Area (Clark County 2007). It supports cottonwood, willow, and reed canarygrass, and has low functional values for water quality and flood control, and a moderate habitat value.

The Burnt Bridge Creek wetland complex comprises a series of wetlands between Burnt Bridge Creek and I-5. The wetland area includes a mitigation site managed by WSDOT, which receives stormwater runoff from I-5.

The Burnt Bridge Creek wetlands are located in an area classified as Critical Lands and as a Riparian Habitat Conservation Area (Clark County 2007). They are seasonally flooded and support shrubby plants such as Pacific ninebark (*Physocarpus capitatus*), blackberry, and red osier dogwood (*Cornus sericea*) and understory species such as reed canarygrass, meadow foxtail (*Alopecurus pratensis*), and knotweeds (*Polygonum* sp.). These wetlands have moderate values for water quality and flood control, and low to high values for habitat.

Exhibit 3.15-4

Wetlands in Washington



Dimensions are approximate.

Waterways

The project team analyzed potential structural work, fill, and excavation that could affect waterways near the CRC project. No project construction will occur in the Columbia Slough, Burnt Bridge Creek, or Fairview Creek waterways. See Section 3.14, Water Quality and Hydrology and Section 3.16, Ecosystems for details on the watersheds, habitat values, and water quality issues pertaining to these jurisdictional waterways in the CRC project area. Construction activities would occur in the Columbia River and North Portland Harbor for any of the build alternatives, and are described in the Temporary Effects discussion later in this section. The existing I-5 bridges are supported by piers in both the Columbia River main channel and the North Portland Harbor side channel, and the presence of in-water piers would continue to have long-term effects under all build alternatives, as discussed below. Several roadside ditches are present throughout the project area, and are not considered jurisdictional under Oregon regulations. Depending on hydrological connections and current interpretations of USACE and State of Washington regulations, they may or may not be considered jurisdictional under Section 404 of the Clean Water Act or Washington regulations. The USACE, Department of Ecology, and City of Vancouver make jurisdictional determinations during the permit review process. Construction activities might impact these ditches.

3.15.3 Long-term Effects

In accordance with relevant state and federal regulations, impacts to wetlands, wetland buffers, and jurisdictional waters were avoided and/or minimized to the extent practicable in the design of each build alternative. Exhibit 3.15-5 summarizes the likely long-term impacts of the project alternatives to wetlands, adjoining buffer zones, and waterways, including fill and excavation.

As shown in Exhibit 3.15-5, while Alternatives 2 through 5 directly impact between 0.04 and 0.13 acre of wetlands, the LPA was refined to avoid encroachment on these resources. In addition, while Alternatives 2 through 5 directly impact between 0.56 and 1.31 acres of wetland buffer, the LPA Options A and B designs directly impact less wetland buffer—0.41 and 0.45 acre, respectively. With the LPA highway phasing options, all wetland buffer impacts would be delayed to a future phase of construction.

Direct impacts to waterways will occur in the Columbia River (including North Portland Harbor), with the LPA having less fill activity and displacing a smaller volume of water from the river than all other build alternatives. The LPA and the replacement bridge alternatives would remove the existing bridges over the main stem of the Columbia River, while the supplemental bridge alternatives would retain these bridges. In addition, the LPA would retain the existing bridges over North Portland Harbor, while all other build alternatives would replace these structures. All alternatives might impact roadside ditches that might be considered jurisdictional waterways, but the extent of the impacts is not known at this level of design and permitting.

Compared with Alternatives 2 through 5, the LPA has a more detailed design; therefore, the corresponding fill, removal, and river pier volume measurements for the LPA are more precise than those available for the other

build alternatives. The LPA with highway phasing options have the same fill, removal, and river pier impacts as the full LPA options.

Impacts to wetland and waterway functions can also affect water quality and ecosystem habitats. For more discussion on these effects, see Section 3.14, Water Quality and Hydrology and Section 3.16, Ecosystems.

Exhibit 3.15-5

Comparison of Long-term Effects on Wetlands and Jurisdictional Waters

Affected Resources	Locally Preferred Alternative[a]		No-Build	Alt 2: Repl Crossing with BRT	Alt 3: Repl Crossing with LRT	Alt 4: Suppl Crossing with BRT	Alt 5: Suppl Crossing with LRT
	LPA Option A	LPA Option B					
Expo Road Wetland (acres)	0	Same as Option A	0	0.09	0.04	0.13	0.08
Kiggins Bowl Wetland (acres)	0	Same as Option A	0	<0.01	<0.01	<0.01	<0.01
Total wetlands impact (acres)	0	Same as Option A	0	0.09	0.04	0.13	0.08
Victory Interchange buffer	0.01 (0)	0.05 (0)	0	0	0	0	0
Expo Road buffer (acres)	0	Same as Option A	0	0.98	0.43	1.18	0.63
Walker Slough buffer (acres)	0	Same as Option A	0	0.13	0.13	0.13	0.13
Kiggins Bowl buffer (acres)	0.3 (0)	Same as Option A	0	0	0	0	0
Burnt Bridge Creek buffer (acres)	0.1 (0)	Same as Option A	0	<0.01	<0.01	0	0
Total wetland buffer impact (acres)	0.41 (0)	0.45 (0)	0	1.11	0.56	1.31	0.76
Columbia River fill (acres)[b]	1.40	Same as Option A	0	2.81	2.81	1.93	1.93
Columbia River remove (acres)[b]	0.64	Same as Option A	0	0.75	0.75	0.25	0.25
Columbia River bridge piers (total cubic yards)[b,c]	48,400	Same as Option A	45,300	54,700	54,700	101,400	101,400

a Information in parentheses indicates impacts if the LPA Option A or B is constructed with highway phasing.

b This FEIS includes more precise measurements of the existing bridges over the Columbia River than were available for the DEIS.

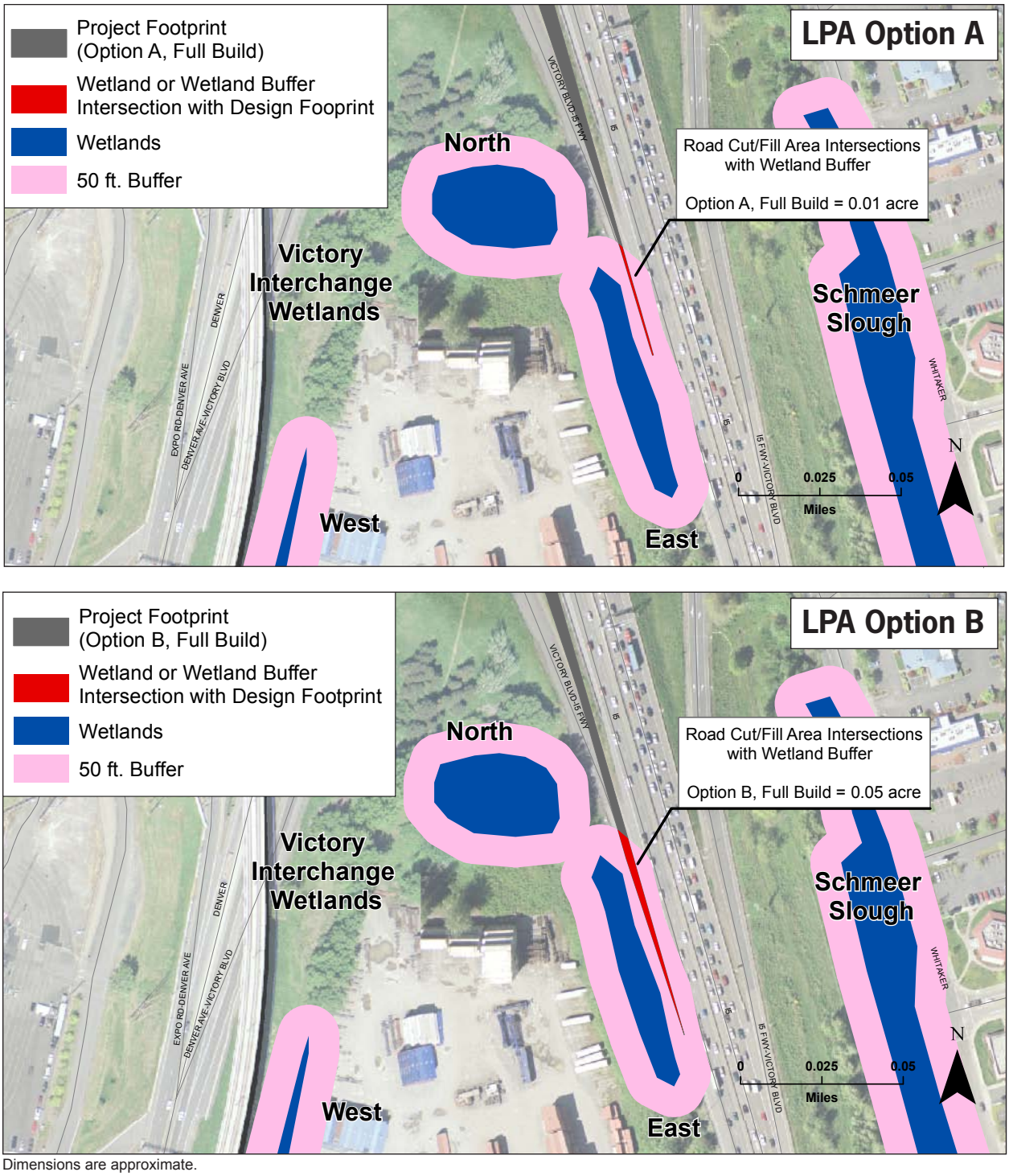
c To better convey the relative impacts of the No-Build and build alternatives, the FEIS reports the total cubic yards of the Columbia River that would be displaced by bridge piers. The DEIS reported the net cubic yard impacts of the build alternatives relative to the No-Build Alternative.

LPA Impacts on Wetlands and Waters

Exhibits 3.15-6 and 3.15-7 illustrate how the LPA construction footprint would intersect with wetland resources in Oregon and Washington. Likely long-term impacts are discussed in detail below.

Exhibit 3.15-6

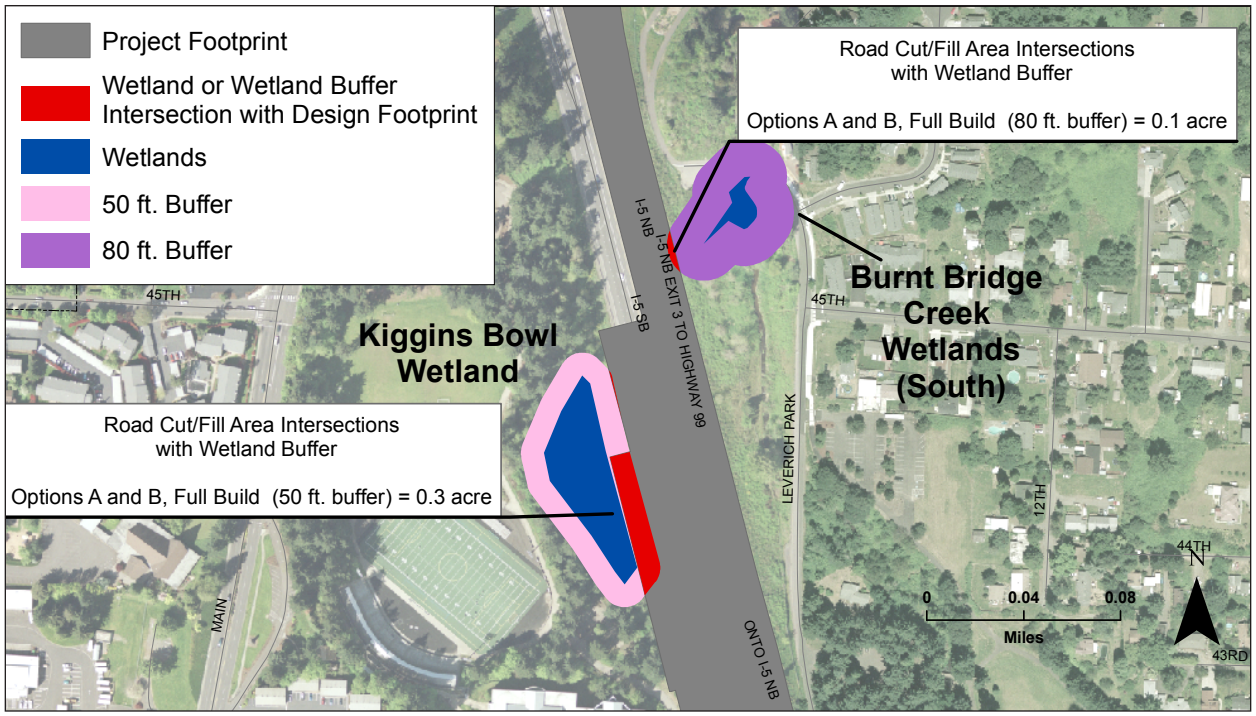
Potential Impacts of LPA on Wetland Buffers in Oregon



Dimensions are approximate.

Exhibit 3.15-7

Potential Impacts of LPA on Wetland Buffers in Washington



Dimensions are approximate.

WETLANDS AND WETLAND BUFFERS

The LPA project footprint would not encroach upon any delineated wetlands. However, the LPA footprint would encroach upon three wetland buffers: Victory Interchange (0.01 acre for LPA Option A and 0.05 acre for LPA Option B), Kiggins Bowl (0.3 acre), and Burnt Bridge Creek (0. 1 acre). Although this encroachment would introduce more impervious surface in the vicinity of project wetlands and bring highway traffic closer to wildlife within the wetlands, the long-term effects are expected to be small. The new impervious surface would not discharge untreated stormwater runoff into the wetlands, and the wildlife activities that may be impacted are already negatively affected by the urbanized environment. For more information on long-term impacts to water quality and wildlife, refer to both the CRC Ecosystems Technical Report and the CRC Water Quality and Hydrology Technical Report, included as electronic appendices to this FEIS.

Aerial photographs have mapped wetlands to the west and southwest of the Ruby Junction area (USFWS 2010a); however, right-of-entry for the properties was not obtained, and therefore the sites could not be thoroughly examined. No potential wetlands were identified during a preliminary survey of the Ruby Junction Maintenance Facility and proposed expansion area, so wetlands impacts are not expected at this site. Prior to initiation of project activities, further wetland investigations would be necessary.

Depending on how the LPA is constructed, as a single or phased project, impacts to wetland buffers may be delayed. Should construction of the braided ramp improvements to the Victory Boulevard interchange be deferred, the impacts to the Victory Interchange wetland buffers would also be deferred.

Similarly, should the improvements to the northern half of the SR 500 interchange be deferred, impacts to the Kiggins Bowl and Burnt Bridge Creek wetland buffers would be deferred.

LPA Option A and B differ in their proximity to the Vanport Wetlands and the potential Vancouver Way Wetland. LPA Option A (but not Option B) includes improvements to the existing North Expo Road, parallel to the Port of Portland's Vanport Wetlands mitigation site's northern boundary. The mitigation site is protected by a conservation easement and as such, roadway improvements will only occur outside the mitigation site boundaries. LPA Options A and B include new roadways connecting North Vancouver Way to North Marine Drive; however, only the LPA Option A design has the possibility of encroaching upon the eastern edge of the potential Vancouver Way Wetland. Lacking permission from the property owner to enter the Vancouver Way property, neither the project team nor regulatory agencies can confirm the presence or absence of jurisdictional wetlands at this location. If LPA Option A is advanced into final design, ODOT and FHWA will take additional measures, as necessary, to secure right-of-entry to this property in order to confirm the presence or absence of a wetland at this location.

WATERWAYS

Direct impacts to waterways would occur from bridge piers in the Columbia River, including both the main channel and North Portland Harbor side channel. No in-water impacts would occur in other identified waterways, including Fairview Creek adjacent to the Ruby Junction Maintenance Facility, but roadside ditches that might be considered jurisdictional waterways may be impacted.

Under the LPA, new permanent bridge piers in the Columbia River (including those associated with additional new bridges over North Portland Harbor) would cover an area of 1.40 acres and displace a water volume of 47,400 cubic yards. Demolition of the existing bridges in the main stem of the Columbia River would result in removal activity in approximately 0.64 acre of waterway and would remove 44,300 cubic yards of material (thus offsetting some of the water volume displaced by the new bridge piers), for a net 0.76 acre of river impacted and 3,100 cubic yards of water displaced by the LPA.

As with the existing bridge piers, replacement bridge piers in the Columbia River for the LPA may result in long-term impacts to aquatic species, including protected fish species. For more information on these impacts see the Section 3.16, Ecosystems.

INDIRECT EFFECTS

Construction of the LPA would support redevelopment on Hayden Island and in downtown Vancouver, particularly mixed-use, higher density development around the light rail transit stations. This potential change in land uses and development patterns is consistent with local plans, and no wetlands have been identified in these areas. Furthermore, stormwater runoff from these areas does not flow to any identified wetlands.

Although the project is not expected to generate any substantial new demand for development outside these areas, it could indirectly induce at least some

development on currently undeveloped properties that contain wetlands, and could therefore result in indirect impacts to wetlands or wetland buffers. However, as discussed in the CRC Indirect Effects Technical Report (included as an electronic appendix to this FEIS), this kind of induced development is likely to be very low, and to the extent it occurs, it would be subject to federal and state regulations that require avoidance, minimization, and mitigation for wetland impacts. Therefore, little or no long-term decreased wetland habitat function or disruption of wetland flow patterns would be expected to occur as a result of indirect effects of the LPA.

Section 3.14, Water Quality and Hydrology and Section 3.16, Ecosystems discuss indirect effects to jurisdictional waters.

3.15.4 Temporary Effects

Temporary effects are those related to construction activities. Temporary effects of the LPA have been divided into on-site construction and off-site construction effects. On-site refers to construction-related activities within the main project area and at the Ruby Junction Maintenance Facility. Off-site refers to construction activities that will take place at major project casting and staging areas.

The No-Build Alternative would not involve CRC-related construction activities and so would not entail any temporary disturbance of wetlands, wetlands buffers, waterways or their functions.

On-site Construction Effects

Temporary impacts to wetlands buffers and waterways are more likely to occur at locations where long-term impacts are anticipated. Temporary disturbances to wildlife activity, hydrology, and water quality will be avoided as much as possible through the use of best management practices (BMPs) such as silt fences, construction fencing, and wildlife exclusionary netting during the construction process.

The LPA would involve in-water construction activities in the Columbia River, including North Portland Harbor. Section 3.16, Ecosystems discusses the temporary effects of this activity to habitat functions, and Section 3.14, Water Quality and Hydrology discusses temporary effects to water quality and flood control functions. All alternatives might impact roadside ditches that might be considered jurisdictional waterways, but the extent of the impacts is not known at this level of design and permitting.

There were no wetlands or other jurisdictional waters identified in the Ruby Junction Maintenance Facility expansion area. Temporary disturbances to wildlife activity, hydrology, and water quality in Fairview Creek (adjacent to the Ruby Junction site) will be avoided as much as possible through the use of BMPs during the construction process.

Off-site Construction Effects

Potential locations for off-site construction staging and bridge assembly/casting areas include the Port of Vancouver Parcel 1A, Port of Vancouver Alcoa/Evergreen West, Red Lion at the Quay, Thunderbird Hotel, and

Sundial sites. Each of these sites is near the Columbia River, and some of them have been identified by the National Wetlands Inventory as potentially containing wetlands. The existing conditions on the assembly/casting yard sites range from developed and paved (Port terminal) to undeveloped. The staging and casting/assembly site activities may increase stormwater runoff over existing conditions and may increase pollutant loading of waterways. The development and use of any of the staging and casting sites would meet all applicable stormwater requirements during and following utilization of the sites. The project would also be required to avoid, minimize, or mitigate wetland impacts at any off-site location. Further study will be needed before these or any other sites can be permitted, and all necessary permits would be secured prior to site development and operations.

3.15.5 Mitigation or Compensation

Mitigation is required for the 0.41 acre (LPA Option A) or 0.45 acre (Option B) of impacts to wetland buffers and the 1.40 acres (all LPA options) of impacts to the Columbia River.

Mitigation for Wetland Buffers and Potential Wetlands Effects

Within its borders, the City of Portland's Zoning Code regulates wetland buffers when the resource is within a mapped environmental zone overlay. If the CRC project is not exempt from environmental zone regulations (33.430.080) and if the project does not meet the City's development standards (33.430.140 through .190), environmental review and mitigation will be required by the City. The CRC project must demonstrate how resources within the environmental overlay zones will be avoided and minimized to the maximum extent possible; unavoidable impacts will require mitigation. The mitigation site plan must demonstrate that the mitigation will replace all of the resources and functions affected and that a suitable mitigation site is owned by the applicant. The mitigation must be within the same watershed as the affected environmental zone, except when the purpose of the mitigation could be better provided elsewhere.

If LPA Option A is advanced into final design, ODOT and FHWA will secure right-of-entry to the property containing the potential Vancouver Way Wetland in order to confirm the presence or absence of a wetland at this location. If presence is confirmed, then the project would comply with the relevant regulatory and permitting requirements, including avoiding, minimizing, and mitigating wetland impacts.

In the project area in Washington, wetland buffers are regulated by the City of Vancouver under its critical areas protection ordinance. Compensatory mitigation is required to address affected functions by achieving a functional equivalency or improvement and providing a similar wetland or buffer function. Approval criteria require no net loss of functions or values for any activity impacting a critical area.

Mitigation for temporary effects includes the replacement of vegetation that is cleared for construction activity; this would occur in accordance with local regulatory guidance. For more details on mitigation for temporary effects, refer to Section 3.14, Water Quality and Hydrology and Section 3.16, Ecosystems.

Mitigation for Waterway Effects

The CRC project would mitigate for unavoidable impacts to the Columbia River and other jurisdictional waterways as required under Section 404 of the Clean Water Act, the Oregon Removal/Fill Law, and Washington Department of Fish and Wildlife (WDFW) Hydraulic Project Approval. The DOTs will be the applicants for necessary permits. The project would include mitigation plans and actions to identify and implement habitat protection, restoration, and enhancement as appropriate. These actions are intended to provide a net conservation benefit for the unavoidable impacts bridge construction and demolition have on species, habitats, and resource sites. Mitigation for impacts to jurisdictional ditches, if any occur, will likely involve reconstruction of the ditches and revegetation with native plants.

Due to statutory requirements, impacts to water resources on the Oregon side of the project require compensation within Oregon, and impacts to water resources on the Washington side of the project require compensation within Washington. The compensatory mitigation ultimately selected will be based on a functional assessment of adverse effects and replacement of equivalent functional value. The project mitigation will provide meaningful improvement in the size, amount, distribution, and quality of habitats relative to that which existed prior to implementation of the CRC project.

For temporary impacts (less than 2 years) to open water habitat, a 1:1 mitigation to impact ratio will be employed. This mitigation is in addition to the restoration of the temporarily impacted open water habitat, which will occur prior to project completion. For permanent impacts to open water habitat, at a minimum a 3:1 ratio will be employed. This increased ratio is to accommodate the risk of failure associated with some habitat projects and in recognition of the long periods of time sometimes necessary for successful habitat projects to provide desired function and conditions (Kentula et. al. 1992). Quigley and Harper (2006) demonstrated that providing compensation for the loss to fish habitat at a 2:1 ratio was not sufficient to achieve "No Net Loss" under the habitat provisions of Canada's Fisheries Act of 1976. Although prepared for a project subject to Canadian laws, the study's analysis suggests that a 2:1 ratio may not provide compensatory mitigation consistent with CRC's conservation priorities. As a result, CRC will provide, at a minimum, a 3:1 mitigation to impact ratio for permanent impacts to open water habitat.

Working with relevant regulatory agencies, goals and project selection criteria were developed for use in compensatory mitigation site selection. These goals and selection criteria are listed below.

MITIGATION GOALS

- To restore habitat types or aspects that have been lost or greatly reduced over the last approximately 75 years.
- To restore access to historical habitats for anadromous and resident aquatic species.
- To provide "connectivity" and not be physically isolated from other habitat areas.

- To address impaired watershed processes that affect the aquatic system, water quality, and related ecosystem services.
- To preserve, enhance, and protect natural processes in order to maintain the habitat restored.
- To help implement adopted recovery plans or develop information to help advance the science.

MITIGATION PROJECT SELECTION CRITERIA

- Sites will address recovery measures or critical limiting factors such as those identified in the Basin Recovery Plan Module or the Watershed Assessment and Action Plan.
- Will be large enough (in size and shape) to provide for complexity (i.e., multiple niche habitats within overall habitat) and provide some measurable and demonstrable improvement in the function of a system.
- Avoid sites where success is not achievable. Sites where the natural conditions or functions have been so altered as to be irreversible or where adjacent land use would limit or preclude project success.
- Avoid sites that would conflict with existing management plans or strategies.
- Conduct restoration measures that will have demonstrable, measurable results and have a high likelihood of achievement.
- Funding and scope to ensure long-term monitoring (a "feedback loop") and be able to implement adaptive management.
- Activity will have defined and supported goals, objectives, and success criteria so success can clearly be demonstrated.
- Ground activities such as aquatic or riparian habitat restoration and enhancement must have a mechanism for long-term protection (e.g., conservation easement or public ownership).
- Site selection will avoid locations where restoration actions conflict with other ESA-protected species.

A variety of potential mitigation sites were analyzed for inclusion in the CRC project, and the following two projects—one in Oregon and one in Washington—were the only projects that met all of the mitigation goals, described above.

Oregon

For mitigation in Oregon, CRC is planning to use the Hood River Off-Channel Reconnection Project because it would provide high-value off-channel rearing habitat for ESA-listed Lower Columbia River ESU/DPS juvenile salmonids and spawning habitat for adult salmonids. The project would also provide essential spawning and rearing habitat for other native fishes.

Specifically, the project would provide off-site compensatory mitigation on the lower Hood River located between RM 1.0 and 2.0, where the Mount Hood Railroad (MHRR) has cut off and isolated a historic side channel and associated wetland. The mitigation project would restore connectivity of the side channel and associated low-functioning 21-acre wetland complex

to the mainstem Hood River, greatly improving aquatic habitat, and habitat complexity for migrating and rearing salmonids.

Washington
In Washington, CRC is planning to use the Lewis River Confluence Side Channel Restoration Project because the restored shallow water, off-channel habitats would provide high-value tidal rearing habitat for ESA-listed Lower Columbia River ESU/DPS juvenile salmonids. The project would also provide essential spawning and rearing habitat for other native fishes.

Specifically, the project would occur on the east bank of the Lewis River at its confluence with the Columbia River. This site is located downriver and approximately 10 miles northwest of the CRC project in the Lewis River watershed in Clark County. Historically the east bank of the Lewis River at the confluence of the Columbia River had multiple side channels with an open hydraulic connection to the Columbia River. Those side channels were filled in and blocked by deposition of dredge spoils by USACE between the years 1965 to 1973. Restoration of the side channels would consist of removal of the dredge spoils to restore the channels and reconnect to the Lewis and Columbia Rivers. The mitigation project would restore over 3,000 linear feet of historic side channels of the Lewis River. These restored shallow water off-channel habitats would provide high value tidal rearing habitat for juvenile salmonids.

If during the permitting process, the compensatory mitigation sites discussed above are proven to be infeasible, the project will work with regulatory agencies to identify replacement sites and activities in Oregon and Washington that meet all relevant federal, state, and local requirements. For more details on mitigation for temporary construction impacts to waterways, refer to Section 3.14, Water Quality and Hydrology and Section 3.16, Ecosystems in this FEIS.

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