Wasco County Planning Department
"Service, Sustainability & Solutions"

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WASCO COUNTY PLANNING COMMISSION AGENDA PACKET

FOR

Hearing Date: September 6, 2016

Hearing Time: 3:00 pm
Hearing Location: Columbia Gorge Discovery Center, Theater/Auditorium
5000 Discovery Drive
The Dalles, Oregon 97058

Action Item(s):

QUASI JUDICIAL HEARING:

PLASAR-15-01-0004

Request by Union Pacific Railroad and their land use consultants, CH2M Hill, to expand an existing railroad siding on either side of Mosier, Oregon for 4.02 miles of new second mainline track and realigned existing track; place five new equipment shelters; install drainage structures, a retaining wall, new lighting and signage, and wireless communication poles; modify existing utilities, temporary landing zones for construction; construct temporary and permanent access roads; and a property line adjustment. The request also includes off-site wetland mitigation east of the primary project site.

VOLUME #3

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Date: August 30, 2016

To: Wasco County Planning Commission

From: Wasco County Planning Office

Subject: Submittal for Hearing dated September 6, 2016

QUASI JUDICIAL HEARING:

PLASAR-15-01-0004

Request by Union Pacific Railroad and their land use consultants, CH2M Hill, to expand an existing railroad siding on either side of Mosier, Oregon for 4.02 miles of new second mainline track and realigned existing track; place five new equipment shelters; install drainage structures, a retaining wall, new lighting and signage, and wireless communication poles; modify existing utilities, temporary landing zones for construction; construct temporary and permanent access roads; and a property line adjustment. The request also includes off-site wetland mitigation east of the primary project site.

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Pages Redacted	PC 1 3-750-752
Pages Redacted	PC 1 3-771-812
Application Appendix K	PC 1 3-881
Pages Redacted	PC 1 3-930-932
Pages Redacted	PC 1 3-951-992

PLASAR-15-01-0004 UPRR

Application Materials

Please Note:

All *sensitive natural and cultural resource information, including correspondence that include confidential resource protection information, has been withheld to ensure ongoing resource protection. Please contact staff with any questions.*

Appendix J
Special-Status Species Plant Survey and Habitat Mapping Report

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Draft Report

Special-Status Plant Species and Habitat Mapping Union Pacific Railroad Second Mainline Track Project Wasco County, Oregon

Prepared for

Union Pacific Railroad

January 2015

Prepared by

CH2MHILL®

2020 S.W. Fourth Avenue
Suite 300
Portland, OR 97201

PC 1 3-718

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SECTION 1

Introduction

Union Pacific Railroad (UPRR) proposes to construct approximately 4.02 miles of second mainline track along the existing Portland Subdivision between rail mileposts (MP) 66.98 and 72.35. The project is referred to as the Second Main Line Track Project. Figure 1 (all figures are provided in Appendix A) shows the project location. The Portland Subdivision is an existing rail line that extends east from Portland, Oregon, through the Columbia River Gorge to the existing Hinkle Yard near Hermiston, Oregon. Approximately 3.58 miles of the proposed project will be located in an area subject to Development Approval in accordance with the Columbia River Gorge National Scenic Area Act (NSA Act). The project will develop a second set of tracks (that is, "second mainline track") parallel to the existing track. UPRR will construct the proposed second mainline within existing right-of-way (ROW) to the greatest extent practicable.

The purpose of the project is to improve the operational efficiency of train movements along the Portland Subdivision. The project is needed to correct the operational constraints that result from the existing railroad infrastructure between MP 66.98 and 72.35. The specific infrastructure-based constraints that create the need for the project include the short siding between MP 69.38 and 70.72 (Mosier Siding) and the surrounding single mainline track. The segment of the Subdivision between MP 66.98 and 72.35 has the poorest operational performance and efficiency along the entire route because of the location and configuration of the Mosier Siding, which has resulted in an operational bottleneck that affects freight movements throughout the Portland Subdivision.

CH2M HILL conducted special-status plant surveys and mapped existing vegetation communities in support of the project to identify potential populations of special-status species or priority habitats within and immediately adjacent to the proposed construction corridor. The project will avoid sensitive populations and priority habitats to the greatest extent possible.

This report provides a brief overview of the proposed project, discusses current regulatory requirements, describes the methodology followed to conduct the surveys, presents survey results and conclusions, and offers recommendations for the future, including proposed measures for avoiding or minimizing impacts.

SECTION 2

Project Description

2.1 Location

The project is located along the Portland Subdivision of the UPRR ROW in Wasco County, Oregon. It begins at MP 66.98, east of the Wasco County boundary line, approximately 2 miles west of Mosier, Oregon, and ends at MP 72.35, approximately 3 miles east of Mosier, Oregon. The subdivision roughly parallels the Columbia River and Interstate 84 for the length of the project. More specifically, the project ranges from 45°41'27.44"N 121°26'25.13"W to 45°41'49.65"N 121°20'8.17"W, and includes Township 3 North, Range 12 East, Sections 31 and 32; Township 3 North, Range 11 East, Section 36; and Township 2 North, Range 11 East, Sections 1, 2, and 3.

The project is located in the Columbia Basin physiographic province (Franklin and Dyrness, 1988) at the eastern end of the Columbia River Gorge (Gorge). The Columbia basin occupies an extensive area south of the Columbia River between the Cascades and the Blue Mountains in Oregon and roughly two-thirds of the area east of the Cascades in Washington. Franklin and Dyrness (1988) further describe the Columbia River Gorge as one of several "Other Botanically Interesting Areas" in Oregon and Washington, based on physiographic characteristics unique to the Gorge.

The Gorge provides the only nearly sea-level break in the Cascade Range in Oregon and Washington, providing a major route for plant and animal migration between the eastern and western halves of these states. It also contains species endemic to the Gorge, some of which may constitute relict populations.[1] The unique topography of the Gorge produces a variety of weather conditions, including an average rainfall that ranges from 75 inches in the west to less than 15 inches in the east. Vegetation in the Gorge transitions along this precipitation gradient from mesophytic Douglas-fir/western hemlock (*Pseudotsuga menzeisii/Tsuga heterophylla*) forests in the west to xerophytic ponderosa pine/Oregon white oak (*Pinus ponderosa/Quercus garryana*) communities on the east.

2.2 Project Components

2.2.1 Rail Lines

Between rail MPs 66.98 and 69.38, the proposed second mainline would be constructed to the north of the existing track (see Appendix A). At MP 69.44, the proposed second mainline would tie into existing siding. Between MP 70.37 and MP 70.74, both the existing siding and the existing main line track would be realigned to the south. From MP 70.74 east to MP 72.35, the new track would be constructed south of the existing track. UPRR also proposes to acquire new ROWs and temporary construction easements where construction is planned to occur. The locations of ROW enhancements and temporary construction areas are shown in Figure 2.

2.2.2 Proposed Structures, Lighting, and Signage

Most of the project will be constructed at grade. The only aboveground structures or related and supporting facilities proposed within areas subject to Scenic Area Review (that is, in unincorporated Wasco County parcels not zoned "Urban Areas") are proposed in-kind guardrail extensions along I-84, standard railroad signage, signal lights, up to five wooden poles and wireless signaling appurtenances, and up to five signal buildings necessary for the safe operation of the railroad. Each of these signal buildings will have a footprint that will range from approximately 6 feet by 6 feet to approximately 8 feet by 10 feet and will be approximately 9 feet in height. Signal buildings will house essential circuitry and will be constructed of a

[1] A relict population refers to a population of organisms that naturally occur in a restricted area, but whose original range was far wider during a previous geologic time period.

non-reflective metal and will be painted with a dark earth-toned paint that matches the surrounding natural environment. All signal buildings will be located within UPRR ROW.

2.2.3 Structures to be Removed

Up to five existing signal buildings are proposed for removal, resulting in no net increase in signal buildings from current conditions. In addition to signal box removal, up to two existing antenna poles will be removed from areas along the route.

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SECTION 3

Regulatory Setting

3.1 Columbia River Gorge National Scenic Area Act

The proposed project is located entirely within the Columbia Gorge National Scenic Area (CRGNSA, which was designated a National Scenic Area by the Columbia River Gorge National Scenic Area Act of 1986.

The Scenic Area is managed by the Columbia Gorge counties, the states of Oregon and Washington, the U.S. Forest Service, and the Gorge Commission. The Gorge Commission is a bi-state Compact agency authorized by the Scenic Act and created by Washington and Oregon legislation in 1987.

The Scenic Area extends 85 miles on both sides of the Columbia River, from Troutdale, Oregon, and Washougal, Washington, on the west to the Deschutes River in the east. The Scenic Area comprises three areas:

- **Special Management Areas** (approximately 114,600 acres) in which the U.S. Forest Service sets land management policy and determines federal consistency.
- **General Management Areas** (approximately 149,400 acres and all of the Columbia River). Development of private lands in this area is administered by the Gorge counties and the Gorge Commission. Five of the six Gorge counties, including Wasco County, implement ordinances under the Scenic Area Management Plan.
- **Urban Areas.** Thirteen Urban Areas, including the City of Mosier, are not subject to the CRGNSA. Land use decisions in these areas are under the jurisdiction of the applicable city or county government.

All three of these management area categories occur within the proposed project area.

Wasco County regulates development in the CRGNSA in partnership with the agencies described above and the Gorge Commission under the Wasco County National Scenic Area Land Use Development Ordinance (NSA LUDO) (Wasco County, 2010).

3.2 Wasco County National Scenic Area Land Use Development Ordinance

The Wasco County National Scenic Area Land Use Development Ordinance (Wasco County, 2010) contains conditions for protecting special-status plant and wildlife species.

3.2.1 Section 14.600 (General Management Areas)

This section states that new uses must not result in adverse effects to special-status plant species. A species is considered to be special status if it meets one or more of the following criteria:

1. Endemic to the Columbia River Gorge and vicinity;
2. Listed as endangered or threatened pursuant to federal or state endangered species acts; or
3. Listed as endangered or threatened on list (1) or list (2), by the Oregon Natural Heritage Program. (For brevity, these species will be referred to as “sensitive” plant species.)

Section 14.600 also requires that new uses in the Scenic Area not result in adverse effects to sensitive wildlife area and sites. “Sensitive wildlife areas” are defined as the 17 land and water areas that are included in the wildlife inventory of the management plan.

“Sensitive wildlife sites” are defined as sites that are used by species that are:

1. Listed as endangered or threatened pursuant to federal or state endangered species acts;

2. Listed as sensitive by the Oregon Fish and Wildlife Commission; or
3. Considered to be of special interest to the public, limited to great blue heron, osprey, mountain goat, golden eagle, and prairie falcon.

3.2.2 Section 14.610 (Special Management Areas)

Section 14.610 addresses sensitive plant areas and sites for new developments or uses within 1,000 feet of a sensitive wildlife site or area. “Sensitive plant areas and sites” include endemic plants and those plant species potentially occurring in identified “Priority Habitat.”

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SECTION 4

Methods

4.1 Objectives and Study Area

4.1.1 Special-Status Plants

The purpose of the special-status plant survey was to locate all populations of special-status plants within the project area, to record and map their locations using geographic positioning system (GPS) technology with submeter accuracy, and to determine the size and phenology of each rare plant population and its microhabitat characteristics.

The study area included all areas where potential impacts could occur from project implementation, including the footprint of the proposed alignment and associated access roads and other facilities.

Target species included all plant taxa covered under the regulations described in Section 3 potentially occurring in Wasco County, Oregon. Additionally, in Special Management Areas, special-status species included plant species identified as Forest Service-Sensitive (FS-S) species in the *Columbia River Gorge National Scenic Area Management Plan* (USFS, 2006). A species was determined to have potential to occur in the study area if its known or expected geographic range includes the study area or the vicinity of the study area, and if its known or expected habitat is represented within or adjacent to the study area.

4.1.2 Habitat Mapping

The purpose of the habitat mapping was to identify and characterize habitats present within the proposed project area and to determine whether suitable habitat is present to support any special-status terrestrial wildlife species. The study area included all areas where potential impacts could occur from project implementation, including the footprint of the proposed alignment and associated access roads and other facilities.

Special-status terrestrial wildlife species are defined as those wildlife species listed on the *Columbia River Gorge National Scenic Area Management Plan Sensitive Wildlife and Plant Species* list (USFS, 2006). A species was determined to have potential to occur in the study area if its known or expected geographic range includes the study area or the vicinity of the study area, and if its known or expected habitat is represented within or adjacent to the study area.

Habitats were identified according to habitat types described in *Wildlife-Habitat Relationships in Oregon and Washington* (Chappell et al., 2001). Within those habitats, specific vegetation communities identified as Priority Habitats according to the Wasco County *National Scenic Area Land Use Development Ordinance*, Chapter 14, Section 14.610 (Wasco County, 2010) were also identified and mapped.

4.2 Office Review

4.2.1 Special-Status Plants

The office review consisted of compiling a list of special-status plant species potentially occurring within the proposed project area, and reviewing topography and soils maps, recent aerial photography, and information on habitat requirements for any of the potentially occurring species.

The following sources were consulted:

- *Columbia River Gorge National Scenic Area (CRGNSA) Management Plan: Sensitive Wildlife and Plant Species: Species with Historic or Suspected Range in the CRGNSA.* Columbia River Gorge National Scenic Area Management Plan. Updated, March 2006 (USFWS, 2006).

- *Natural Resources of Concern: ROW + AR for UPRR Mosier Second Mainline Project.* U.S. Fish and Wildlife Service resource list for the UPRR Second Mainline Track project area. February 26, 2014.
- *Rare, Threatened, and Endangered Vascular Plant List (Wasco County*). Oregon Biodiversity Information Center (ORBIC). Accessed March 2014.
- *ORBIC Database Search Results.* Database search results for recorded observations of sensitive species within one mile of the UPRR Second Mainline Track project. ORBIC, February 4, 2014.
- *Special Status Plant Species Mapping in the vicinity of the* UPRR Second Mainline Track project UPRR Second Mainline Track project. ORBIC, 2014.
- *Topographic Map of the White Salmon, WA-OR Quadrangle.* United States Geological Service (USGS), 1994a.
- *Topographic Map of the Lyle, WA-OR Quadrangle.* United States Geological Service (USGS), 1994b.
- *Web Soil Survey: Mosier Area, Oregon.* U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS), 2014.

4.2.2 Habitat Mapping

A list of habitats potentially present within the proposed project area were identified according to habitat types described in *Wildlife Habitats: Descriptions, Status, Trends, and System Dynamics* (Chappell et al., 2001). The office review included review of recent aerial mapping in the vicinity of the project area and delineation of potential habitat types on the aerial maps for verification in the field.

Additionally, the following resources were consulted for habitat mapping specific to the Columbia Gorge National Scenic Area:

- *Sensitive Wildlife Area Mapping.* Columbia River Gorge Commission, 2011
- *Special Status Wildlife Mapping in the vicinity of the* UPRR Second Mainline Track project UPRR Second Mainline Track project. ORBIC. 2014.

4.3 Field Investigation

4.3.1 Special Status Plants

Surveys were floristic in nature and were conducted according to the U.S. Bureau of Land Management *Survey Protocols for Survey and Manage Strategy 2 Vascular Plants* (Whiteaker et al., 1998). Two survey methods were used: an intuitive controlled survey was conducted throughout the project site and a complete survey was conducted in areas of high potential habitat. Protocol for these methods is described below.

4.3.1.1 Intuitive Controlled Survey

An intuitive controlled survey was conducted throughout the study area. The surveyor traversed through the study area to see a representative cross-section of all the major habitats and topographic features, looking for the target species while en route between different areas. When the surveyor arrived at an area of high potential (defined in the pre-field review or encountered during the field visit), a complete survey for the target species was conducted.

4.3.1.2 Complete Survey

A complete survey was conducted in areas where the most suitable habitat was located. These surveys are defined as a 100 percent visual exam of the study area.

Plant surveys were completed during two survey periods, coinciding with the optimum bloom times for the potentially occurring special-status plant species. The early spring survey period was from April 22 through April 30, 2014; the late spring/early summer survey period was from June 11 through June 13, 2014. A late

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summer survey was not conducted because earlier surveys concluded that no habitat is present to support late blooming special-status species.

Lists of all vascular plant taxa encountered within each study area were recorded in the field. Plant species found in the study areas were identified to the level needed to determine whether they qualify as special-status plants. Collections were made of specimens that could not be identified readily in the field. Final determinations were made by keying specimens using standard references such as *Vascular Plants of the Pacific Northwest: Parts 1 through 5* (Hitchcock et al., 1955; 1959; 1961; 1964; 1969; Hitchcock and Cronquist, 1973). A complete list of references used specific to plant identification is provided in Section 7.2 of this report.

4.3.2 Habitat Mapping

Habitats were identified according to habitat types described in *Wildlife Habitats: Descriptions, Status, Trends, and System Dynamics* (Chappell et al., 2001). Habitats were delineated on aerial site photographs. Habitats delineated on aerial photographs were field verified and revised as appropriate. Areas identified as priority habitats were mapped in the field using a Trimble GeoXT GPS unit with submeter accuracy.

4.3.3 Tree Mapping

Because the proposed project will remove trees within the grading limits in the project area, all trees occurring within the grading limits were mapped in the field using a Trimble GeoXT GPS unit with submeter accuracy. Trees were identified according to species and estimated height.

SECTION 5

Results

5.1 Office Review

5.1.1 Special-Status Plants

One hundred four vascular plant species and 11 non-vascular plant species were identified as having special status and potentially occurring in Wasco County in the categories below. Note that many of the identified species occur on multiple lists. “Plant species” refers to vascular plant species, except where noted.

- 93 vascular plant species and 11 non-vascular plant species are listed on the Columbia River Gorge National Scenic Area sensitive wildlife and plant species list (USFS, 2006)
- 2 plant species are listed as federally threatened (USFWS, 2014)
- 6 plant species are listed as state threatened or endangered (ORBIC, 2013)
- 16 plant species are endemic to the Columbia River Gorge (Wasco County, 2010)
- 24 plant species are listed on the ORBIC List 1 (Review) or List 2 (Watch) lists as potentially occurring in Wasco County (ORBIC, 2013).
- 79 plant species are listed as U. S. Forest Service sensitive species (USFS, 2006)
- 38 recorded observations of 7 plant species are documented within one mile of the project area according to the ORBIC database search (ORBIC, 2014). Figures 3A through 3C show locations of ORBIC-mapped special plant species within 1 mile of the proposed project area.

A complete list of potentially occurring plant species, including listing designations and habitat requirements is provided in Appendix B. Specific habitat requirements and known geographic and elevation ranges were reviewed to determine species potentially occurring in the vicinity of the project area. This review identified 84 vascular plant species and 10 non-vascular plant species with potential to occur in the vicinity of the project area.

5.1.2 Terrestrial Wildlife Habitat

The office review identified five general habitat types (Chappell, 2001) with the potential to occur in the vicinity of the proposed project. These habitats are shown in Figures 4A through 4R and described below.

Agricultural, Pasture, and Mixed Environs. This habitat type is characterized by cultivated species. In the immediate vicinity of the project area, this habitat consists of orchards, vineyards, pastures, and associated residential and farm structures, maintained surface roads, and unimproved farm access roads.

Eastside (Interior) Grasslands. This habitat is characterized by short to medium-tall grasses (less than 3.3 feet [1 meter]). Total herbaceous cover can be closed to only sparsely vegetated. In general, this habitat is an open and irregular arrangement of grass clumps rather than a continuous sod cover. These medium-tall grasslands often have scattered and diverse patches of low shrubs, but few or no medium-tall shrubs (less than 10% cover of shrubs are taller than the grass layer). Native forbs may contribute significant cover or they may be absent. In the vicinity of the proposed project area, this habitat may occur in open areas, or in mosaic with woodlands, on plateaus, or lowlands.

Eastside (Interior) Riparian-Wetlands. This habitat type includes two sub-types: riparian and wetlands. Riparian habitat is characterized by predominantly woody vegetation along rivers, streams, or other water bodies. Riparian habitat may be either upland or wetland. Wetland habitat is characterized by a predominance of hydrophytic vegetation, presence of hydrology in the upper 12 inches of the soil during the growing season, and presence of hydric soils. This habitat type is generally dominated by willows (*Salix sp.*),

Oregon ash (*Fraxinus latifolia*), and black cottonwood (*Populus balsamifera*) in wetland areas, and bigleaf maple (*Acer macrophyllum*) and cottonwood in upland riparian areas. In the vicinity of the proposed project area, this habitat type may be found in low areas, or along ponds, lakes, and the Columbia River.

Open Water – Lakes, Rivers, Streams. In the immediate vicinity of the proposed project area, this habitat type includes the Columbia River and several ponds or small lakes. Most of these appear to have been created in as a result of construction of Interstate 84 and/or the railroad. Historically, they were likely part of the Columbia River.

Ponderosa Pine Forest and Woodlands (Includes Eastside Oak). This habitat is typically a woodland or savanna with tree canopy coverage of 10% to 60%, although closed-canopy stands are possible. The tree layer is usually composed of widely spaced large conifer trees. Ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*) are the most common evergreen trees in this habitat. Oregon white oak dominates open woodlands or savannas in limited areas. The undergrowth can include dense stands of shrubs or, more often, be dominated by grasses, sedges, and/or forbs. A layer of tall to medium-tall deciduous shrubs may be present. Undergrowth is generally dominated by herbaceous species, especially graminoids. In the vicinity of the proposed project, this habitat is generally found on plateaus or other upland areas.

In General Management Areas, Wasco County identifies 17 "Sensitive Wildlife Areas" and 8 "Sensitive Wildlife Sites" for management. Five "Sensitive Wildlife Areas" or their buffers are present within the proposed project area as listed in Table 1. Figures 5A through 5C show locations of all mapped Sensitive Wildlife Areas in the vicinity of the proposed project. Figures 6A through 6C show locations of ORBIC-mapped special-status wildlife species within 1 mile of the proposed project.

TABLE 1
Known Sensitive Wildlife Areas and Sites*

	Mapped within Project Area?	Mapped within 1,000 feet of Project Area?
Sensitive Wildlife Areas		
Bald eagle habitat	No	No
Deer and elk winter range	Yes	Yes
Elk habitat	Yes	Yes
Mountain goat habitat	No	No
Peregrine falcon habitat	No	No
Pika colony area	No	No
Pileated woodpecker habitat	No	No
Pine marten habitat	No	No
Shallow water fish habitat (Columbia River)	Yes	Yes
Special streams	No	No
Special habitat area	No	No
Spotted owl habitat	No	No
Sturgeon spawning area	No	No
Tributary fish habitat	No	No
Turkey habitat	Yes	Yes
Waterfowl area	Yes	Yes
Western pond turtle habitat	No	No
Sensitive Wildlife Sites		

TABLE 1
Known Sensitive Wildlife Areas and Sites*

	Mapped within Project Area?	Mapped within 1,000 feet of Project Area?
Golden eagle	No	No
Great blue heron	No	No
Larch Mountain salamander	No	No
Northern spotted owl	No	No
Osprey	No	No
Peregrine falcon	No	No
Purple martin	No	No
Western pond turtle	No	No

*These initial determinations are based on Special Habitat geospatial data provided by the Columbia River Gorge Commission

Source: Wasco County National Scenic Area Land Use Development Ordinance (Wasco County, 2010)

In Special Management Areas, Wasco County identifies eleven Priority Habitats, which are sub-habitats of the general habitats discussed above. Seven of these habitats were identified as potentially occurring within the proposed project area. Table 2 lists these habitats and notes those habitats that may present within the proposed project area.

TABLE 2
Wasco County Priority Habitats

Priority Habitats	Criteria	Potentially Present?
Aspen stands	High fish and wildlife species diversity, limited availability, high vulnerability to habitat alteration.	No
Caves	Significant wildlife breeding habitat, limited availability, dependent species.	No
Old-growth forest	High fish and wildlife density, species diversity, breeding habitat, seasonal ranges, and limited and declining availability, high vulnerability.	No
Oregon white oak woodlands	Comparatively high fish and wildlife density, species diversity, declining availability, high vulnerability	Yes
Prairies and steppe	Comparatively high fish and wildlife density, species diversity, important breeding habitat, declining and limited availability, high vulnerability.	No
Riparian	High fish and wildlife density, species diversity, breeding habitat, movement corridor, high vulnerability, dependent species.	Yes
Wetlands	High species density, high species diversity, important breeding habitat and seasonal ranges, limited availability, high vulnerability.	Yes
Snags and logs	High fish and wildlife density, species diversity, limited availability, high vulnerability, dependent species.	Yes
Talus	Limited availability, unique and dependent species, high vulnerability.	Yes
Cliffs	Significant breeding habitat, limited availability, dependent species.	Yes
Dunes	Unique species habitat, limited availability, high vulnerability, dependent species.	Yes

Source: Wasco County National Scenic Area Land Use Development Ordinance (Wasco County, 2010)

Seventy terrestrial wildlife species were identified as having special status and potentially occurring in Wasco County, including 15 herptiles, 31 birds, 17 mammals, and 5 invertebrates. These species fall into the following categories. Note that many of the identified species occur on multiple lists.

- 15 herptiles, 33 birds, 17 mammals, and 5 invertebrate species are listed on the Columbia River Gorge National Scenic Area sensitive wildlife and plant species list (USFS, 2006)
- 1 bird and 3 mammal species are listed as federally threatened or endangered (USFWS, 2014)
- 3 birds and 2 mammal species are listed as state threatened or endangered (ORBIC, 2013)
- 4 bird and 1 mammal species are listed as "Management Plan" species on the Columbia River Gorge National Scenic Area sensitive wildlife and plant species list (USFS, 2006)
- 7 herptiles, 7 birds, 4 mammals, and 5 invertebrate species are listed as U. S. Forest Service sensitive species (USFS, 2006)
- 1 herptile, 2 bird, and 2 mammal species are documented within one mile of the project area according to the ORBIC database search (ORBIC, 2014).

Specific habitat requirements and known geographic and elevation ranges were reviewed to determine wildlife species potentially occurring in the vicinity of the project area. This review identified 26 terrestrial wildlife species, including 7 herptiles, 15 birds, 3 mammals, and 1 invertebrate, with potential to occur in the vicinity of the project area. A complete list of potentially occurring terrestrial wildlife species, including listing designations and habitat requirements is provided in Appendix B.

5.2 Field Survey

All areas within the proposed project construction area under jurisdiction of the NSA Act were surveyed and mapped. No surveys or mapping were conducted in the City of Mosier Urban Area because this area is not governed by the NSA Act.

The field surveys identified 134 plant species (20 tree, 13 shrub, 9 grass, 2 woody vine, and 90 forb species) including three special-status plant species. The surveys also identified and mapped five general habitat types. Six priority habitats were identified and mapped within these general habitat types. Figures 7A through 7R (Appendix A) show locations of identified special status plants. Figures 9A through 9R show locations of priority habitats. Appendix C presents a complete list of all plant species identified during the course of the field surveys. Representative site photographs are provided in Appendix D.

5.2.1 Special-Status Plants

Three special-status plant species were identified and mapped within or adjacent to the study area during the April surveys: Barrett's penstemon (*Penstemon barrettiae*), currant-leaf alumroot (*Heuchera grossularifolia* var. *tenuifolia*), and Columbia Gorge lupine (*Lupinus latiforlius* var, *thompsonianus*).

Barrett's penstemon was found [redacted] Approximately 20 individuals were identified. The plants were not yet in bloom, but were readily identifiable based on the distinctive leaf.

Currant-leaf alumroot was observed [redacted] Approximately 12 plants were mapped. Several were in full bloom, aiding identification of this species.

Columbia Gorge lupine was observed in several locations [redacted] and were in full bloom at the time of the April field surveys. [redacted] An estimated 250-300 individuals were observed.

5.2.2 Terrestrial Wildlife Habitats

Five general habitats, five sensitive wildlife areas, and six priority habitat areas were identified within the study area. General habitats identified within the proposed project area may support 22 special-status terrestrial wildlife species. General habitat types, their acreages within the proposed project area, and potentially occurring wildlife species within each habitat, are provided in Table 3. General habitats within the proposed project area are shown on Figures 4A through 4R.

TABLE 3
General Habitats Mapped within the Project Area

Habitat Type	Acreage*	Potentially Occurring Species
Agricultural, Pasture, and Mixed Environs	0.45	peregrine falcon, purple martin
Eastside (Interior) Grasslands	12.26	peregrine falcon, purple martin
Eastside (Interior) Riparian-Wetlands	2.91	yellow-billed cuckoo, willow flycatcher
Open Water – Lakes, Rivers, Streams	0.41	Larch Mountain salamander, Columbia spotted frog, western toad, northern red-legged frog, northwestern pond turtle, painted turtle, bald eagle, horned grebe, bufflehead, peregrine falcon, purple martin, great blue heron, golden eagle, osprey
Ponderosa Pine Forest and Woodlands (Includes Eastside Oak)	11.21	Lewis' woodpecker, pileated woodpecker, mountain quail, peregrine falcon, purple martin, western gray squirrel, Dalles sideband

* Project area habitat calculations include the proposed area of disturbance within existing UPRR ROW, the proposed ROW acquisition area, and the temporary construction easements.

Five Sensitive Wildlife Areas are mapped within or adjacent to the proposed project area. The field surveys confirmed presence of these habitats and identified three additional waterfowl area adjacent to the study area. Sensitive Wildlife Areas within the proposed project area are shown in Figures 8A through 8T.

Deer and Elk Habitat. Deer and elk habitat is present [redacted].

Turkey Habitat. Turkey habitat is mapped concurrently with the deer and elk habitat at the [redacted].

Waterfowl Areas. Waterfowl areas are present [redacted] and three small lakes in the eastern portion of the project area (Figures 8K, 8L 8N, 8P).

Sensitive Wildlife Areas and acreage of their mapped habitats and buffers is provided in Table 4.

TABLE 4
Sensitive Wildlife Areas and Sites Mapped within the Project Area

Sensitive Wildlife Area	CRGC Habitat Inventory Mapping	Habitat within Project Area[1] (acres)	Project Area within Buffer Zone (acres)
Deer and elk winter range	Big Game Turkey		
Elk habitat	Big Game Turkey	0.02[2]	
Turkey Habitat	Big Game Turkey		
Waterfowl Area	Shallow Water - Waterfowl	0.06	5.95[2]
Shallow water fish habitat (Columbia River)	Shallow Water/ Shallow Water Waterfowl	---	
Waterfowl Area	Special Habitat - Waterfowl	---	

TABLE 4
Sensitive Wildlife Areas and Sites Mapped within the Project Area

Sensitive Wildlife Area	CRGC Habitat Inventory Mapping	Habitat within Project Area[1] (acres)	Project Area within Buffer Zone (acres)

[1] Project area calculations include the proposed area of disturbance within existing UPRR ROW, the proposed ROW acquisition area, and the temporary construction easements.

[2] Sensitive wildlife areas and sites and their buffer zones overlap in several cases, necessitating disturbance to be reported as a combined acreage.

Source: Wasco County National Scenic Area Land Use Development Ordinance (Wasco County, 2010)

The following five priority habitats were identified and mapped within the general habitats described above. Priority Habitats mapped within the proposed project area are shown in Figures 9A through 9T.

Cliffs. Cliffs are present immediately adjacent and south of the proposed project area in the western segment of the project, west from the Mosier Urban Area to the western end of the alignment (Figures 9A, 9B, 9C, 9D, 9E, 9G, 9H). Several discontinuous areas of cliffs are also present in the eastern portion of the proposed project area (Figures 9M, 9N, 9O).

Dunes. Dune habitat is present in two areas along the Columbia River in the Segment 2 West of the project area (Figures 9L, 9M).

Oak Woodland. Oak woodland was identified on a high terrace between the railroad and the Columbia River (Figure 9M), in the proposed potential staging area in the eastern portion of the project area (Figures 9N, 9O), and on a high plateau just east of the proposed staging area and south of the existing railroad tracks from approximately MP 71.5 to MP 71.7 (Figure 9O).

Riparian. Riparian habitat was identified within the proposed project area adjacent to two small lakes in Segment 1 of the project area (Figure 9H). Riparian habitat was also identified adjacent to two small lakes and along the Columbia River in the eastern portion of the study area (Figures, 9L, 9P, 9Q, 9R).

Wetland. Wetland habitat is present in two locations in Segment 1, one location in Segment 2 West, and two locations in Segment 2 East. Palustrine forested wetlands are present on both sides of the railroad tracks near the eastern end of the alignment (Figure 9R). A palustrine forested/open water wetland was identified at the western end of the proposed staging area (Figure 9N).

In addition to the above priority habitats, several areas of black cottonwood forest were mapped in the eastern portion of the project area (Figures 9L, 9M, 9Q, 9R). Black cottonwood gallery forests may support the state sensitive [redacted].

Priority habitats identified within the proposed project area may support 16 special-status terrestrial wildlife species. Priority habitat types, their acreages within the proposed project area, and potentially occurring special-status wildlife species are provided in Table 5.

TABLE 5
Priority Habitats Mapped within the Project Area

Habitat Type	Acreage*	Potentially Occurring Species
Cliffs	1.14	[redacted]
Dunes	0.25	[redacted]
Oak Woodland	2.99	[redacted]
Riparian	2.16	[redacted]

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TABLE 5
Priority Habitats Mapped within the Project Area

Habitat Type	Acreage*	Potentially Occurring Species
Talus	0.06	[redacted]
Wetland	0.75	[redacted]

* Project area habitat calculations include the proposed area of disturbance within existing UPRR ROW, the proposed ROW acquisition area, and the temporary construction easements.

5.2.3 Tree Mapping

A total of 1,438 trees were identified and mapped within the proposed project grading limits. Twenty tree species were identified: 16 native tree species and 4 non-native or domestic tree species. Table 6 provides a summary of all trees identified. Figures 10A- 10R provides location and height of all trees mapped.

TABLE 6
Trees Mapped within Proposed Grading Limits

Scientific Name	Common Name	Number mapped
Acer macrophyllum	bigleaf maple	43
Alnus rubra	red alder	11
Corylus cornuta	beaked hazelnut	1
Crataegus monogyna	Douglas hawthorn	1
Fraxinus latifolia	Oregon ash	142
Malus sp.	domestic apple	2
Pinus ponderosa	ponderosa pine	587
Populus balsamifera	black cottonwood	134
Populus nigra	Lombardy poplar	45
Prunus emarginata	bitter cherry	1
Prunus sp.	domestic plum	7
Pseudotsuga menzeisii	Douglas-fir	71
Pyrus sp.	domestic pear	2
Quercus garryana	Oregon white oak	287
Robinnia pseudoacacia	black locust	4
Salis sitchensis	Sitka willow	10
Salix exigua	narrow-leaf willow	54
Salix fluviatilis	Columbia River willow	1
Salix lasiandra	Pacific willow	32
Salix scouleriana	Scouler's willow	3
	Total Number of Trees	**1,438**

SECTION 6

Conclusions and Recommendations

The surveys identified 134 plant species and 3 special-status plant species. The surveys identified five general habitat types that have the potential to support 22 special-status wildlife species. Within those habitats, the survey identified 7.35 acres of priority habitats including riparian, wetland, cliffs, dunes, talus, and oak woodland within the proposed project grading limits. These priority habitats have the potential to support 16 special-status terrestrial wildlife species. The surveys confirmed the presence of six Sensitive Wildlife Areas. These areas may support deer, elk, turkey, peregrine falcon, fish, and waterfowl.

To the extent practicable, special-status species and priority habitats will be avoided. A Protection, Management, Rehabilitation, & Mitigation Plan has been prepared to address unavoidable impacts to special-status plant species and their buffer zones, priority habitats, and special-status terrestrial wildlife species.

The proposed project will avoid and/or minimize impacts to special-status plant species or habitats to the extent practicable during construction as follows:

- Avoid areas of identified special-status plant populations to the maximum extent practicable.
- Where possible, avoid or minimize impacts to priority habitats.
- Implement micrositing slight relocations of proposed project facilities to avoid special-status plant populations if practicable.
- Implement weed control procedures to prevent spread of noxious weeds to native plant habitats.
- Implement all appropriate best management practices as outlined in the Protection and Rehabilitation Plan.

SECTION 7

References

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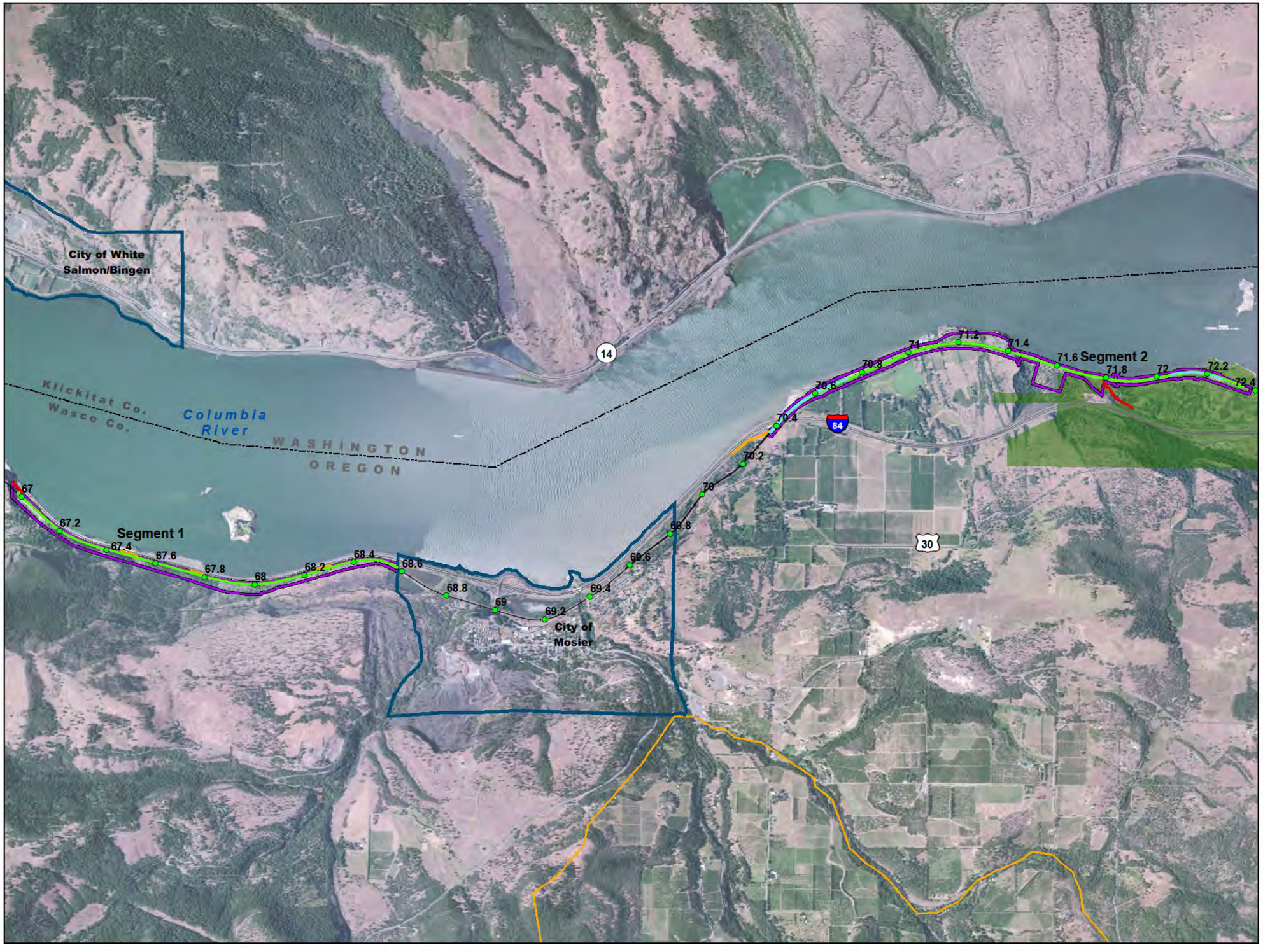
Appendix A
Figures



VICINITY MAP

LEGEND

- Study Area Boundary
- Existing Mainline Track
- Proposed Second Mainline Track
- Proposed Realigned Mainline Track
- Proposed Temporary Construction Access Road
- Proposed Permanent Maintenance/ Construction Access Road
- Track Mileposts
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

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Figure 1
Location Map
Second Mainline Track Project
Union Pacific Railroad

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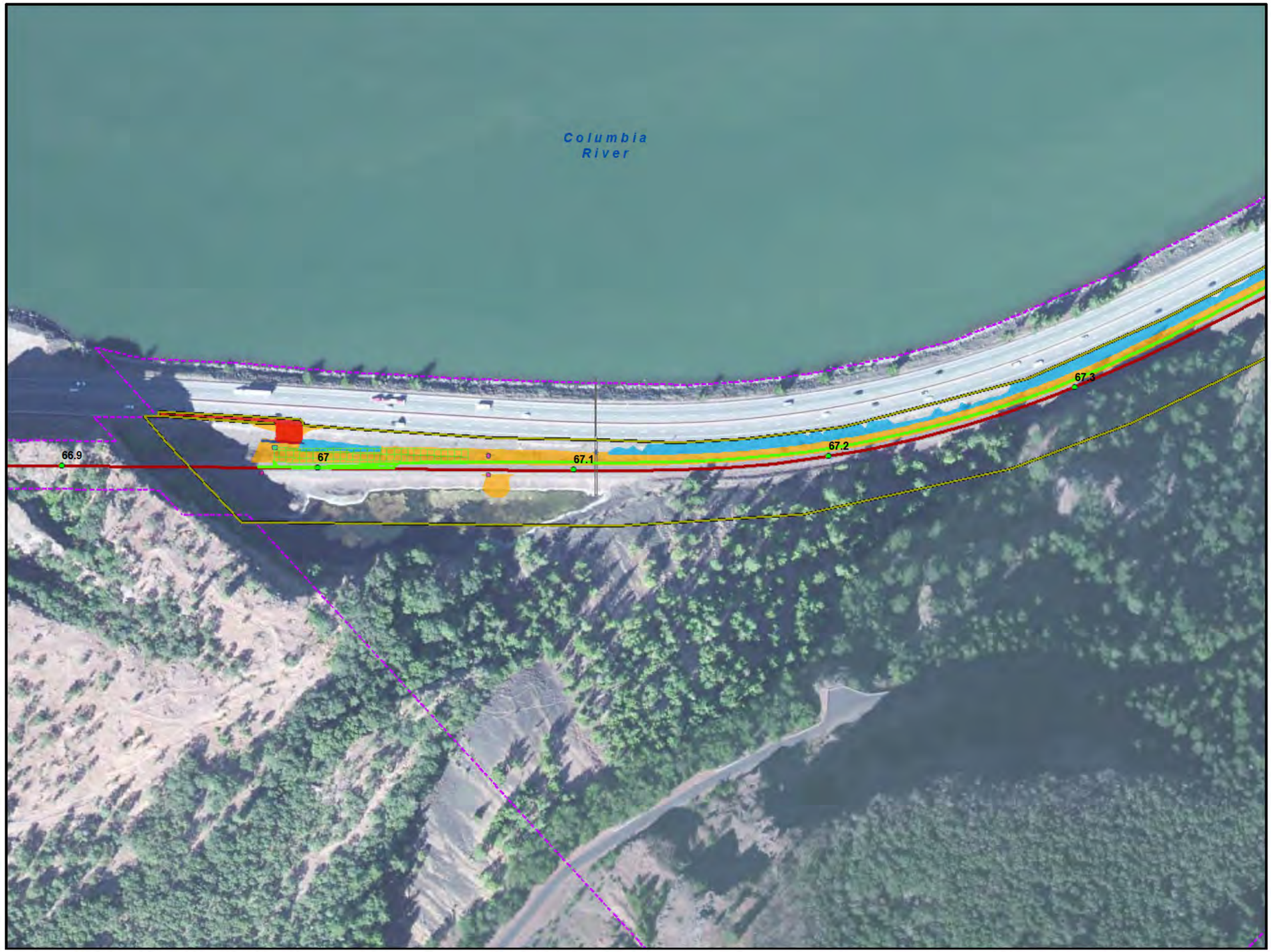

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Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

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Figure 2-A
Project Features
Second Mainline Track Project
Union Pacific Railroad

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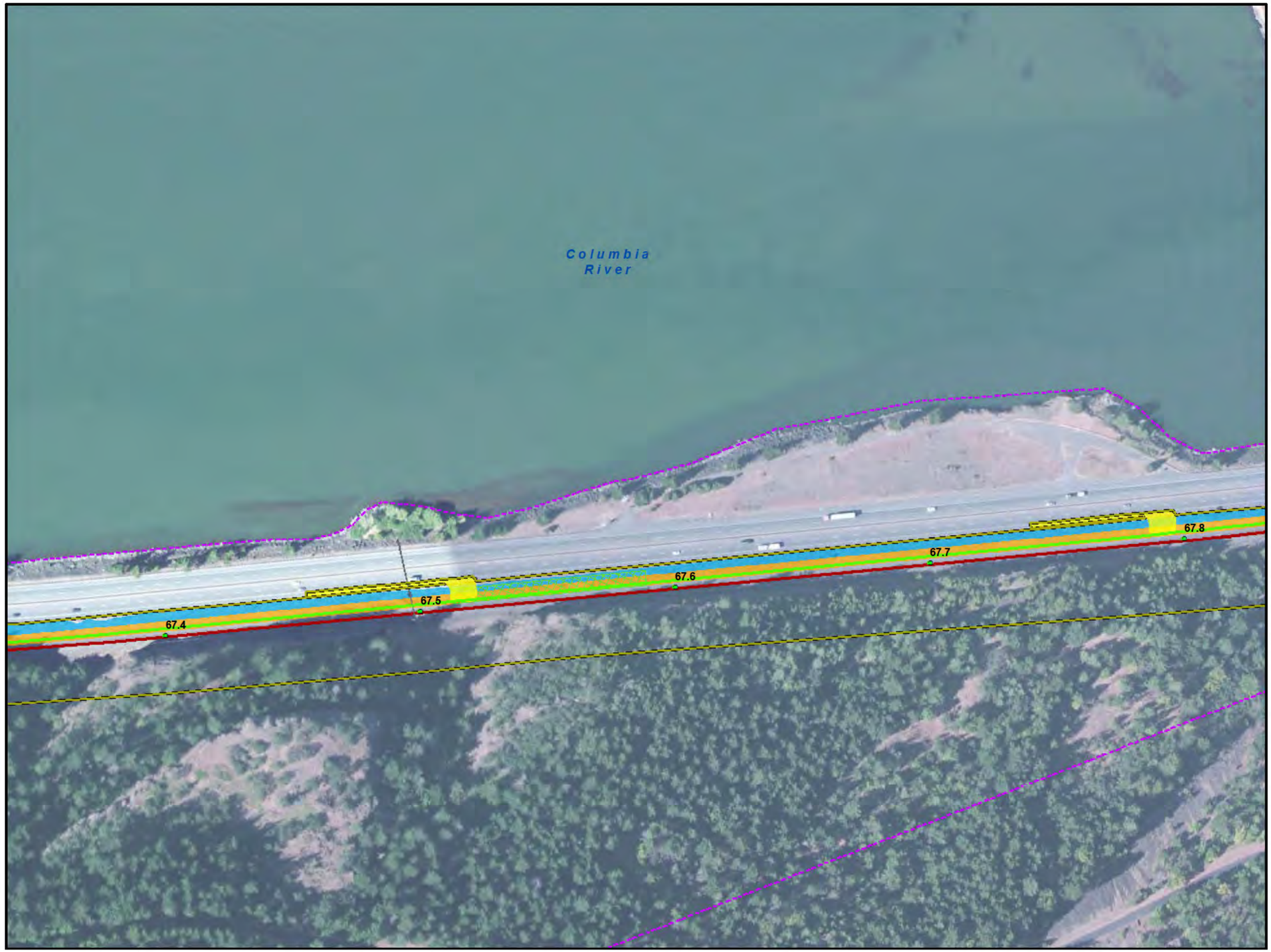

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Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

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Figure 2-B
Project Features
Second Mainline Track Project
Union Pacific Railroad

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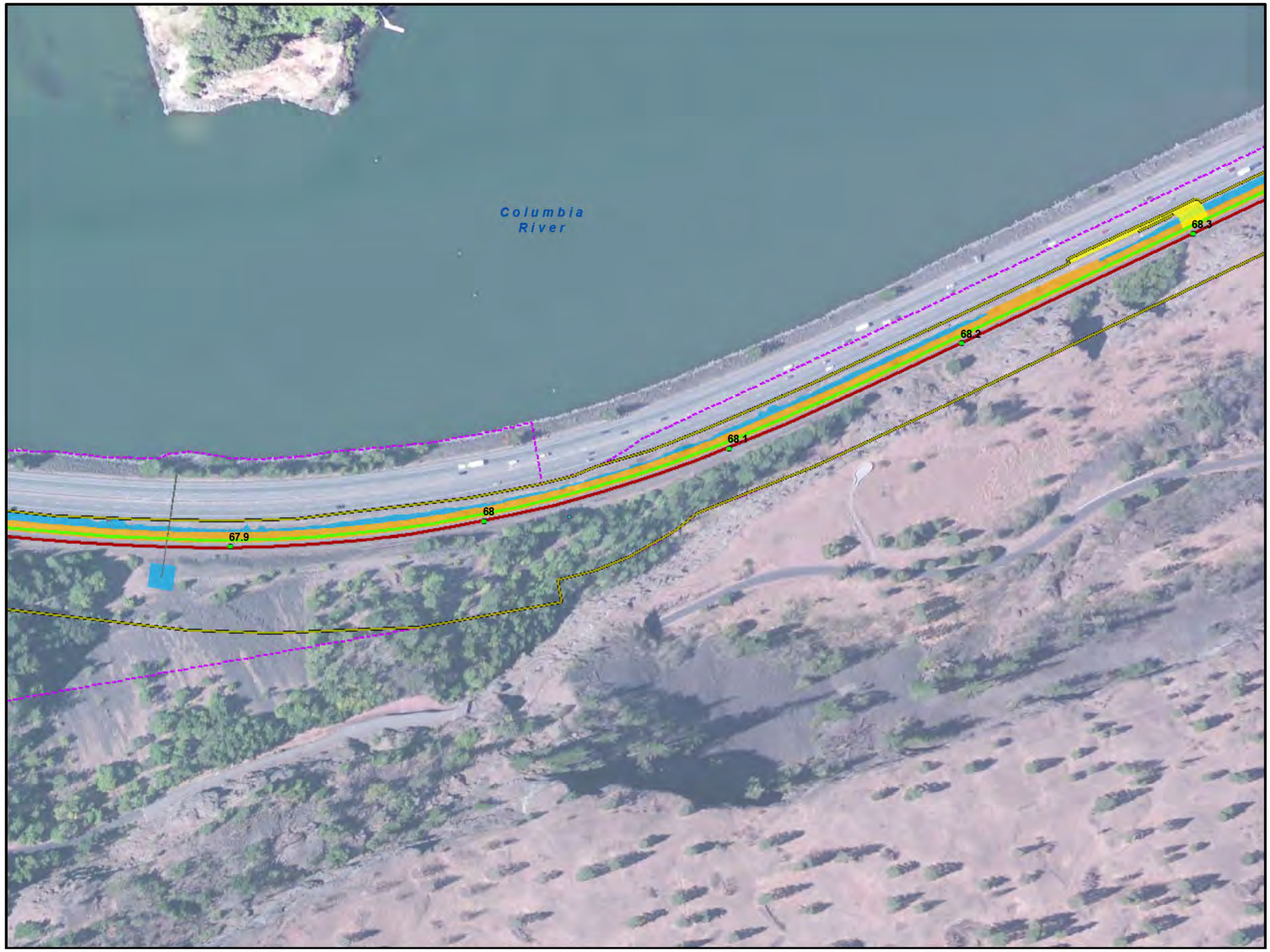

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Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

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Figure 2-C
Project Features
Second Mainline Track Project
Union Pacific Railroad

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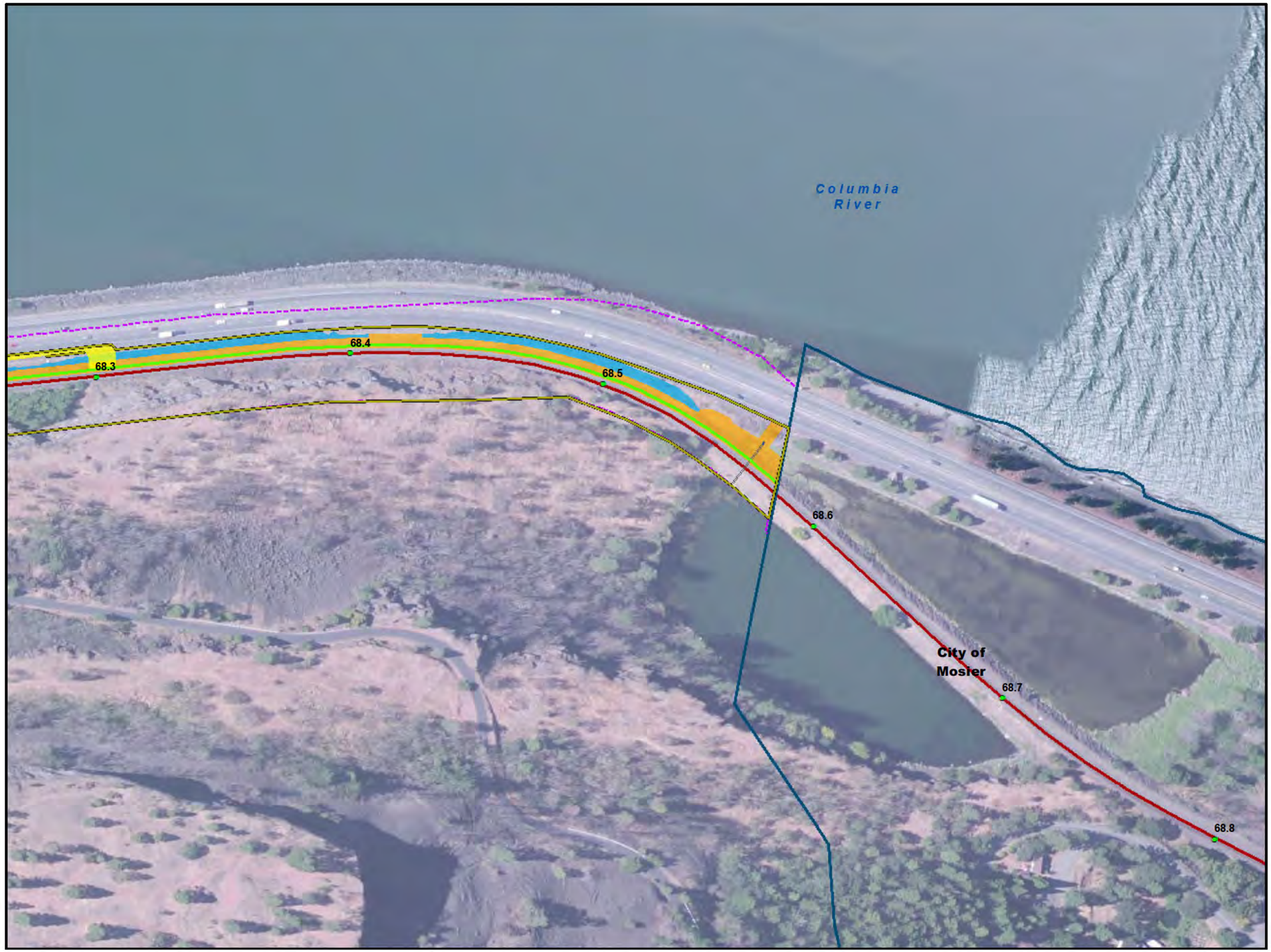

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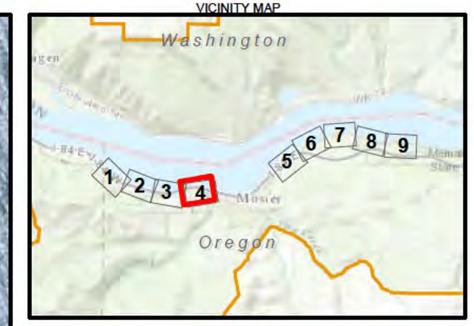

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Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

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Figure 2-D
Project Features
Second Mainline Track Project
Union Pacific Railroad

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Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

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Figure 2-E
Project Features
Second Mainline Track Project
Union Pacific Railroad

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Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

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Figure 2-F
Project Features
Second Mainline Track Project
Union Pacific Railroad

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Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

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Figure 2-G
Project Features
Second Mainline Track Project
Union Pacific Railroad

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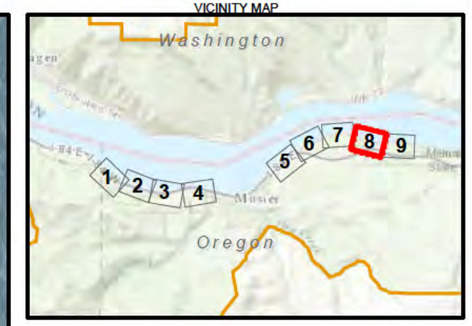

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Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

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Figure 2-H
Project Features
Second Mainline Track Project
Union Pacific Railroad

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- Retaining Wall
- Guardrail
- Staging Areas
- Drainage Structures
- Track Embankment
- Rock Excavations
- Trackside Ditches
- Proposed Construction Access Road
- Proposed Permanent Maintenance/ Construction Access Road

Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

N

0 200
Feet

Figure 2-I
Project Features
Second Mainline Track Project
Union Pacific Railroad

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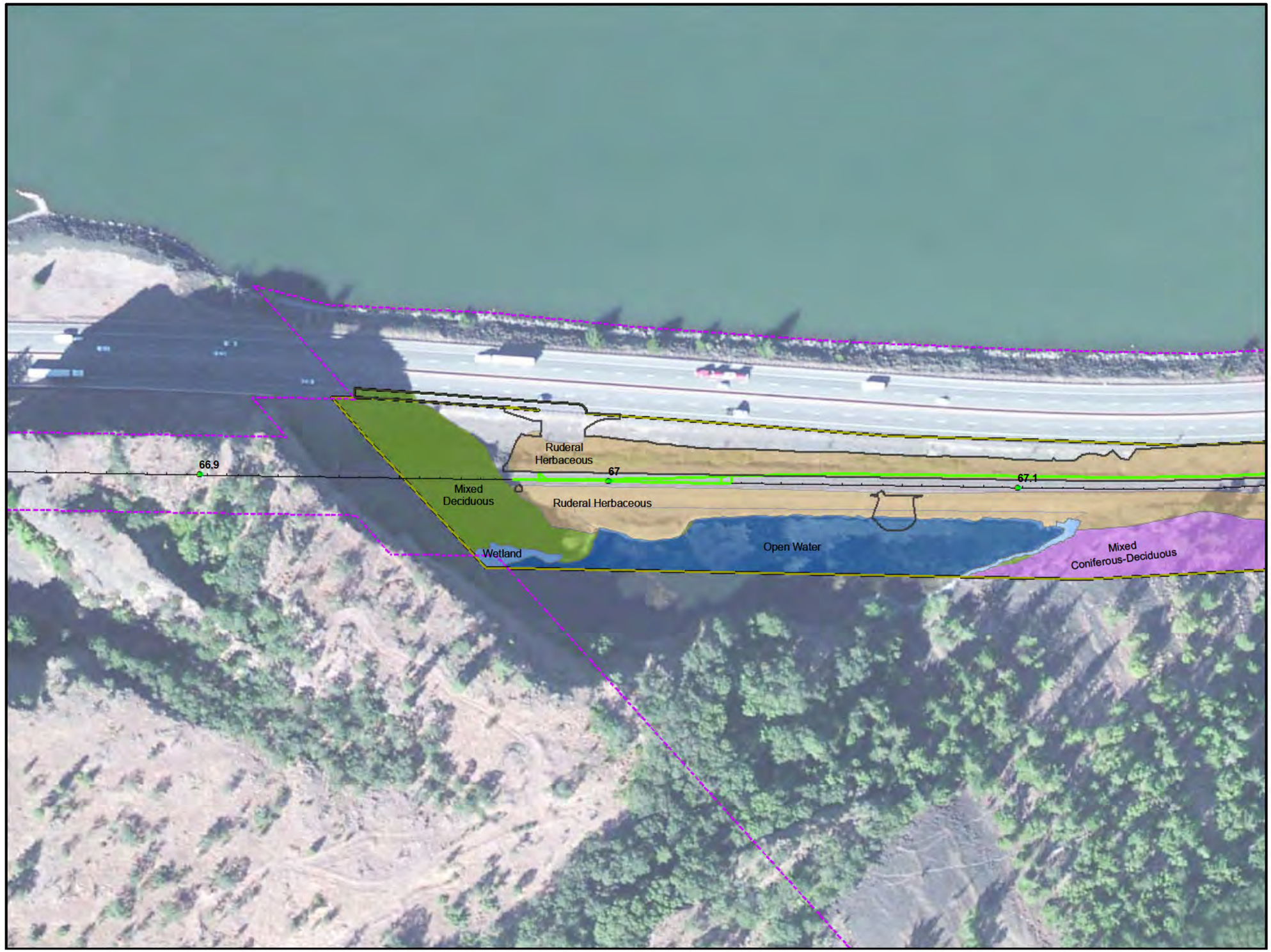

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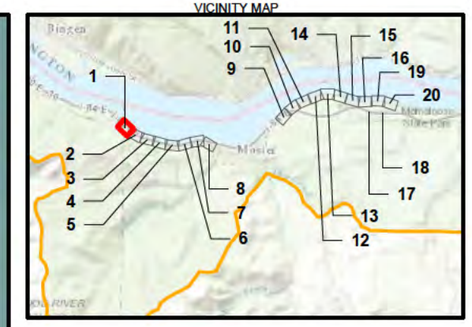

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-A
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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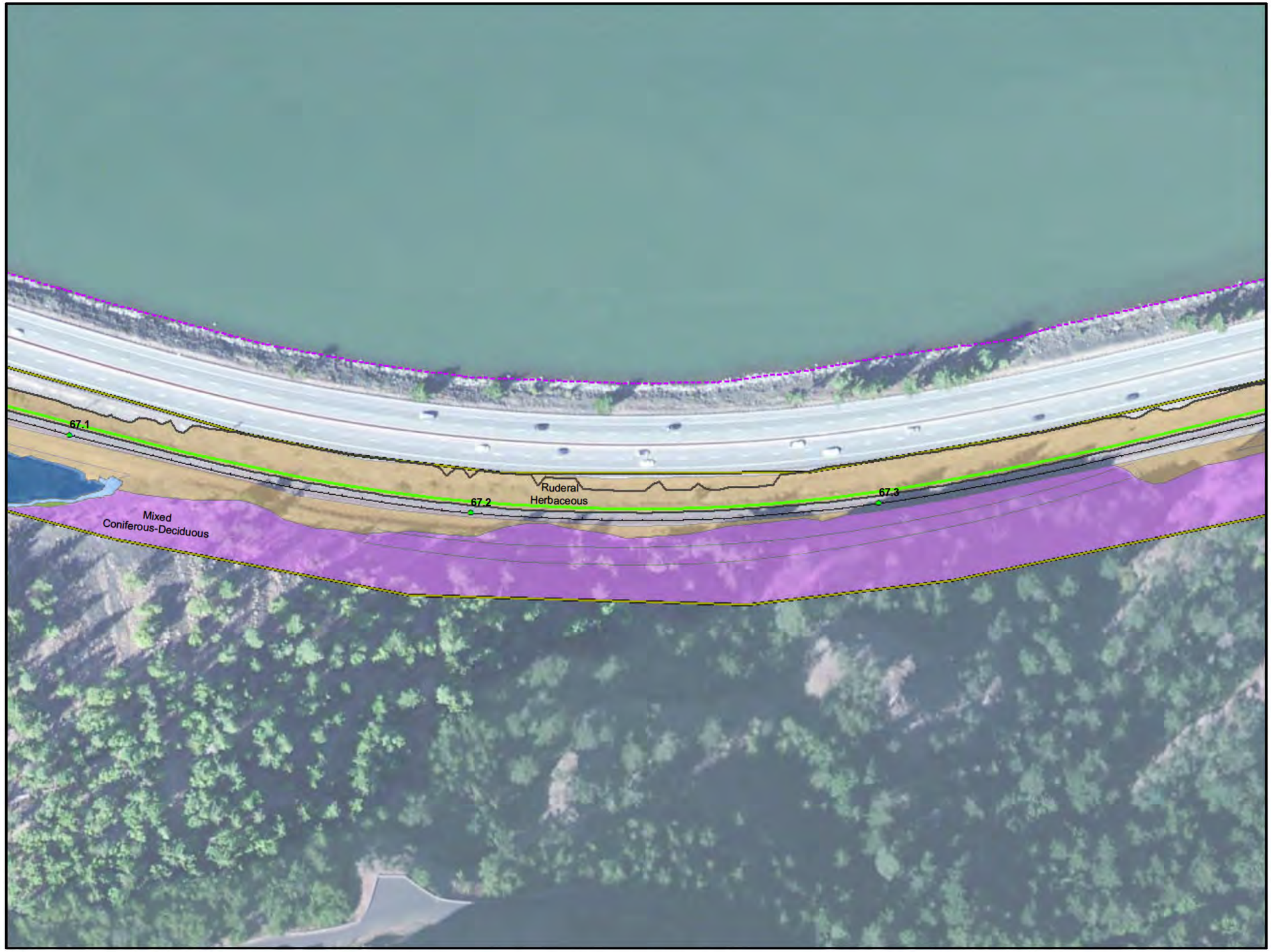

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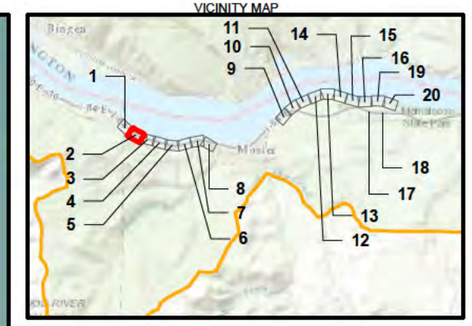

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
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- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-B
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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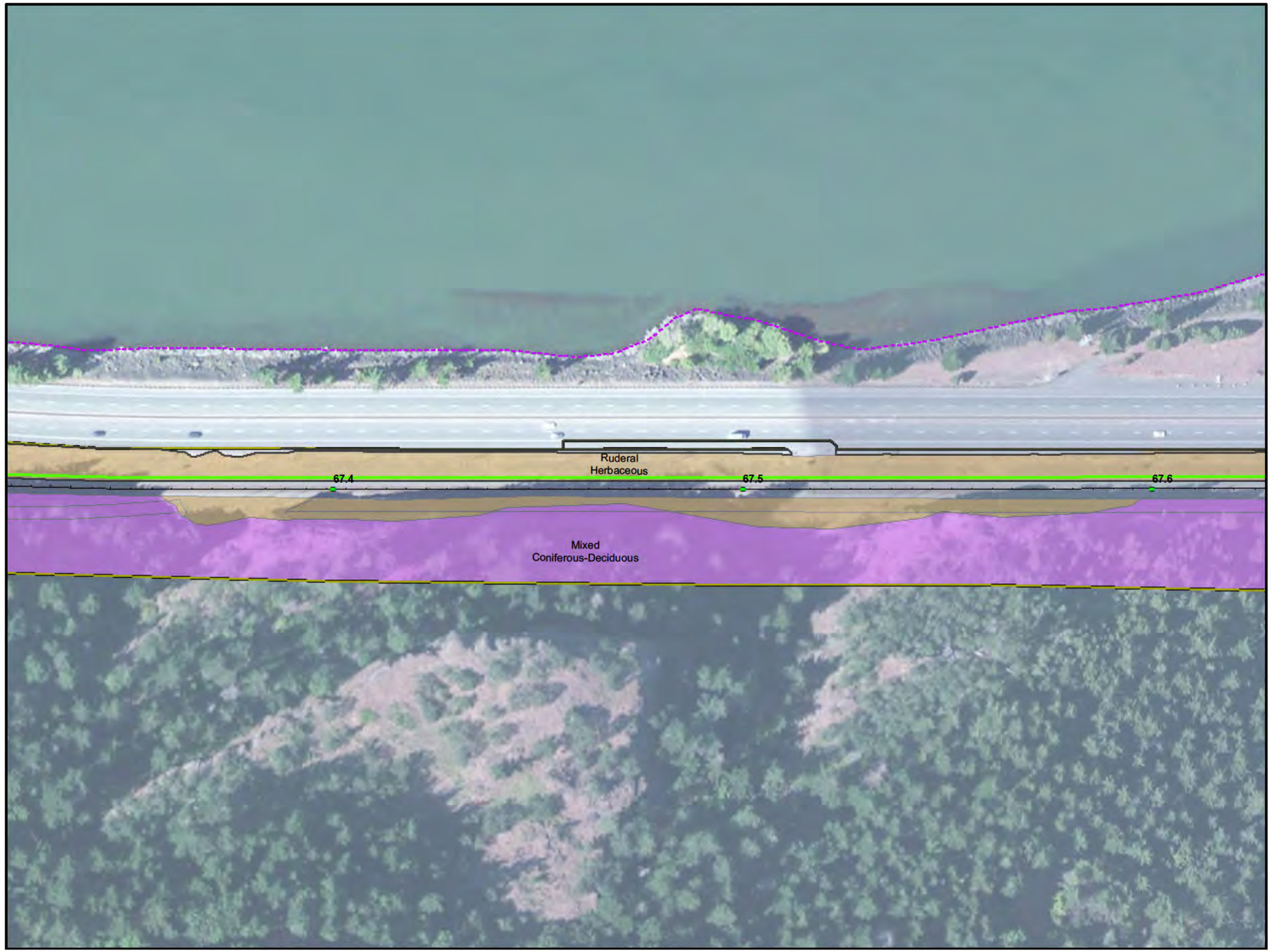

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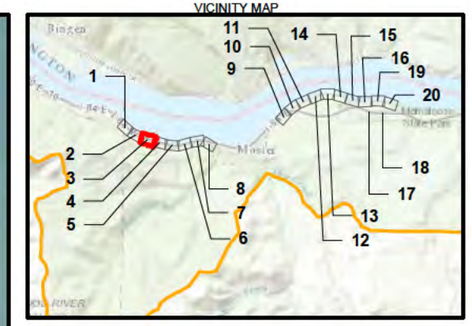

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
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- Designated Urban Area Boundary
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- Himalayan Blackberry

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- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-C
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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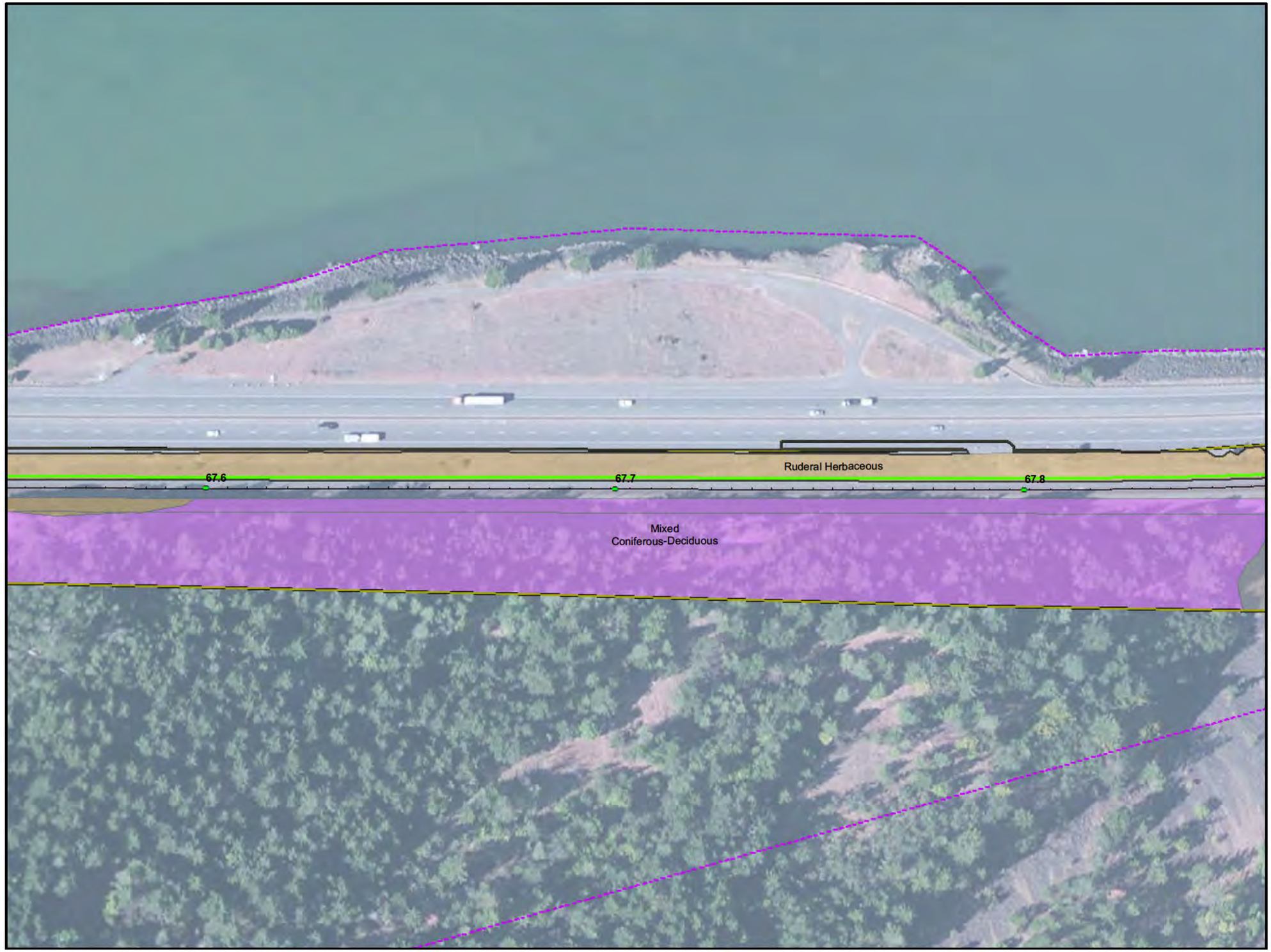

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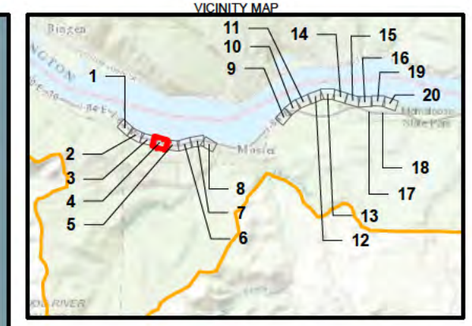

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
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- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-D
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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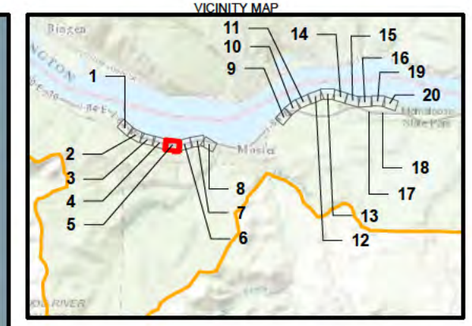

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
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- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

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Feet

Figure 4-E
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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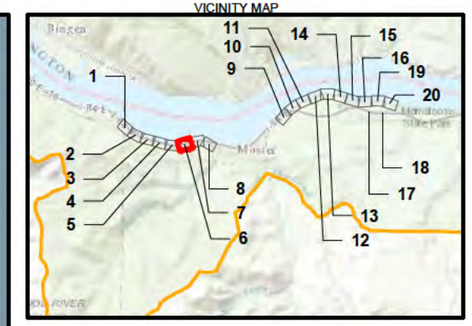

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
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- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

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Feet

Figure 4-F
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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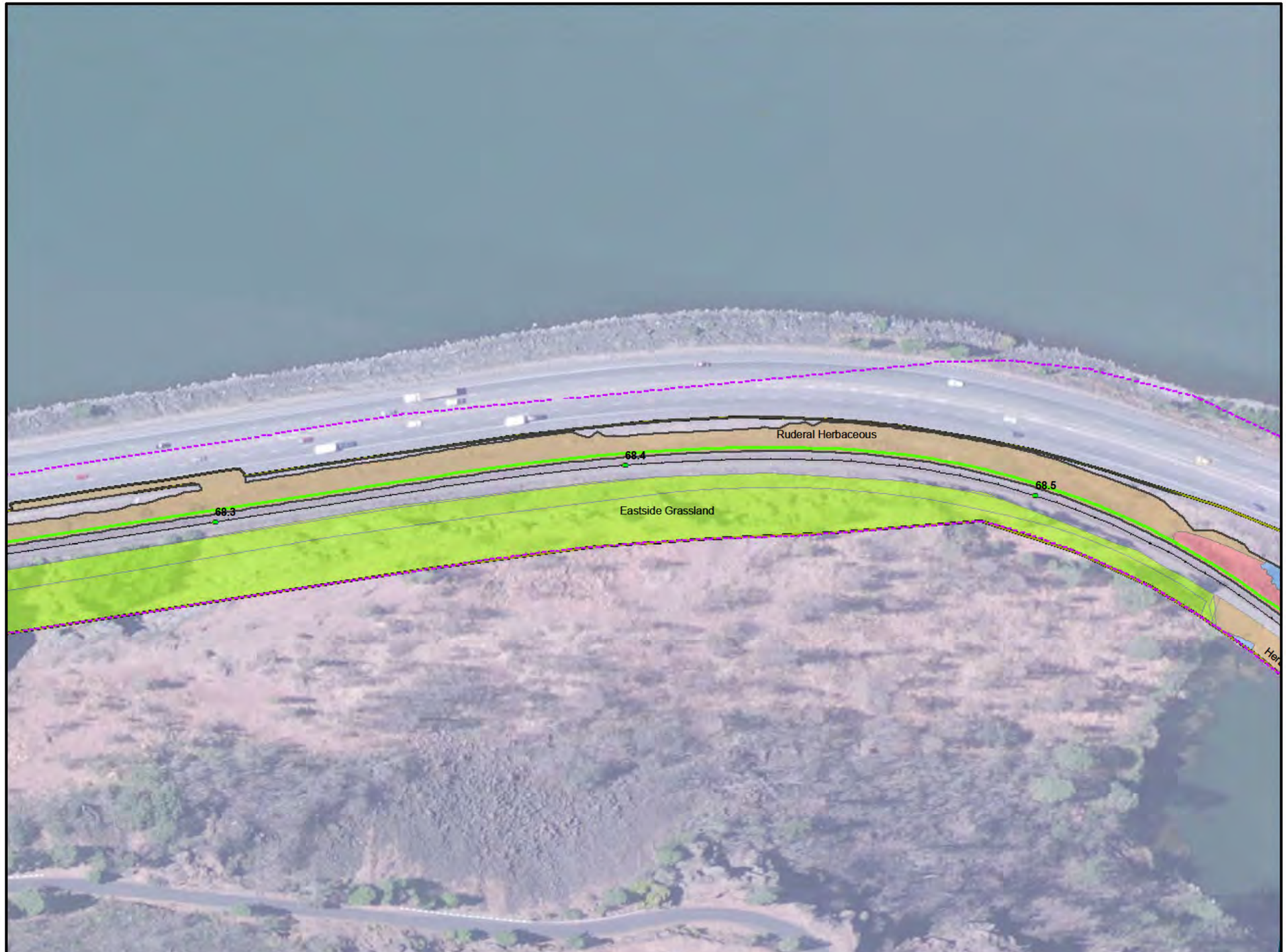

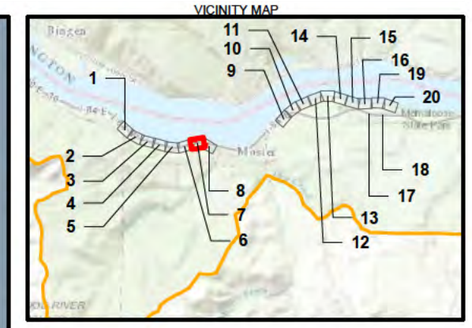

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
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- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

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Feet

Figure 4-G
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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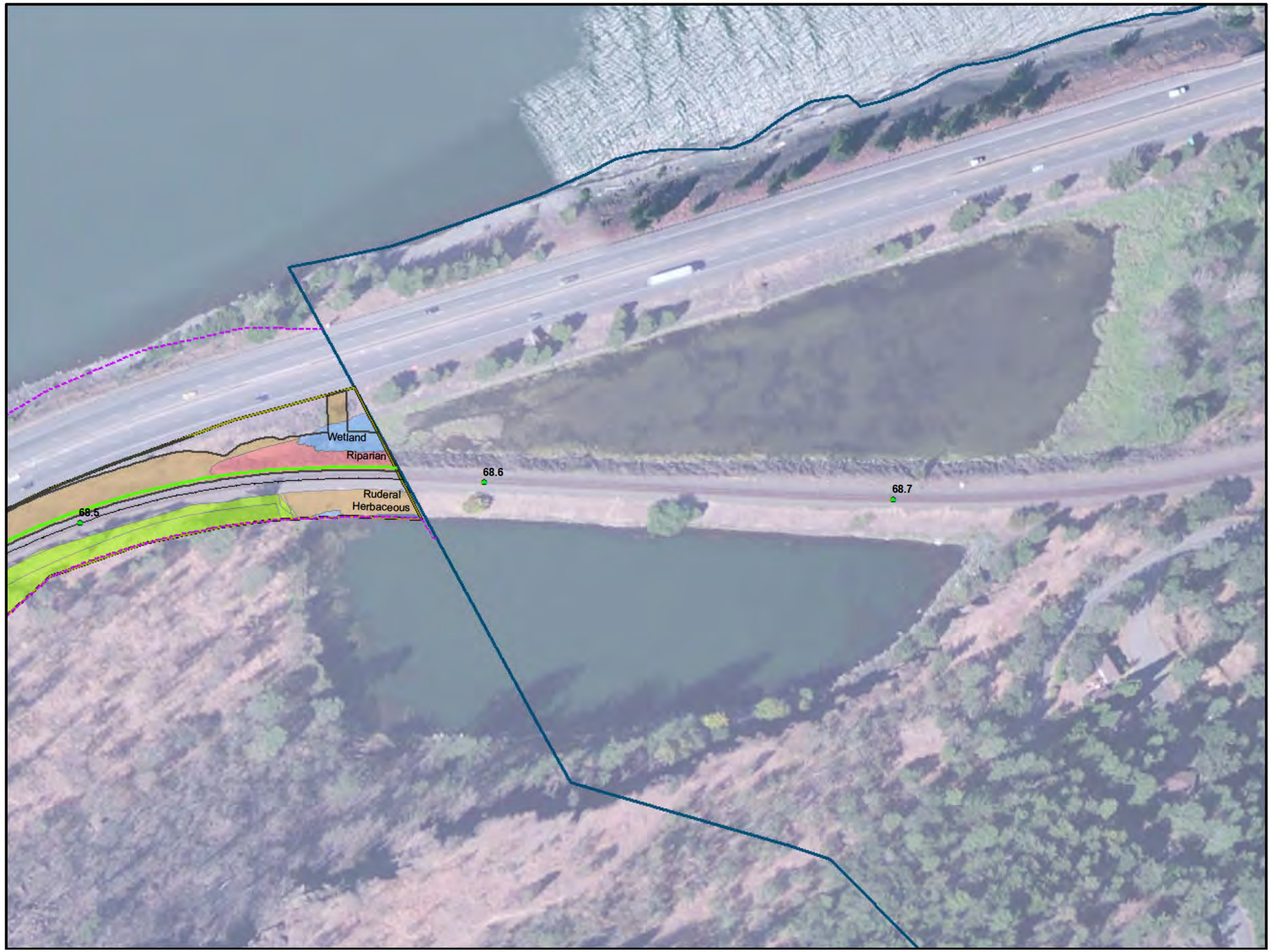

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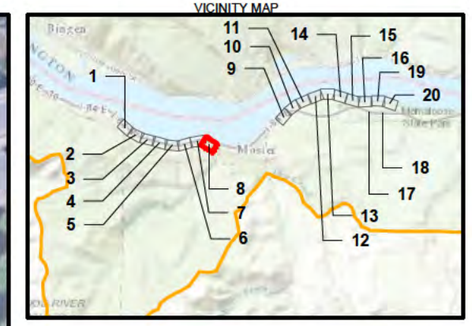

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
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Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

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Feet

Figure 4-H
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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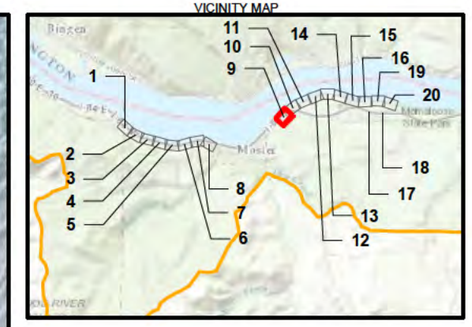

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
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- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
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- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

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Feet

Figure 4-I
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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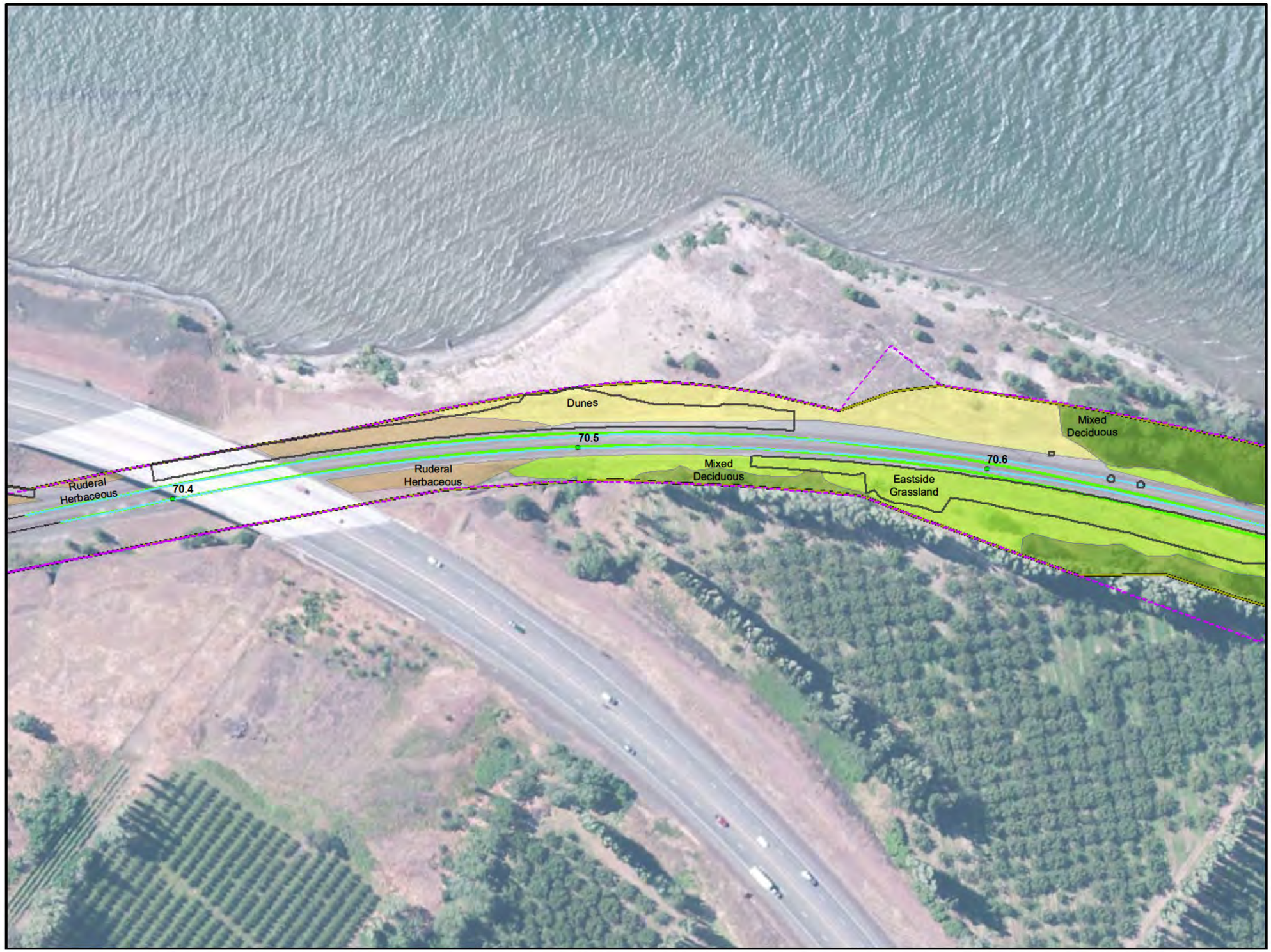

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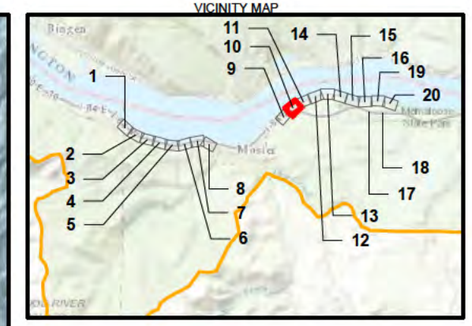

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
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- Eastside Grassland
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Eastside (Interior) Riparian-Wetland
- Riparian
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Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-J
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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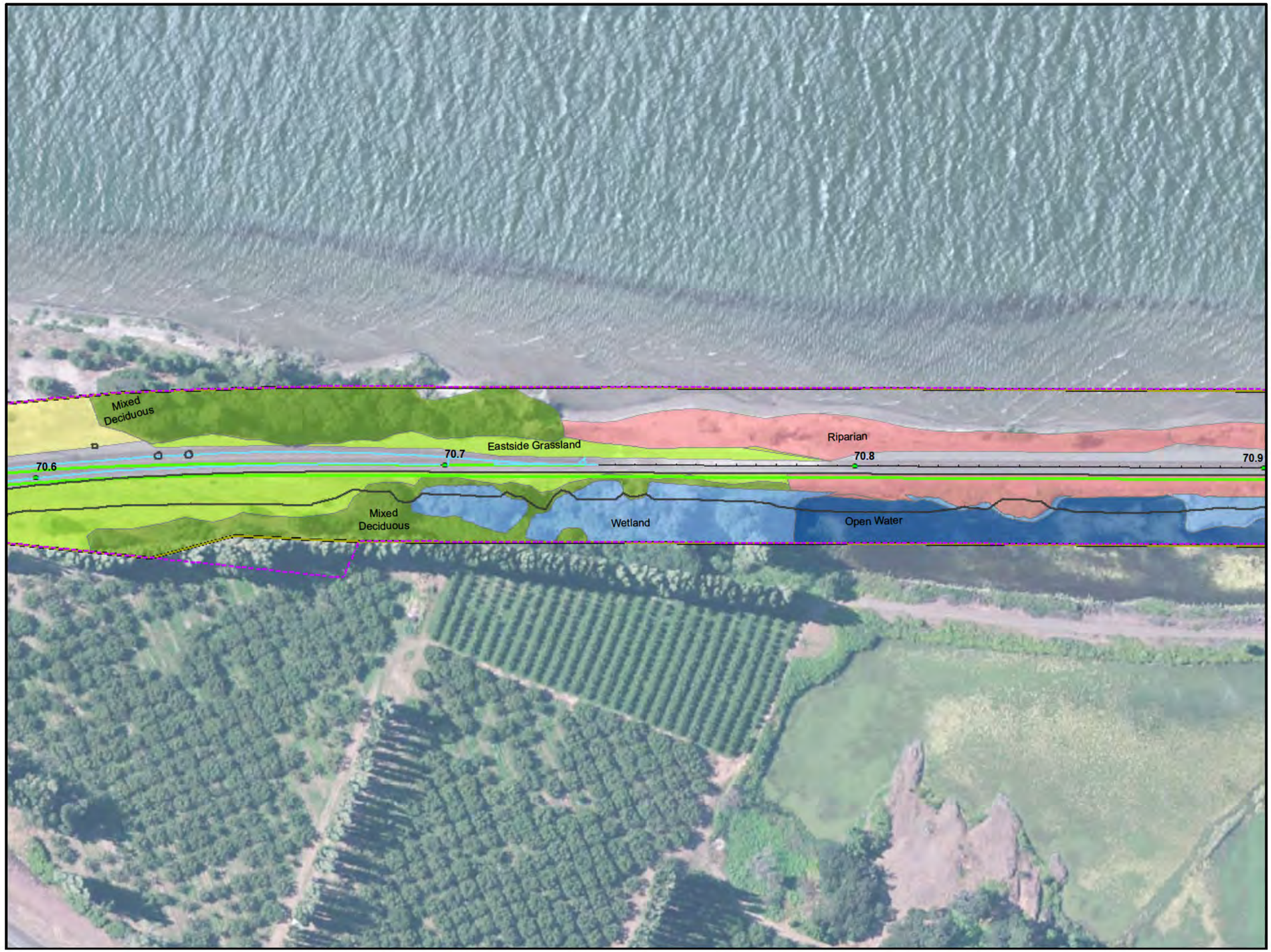

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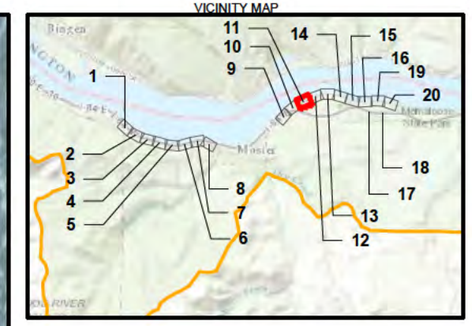

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
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Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

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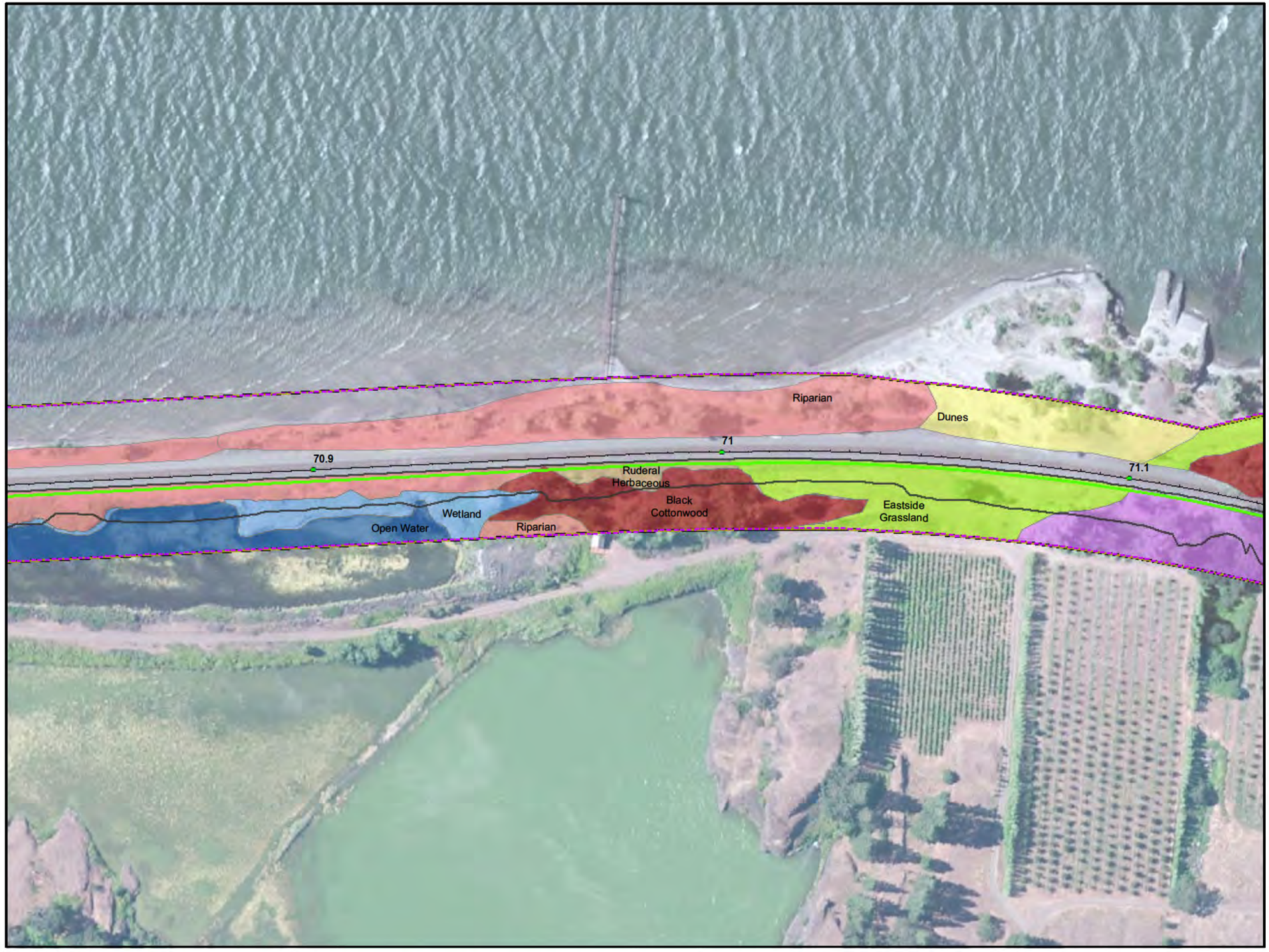
Feet

Figure 4-K
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad



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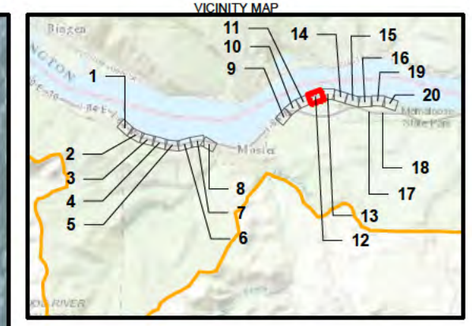

LEGEND

- Study Area Boundary
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- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

0 100
Feet

Figure 4-L
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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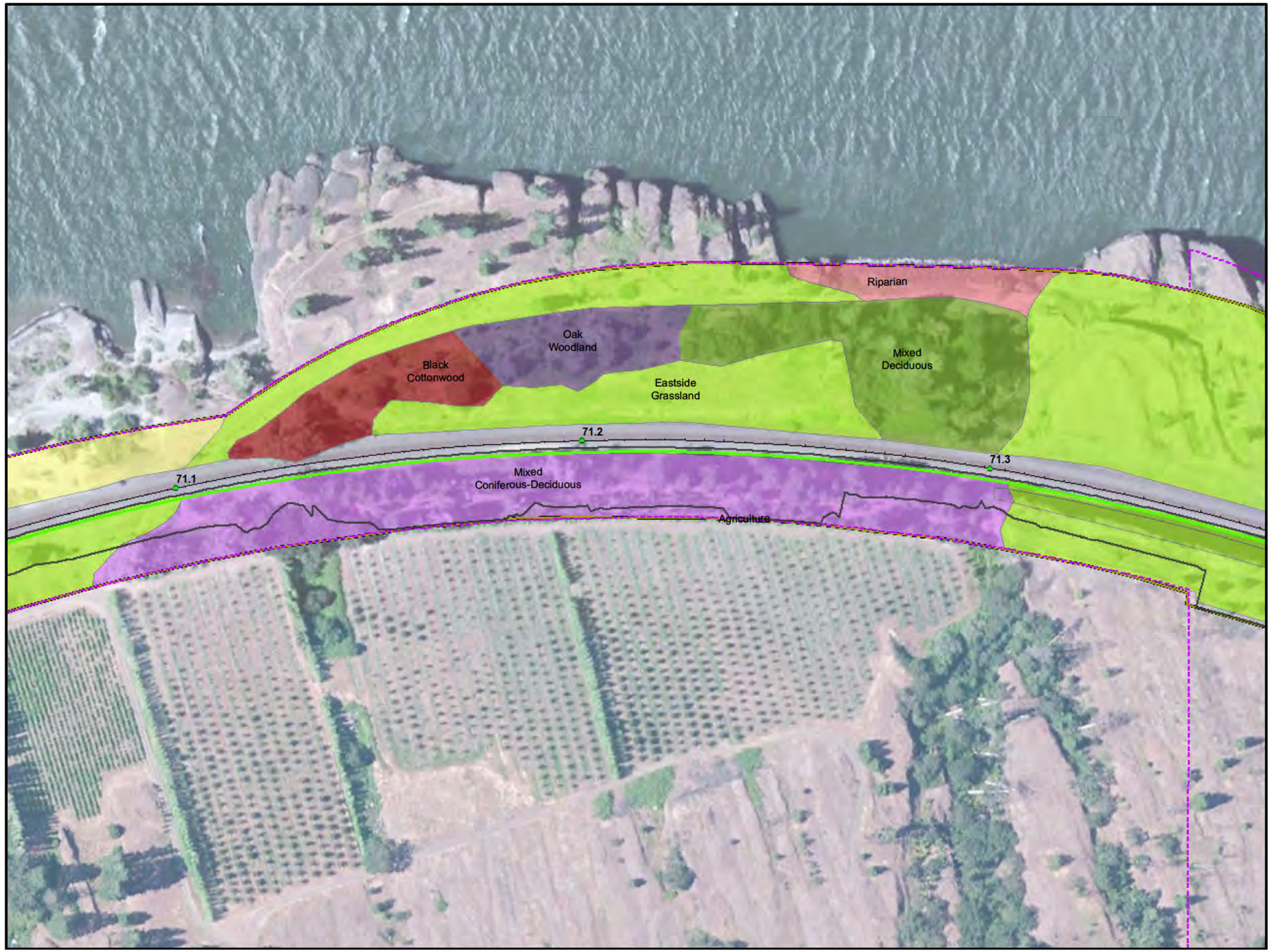

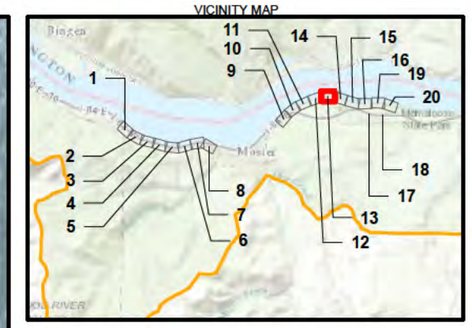

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
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Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-M
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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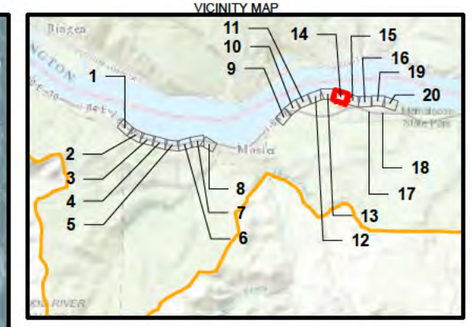
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-N
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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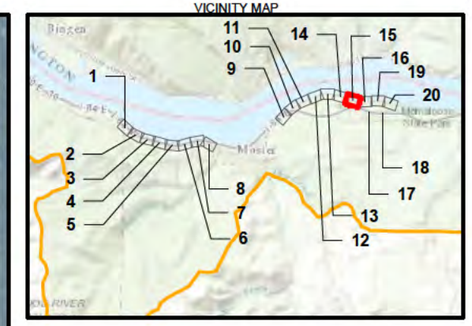

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-O
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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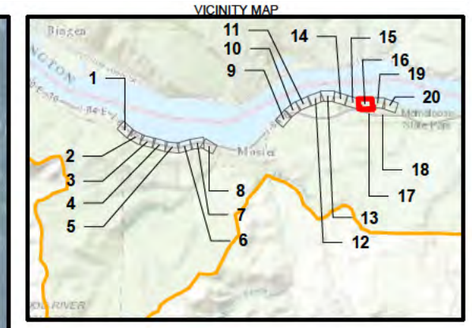

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-P
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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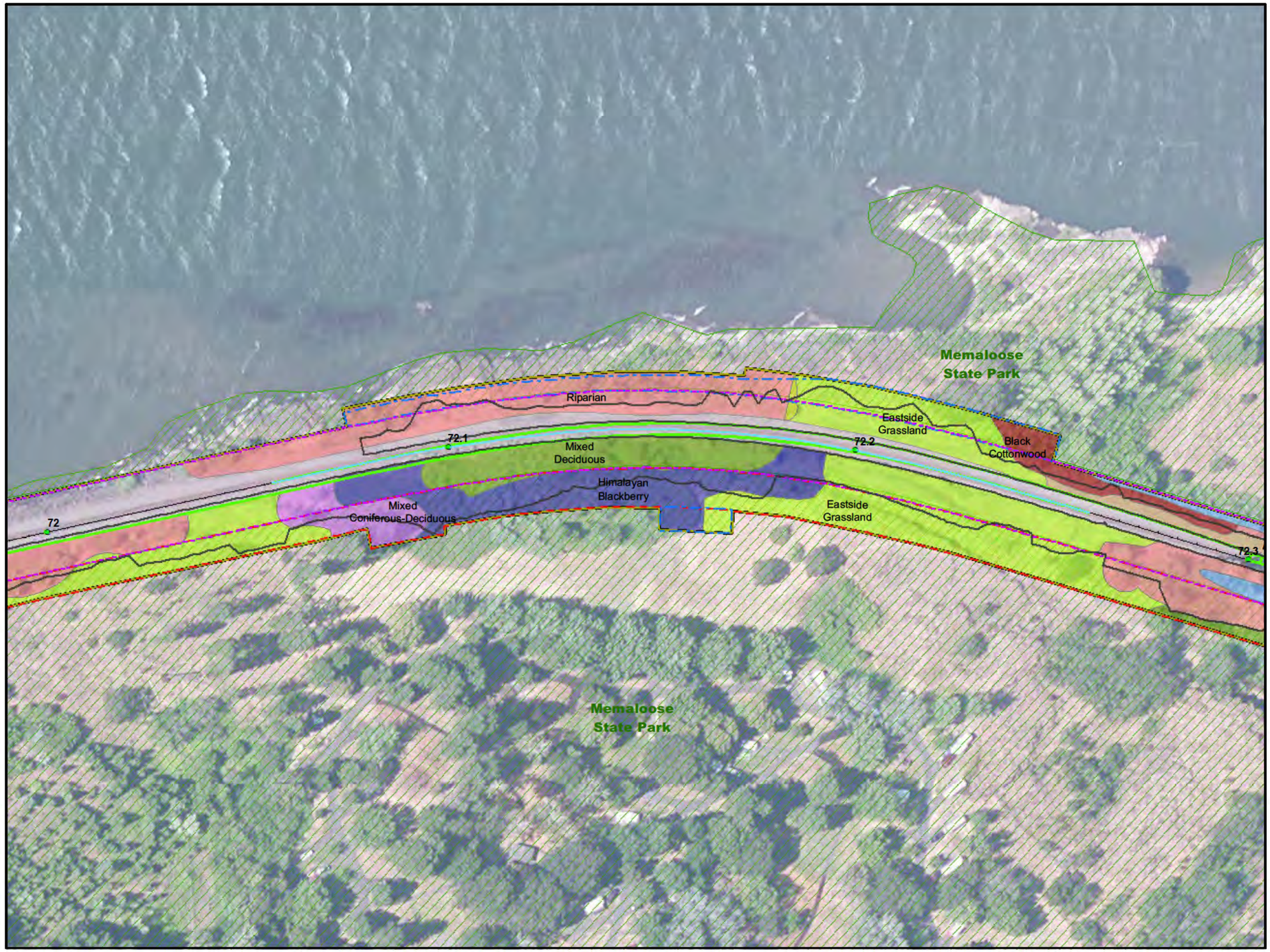

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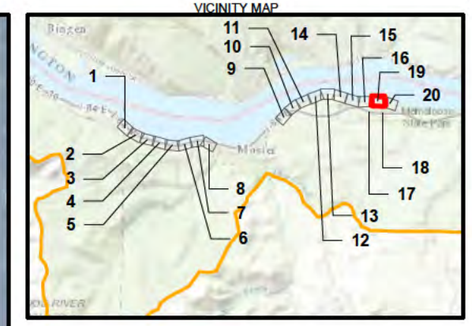

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-Q
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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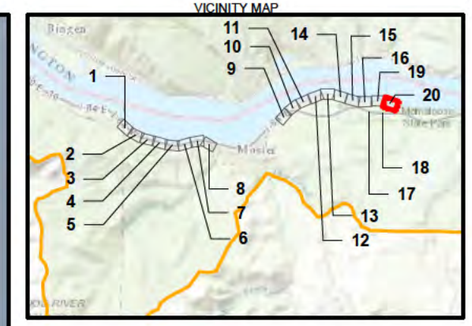

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-R
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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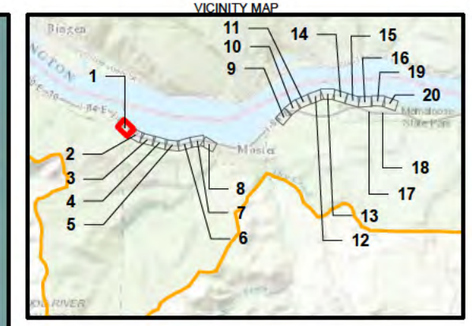

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-A
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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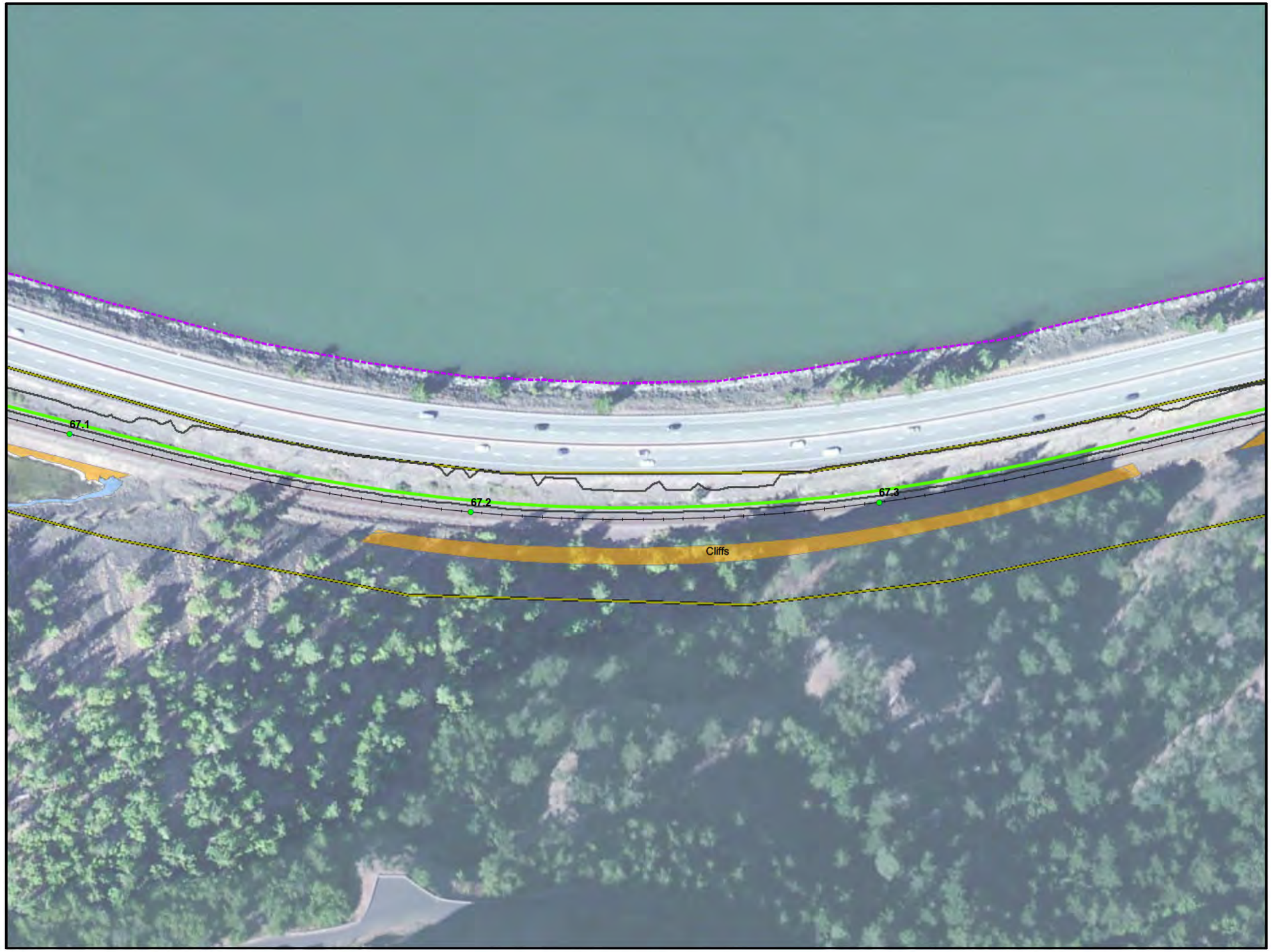

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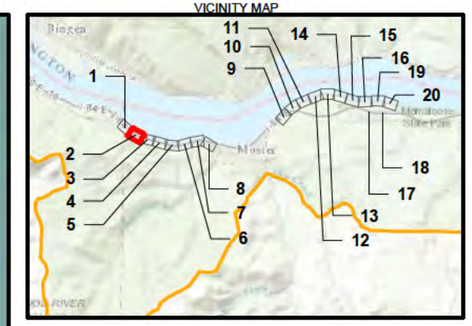

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-B
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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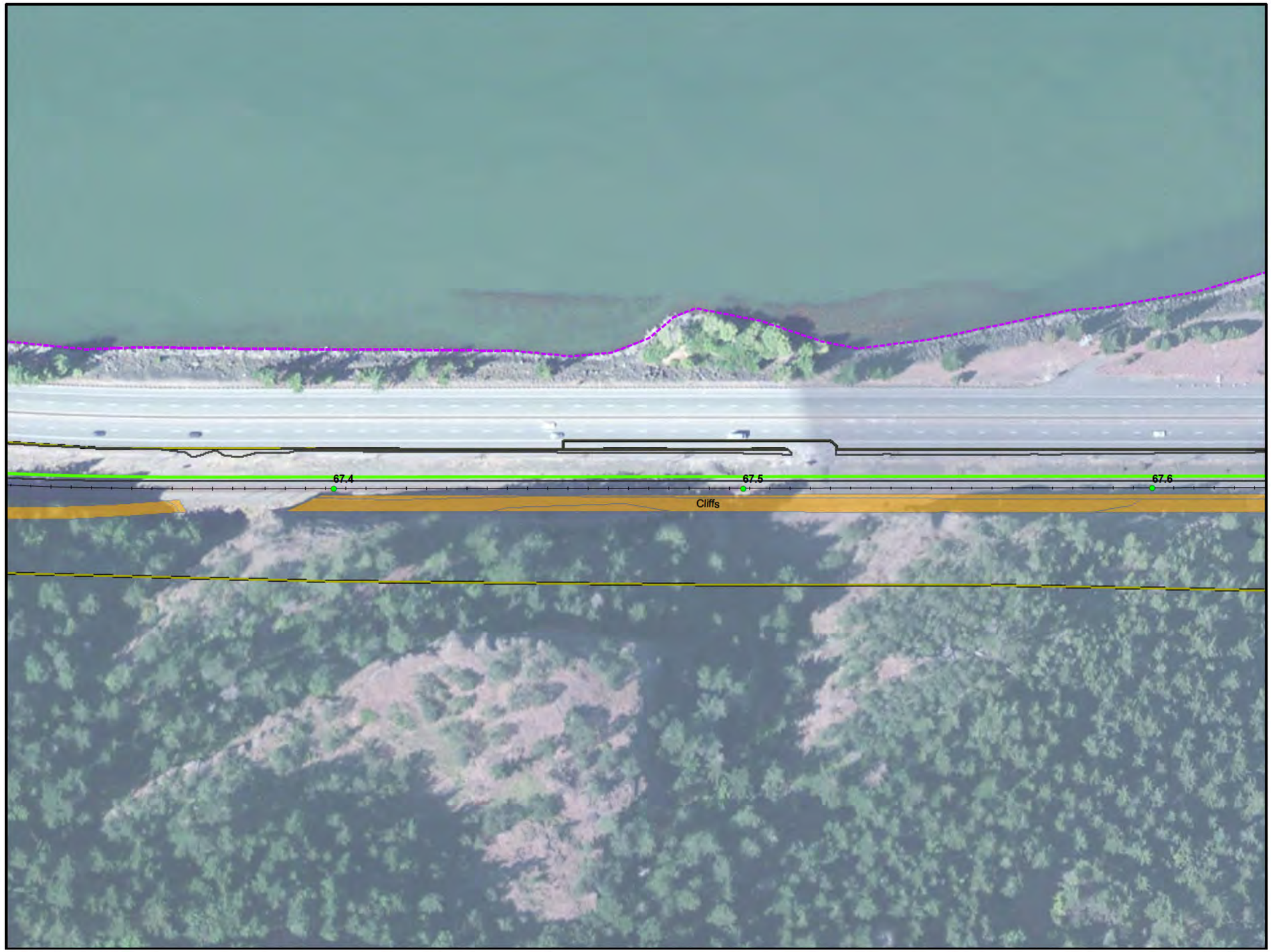

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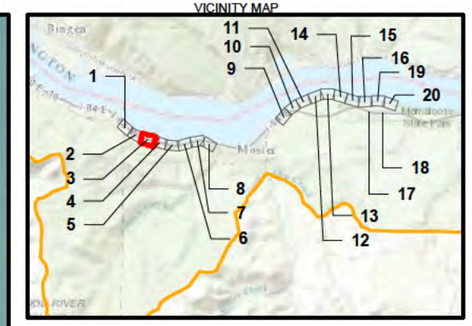

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-C
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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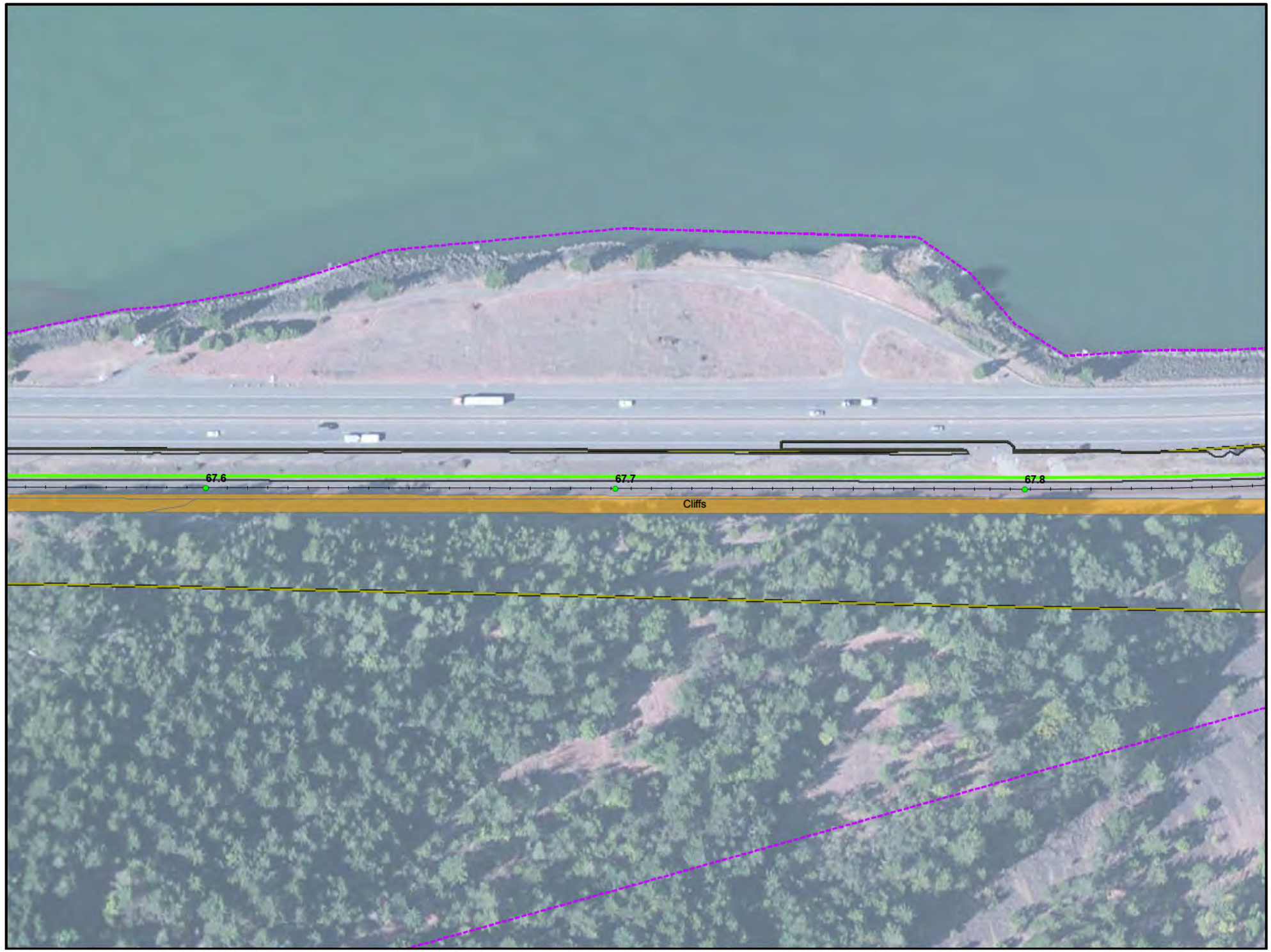

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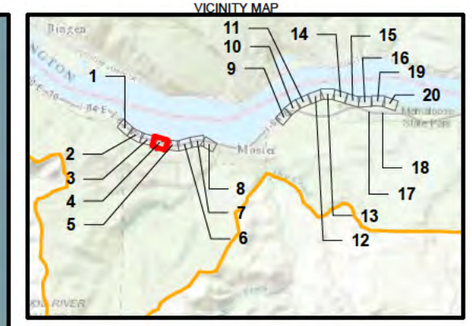

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-D
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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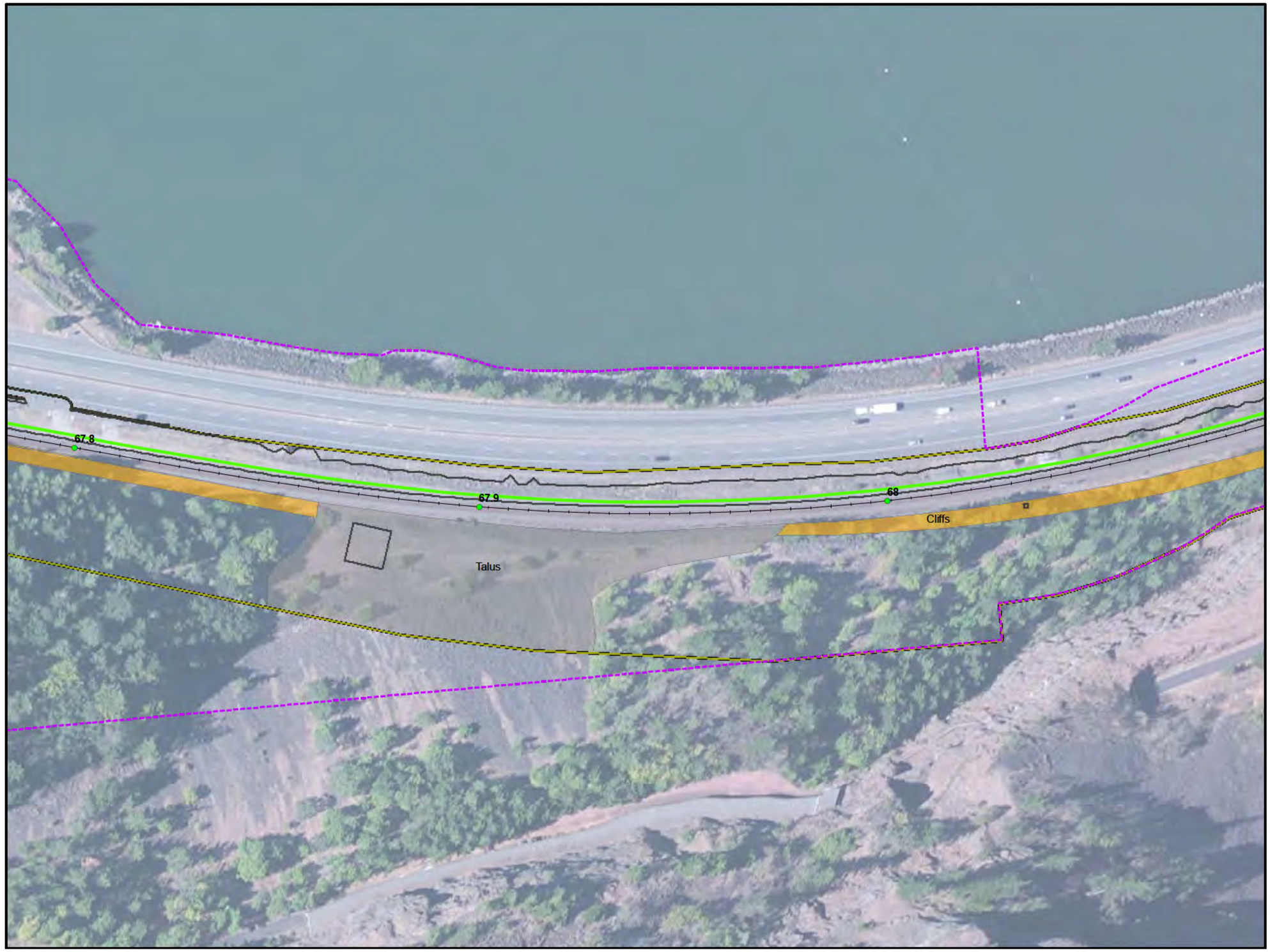

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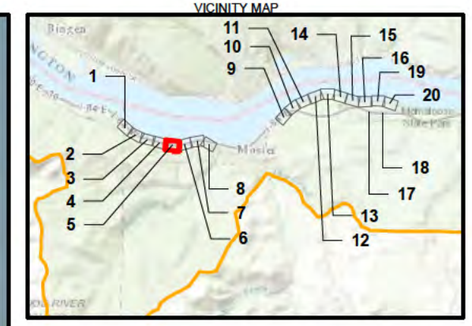

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-E
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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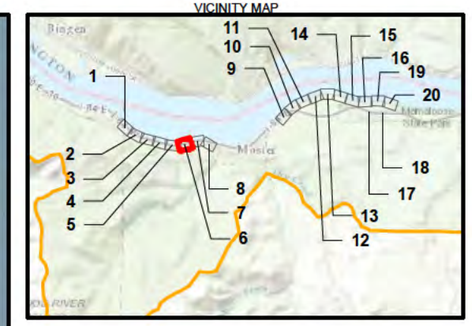
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-F
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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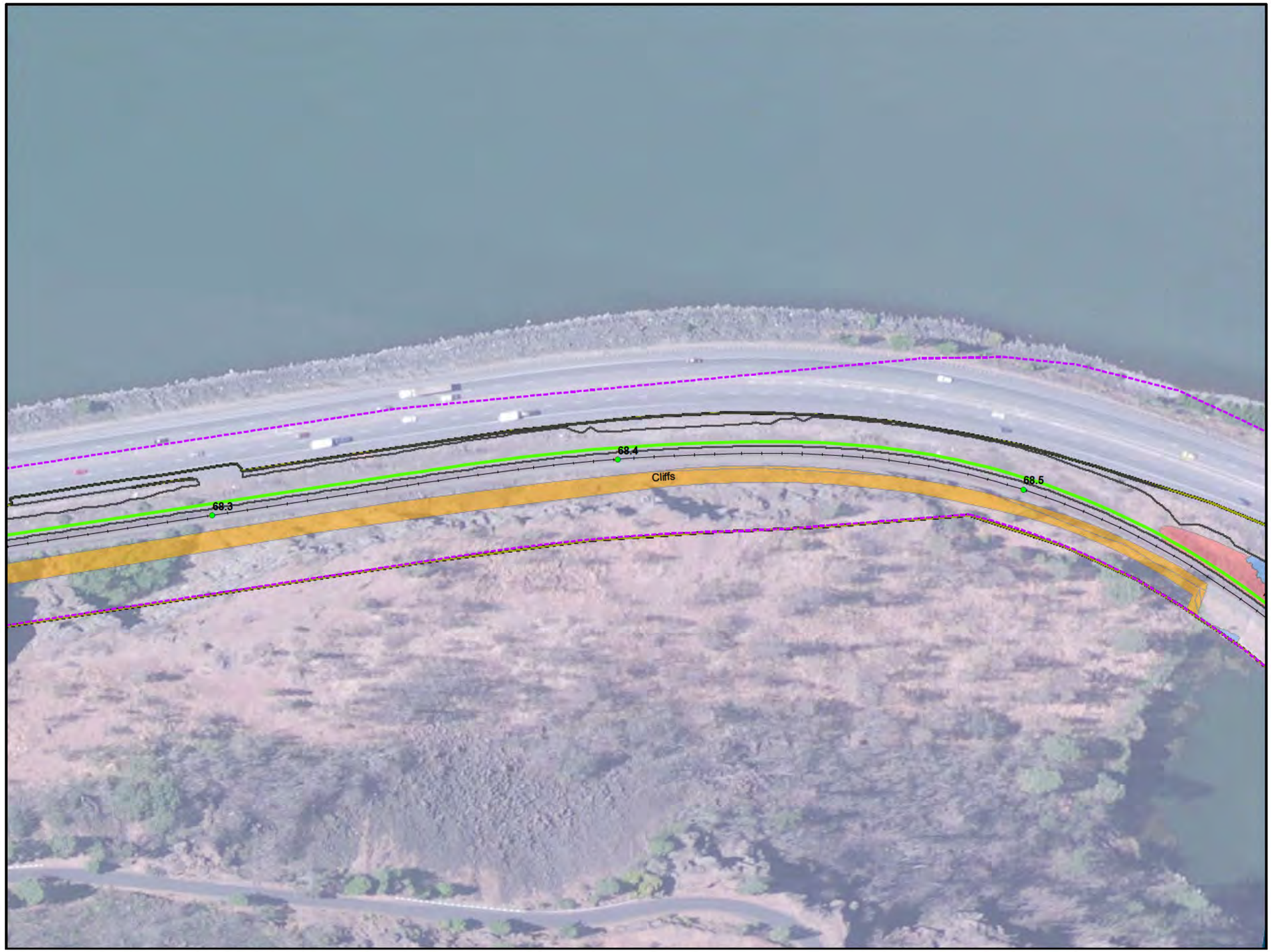

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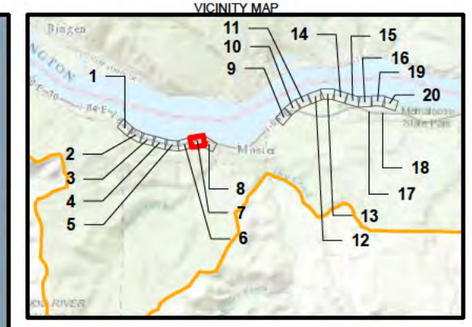


LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

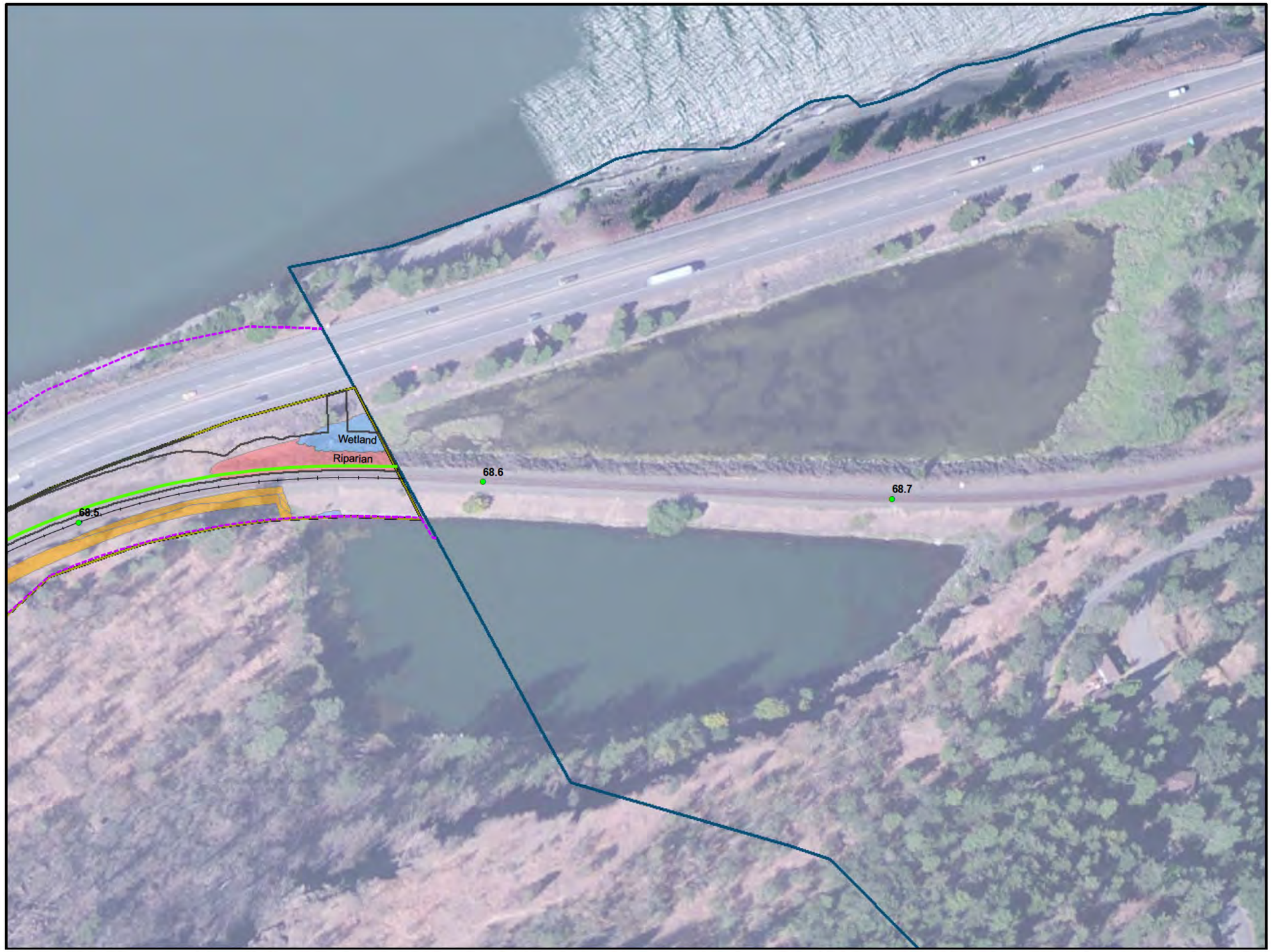
Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-G
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad



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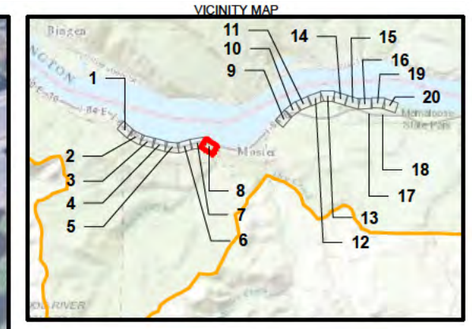

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-H
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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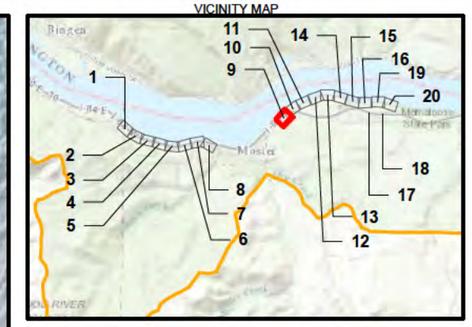

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-I
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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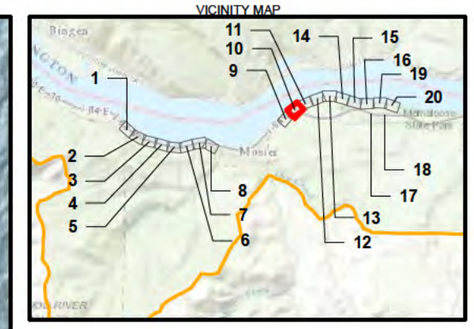

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-J
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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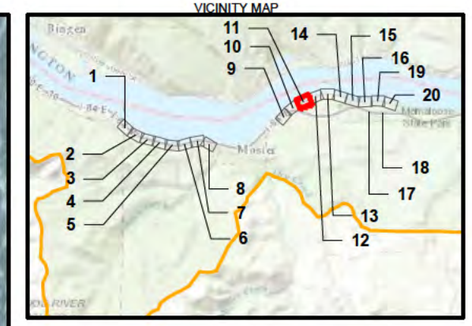

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

0 100
Feet

Figure 9-K
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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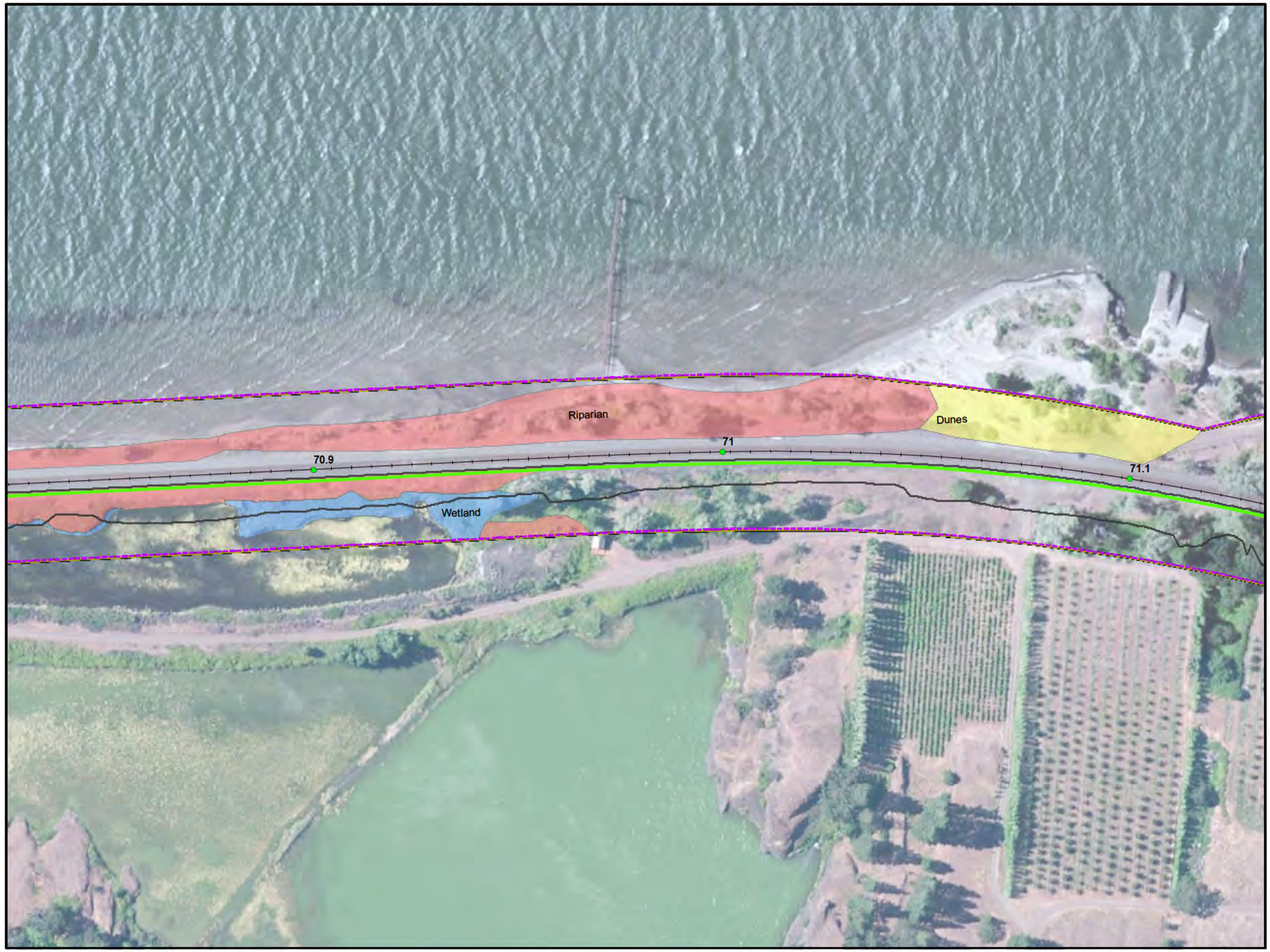

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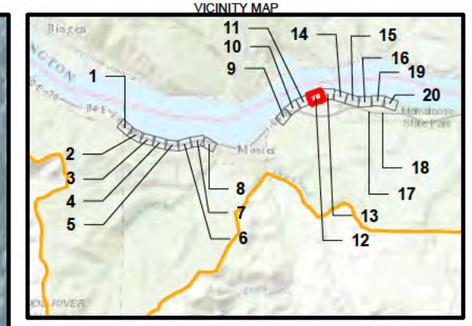

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

0 100
Feet

Figure 9-L
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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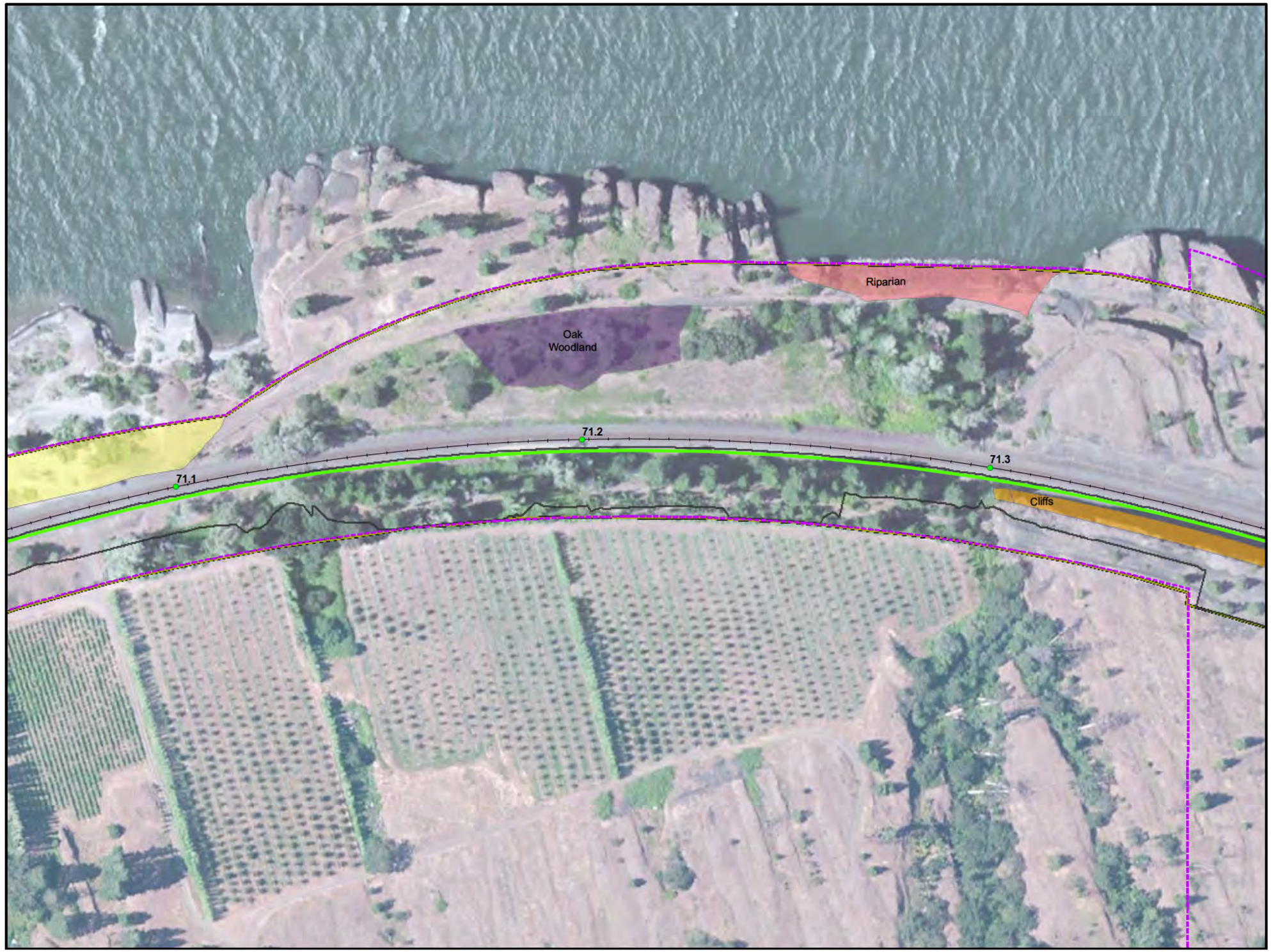

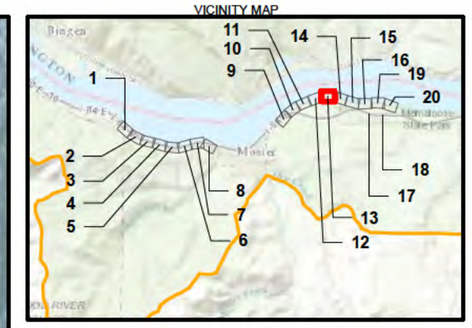

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-M
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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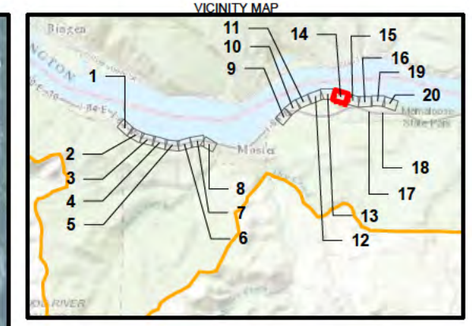
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-N
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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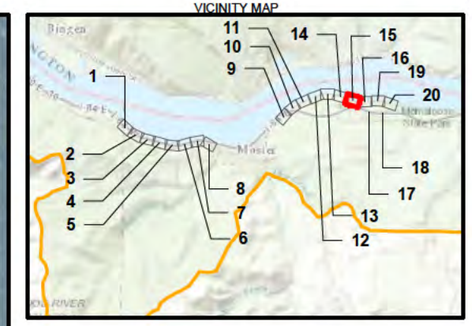

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-O
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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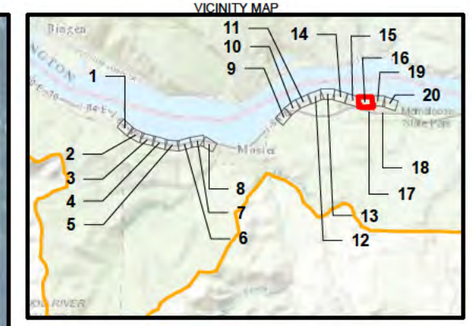
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-P
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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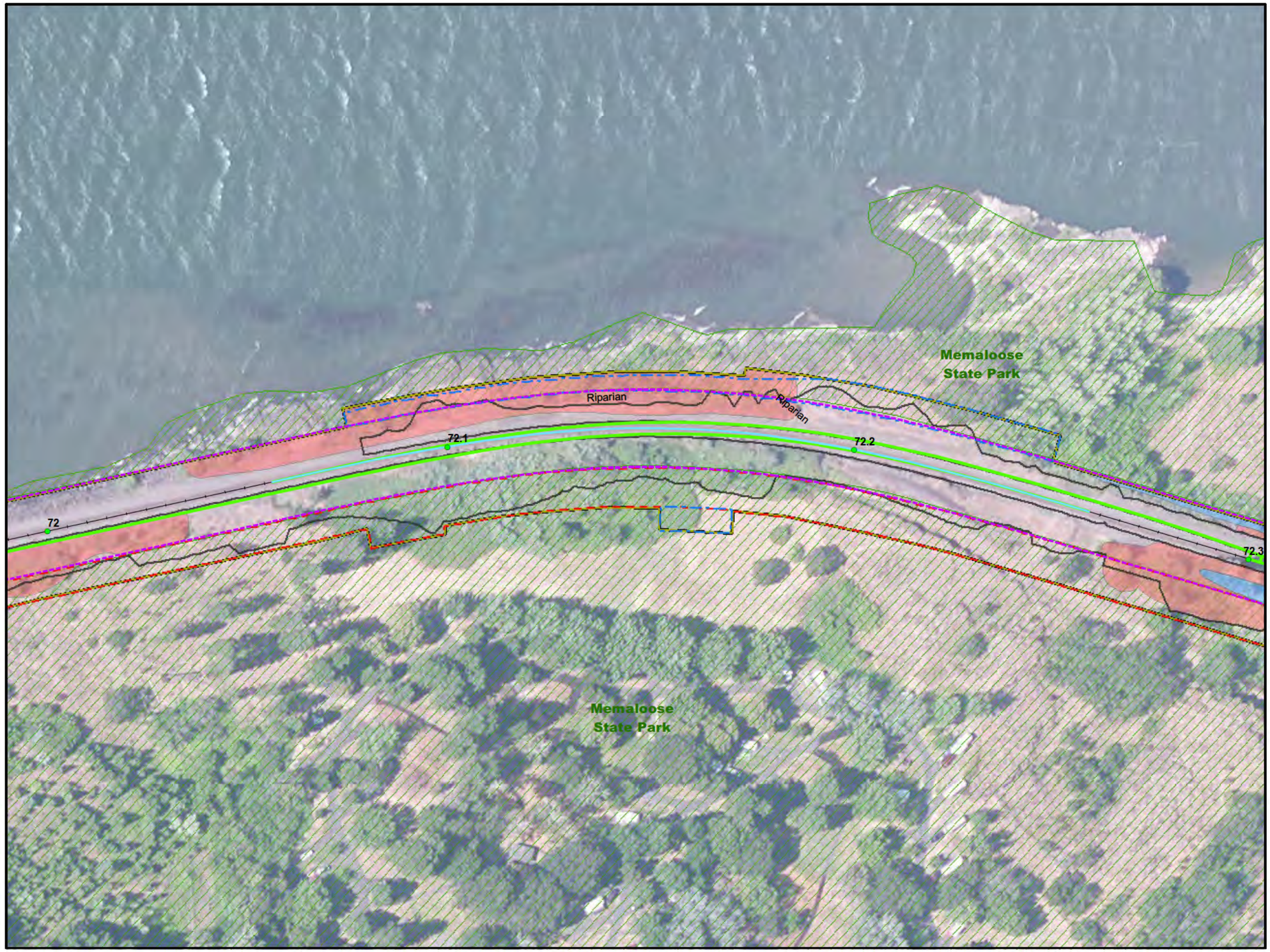

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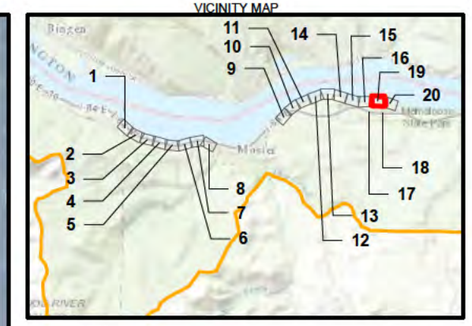

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-Q
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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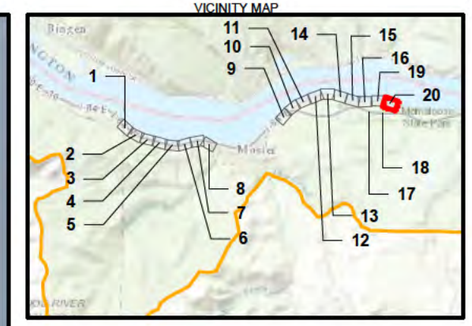

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-R
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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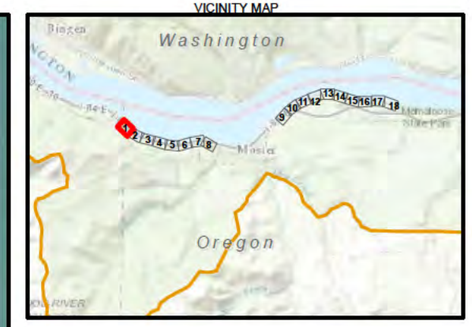

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-A
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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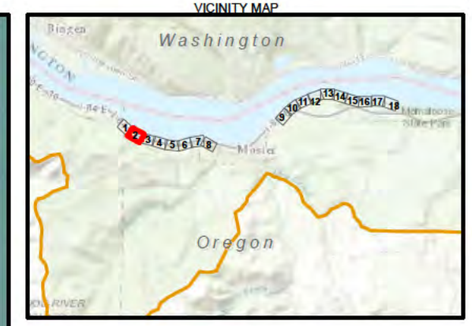

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-B
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

VICINITY MAP

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-C
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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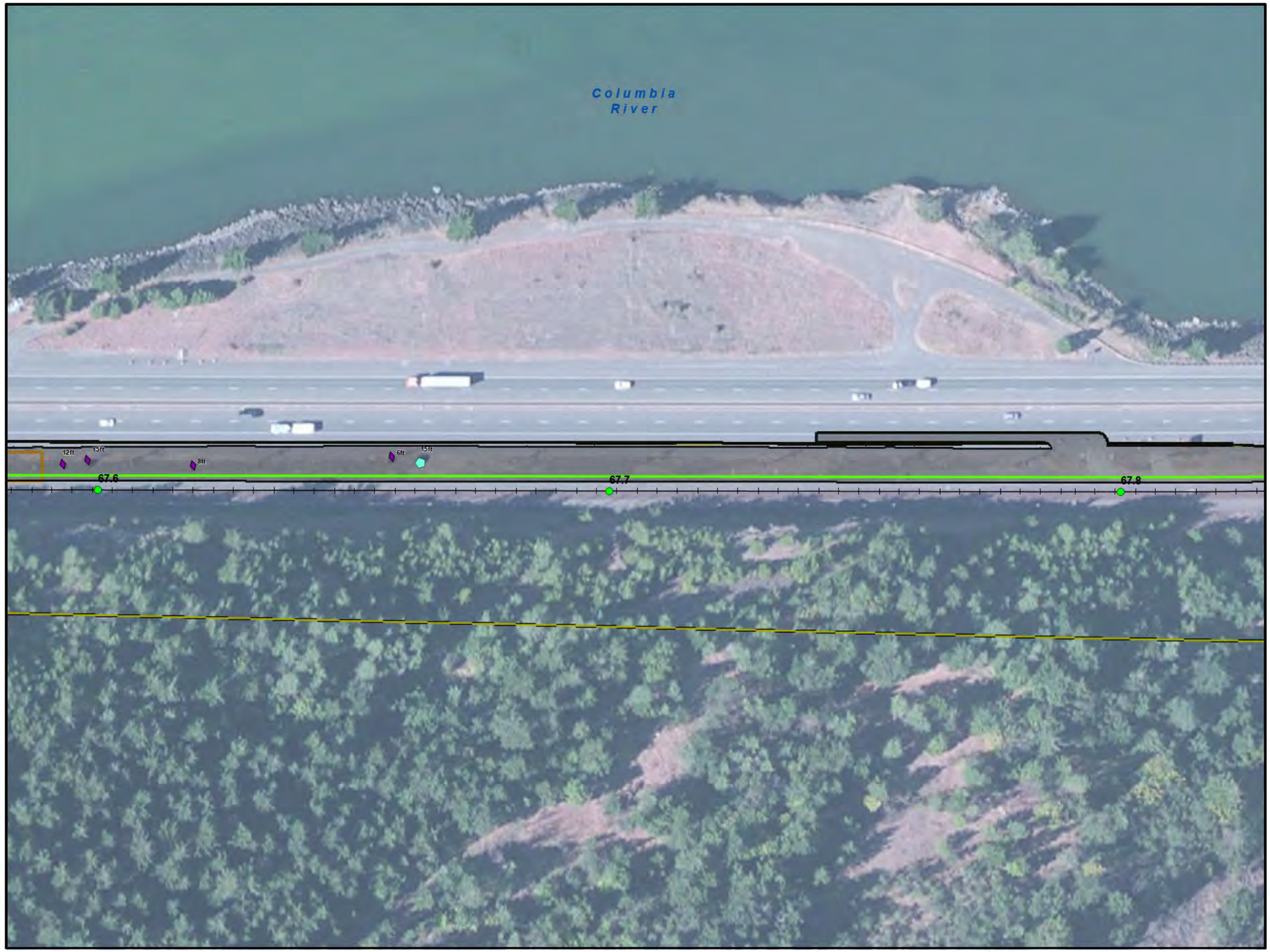

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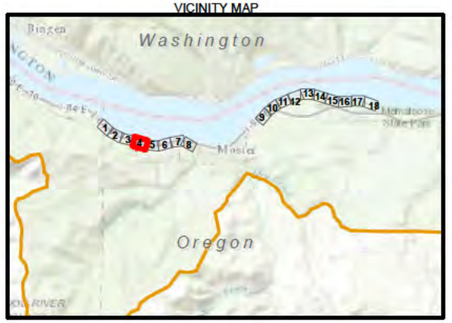

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-D
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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VICINITY MAP

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-E
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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VICINITY MAP

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-F
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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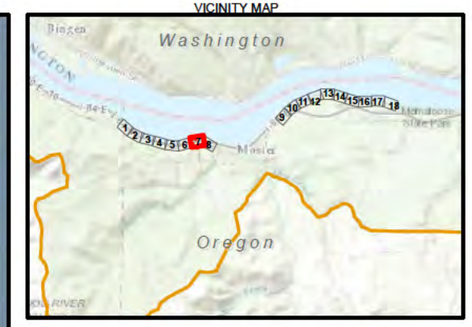

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-G
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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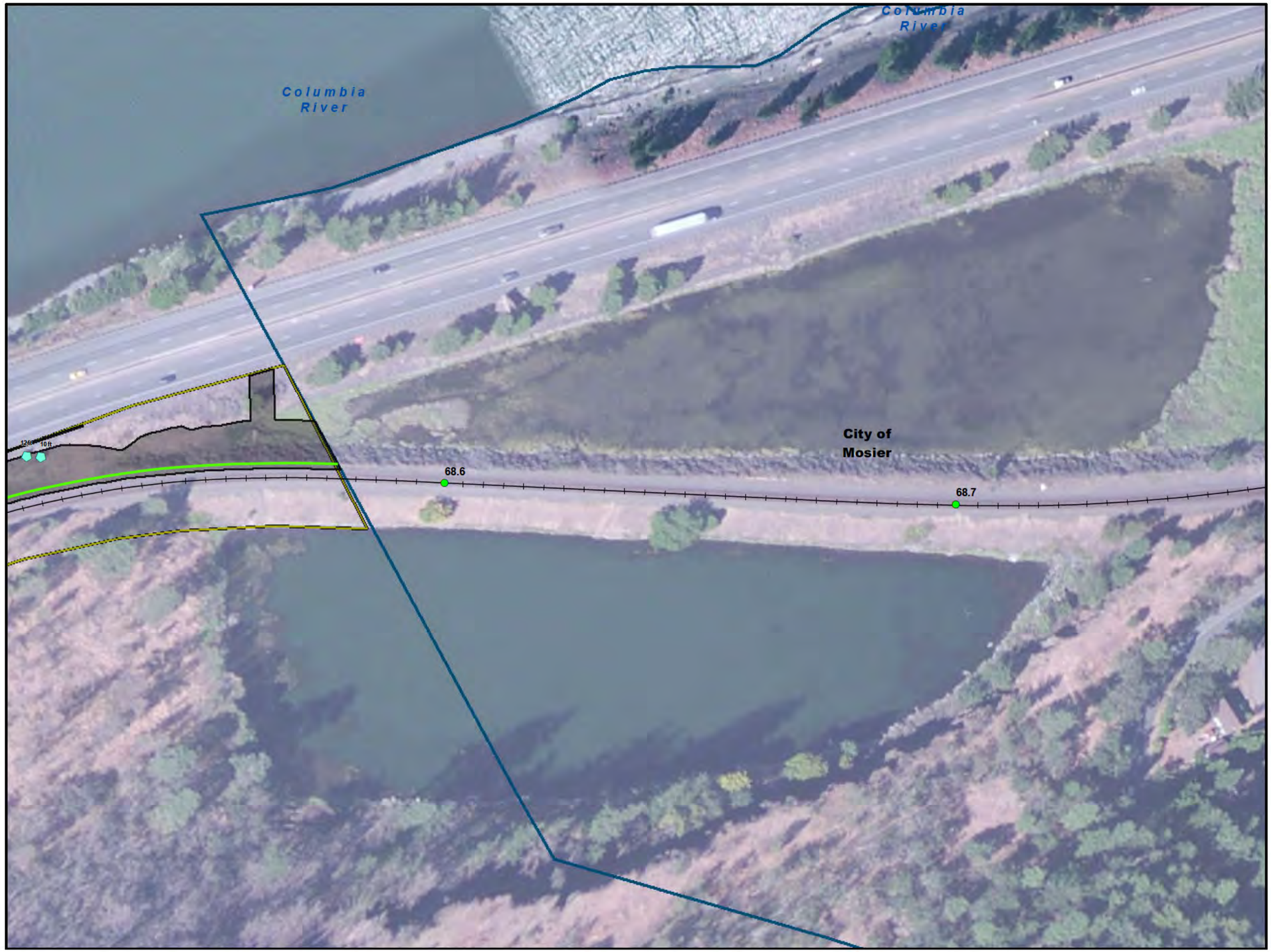

VICINITY MAP

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-H
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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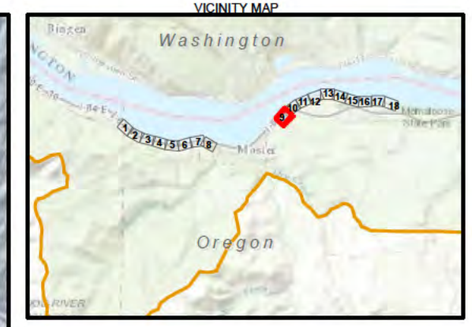

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
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- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-I
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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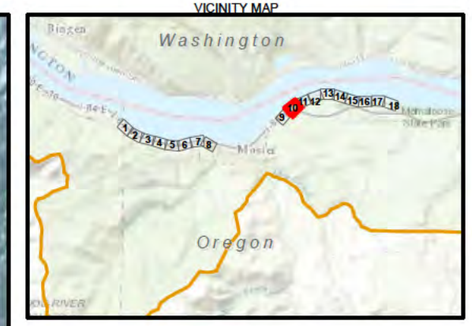

LEGEND

- Study Area Boundary
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- Track Mileposts
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Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
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- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-J
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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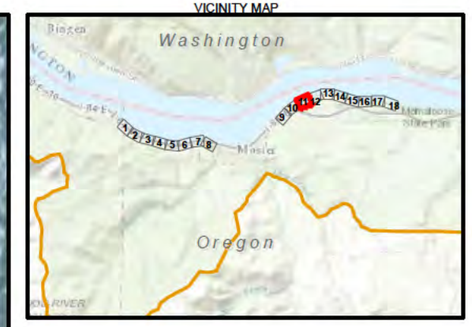

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N

0 100
Feet

Figure 10-K
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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VICINITY MAP

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N

0 100
Feet

Figure 10-L
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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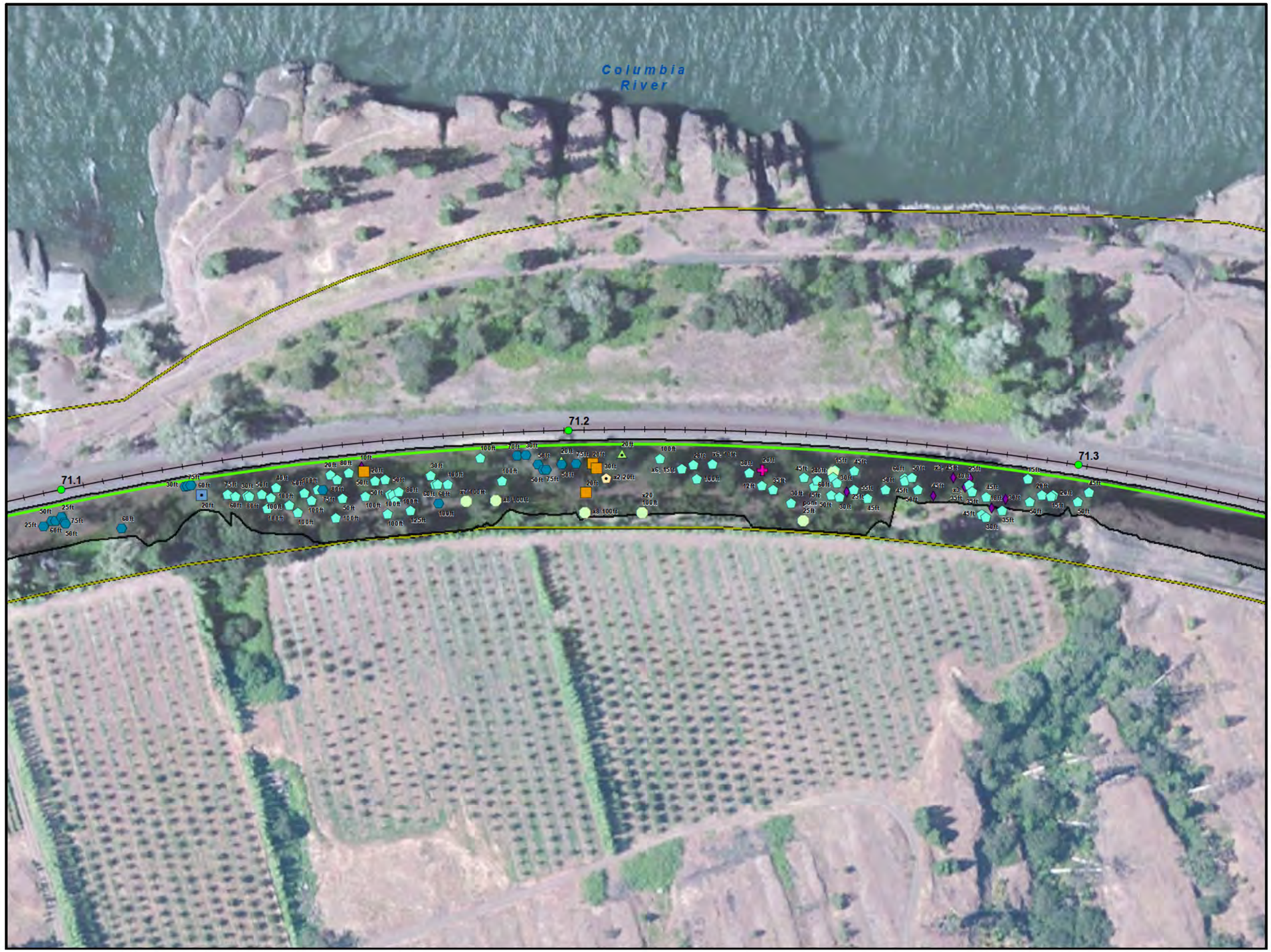

VICINITY MAP

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N

0 100
Feet

Figure 10-M
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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N

0 100
Feet

Figure 10-N
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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N

0 100
Feet

Figure 10-O
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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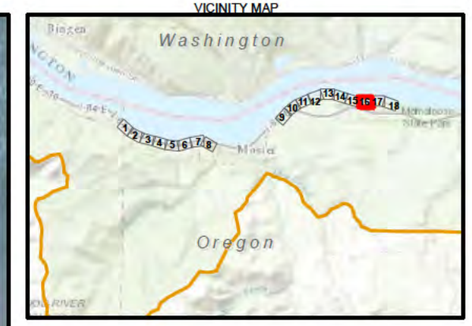

LEGEND

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N

0 100
Feet

Figure 10-P
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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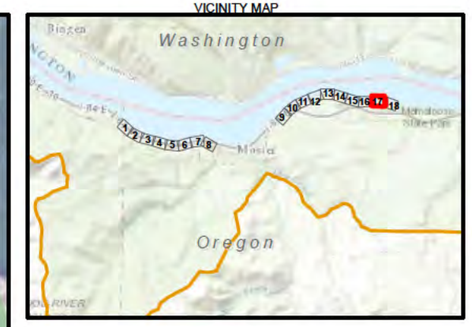

LEGEND

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N

0 100
Feet

Figure 10-Q
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

VICINITY MAP

LEGEND

- Study Area Boundary
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- Proposed Mainline Track
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N

0 100
Feet

Figure 10-R
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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Appendix B
Potentially Occurring Special-Status Plant and Terrestrial Wildlife Species

TABLE B-1
Special-status Plant Species Potentially Occurring in Wasco County, Oregon
Union Pacific Railroad Second Mainline Track Project Wasco County, Oregon

Scientific Name	Common Name	Federal Status	OR State Status	ORBIC List	Other Status	Usual Habitat in OR/WA	ORBIC Record of Occurrence	Suitable Habitat Present?
Achnatherum hendersonii	Henderson ricegrass	SOC	C	1	—	Dry, rocky, shallow soil, in sagebrush or ponderosa pine.	—	Yes
Agoseris elata	Tall Agoseris	SOC	—	2	FS-S	Meadows and open woods to mid-elevations.	—	Yes
Agrostis howellii	Howell's Bentgrass	SOC	C	1	FS-S Endemic	Moist rocks on south side of Gorge (Multnomah and Hood River counties).	—	Yes
Allium nevii	Nevius' onion			3		Open areas where the soil is wet into the spring.	X	Yes
Arabis (Boechera) sparsiflora var. *atrorubens*	Sickle-pod Rock Cress	—	T	2	FS-S	Eastside, low elevation. Open areas.	—	Yes
Artemesia campestris spp borealis var. *wormskioldii*	Northern Wormwood	C	E	1	FS-S Endemic	Gravely beach areas of Columbia. Miller Island in Gorge	—	Yes
Astragalus hoodianus	Hood River Milk-vetch	—	—	2	Endemic	Dry open areas of east Gorge	X	Yes
Astragalus tyghensis	Tygh Valley milk-vetch	—	T	1	—	Dry, rocky, sandy-clay soils, common in sagebrush-bunchgrass communities	—	Yes
Bolandra oregana	Oregon Bolandra	—	C	4	FS-S	Wet basalt cliffs	—	Yes
Botrychium lanceolatum	Lance-leaved grape-fern	—	—	2	FS-S	Moist, wet areas in mountains.	—	—
Botrychium lunaria	Moonwort	—	—	2	FS-S	Moist wet areas but rarely in meadows.	—	Yes
Botrychium montanum	Mountain grapefern	SOC		2	FS-S	Forested/open areas in conifer forest zones	—	—
Calamagrostis breweri	Brewer reedgrass	—	—	2	FS-S	Stream banks, lake margins, sub-alpine to alpine meadows.	—	—
Calamagrostis howellii	Howell's Reedgrass	—	—	—	Endemic	Rocky banks and crevices of cliffs within the Gorge.	—	Yes
Callitriche marginata	Winged water-starwort	—	—	2	—	Seasonally wet areas; vernal pools.	—	Yes

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Special-status Plant Species Potentially Occurring in Wasco County, Oregon
Union Pacific Railroad Second Mainline Track Project Wasco County, Oregon

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Calochortus longebarbaus var. *longebarbatus*	Long-bearded Sego Lily	—	—	—	FS-S	East slope of Cascades.	—	—
Carex densa	Dense Sedge	—	—	—	FS-S	Wet areas on both sides of Cascades.	—	—
Carex heteroneura carex atrata var. *erecta*	Different Nerve Sedge	—	—	—	FS-S	Montane	—	—
Carex lasiocarpa var. *americana*	Slender sedge	—	—	2	—	Bogs, shallow sedge mats, and shallow water.	—	Yes
Carex livida	Pale sedge	—	—	2	FS-S	Willamette Valley.	—	Yes
Carex macrochaeta	Large-awn Sedge	—	—	2	FS-S	Moist open places, coastal but suspected in Gorge.	—	Yes
Carex vernacula	Native sedge	—	—	2	FS-S	Alpine to sub-alpine. Dwarf size.	—	—
Castilleja levisecta	Golden Paintbrush	T	E	1-ex	FS-S	Open fields west side of Cascades.	—	Yes
Castilleja rupicola	Cliff Paintbrush	SOC	—	2	FS-S	Rocky cliffs at low to moderate elevations.	—	Yes
Castilleja thompsonii	Thompson's paintbrush	—	—	—	—	Dry soils; frequently associated with sagebrush. Local on open slopes and bald summits of surrounding mountains.	—	—
Chrysolepis chrysophylla	Golden Chinquapin	—	—	—	FS-S	Open to closed forest openings Low to mid elevations.	—	Yes
Cicuta bulbifera	Bulb-bearing Water-hemlock	—	—	2	FS-S	Wet places to standing water. Low elevations	—	Yes
Cimicifuga elata	Tall Bugbane	—	—	1	FS-S	Hardwood and mixed forest on west side	—	—
Collinsia sparaiflora var. *bruceae*	Few-flowered Blue-eyed Mary	—	—	—	FS-S	Dry slopes with sparse vegetation on east side of Cascades. Low elevations.	—	Yes
Coptis trifolia	Three-leaf goldthread	—	—	2	FS-S	Wasco County.	—	Yes

TABLE B-1
Special-status Plant Species Potentially Occurring in Wasco County, Oregon
Union Pacific Railroad Second Mainline Track Project Wasco County, Oregon

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Corydalis aqua-gelidae	Cold-water Corydalis	—	—	1	FS-S	Along cold streams on west side of Cascades.	—	—
Cryptantha rostellata	Beaked Cryptantha	—	—	—	FS-S	Dry open areas, east side Cascades.	—	Yes
Cyperus bipartitus	Shining cyperus	—	—	—	FS-S	Wet places. Low elevation.	—	Yes
Cypripedium fasiculatum	Clustered lady's-slipper	—	—	2	FS-S	Open to closed forested woodlands/forest. East side of Cascades.	—	Yes
Damasonium californicum	Fringed Waterplantain	—	—	—	FS-S	Sloughs, marshes and other standing waters.	—	Yes
Delphinium leucophaeum	Pale Larkspur	SOC	E	1	—	West side Multnomah County	—	—
Delphinium nuttallii	Nuttall's Larkspur	—	—	2	—	Westside	—	—
Douglasii laevigata var. *laevigata*	Smooth-leaf Douglasia	—	—	3	Endemic	Basalt cliffs and rocky out-crops, low elevation through the Gorge.	—	Yes
Eremothera pygmaea	Dwarf evening-primrose	SOC	C	1	—	Sagebrush steppe, on unstable soil or gravel in steep talus, dry washes, banks, and roadcuts.	—	Yes
Erigeron howellii	Howell's Daisy	SOC	C	1	FS-S Endemic	Open areas on ridges and rocky areas.	—	Yes
Erigeron oreganus	Columbia Gorge Daisy	SOC	C	1	FS-S Endemic	Overhanging basalt cliffs.	X	Yes
Eryngium petiolatum	Oregon Coyote-thistle	—	—	—	FS-S	Dry ephemeral wetlands in east Gorge.	—	—
Euonymus occidentalis	Western Wahoo	—	—	—	FS-S	In woods in west Cascades.	—	—
Fritillaria camschatcensis	Black Lily	—	—	2	FS-S	Moist areas west Cascades from coast to mountains.	—	—
Heuchera grossularifolia var. *tenuifolia*	Currant-leaf Alumroot	—	—	—	FS-S	Cliffs, often shaded, along streams or rivers in East Gorge.	—	Yes
Hieracium longiberbe	Long-beard Hawkweed	—	—	—	Endemic	Open areas throughout Gorge.	—	Yes
Howellia aquatilis	Howellia	T		1	FS-S	Low elevation wetlands.	—	Yes

TABLE B-1
Special-status Plant Species Potentially Occurring in Wasco County, Oregon
Union Pacific Railroad Second Mainline Track Project Wasco County, Oregon

Scientific Name	Common Name	Federal Status	OR State Status	ORBIC List	Other Status	Usual Habitat in OR/WA	ORBIC Record of Occurrence	Suitable Habitat Present?
Lepidium dictyotum	Alkali peppergrass	—	—	2	—	Usually on more or less alkaline soil of lowlands, often where flooded in the spring.	—	Yes
Lewisia columbiana var. *columbiana*	Columbia Lewisia	—	—	2	FS-S	Open rocks areas in west Gorge, generally middle to high elevations.	—	Yes
Linanthus bolanderi	Baker's Linanthus	—	—	—	FS-S	Dry open areas in East Gorge.	—	Yes
Liparis loeselii	Twayblade	—	—	—	FS-S	Wet or damp areas within forest.	—	—
Lomatium laevigatum	Smooth Desert Parsley	—	—	2	FS-S Endemic	Basalt cliffs in east Gorge.	—	Yes
Lomatium salmoniflorum	Salmon River lomatium	—	—	2	—	Wasco County.	—	Yes
Lomatium suksdorfii	Suksdorf's Desert Parsley	SOC	C	2	FS-S Endemic	Open wooded or open areas in east Gorge.	—	Yes
Lomatium watsonii	Watson's desert-parsley	—	—	2	FS-S	Hood River and Wasco Counties.	X	Yes
Lupinus latifoius var. *thompsonianus*	Columbia Gorge Broad-leaf Lupine	—	—	—	Endemic	Open areas in pine/oak woodlands.	—	Yes
Luzula arcuata	Curved Woodrush	—	—	2	FS-S	Hood River County	—	Yes
Lycopodiella inundata	Northern bog clubmoss	—	—	2	FS-S	Wet, sandy places, wetlands adjunct to lakes, and swampy ground. Westside	—	—
Lycopodium complanatum	Ground cedar	—	—	2	FS-S	Westside	—	—
Meconella oregana	White Meconella	SOC	C	1	FS-S	Oak woodlands in east Gorge.	X	Yes
Microseris borealis	Northern Microseris	—	—	—	FS-S	Low to mid elevation wetlands.	—	Yes
Mimulus jungermannioides	Columbia Monkey Flower	—	C	1	FS-S	Wet areas in east Cascades.	—	—

TABLE B-1
Special-status Plant Species Potentially Occurring in Wasco County, Oregon
Union Pacific Railroad Second Mainline Track Project Wasco County, Oregon

Scientific Name	Common Name	Federal Status	OR State Status	ORBIC List	Other Status	Usual Habitat in OR/WA	ORBIC Record of Occurrence	Suitable Habitat Present?
Mimulus pulsiferae	Pulsifer's Monkey-flower	—	—	—	FS-S	Wet areas.	—	Yes
Mimulus suksdorfii	Suksdorf's Monkey-flower	—	—	—	FS-S	Open, moist, or rather dry places.	—	Yes
Montia diffusa	Branching Montia	—	—	—	FS-S	Up-turned root disturbances within the forest of Cascades.	—	—
Montia howellii	Howell's montia	—	—	—	FS-S	Multnomah County	—	—
Navarretia tagetina	Marigold Navarretia	—	—	—	FS-S	Dry, open areas in east Gorge.	—	Yes
Ophioglossum pusillum	Adder's-tongue	—	—	2	FS-S	Meadows and woods.	—	Yes
Parnassia frimbriata var. *hoodiana*	Fringed Grass-of-Parnassus	—	—	—	FS-S	Bogs, stream banks, wet areas (Multnomah, Hood, and Washington counties, Oregon).	—	—
Penstemon barrettiae	Barrett's Penstemon	SOC	C	1	FS-S Endemic	Rocky cliffs, talus slopes in east Gorge.	X	Yes
Penstemon deustus var. *variabilis*	Hot-rock penstemon	—	—	1	—	Dry foothills and lowlands, on open, dry, thin soils over basalt.	—	Yes
Phemeranthus spinescens	Spiny flame-flower	—	—	2	—	On rocky basalt outcrops and scablands in sagebrush.	—	Yes
Phlox hendersonii	Henderson phlox	—	—	2	FS-S	Hood River County	—	—
Pityopus californica	Pine-foot	—	—		FS-S	Low elevation mixed conifer forest.	—	—
Plagiobothrys figuratus ssp. corallicarpus	Coral seeded popcorn flower	—	—	1	FS-S	Meadows, low ground, and moist fields.	—	Yes
Platanthera sparsiflora	Canyon Bog-orchid	—	—	—	FS-S	Wet, boggy areas	—	Yes
Poa gracillima var. *multnomae*	Pacific bluegrass	—	—	—	Endemic	Mostly on s. side of Columbia Gorge in rocky, shaded cliff near water falls	—	—

TABLE B-1
Special-status Plant Species Potentially Occurring in Wasco County, Oregon
Union Pacific Railroad Second Mainline Track Project Wasco County, Oregon

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Poa laxiflora	Loose-flowered Bluegrass	—	—	—	FS-S	Moist woods to open rocky slopes up to mid-elevations	—	—
Poa nervosa var. nervosa	Wheeler's Bluegrass	—	—	—	FS-S	Limited to lower Columbia River and adjacent tributaries. Open slopes, ridges and talus slopes.	—	Yes
Polemonium carneum	Great Polemonium	—	—	—	FS-S	Mid elevation forests in west Gorge.	—	—
Potentilla breweri	Brewer's Cinquefoil	—	—	—	FS-S	Moist to dry and exposed areas at middle and upper elevations.	—	Yes
Potentilla diversifolia var. *perdissecta*	Diverse-leaved Cinquefoil	—	—	—	FS-S	Moist, shady and open areas, gravelly soils of glacially carved areas, , ledges and rocky slopes, stream banks.	—	Yes
Potentilla villosa var. *parviflora*	Villous cinquefoil	—	—	2	FS-S	Hood River County	—	—
Ranunculus populago	Mountain Buttercup	—	—	—	FS-S	Moist meadows, stream terraces, riparian corridors, adjacent to a perennial streams and bogs.	—	Yes
Ranunculus reconditus (triternatus)	Obscure Buttercup	SOC	E	1	FS-S Endemic	Open grasslands or open areas in pine/oak woodlands. East Gorge.	—	Yes
Romanzoffia thompsonii	Thompson mistmaiden	—	—	1	FS-S	Wet cliffs and ledges	—	—
Rorippa columbiae	Columbia Yellow Cress	—	—	1	FS-S	Mud flats along Columbia River	—	—
Scheuchzeria palustris var. *americana*	Scheuchzeria	—	—	2	FS-S	Multnomah County	—	—
Schoenoplectus subterminalis	Water clubrush	—	—	2	—	Wasco County	—	Yes
Scribneria bolanderi	Scribner-grass	—	—	—	FS-S	Dry, sandy to rocky soil.	—	Yes

TABLE B-1
Special-status Plant Species Potentially Occurring in Wasco County, Oregon
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Sidalcea hirtipes	Hairy-stemmed Checker-mallow	SOC	C	1	FS-S	Mesic habitats associated with creeks and streams.	—	Yes
Sisyrinchium sarmentosum	Pale Blue-eyed Grass	—	—	1	FS-S	Wet/dry meadows at mid to high elevations	—	Yes
Spiranthes porrifolia	Western Ladies' Tresses	—	—	—	FS-S	Open moist meadows.	—	—
Streptopus streptopoides	Kruhsea	—	—	2	—	Hood River, Multnomah Counties	—	—
Suksdorfia violacea	Violet Suksdorfia	—	—	2	FS-S	Moist cliffs at low elevations in Mid-Gorge.	X	Yes
Sullivantia oregana	Oregon Sullivantia	SOC	C	1	FS-S Endemic	Wet basalt cliffs near waterfalls at low elevations in the west Gorge.	—	—
Synthyris stellata	Columbia Kittentails	—	—	—	Endemic	Shaded banks, cliffs and ridges in the west Gorge.	—	—
Tauschia stricklandii	Strickland's Tauschia	—	—	2	FS-S	Wet subalpine meadows in the west Gorge.	—	—
Utricularia intermedia	Flat-leaved Bladderwort	—	—	—	FS-S	Slow moving water or streams.	—	Yes
Utricularia minor	Lesser Bladderwort	—	—	2		Wasco County	X	Yes
Veratrum insolitum	Siskiyou False Hellebore	—	—	—	FS-S	Dry open woods and brush in the middle Gorge.	—	Yes
Wolffia borealis	Dotted water-meal	—	—	2	FS-S	Ponds and standing water at low elevations.	—	Yes
Wolffia columbiana	Columbia Water-meal	—	—	2	—	Freshwater lakes, ponds, and slow streams below 650 feet.	—	Yes
FUNGI								
Bridgeoporus nobilissimus	Giant polypore fungus	—	—	1	—	On boles of noble firs. Multnomah County	—	—
Helvella crassitunicata	—	—	—	2	—	Fungus. Hood River County	—	—

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Hygrophorus caeruleus	—	—	—	2	—	Fungus. Hood River County	—	—
Macowanites mollis	—	—	—	1	—	Fungus. Multnomah County	—	—
Phaeocollybia californica (OR only)	—	—	—	1	—	Fungus. Multnomah County	—	—
Phaeocollybia oregonensis	—	—	—	1	—	Fungus. Multnomah County	—	—
BRYOPHYTES								
Conostomum tetragonum	—	—	—	2	—	Moss, Hood River County	—	—
Gymnomitrion concinnatum	—	—	—	2	—	Liverwort, Hood River and Multnomah Counties	—	—
Polytichium sphaerothecium	—	—	—	2	—	Moss, Hood River County	—	—
Rhizomnium nudum (OR only)	—	—	—	2	—	Moss, Very moist humus or soil, typically near seepage in conifer forest. Wasco County	—	—
Tetraphis geniculata	—	—	—	2	—	Moss OR/WA Moist forests with large down logs	—	—

Key:

E	Endangered
T	Threatened
C	Candidate
SOC	Species of Concern
1	Review - Threatened or Endangered throughout range (ORBIC)
1-ex	Review - Threatened or Endangered throughout range, extirpated (ORBIC)
2	Watch - Threatened, Endangered, or extirpated from Oregon, secure elsewhere (ORBIC)
FS-S	Forest Service Sensitive

TABLE B-2

Special-status Wildlife Species Potentially Occurring in Wasco County, Oregon

Union Pacific Railroad Second Mainline Track Project Wasco County, Oregon

Scientific Name	Common Name	Federal Status	OR State Status	Other Status	Usual Habitat in OR/WA	ORBIC Record of Occurrence	GMA/ SMA	SMA Only	Suitable Habitat Present?
HERPTILES									
Dicamptodon copei	Cope's giant salamander	—	SU	FS	Western WA, Northwestern OR: Clear, cold mountain streams w/rocky substrate	—	x	—	No
Rhyacotriton cascadae	Cascade torrent salamander	—	SV	FS	Cascade Mtns of southern WA and northern OR: in and adjacent to cold, fast, mountain streams or seeps w/rocky substrate	—	x	—	No
Batrachoseps wrighti	Oregon slender salamander	—	SU	FS	North and Central OR Cascades: Forests with large down logs and moist talus with abundant wood debris	—	x	—	No
Plethodon larselli	Larch mountain salamander	—	SV	FS	Cascades mountains of southern WA/northern OR: Largely in moss-covered shady talus slopes, low-mid elevation.	—	x	—	Yes
Rana luteiventris	Columbia spotted frog	—	SU	—	Columbia basin (east of Cascades Range): In or near permanent slow ponds, streams, marshes with abundant veg. (one known site at Conboy). No currents sites in NSA.	—	x	—	Yes
Rana pretiosa	Oregon spotted frog	—	SC	FS	The Oregon spotted frog was historically found in the Puget Trough from the Canadian border to the Columbia River and east into the southern Washington Cascades. In or near large perennial lakes/marshes. Closest extant population at Crane prairie reservoir in Deschutes county.	—	x	—	No
Rana pipiens	Northern leopard frog	—	SC	—	Lowland marsh/ponds with dense vegetation; presently found in Grant county only. Likely extirpated in Gorge.	—	x	—	No
Bufo boreas	Western toad	—	SV	—	Widespread distribution in WA and OR: Most common near marshes and small lakes (breeding sites in mid-spring); can travel readily overland and be found along streams/seeps.	—	x	—	Yes
Ascaphus truei	Tailed frog	—	SV	—	Clear, cold, fast forest streams with little silt and (often) cobble substrate.	—	x	—	No

TABLE B-2

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Scientific Name	Common Name	Federal Status	OR State Status	Other Status	Usual Habitat in OR/WA	ORBIC Record of Occurrence	GMA/ SMA	SMA Only	Suitable Habitat Present?
Rana cascadae	Cascades frog	—	SV	—	High elevation streams (1500-6000') as well as mountain meadows and moist forests	—	x	—	No
Rana aurora	Northern red-legged Frog (West Cascades)	—	SU	—	Generally found below 3000' in moist forests and forested wetlands. Breeds in cool ponds and slow streams. Adults can be found some distance from water during wet seasons.	—	x	—	Yes
Clemmys(Actinemys) marmorata	Northwestern pond turtle	—	SC	FS	Streams, large rivers, slow sloughs, and quiet waters with nesting habitat (open meadow) within ½ mile. Occurs below 3000' elevation.	X	x	—	Yes
Chrysemys picta	Painted turtle	—	SC	FS	Slow water ponds, marshes, rivers below 3000' elevation Widely introduced outside Columbia River Gorge and Columbia River basin.	—	x	—	Yes
Lampropeltis zonata	California Mtn king snake	—	SV	—	Main population in CA and Klamath mtns, with disjunct population. In Columbia River Gorge (Klickitat, Skamania county area): oak/pine woodland, rocky riparian within logs/rocky cover. No confirmed specimens on OR side of NSA, although unconfirmed sightings have been reported at The Dalles and Maupin areas.	—	x	—	No
Contia tenuis	Sharptail snake	—	SV	—	East slope of WA Cascades, Columbia River Gorge, western OR: rocky slopes often in open pine/oak woodland w/prey species of small slugs. Often in moist riparian east of Cascades. Largely subterranean during summer, appearing in spring/fall.	—	x	—	Yes
BIRDS									
Haliatus leucocephalus	Bald eagle	—	T	—	Shoreline (generally within 1 mile of large water bodies) with large trees and prey base of primarily fish. Diet also includes some waterfowl, turtles, and carrion.	—	x	—	Yes

TABLE B-2

Special-status Wildlife Species Potentially Occurring in Wasco County, Oregon

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Strix occidentalis caurina	Northern spotted owl	T	T	—	Mature coniferous forest generally used for nesting, roosting, and foraging. Will disperse in early or mid-seral forests.	—	x	—	No
Buteo regalis	Ferruginous hawk	—	SC	—	Open prairie and shrub steppe in eastern WA and OR.	—	x	—	No
Falco peregrinus	Peregrine falcon	—	E	FS	Tall cliff (nest) sites within 1 mile of water with sm. bird prey base.	—	x	—	Yes
Accipiter gentilis	Northern goshawk	—	SC	—	Typically more common east of Cascades in a wide variety of forest ages, structural conditions, and successional stages. Uses stands of mature forest as nesting sites. Typically found between 1900 and 6100 feet in Oregon.	—	x	—	No
Otus flammeolus	Flammulated owl	—	SC	—	East Cascades: cavity nester in mature pine and mixed conifer, at mid-elevations. Winters south of US border.	—	x	—	No
Podiceps grisegena	Horned grebe	—	SP	FS	Common winter resident on Columbia River within NSA. Breeds on marshes and lakes in eastern WA/OR	—	x	—	Yes
Podiceps grisegena	Red-necked grebe	—	SC	FS	Rare winter migrant on the Columbia River. Uncommon breeder in eastern WA/OR.	—	x	—	No
Bucephala albeola	Bufflehead	—	SU	FS	Nests in tree cavities at high elevation forested lakes. Common migrant and winter resident in OR and western WA in large ponds (including Columbia River.) to coastal estuaries.	—	x	—	Yes
Bucephala islandica	Barrow's goldeneye (breeding population)	—	SU	—	Cascade range: breeds along ponds, sloughs and lakes in mountainous areas, using tree cavities or nest boxes. Winters in large rivers or marine habitat.	—	x	—	No
Histrionicus histrionicus	Harlequin duck	—	SU	FS	Swift forested streams during breeding season. Coastal estuaries in winter. Documented in Eagle Creek (OR), Hood River, and Wind, White Salmon Rivers (WA).	—	x	—	No

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Pelecanus erythrorhynchos	American white pelican	—	SV	—	Gregarious birds that nest in large colonies on islands within shallow water and marshes free of human disturbance and mammalian predators. Post breeders sometimes seen in Columbia River (such as Klickitat Delta). Winters in southern US through Mexico.	—	x	—	No
Coccyzus americanus	Yellow-billed cuckoo	—	SC	—	Historic range in WA and OR. No reported breeding occurrences since the 1950s, although individuals have been sighted east of Cascades sporadically. Riparian forests, with cottonwood/thick willow; Neotropical migrant. Considered extirpated from WA and OR.	—	x	—	Yes
Melanerpes lewis	Lewis' woodpecker	—	SC	—	Open pine/oak woodland, conifer forests, and riparian woodland; neotropical migrant. Commonly seen in east areas of NSA in dry forest types of oak and pine.	—	x	—	Yes
Picoides albolarvatus	White-headed woodpecker	—	SC	—	Central/eastern. WA/OR in mature and open coniferous forests, especially ponderosa pines. Cavity nester. Not currently documented in NSA.	—	x	—	No
Picoides tridactylus	Three-toed woodpecker	—	SC	—	Range in higher elevation OR Cascades in forests with Pine or Spruce component with bark beetle availability (diseased/ dying/ burned trees). Very limited habitat in NSA.	—	x	—	No
Picoides arcticus	Black-backed woodpecker	—	SC	—	Uncommon Cascades resident usu. at higher elevations (above 3000'). Eastern Cascades in WA. Scattered distribution as populations are highly associated with post- fire habitats in mature forests (stand-replacement fires with snags), dependent on high density of dead and insect-ridden trees.	—	x	—	No
Dryocopus pileatus	Pilieated woodpecker	—	SV	—	Conifer/mixed conifer forests, as well as deciduous stands in valley bottoms with large dead or live trees (or remnants) for foraging and nesting. Primary cavity nester.	—	x	—	Yes

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Sphyrapicus thyroideus	Williamson's sapsucker	—	SU	—	East slopes of Cascades: breeds in coniferous mountain forests at mid to high elevation. Prefers large snags for nesting. Majority of population migrate to southwestern US for winter.	—	x	—	No
Oreotryx pictus	Mountain quail (E Cascades, Blue Mtns, High Plains pops.)	—	SU	—	Generally found in shrub dominated communities that can be within mixed conifer/deciduous forests, generally near available water. Locally found around Seven-mile hill, Mosier, and Middle Mountain in Oregon. Not listed in WA, but found in southeastern Skamania and western Klickitat counties. Seasonal migrations vertically.	—	x	—	Yes
Sitta pygmaea	Pygmy nuthatch (E. Cascades population)	—	SV	—	Open mature and old growth ponderosa pine stands; although foraging may occur in younger stands. Cavity maker/nester in large snags (critical habitat component)	—	x	—	No
Sialia mexicana	Western bluebird (West slope Cascades population)	—	SV	—	Secondary cavity nester. Found in open habitat that has required snags (or nest boxes). Limited habitat in Scenic Area on west slope of Cascades, except Sandy River Delta.	—	x	—	No
Empidonax wrightii	Gray flycatcher	—		FS	Southeast WA and eastern OR: Sagebrush and pinyon juniper woodlands. On periphery of habitat in NSA. Winters in southwest US and southward.	—		—	No
Empidonax adastus	Willow flycatcher (East Cascades population)	—	SU	—	Associated with shrub habitat. Dependent on willow thickets in riparian zones for nesting and migration. Neotropical migrant.	—	x	—	Yes
Cypseloides niger	Black swift	—	SP	FS	Nests in waterfalls, steep cliffs, and damp caves out of direct sunlight. Highly suspected to be in NSA. Neotropical migrant.	—	x	—	No

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Progne subis	Purple martin	—	SC	—	Western WA/OR up through Gorge to western Wasco County: cavity/crevice nester, often near water. Forages over open water/fields/ forest canopy. Winters in South America.	—	x	—	Yes
Riparia riparia	Bank swallow	—	SU	—	East of Cascades along waterways or roadcuts where vertical cliffs of soil are exposed adjacent to large open area. Neotropical migrant.	—	x	—	No
Ardea herodias	Great Blue Heron	—	MP	—	Near water, including rivers, lake and pond edges, and wetlands, as well as dry fields and pastures. Highly adaptable to urban areas Often nests colonially, near water.	—	x	—	Yes
Aquila chrysaetos	Golden Eagle	—	MP	—	Generally open habitats such as shrub steppe, grassland, open pine and juniper forest and mixed conifer/deciduous forest. Nests on trees, ledges and cliffs.	—	x	—	Yes
Pandion haliaetus	Osprey	—	MP	—	Near freshwater lakes, rivers and reservoirs with fish. Nests almost always within two miles of water.	—	x	—	Yes
Falco mexicanus	Prairie Falcon	—	MP	—	Breeds in open country east of the Cascades containing cliffs and outcrops for nesting.	—	x	—	No
Falco peregrinus anatum	American peregrine falcon	—	SV	—	Tall cliff (nest) sites within 1 mile of water with sm. bird prey base.	X	—	—	Yes
Haliaeetus leucocephalus	Bald eagle	—	SV	—	Shoreline (generally within 1 mile of large water bodies) with large trees and prey base of primarily fish. Diet also includes some waterfowl, turtles, and carrion.	X	—	—	Yes
MAMMALS								—	
Ursus arctos	Grizzly bear	T	—	—	Historically in lower 48 states, presently restricted to areas with low human populations, such as North Cascades Range.	—	x	—	No

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Canis lupus	Gray wolf	E	—	—	Historically found in almost all habitats in lower 48 states; presently in steppe, woodland, and forest where reintroduced.	—	E	—	No
Gulo gulo	California wolverine	—	T	FS	Conifer Forests. Intolerant of human encounters/ disturbance. Require very large home ranges. One sighting in last several decades from road-killed juv male on I-84, near Starvation Creek, January 1990.	—	x	—	No
Martes pennanti	Pacific fisher	—	SC	FS	Optimum habitat is dense, lower elevation, mature conifer forest, with large down logs for nesting. Likely extirpated in NSA and adjacent forests.	—	x	—	No
Martes americana	American marten	—	SV	—	Mature and old growth forests with large amounts of standing snags and down wood. Tend to be in mesic forests at mid to high elevation.	—	x	—	No
Odocoileus virginianus leucurus	Columbian white-tailed deer (Lower Columbia River population only)	E		E	Historic distribution in floodplains, bottomland riparian of Willamette and Lower Columbia River now limited to these lower southwest counties: Clark, Cowliz, Pacific, Skamania, and Wahkiakum counties, WA, and Clatsop, Columbia, and Multnomah counties, OR.	—	x	—	No
Lepus townsendii	White-tailed jackrabbit	—	SU	—	East of Cascades: open areas with native bunchgrass, sagebrush plains, can also be found in coniferous forests and subalpine meadows. On periphery of habitat in NSA at the Dalles/Dallesport.	—	x	—	No
Spermophilus washingtoni	Washington ground squirrel	—	E	—	Presently found in Columbia basin of WA state in sagebrush/grassland w/ sandy soils; also Giliam, Morrow and Umatilla counties, OR. May have historically been within the eastern edge of NSA.	—	x	—	No
Sciurus griseus	Western gray squirrel	—	SU	—	Open mixed oak/conifer woodland, typically within ½ mile of water source. Core range for WA in Klickitat county. Known to occur in Hood River and areas east within OR. Easy to confuse with non-native and invasive Eastern gray squirrel.	—	x	—	Yes

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Corynorhinus townsendii	Townsend's big-eared bat	—	SC	—	Throughout Western US. Roost and hibernaculum sites within caves, buildings, mines and bridge undersides, with exacting temp, humidity, and physical requirements. Very intolerant of human disturbance which results in loss of critical fat reserves during torpid period.	X	x	—	Yes
Antrozous pallidus	Pacific Pallid bat	—	SV	FS	Arid area specialist. Daytime roosts in buildings and crevices, less often in caves and other shelters. Feeds primarily on the ground on large insects, scorpions, and other small prey.	X	x	—	No
Myotis thysanodes vespertinus	Pacific Fringe-tailed bat	—	—	FS	Nursery colonies and roosts in mines, caves, buildings and similar. Intolerant of human disturbance. Documented in Little White Salmon sub basin 1996	—	—	x	No
Lasionycteris noctivagans	Silver-haired bat	—	SU	—	Found throughout Oregon: among the most common bats in forested areas of America, most closely associated with coniferous or mixed coniferous and deciduous forest types, especially in areas of Old Growth. They form maternity colonies almost exclusively in tree cavities or small hollows.	—	x	—	No
Myotis ciliolabrum	Western small-footed myotis	—	SU	—	West Cascades and eastward: Rears its young in cliff-face crevices, erosion cavities, and beneath rocks on the ground as well as hibernating in caves or mines. Relatively little is known about this species.	—	x	—	Yes
Myotis evotis	Long-eared myotis	—	SU	—	Statewide: found in coniferous roost in tree cavities and beneath exfoliating bark in both living trees and dead snags.	—	x	—	No

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Scientific Name	Common Name	Federal Status	OR State Status	Other Status	Usual Habitat in OR/WA	ORBIC Record of Occurrence	GMA/ SMA	SMA Only	Suitable Habitat Present?
Myotis volans	Long-legged- myotis	—	SU	—	Statewide: especially dependent on wooded habitats of coniferous forests, usually at elevations of 4,000 to 9,000 feet. Nursery colonies found in large mature trees that provide crevices or exfoliating bark, along openings or along forest edges where they receive a large amount of daily sun. Also found in rock crevices, cliffs, and buildings. Long-legged myotis forage over ponds, streams, water tanks, and in forest clearings, often on moths.	—	x	—	No
Oreamnos americanus	Mountain Goat	—	MP	—	Typically, steep slopes and cliffs and associated meadows. May travel many hundreds of miles in atypical habitat to reach suitable habitat.	—	x	—	No
INVERTEBRATES									
Cryptomastix devia	Puget Oregonian	—	—	FS	Western Cascade Range in Low/Mid elevations (CRGNSA, GPNF, Clackmas RD. HR RD, ZZ RD, OlympicNF, Salem BLM, Hebo RD, Wenatchee NF, MBSNF): Moist conifer forests, associated with bigleaf maple. Often found on or under hardwood logs, leaf litter, or under sword fern, moist rocks/talus. Yound devia may be under mosses on trunk of big-leaf maple.	—	—	x	No
Cryptomastix)hendersoni	Columbia Oregonian	—	—	FS	Low to Mid elevations Gorge in Wasco, Sherman, Skamania and Klickitat counties (CRGNSA, MHNF, Naches RD, Mt. Adams RD): Within 100 m. of streams, seeps, & springs (low elevation) in steppe communities. May also be in mid elevation mature closed canopy forests among moist talus, leaf litter, or shrubs, or under logs or other debris.	—	—	x	No
Juga (O) n. sp. 2	Basalt Juga	—	—	FS	CRGNSA (listed in OR only, Wasco and Hood River counties, but also found in Klickitat and Skamania County): Spring fed springs/streams in low elevation (perennial), small drainages that drain to the Columbia River in Gorge.	—	—	x	No

TABLE B-2

Special-status Wildlife Species Potentially Occurring in Wasco County, Oregon

Union Pacific Railroad Second Mainline Track Project Wasco County, Oregon

Scientific Name	Common Name	Federal Status	OR State Status	Other Status	Usual Habitat in OR/WA	ORBIC Record of Occurrence	GMA/ SMA	SMA Only	Suitable Habitat Present?
Lyogyrus n. sp. 1	Columbia Duskysnail	—	—	FS	CRGNSA, GPNF, MHNF. Counties include Klickitat, Skamania, Cowlitz, Clark, Wash, Mult, Clack, Hood River): Spring and Spring outflows in cold, clear, and well- oxygenated water. Usu. slow flow with moss substrate.	—	—	x	No
Monadenia fidelis minor	Dalles sideband	—	—	FS	Central and East Gorge; Wasco and Klickitat Counties. CRGNSA, MHNF Barlow and Hood R RD, GPNF Mt Adams RD): Within 200 m. of streams, seeps, or springs, in steppe or dry forest plant communities (within talus and moist rocky areas). May be found among rocks, shrubs/veg. and down wood.	—	—	x	Yes

Appendix C
Plant Species Observed

TABLE C-1
Plant Species Observed
UPRR Second Mainline Track Project, April 22-24, & June 11-13, 2014

Family	Scientific Name	Common Name	Native	Non-native	Form
Aceraceae					
	Acer macrophyllum	big leaf maple	X	--	tree
Anacardiaceae					
	Toxicodendron diversilobum	poison oak	X	--	forb
Apiaceae					
	Anthriscus caucalis	bur chervil	--	X	forb
	Conium maculatum	poison hemlock	--	X	forb
	Daucus carota	Queen Anne's lace	--	X	forb
	Lomatium columbianum	Columbia desert parsley	X	--	forb
	Lomatium grayii	pungent desert parsley	X	--	forb
	Lomatium macrocarpum	gray-leaf desert parsley	X	--	forb
	Lomatium triternatum	nine-leaf desert parsley	X	--	forb
Apocynaceae					
	Asclepias speciosa	showy milkweed	X	--	forb
Araliaceae					
	Hedera helix	English ivy	--	X	woody vine
Asteraceae					
	Achillea millefolium	wooly yarrow	X	--	forb
	Anaphalis margaritacea	pearly-everlasting	X	--	forb
	Antennaria luzuloides	woodrush pussytoes	X	--	forb
	Anthemis cotula	mayweed	--	X	forb
	Artemisia biennis	biennial wormwood	X	--	forb
	Balsamorhiza careyana	Carey's balsamroot	X	--	forb
	Blepharipappus scaber	rough eyelashweed	X	--	forb
	Centaurea cyanus	bachelor's button	--	X	forb
	Centaurea stoebe	spotted knapweed	--	X	forb
	Chrysothamnus viscidiflorus	yellow rabbitbrush	X	--	forb
	Crocidium multicaule	gold stars	X	--	forb
	Hypochaeris radicata	hairy cats-ear	--	X	forb
	Senecio integerrimus	lambstongue ragwort	X	--	forb

TABLE C-1
Plant Species Observed
UPRR Second Mainline Track Project, April 22-24, & June 11-13, 2014

Family	Scientific Name	Common Name	Native	Non-native	Form
	Senecio vulgaris	common groundsel	--	X	forb
	Tanacetum vulgare	common tansy	--	X	forb
	Tragopogon dubius	yellow salsify	--	X	forb
Berberidaceae					
	Mahonia aquifolium	tall Oregongrape	X	--	shrub
	Mahonia nervosa	Cascade Oregongrape	X	--	shrub
Betulaceae					
	Alnus rhobifolia	white alder	X	--	tree
	Corylus cornuta	beaked hazelnut	X	--	shrub
Boraginaceae					
	Amsinckia menziesii	Menzie's fiddleneck	X	--	forb
	Cryptantha intermedia	common cryptantha	X	--	forb
	Hydrophyllum capitatum	ball-head waterleaf	X	--	forb
	Hypericum perforatum	common St. John's-wort	--	X	forb
	Lithospermum ruderale	Columbia puccoon	X	--	forb
	Myosotis laxa	small-flowered forget-me-not	X	--	forb
	Phacelia hastata	silver-leaf phacelia	X	--	forb
	Plagipbothrys tenellus	Pacif popcornflower	X	--	forb
Brassicaceae					
	Capsella bursa-pastoris	shepherd's-purse	--	X	forb
	Cardamine oligosperma	few-seeded bittercress	X	--	forb
	Draba verna	spring whitlow grass	--	X	forb
	Thysanocarpus curvipes	hairiy fringepod	X	--	forb
Caprifoliaceae					
	Symphoricarpos albus	snowberry	X	--	shrub
Caryophyllaceae					
	Cerastium arvense	mouse-ear chickweed	--	X	forb
	Stellaria media	common chickweed	--	X	forb
Chenopodiaceae					
	Salsola kali	Russian thistle	--	X	shrub

TABLE C-1
Plant Species Observed
UPRR Second Mainline Track Project, April 22-24, & June 11-13, 2014

Family	Scientific Name	Common Name	Native	Non-native	Form
Convolvulaceae					
	Convolvulus arvensis	field Morning-glory	--	X	forb
Cornaceae					
	Cornus sericea	red-osier dogwood	X	--	tree
Crassulaceae					
	Sedum sp.	stonecrop	--	X	forb
Curcurbitaceae					
	Marah oreganus	coastal manroot	X	--	forb
Dipsacaceae					
	Dipsacus fullonum	teasel	--	X	forb
Dryopteridaceae					
	Athyrium filix-femina	lady fern	X	--	forb
Equisitaceae					
	Equisetum arvense	field horsetail	X	--	forb
	Equisetem hyemale	scouring rush	X	--	forb
Fabaceae					
	Lupinus bicolor	two color lupine	X	--	forb
	Lupinus latifolius var. thompsonianus	Columbia Gorge broad-leaf lupine	X	--	forb
	Medicago sativa	alfalfa	--	X	forb
	Mellilotis officinalis	sweet clover	--	X	forb
	Robinia pseudoacacia	black locust	X	--	tree
	Trifolium arvense	rabbitfoot clover	--	X	forb
	Trifolium repens	white clover	--	X	forb
	Vicia americana	American purple vetch	X	--	forb
	Vicia tetrasperma	slender vetch	--	X	forb
	Vicia villosa	hairy vetch	--	X	forb
Fagaceae					
	Quercus garryana	Oregon white oak	X	--	tree
Gentianaceae					
	Frasera albicaulis var. columbiana	Columbia swertia	X	--	forb

TABLE C-1
Plant Species Observed
UPRR Second Mainline Track Project, April 22-24, & June 11-13, 2014

Family	Scientific Name	Common Name	Native	Non-native	Form
Geraniaceae					
	Erodium cicutarium	crane's-bill	--	X	forb
	Geranium pusillum	small geranium	--	X	forb
Grossulariaceae					
	Ribes sanguineum	red-flowering currant	X	--	shrub
Hydrangeaceae					
	Philadelpus lewisii	Lewis' mock-orange	X	--	tree
Hypericaceae					
	Hypericum perforatum	St. Johnswort	--	X	forb
Juncaceae					
	Luzula multiflora	common woodrush	X	--	forb
Liliaceae					
	Triteleia grandiflora	Douglas' brodiaea	X	--	forb
Oleaceae					
	Fraxinus latifolia	Oregon ash	X	--	tree
Onagraceae					
	Oenothera pallida	pale evening-primrose	X	--	forb
Orobanchaceae					
	Castilleja attenuata	narrow-leaf owls clover	X	--	forb
Papaveraceae					
	Eschscholzia californica	California poppy	X	--	forb
Pinaceae					
	Pinus ponderosa	ponderosa pine	X	--	tree
	Pseudotsuga menziesii	Douglas-fir	X	--	tree
	Thuja plicata	western redcedar	X	--	tree
Plantaginaceae					
	Collinsia parviflora	small-flowered blue-eyed Mary	X	--	forb
	Penstemon barrettiae	Barrett's beardtongue	X	--	forb
	Penstemon richardsonii var. richardsonii	cut-leaf penstemon	X	--	forb
	Plantago lanceolata	English plantain	--	X	forb

TABLE C-1
Plant Species Observed
UPRR Second Mainline Track Project, April 22-24, & June 11-13, 2014

Family	Scientific Name	Common Name	Native	Non-native	Form
	Plantago patagonica	wooly plantain	X	--	forb
Poaceae					
	Agrostis sp.	bentgrass	--	X	graminoid
	Bromus sitchensis	Alaska brome	X	--	graminoid
	Bromus tectorum	cheat grass	--	X	graminoid
	Elymus elymoides	squirreltail	X	--	graminoid
	Elymus glaucus	blue wild-rye	X	--	graminoid
	Holcus lanatus	velvetgrass	--	X	graminoid
	Poa bulbosa	bulbous bluegrass	--	X	graminoid
	Poa secunda	Sandberg bluegrass	X	--	graminoid
	Schedonorus arundinaceus	tall fescue	--	X	graminoid
Polygonaceae					
	Eriogonum compositum	heart-leaf buckwheat	X	--	forb
	Eriogonum sp.	buckwheat	X	--	forb
	Eriogonum compositum	heart-leaf buckwheat	X	--	forb
	Polygonum aviculare	prostrate knotweed	X	--	forb
	Rumex acetosella	sheep sorrel	--	X	forb
	Rumex venosus	winged dock	X	--	forb
Polypodiaceae					
	Polypodium glycyrrhiza	licorice fern	X	--	forb
	Polystichum munitum	sword fern	X	--	forb
	Pteridium aquilinum	bracken fern	X	--	forb
Portulacaceae					
	Claytonia perfoliata	miner's lettuce	X	--	forb
Ranunculaceae					
	Delphinium nuttallianum var. nuttallianum	upland larkspur	X	--	forb
Rosaceae					
	Amelanchier alnifolia	serviceberry	X	--	shrub
	Crataegus douglasii	Douglas hawthorn	X	--	tree
	Holodiscus discolor	oceanspray	X	--	shrub
	Malus fusca	flowering crabapple	X	--	tree
	Malus sp.	domestic apple		X	tree

TABLE C-1
Plant Species Observed
UPRR Second Mainline Track Project, April 22-24, & June 11-13, 2014

Family	Scientific Name	Common Name	Native	Non-native	Form
	Purshia tridentata	bitterbrush	X	--	shrub
	Prunus emarginata	bitter cherry	X	--	tree
	Prunus sp.	domestic plum	--	X	tree
	Pyrus sp.	domestic pear	--	X	tree
	Rosa sp.	rose	X	--	shrub
	Rosa woodsii	Wood's rose	X	--	shrub
	Rubus armeniacus	Himalayan blackberry	--	X	woody vine
	Rubus spectabilis	salmonberry	X		shrub
Rubiacea					
	Galium aparine	cleavers	X	--	forb
Salicaceae					
	Populus balsamifera	black cottonwood	X	--	tree
	Populus nigra	Lombardy poplar	--	X	tree
	Salix exigua	narrow-leaf willow	X	--	tree
	Salix fluviatilis	Columbia River willow	X	--	shrub
	Salix lasiandra	Pacific willow	X	--	tree
	Salix scouleriana	Scouler's willow	X	--	tree
Saxifragaceae					
	Heuchera grossulariifolia var. tenuifolia	Gooseberry-leaved alumroot	X	--	forb
	Lithophragma parviflorum	small-flowered prairie-star	X	--	forb
	Saxifraga integrifolia var. integrifolia	common western saxifrage	X	--	forb
	Saxifraga occidentalis	western saxifrage	X	--	forb
	Saxifrage ondontoloma	brook saxifrage	X	--	forb
Scrophulariaceae					
	Verbascum thapsus	wooly mullein	--	X	forb
Typhaceae					
	Typha latifolia	common cattail	X	--	forb
Valerianaceae					
	Plectritis macrocera	white plectritis	X	--	forb

Appendix D
Site Photographs

Photo 1: Oregon Ash-black cottonwood wetland at eastern end of study area.

Photo 2: Typical cliff habitat within study area.

Photo 3: Typical dune habitat along the Columbia River in eastern portion of study area.

Photo 4: Typical grassland habitat within study area.

Photo 5: Typical mixed coniferous deciduous forested habitat within study area.

Photo 6: Typical Oregon white oak woodland, eastern portion of study area.

Photo 7: Typical ponderosa pine woodland within study area.

Photo 8: Typical riparian habitat within study area.

Photo 9: Typical ruderal herbaceous vegetation (sub-category of Eastside Grassland habitat).

Appendix K
Sensitive Species and Wildlife Habitat Protection and Rehabilitation Plan Project, Wasco County, Oregon

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Draft Report

Sensitive Species and Wildlife Habitat Protection and Rehabilitation Plan Union Pacific Railroad Second Mainline Track Project Wasco County, Oregon

Prepared for

Union Pacific Railroad

January 2015

Prepared by

CH2MHILL®

2020 S.W. Fourth Avenue
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SECTION 1

Introduction

Union Pacific Railroad (UPRR) proposes to construct approximately 4.02 miles of second mainline track along the existing Portland Subdivision between rail mileposts (MP) 66.98 and 72.35 (see Figure 1). The proposed project will develop a second set of tracks parallel to the existing track, which runs east to west on the southern shoreline of Bonneville Reservoir on the Columbia River. The existing section of railway is part of the Portland Subdivision extending east from Portland, Oregon, through the Columbia River Gorge to the Hinkle Rail Yard near Hermiston, Oregon. The proposed project will also include realignment of siding and the main track in some areas, grading and other ground-disturbing activities, and associated facilities such as signal buildings, signage, and lighting.

This document addresses regulatory requirements for the approximately 3.58-mile portion of the proposed project that will be located in an area subject to Development Review in accordance with the Columbia River Gorge National Scenic Area Act (NSA Act). This area includes approximately 3.21 miles of new second mainline track and approximately 0.37 mile of realigned existing track. The remaining 0.44-mile portion of the project is located within a NSA-designated Urban Area and is not subject to Development Review by Wasco County.

The purpose of the project is to improve the operational efficiency of train movements along the Portland Subdivision. The project is needed to correct the operational constraints that result from the existing railroad infrastructure between MP 66.98 and 72.35. The specific infrastructure-based constraints that create the need for the project include the short siding between MP 69.38 and 70.72 (Mosier Siding) and the surrounding single mainline track. The segment of the Subdivision between MP 66.98 and 72.35 has the poorest operational performance and efficiency along the entire route because of the location and configuration of the Mosier Siding, which has resulted in an operational bottleneck that affects freight movements throughout the Portland Subdivision.

This report addresses the requirements of mitigation, protection, and management plans in accordance with the Wasco County *National Scenic Area Land Use Development Ordinance* (NSA-LUDO) Sections 14.600 (C)(5), 14.600 (D)(5) and 14.610(E) (Wasco County, 2010) to address impacts to special-status plants, sensitive wildlife species, and their habitats potentially present on the project site. Specifically, it describes the proposed project, applicable regulatory provisions, the biology of potentially occurring special-status species, recommendations for avoiding or minimizing impacts, and rehabilitation for areas of disturbance and mitigation to offset direct impacts to special-status species.

SECTION 2

Project Information

This section includes a detailed description of the portion of the Second Mainline Track Project that is subject to Development Review by Wasco County. Proposed second mainline track and bridge construction within the city of Mosier and NSA-designated Urban Areas are not included in this project description.

2.1 Site Location

The portion of the Second Mainline Track Project that will be constructed within the NSA will include approximately 3.21 miles of new second mainline track and realignment of 0.37 mile of existing track across the NSA in Wasco County starting from MP 66.98 to 68.58 (hereafter referred to as Segment 1) and again from MP 70.37 to 72.35 (hereafter referred to as Segment 2). The project alignment crosses generally west to east starting just inside the western Wasco County line. The project exits unincorporated Wasco County into Urban Area-designated land associated with the City of Mosier at approximately MP 68.58. The project begins again in the NSA at MP 70.37 where it crosses underneath I-84 before terminating in Memaloose State Park at MP 72.35.

The subdivision roughly parallels the Columbia River and I-84 for the length of the project. More specifically, the project ranges from 45°41'27.44"N; 121°26'25.13"W to 45°41'49.65"N; 121°20'8.17"W, and crosses Township 3 North, Range 12 East, Sections 31 and 32; Township 3 North, Range 11 East, Section 36; and Township 2 North, Range 11 East, Sections 2, and 3.

2.2 Project Description

UPRR will construct the proposed second mainline track within the established UPRR ROW for the existing mainline track to the greatest extent practicable. Key components of the proposed project are described below.

2.2.1 Second Mainline Track Route and ROW

As shown on the alignment mapbook (Figure 2), between rail MPs 66.98 and 68.58, the proposed second mainline track would be constructed to the north of the existing track. Between rail MP 70.37 and MP 70.74, both the existing siding and the existing main line track would be realigned to the south. From MP 70.74 east to MP 72.35, the new track would be constructed south of the existing track.

While the majority of the project work will be conducted within UPRR's ROW, there is one area along the route where ROW acquisition will be required to satisfy federal rail safety standards. Approximately 2.72 acres of new ROW will be acquired for the project in one location, affecting two parcels (see Figure 2). UPRR Real Estate is coordinating directly with landowners to acquire the necessary permanent ROW for safe operation of the project. Additionally, temporary construction easements outside the existing UPRR ROW will be required in two areas.

2.2.2 Proposed Structures, Lighting, and Signage

Most of the project will be constructed at-grade and will not require aboveground structures or appurtenances. The only aboveground structures or ancillary facilities proposed within areas subject to Development Review (that is, in unincorporated Wasco County parcels not zoned "Urban Areas") are in-kind guardrail extensions along I-84, standard railroad signage, signal lights, up to five wooden poles and wireless signaling appurtenances, and up to five signal buildings necessary for the safe operation of the railroad. Each of these signal buildings will have a footprint ranging from approximately 6 feet by 6 feet to approximately 8 feet by 10 feet and will be approximately 9 feet in height. Signal buildings will house essential circuitry and will be constructed of a non-reflective metal and will be painted with a dark earth-toned paint that matches the surrounding natural environment. All signal buildings will be located within UPRR ROW.

One new culvert will be constructed to serve as an outlet for trackside ditches and to provide drainage under track embankment. Two new culverts will also be installed at the western end of Thompsons Lake with the objective of providing enhancements to fish passage for listed fish species that use the lake. Six existing culvert structures will be tapped or extended to maintain service through the existing and proposed track embankment.

2.2.3 Structures to be Removed

Up to five existing signal buildings will be removed from unnecessary locations along the route, resulting in no net increase in signal buildings from current conditions. In addition to signal box removal, up to two existing antenna poles will be removed from areas along the route.

Public and private utilities, including overhead utility lines and underground sewer and water lines, may need to be relocated or modified in several locations along the project alignment to accommodate construction activities. It is anticipated that minimal ground disturbance will be required for utility relocation. Overhead utility removal may require backfilling of power pole holes upon removal of existing poles. No new utilities are included as part of the proposed project.

2.2.4 Access Roads and Construction Staging Areas

Two 10-foot-wide permanent access roads will be established to provide maintenance access to the existing rail and new second mainline track. One will be located at the western side of the project at MP 66.98 from eastbound I-84 to the proposed second mainline track. A break in the guardrail will be required to facilitate this access road; however, no improvement to the road shoulder and existing ROW will be required. The second access point will be located within Memaloose State Park, at approximately MP 71.79. This complete road length will total approximately 0.6 mile, and will use an existing travel corridor for much of the route. The majority of this road is currently paved and will not require additional upgrades to support maintenance equipment. A small, approximately 800-foot segment of the road will require minor grading, vegetation removal, and placement of crushed gravel to accommodate vehicles as they exit the existing paved road and connect to the existing ROW near Thompson’s Lake.

Four temporary 10-foot-wide construction access roads will be established to provide construction access to the project area. The complete length of construction roads required will total approximately 0.64 mile, will consist of crushed gravel road surfaces, and will use existing travel corridors for much of the route. Access to temporary construction roads will be made by existing roads, including I-84.

The project will require nine construction staging areas, of which six will be located partly or entirely outside of the permanent project footprint. Materials to be stored at staging areas may include soil, rock, track materials (ballast, ties, rail, track hardware), construction materials (filter fabric, riprap, erosion control material, water) and construction equipment and support material. These materials will generally be transported to and from the staging areas by truck. Temporary staging areas will be restored as closely as practical to their original condition following construction, including replanting with native vegetation in accordance with all permit requirements.

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SECTION 3

Regulatory Requirements

The proposed project is located entirely within the Columbia Gorge National Scenic Area (CRGNSA). The Columbia River Gorge was designated a National Scenic Area by the United States Congress under the *Columbia River Gorge National Scenic Area Act* of 1986. A National Scenic Area is a federally designated area of outstanding natural and scenic value that receives a level of protection that is less stringent than wilderness designation.

The Scenic Area is managed on a partnership basis by the Columbia Gorge counties, the states of Oregon and Washington, the U.S. Forest Service, and the Gorge Commission. The Gorge Commission is a bi-state Compact agency authorized by the Scenic Act and created by Washington and Oregon legislation in 1987.

The Scenic Area extends 85 miles on both sides of the Columbia River, from Troutdale, Oregon, and Washougal, Washington, on the west to the Deschutes River in the east. It is categorized into three areas:

- **Special Management Areas** cover approximately 114,600 acres in which the U.S. Forest Service sets land management and determines federal consistency.
- **General Management Areas** cover approximately 149,400 acres and all of the Columbia River and contain a mix of land uses including farming, logging, cattle grazing, public recreation, and rural residential uses. Development of private lands is administered by the Gorge counties and the Gorge Commission. Five of the six Gorge counties, including Wasco County, implement ordinances under the Scenic Area Management Plan.
- **Urban Areas.** Thirteen Urban Areas, including the City of Mosier, were designated by Congress as *not* subject to NSA regulation, but solely under the jurisdiction of the applicable city or county government.

All three of these management area categories occur within the proposed project area.

Wasco County regulates development in the CRGNSA in partnership with the agencies described above and the Gorge Commission under the NSA-LUDO (Wasco County, 2010). The Ordinance addresses specific requirements in General Management Areas and Special Management Areas as described below.

General Management Areas

Section 14.600 of the NSA-LUDO (Wasco County, 2010) addresses protection of sensitive wildlife and plant species in General Management Areas. Required actions for impacts to natural resources are described in parts (C)(5) and (D)(5) of this section:

> **Section 14.600 (C)(5)** requires preparation of a *Wildlife Management Plan* when a proposed use is likely to adversely affect a sensitive wildlife area or site. The primary purpose of the plan is to "...*document the special characteristics of a project site and the habitat requirements of affected wildlife species*."
>
> **Section 14.600 (D)(5)** requires preparation of a *Protection and Rehabilitation Plan to* minimize and offset unavoidable impacts that result from a new use that occurs within a sensitive plant buffer zone as the result of a variance granted according to Chapter 6 of the Ordinance.

Special Management Areas

Section 14.610 of the NSA-LUDO (Wasco County, 2010) address protection of sensitive wildlife and plant species in Special Management Areas.

Section 14.610 (E) requires preparation of a *Mitigation Plan* for impacts to wildlife and plants under the following conditions:

a) *The proposed development or use is within a buffer zone (wetland, pond, lakes, riparian areas, wildlife or plant areas and/or sites); and*

b) *There is no practicable alternative according to part D of this section*.

Section 14.610 (D) requires consideration of an alternate site or sites for the propose development or use. This section further states that a practicable alternative does not exist if the proposed development or use meets all of the identified criteria. The proposed project meets all criteria for "no practicable alternative" as follows:

a) *The basic purpose of the use cannot be reasonably accomplished using one or more other sites in the vicinity that would avoid or result in less adverse effects on wetlands, ponds, lakes, riparian areas, wildlife or plant areas and/or sites.*

The purpose of the project is improve operational efficiency of train movement along UPRR's existing mainline track near the City of Mosier in Wasco County, Oregon while maintaining safe operating conditions. The project is needed to correct the operational constraints that result from the existing railroad infrastructure between MP 66.98 and 72.35. The segment of the Portland Subdivision between MP 66.98 and 72.35 has the poorest operational performance and efficiency along the entire route because of the location and configuration of the Mosier Siding, which has resulted in an operational bottleneck at this location. The project will relieve this bottleneck by decreasing the number of delayed or stopped trains, reducing barriers to industry-standard train lengths, and improving the efficiency and fluidity of train movements in this area, while maintaining safe operating conditions.

The proposed Second Mainline Track project, is the only alternative that satisfies all of the alternative evaluation criteria, and avoids or minimizes disturbance to environmental resources to the maximum extent practicable to meet the stated purpose and need. The proposed project will alleviate the operational inefficiencies currently experienced near the City of Mosier and at the Mosier Siding, thus meeting the purpose and need for moving trains more efficiently to relieve the existing operational bottleneck. The proposed second mainline track expansion maximizes use of existing infrastructure and the existing previously disturbed UPRR ROW to reduce impacts to natural resources such as wetlands, streams, ponds, lakes, riparian areas, wildlife, or plant areas and sites. Therefore, the project meets this criteria, demonstrating that a practicable alternative to the proposed project does not exist.

b) *The basic purpose of the use cannot be reasonably accomplished by reducing its proposed size, scope, configuration, or density, or by changing the design of the use in a way that would avoid or result in less adverse effects on wetlands, ponds, lakes, riparian areas, wildlife or plant areas and/or sites.*

The project is needed to correct the operational constraints that result from the existing railroad infrastructure between MP 66.98 and 72.35. To meet the project need, a minimum of 5 miles of contiguous second mainline track is required to allow for trains to pass at standard operating speed. In addition, the new second mainline track must be spaced approximately 10 miles from other existing passing locations along the existing route to accommodate for the safe passage of trains traveling in opposite directions. UPRR conducted an extensive network operational review to

identify the nature and cause of operational inefficiencies along the route. As discussed in Section 2, existing operational inefficiencies are directly related to the length and location of the existing Mosier Siding, including how the inefficiency of that siding results in delays throughout other parts of the route.

The proposed Second Mainline Track project, is the only alternative that satisfies all of the alternative evaluation criteria, and avoids or minimizes disturbance to environmental resources to the maximum extent practicable to meet the stated purpose and need. The proposed project will alleviate the operational inefficiencies currently experienced near the City of Mosier and at the Mosier Siding, thus meeting the purpose and need for moving trains more efficiently to relieve the existing operational bottleneck. The proposed second mainline track expansion maximizes use of existing infrastructure and the existing previously disturbed UPRR ROW to reduce impacts to natural resources such as wetlands, streams, ponds, lakes, riparian areas, wildlife, or plant areas and sites..

UPRR has incorporated additional design considerations in order to reduce the project footprint, and its impacts to natural resources including wetlands, streams, ponds, lakes, riparian areas, wildlife or plant areas and sites. These measures include:

- **Track Alignment and Centerline Offset Width Reduction.** In determining the alignment for the proposed track in the project area, UPRR reduced the centerline offset from 20 feet to 15 feet (the minimum allowable centerline offset) to significantly reduce the project footprint and avoid waters and wetlands to the north and south of the track. On the west end of the project (MP 66.98 to MP 69.38), an alignment to the north of the track was selected because it would have fewer aquatic impacts, and avoid additional excavation of a tall rock face. On the east end of the project (MP 70.73 to MP 72.35), an alignment primarily to the south of the existing track was selected to avoid direct impacts to the Columbia River. The reduction of centerline-track offsets decreased the project footprint by 2.1 acres along the full 4.02 miles of new track.
- **Embankment Design Minimization.** UPRR design standards for track embankments are for a 2:1 horizontal to vertical (H:V) slope, which provides stability to the rail roadbed and incorporates safety considerations for maintenance work along the tracks. Geotechnical design options to steepen the embankment slope (standard 2H:1V slopes to vertical retaining walls) were assessed to reduce project footprint and adjacent aquatic disturbance. Based on site-specific considerations, UPRR selected 1.5H:1V slopes in waters and wetland areas to provide the greatest effective reduction in aquatic impacts while retaining the safe functioning of the railroad. Riprap/rock fill can provide the steepest slope at 1.5H:1V achievable with natural materials.
- **Reduced Access Road and Drainage Ditches.** UPRR design standards include construction of a 10-foot-wide access road outside the tracks for ease of operation and maintenance and to construct a 10-foot-wide flat bottom drainage ditch adjacent to the track embankment in cut sections. To reduce the project footprint and associated disturbance, UPRR eliminated the access road in all but one location and reduced the widths of associated drainage ditches where compliant with UPRR-required hydraulic design guidelines. The elimination of the access road and reduced ditch width reduced the potential project footprint by roughly 5.5 acres along the full 4.02 miles of new track construction.

Therefore, the project meets this criteria, demonstrating that a practicable alternative to the proposed project does not exist.

c) Reasonable attempts were made to remove or accommodate constraints that caused a project applicant to reject alternatives to the proposed use. Such constraints include inadequate infrastructure, parcel size, and land use designations. If a land use designation or

recreation intensity class is a constraint, an applicant must request a Management Plan amendment to demonstrate that practicable alternatives do not exist.

Due to the nature of the railroad as a pre-existing, interstate transportation system, constraints associated with rejected alternatives cannot be removed. The project includes the relocation of certain utilities, but will not require additional use of existing regional infrastructure. UPRR will use existing connections to collocated transmission lines, therefore no associated constraints are anticipated for the project.

The majority of the proposed project will be constructed within the existing UPRR ROW, and one minor ROW acquisition will be required between MP 71.61 and MP 72.35 in Segment 2; no constraints are anticipated associated with parcel size or orientation.

The project is a conditional use in the seven NSA zoning districts that will be crossed, pursuant to NSA-LUDO Section 3 provisions. No constraints associated with land use designations in the Project area are anticipated.

Therefore, the project meets this, and all, criteria, demonstrating that a practicable alternative to the proposed project does not exist.

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SECTION 4

Environmental Setting

4.1 General

The project is located in the Columbia Basin physiographic province (Franklin and Dyrness, 1988) at the eastern end of the Columbia River Gorge. The Columbia basin occupies an extensive area south of the Columbia River between the Cascades and the Blue Mountains in Oregon and roughly two–thirds of the area east of the Cascades in Washington. Franklin and Dyrness (1988) further describe the Columbia River Gorge as one of several "Other Botanically Interesting Areas" in Oregon and Washington, based on physiographic characteristics unique to the Gorge.

The Columbia Gorge provides the only nearly sea-level break in the Cascade Range in Oregon and Washington, providing a major route for plant and animal migration between the eastern and western halves of these states. It also contains species endemic to the Columbia River Gorge, some of which may constitute relict populations.[1] The unique topography of the Gorge produces a variety of weather conditions including a steep precipitation gradient, ranging from 75 inches average annual rainfall in the west to less than 15 inches average annual rainfall in the east. Vegetation in the Gorge transitions along this precipitation gradient from mesophytic Douglas-fir/western hemlock (*Pseudotsuga menzeisii/Tsuga heterophylla*) forests in the west to xerophytic ponderosa pine/Oregon white oak (*Pinus ponderosa/Quercus garryana*) communities on the east.

4.2 Site Characteristics

The proposed project site traverses urban, rural, and natural areas. The western segment of the proposed project is adjacent to I-84. It continues through the city of Mosier and then crosses under I-84 just east of the Mosier city limits. The eastern segment of the proposed project extends eastward adjacent to the Columbia River and through Memaloose State Park. The existing alignment runs along the base of basalt cliffs, adjacent to high plateaus, and along constructed berms adjacent to the Columbia River.

Five general habitats types are present within the proposed project area:

Agricultural, Pasture, and Mixed Environs. This habitat type is characterized by cultivated species. In the immediate vicinity of the project area, this habitat consists of orchards, vineyards, pastures, and associated residential and farm structures, maintained surface roads, and unimproved farm access roads.

Eastside (Interior) Grasslands. This habitat is characterized by short to medium-tall grasses (less than 3.3 ft [1 m]). Total herbaceous cover can be closed to only sparsely vegetated. In general, this habitat is an open and irregular arrangement of grass clumps rather than a continuous sod cover. These medium-tall grasslands often have scattered and diverse patches of low shrubs, but few or no medium-tall shrubs (less than 10% cover of shrubs are taller than the grass layer). Native forbs may contribute significant cover or they may be absent. Within the proposed project area, this habitat occurs in open areas, or in mosaic with woodlands, and on plateaus or lowlands.

Eastside (Interior) Riparian-Wetlands. This habitat type includes two sub-types: (1) riparian, and (2) wetlands. Riparian habitat is characterized by predominantly woody vegetation along rivers, streams, or other water bodies. Riparian habitat may be either upland or wetland. Wetland habitat is characterized by a predominance of hydrophytic vegetation, presence of hydrology in the upper 12 inches of the soil during the growing season, and presence of hydric soils. This habitat type is generally dominated by willows (*Salix sp.*), Oregon ash (*Fraxinus latifolia*), and black cottonwood (*Populus balsamifera*) in wetland areas, and bigleaf

[1] A relict population refers to a population of organisms that naturally occur in a restricted area, but whose original range was far wider during a previous geologic time period.

maple (*Acer macrophyllum*) and cottonwood in upland riparian areas. Within the proposed project area, this habitat type is found in low areas, or along ponds, lakes, and the Columbia River.

Open Water – Lakes, Rivers, Streams. In the immediate vicinity of the proposed project area, this habitat type includes the Columbia River and several ponds or small lakes. Most of these appear to have been created in as a result of construction of I-84 and/or the railroad. Historically, they were likely part of the Columbia River.

Ponderosa Pine Forest and Woodlands. This habitat is typically a woodland or savanna with tree canopy coverage of 10% to 60%, although closed-canopy stands are possible. The tree layer is usually composed of widely spaced large conifer trees. Ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*) are the most common evergreen trees in this habitat. Oregon white oak dominates open woodlands or savannas in limited areas. The undergrowth can include dense stands of shrubs or, more often, be dominated by grasses, sedges, and/or forbs. A layer of tall to medium-tall deciduous shrubs may be present. Undergrowth is generally dominated by herbaceous species, especially graminoids. Within the proposed project area, this habitat is occurs on plateaus and other upland areas.

4.3 Site Use

4.3.1 Historical Use

The following information is taken from the *Management Plan for the Columbia River Gorge National Scenic Area* (NSA-MP)(Columbia River Gorge Commission, 2011).

Human presence in the Gorge dates back at least 10,000 years. The near sea-level passage of the Columbia River through the Cascade Mountains provided a natural corridor, a relatively easy means of movement for early inhabitants. But the river's remarkable fishing opportunities, easily accessible at Celilo Falls, also drew these early inhabitants to the Gorge. Over time, subsistence needs led to exchange and eventually to the barter among Native Americans that Lewis and Clark observed in 1805.

In more recent time, the Gorge served as a transportation corridor for fur traders. It became a passage route for settlers and missionaries following the Oregon Trail. In the last half of the 1800s, river and then railroad transportation developed beginning with sternwheelers on the Columbia River and eventually construction of locks to bypass the Cascade rapids. This was followed by a period of rapid railroad construction, resulting in the establishment of what is known today as the Union Pacific along the south bank of the Columbia River (completed in 1889) and the Burlington Northern along the north bank (completed in the first decade of the 1900s).

Development of river and rail transportation was followed by an era of highway building. Construction of the Historic Columbia River Highway began in 1913 near Troutdale, was continued to Hood River in 1915, and was completed to The Dalles by 1922. This highway construction opened the Gorge to recreation and stimulated growth and development in communities on both sides of the river.

Damming the Columbia River was accomplished by construction of the Bonneville Dam in 1937 and The Dalles Dam in 1960. These and other dams converted the swift flow of the Columbia River into a series of lakes. They resulted in the revival of river transportation and the introduction of power transmission lines visible today in many parts of the Scenic Area.

Past impacts to the site as a result of the above-described activities include vegetation removal, introduction of non-native plant and wildlife species, alteration of the Columbia River shoreline, isolation of lakes and ponds, and fragmentation of plant and wildlife habitat.

4.3.2 Current Use

Current use within the project area is the existing alignment of the UPRR Portland Subdivision mainline track and the UPRR ROW. Land use in the immediate vicinity of the proposed project includes transportation corridors (roadway, rail, and river), recreational areas, agricultural, and open space.

Current impacts to the proposed project site include regular rail traffic through the area, resulting in increased dust and other potential contaminants, and noise. Other impacts include those related to recreational use including trampling of vegetation, spread of invasive weeds, deposition of trash, pollutants from roadway runoff, and vehicular traffic emissions.

4.3.3 Future Use

The majority of the proposed project area can be expected to remain in the current use as a rail corridor. Future potential impacts to sensitive resources may include increased development of the surrounding area, and increases in all of the current uses discussed above.

SECTION 5

Special-status Plant Species

5.1 Criteria for Inclusion

Special-status plant surveys were conducted by CH2M HILL to locate all populations of special-status plants within the project area (CH2M HILL, 2014). The study area included all areas where potential proposed project activities might occur. This included the footprint of the proposed project alignment, associated access roads, and other facilities. Locations of all identified plant species were mapped using geographic positioning system (GPS) technology with submeter accuracy. The size and phenology of each identified special-status plant population and its microhabitat characteristics were recorded.

Section 14.600 (General Management Areas [GMA]) of the NSA-LUDO (Wasco County, 2010) requires that new uses do not adversely affect special-status plant species. A species was considered to be special-status if it met one or more of the following criteria as identified in the NSA-LUDO:

1. Endemic to the Columbia River Gorge and vicinity;
2. Listed as endangered or threatened pursuant to federal or state endangered species acts; or
3. Listed as endangered or threatened on list (1) or list (2), by the Oregon Natural Heritage Program. (For brevity, these species will be referred to as "sensitive" plant species.)

Section 14.610 (Special Management Areas) of the NSA-LUDO requires protection of sensitive plant areas and sites for new developments or uses within 1,000 feet of a sensitive wildlife site or area. “Sensitive plant areas and sites” include endemic plants and those plant species potentially occurring in identified “Priority Habitat” areas as defined in this section of the code.

Target species included all plant taxa on the above lists potentially occurring in Wasco County, Oregon. Additionally, in Special Management Areas (SMA), special-status species included plant species identified as Forest Service-Sensitive (FS-S) species in the *Columbia River Gorge National Scenic Area Management Plan* (USFS, 2006). A species was determined to have potential to occur in the study area if its known or expected geographic range includes the study area or the vicinity of the study area, and if its known or expected habitat is represented within or adjacent to the study area.

A list of all potentially occurring sensitive plant species and a list of all plant species observed onsite during the field surveys is provided in the *Special-status Plant Species Survey and Habitat Mapping Report* (CH2M HILL, 2014).

5.2 Special-status Species Identified

The ORBIC database contains records of occurrence of seven special status plant species within one mile of the proposed project area (Table 1). General locations of these species overlap the study area as shown on Figures 3A – 3C.

TABLE 1
ORBIC-mapped Special Status Plant Species

Scientific Name	Common Name	Federal Status	State Status	ORBIC List	Other Status
Allium nevii	Nevius’ onion	—	—	3	—
Astragalus hoodianus	Hood River Milk-vetch	—	—	2	Endemic
Erigeron oreganus	Columbia Gorge Daisy	SOC	C	1	FS-S Endemic

TABLE 1
ORBIC-mapped Special Status Plant Species

Scientific Name	Common Name	Federal Status	State Status	ORBIC List	Other Status
Lomatium suksdorfii	Suksdorf's Desert Parsley	SOC	C	2	FS-S Endemic
Meconella oregana	White Meconella	SOC	C	1	FS-S
Penstemon barrettiae	Barrett's Penstemon	SOC	C	1	FS-S Endemic
Suksdorfia violacea	Violet Suksdorfia	—	—	2	FS-S

Key:

E	Endangered
T	Threatened
C	Candidate
SOC	Species of Concern
1	Review - Threatened or Endangered throughout range (ORBIC)
1-ex	Review - Threatened or Endangered throughout range, extirpated (ORBIC)
2	Watch - Threatened, Endangered, or extirpated from Oregon, secure elsewhere (ORBIC)
FS-S	Forest Service Sensitive

The field surveys identified and mapped three special-status plant species within or adjacent to the study area: Barrett's penstemon (*Penstemon barrettiae*), currant-leaf alumroot (*Heuchera grossularifolia* var. *tenuifolia*), and Columbia Gorge lupine (*Lupinus latifoliues* var. *thompsoniana*).

5.2.1 Biological Characteristics

5.2.1.1 Barrett's Penstemon

Barrett's penstemon (April survey) was found on [redacted]. Barrett's penstemon is a federal *Species of Concern,* state *Candidate* species, ORBIC *List 1 (Review - Threatened or Endangered throughout range)* species, U.S. Forest Service *Sensitive* species, and is *Endemic* to the Columbia River Gorge. Approximately 20 individuals were noted on [redacted]. One 6-foot-diameter clump of this penstemon was recorded [redacted]. The plants were not yet in bloom, but were readily identifiable based on the distinctive leaf.

Barrett's penstemon is medium-sized perennial herb with stems 8 to 16 inches tall, much branched and somewhat shrubby at the base. The leaves area evergreen, thick, leathery or succulent, bluish- to grayish-green, and toothed along the margins. The rose-purple flowers are 1 to 1.5 inches long, tubular, and strongly two-lipped at the end. The flowers are approximately 0.5 inch wide at the mouth, and hairy on the inside of the lower lip.

Barrett's penstemon generally grows in crevices along basalt cliff faces, on ledges of rock outcrops, on open talus, and occasionally along well-drained roadsides. It occurs mostly at lower elevations, but its range is up to 3,200 feet. It generally occurs on rocky substrates of basaltic origin, with little soil development. Soils are composed of windblown material and organic matter and provide good drainage. It occurs on rocky cliffs and talus slopes in the eastern Gorge.

5.2.1.2 Currant-leaf alumroot

Currant-leaf alumroot (April survey) was observed in several locations [redacted] Currant-leaf alumroot is a U.S. Forest Service *Sensitive* species. This plant was generally growing [redacted]

[redacted]. Approximately 12 plants were mapped. Several were in full bloom, aiding identification of this species.

Currant-leaf alumroot is an attractive perennial with erect, leafless flower stems from 15 to 65 cm tall arising from a mass of basal leaves. The herbage varies from minutely haired and glandular to glandular with longer, stiff hairs, or even smooth-surfaced near the base. The leaves are long petioled with the blade orbicular or kidney-shaped with heart-like bases and the blade 1 to 7 cm wide. The margins are 5- to 7-lobed for one-half to one-third of the length. The lobes occasionally overlap, and they are 2 to 3 times coarsely toothed.

The inflorescence is a panicle, tightly congested at flowering and 1 to 6 cm long, elongating to 5 to 12 cm in fruit. The side branches of the inflorescence are up to 1.5 cm long and 2 to 6 flowered. At flowering, the greenish calyx is tubular, bell-shaped and 4 to 6 mm long. The five lobes or sepals are oval or oblong with the white petals between them. The petals are narrow, oblanceolate to spatulate in shape, and either considerably shorter than the sepals to about 50% longer than the sepals. The ovary is about three-quarters inferior, and the stamens are shorter than the sepals and incurved.

Currant-leaf alumroot may be found on grassy hillsides, shaded cliffs and talus slopes, and on alpine scree. In the Columbia River Gorge, it may be found between the elevations of 100 to 1900 feet from [redacted].

5.2.1.3 Columbia Gorge Lupine

Columbia Gorge lupine (April survey) was observed in several locations [redacted]. Columbia River Lupine is *Endemic* to the Columbia River Gorge. The plants were growing in [redacted]. [redacted] Columbia Gorge broad-leaf lupine is an attractive perennial with erect stems up to 1 meter in height, varying from sparsely haired to heavily haired. The stems typically have 6 to 8 leaves with the lower leaves having petioles 2 to 3 times longer than the blade. The lower leaves tend to persist through flowering time. The petioles of the upper leaves range from 1 to 2 times longer than the blades. The 7 to 9 leaflets are elliptic to obovate in shape and each ranges from 3 to 6 cm long and 10 to 20 mm wide. The upper leaf surface tends to be less haired than the lower surface.

The inflorescence consists of several showy racemes from 10 to 20 cm long. The thin flower pedicels range from 4 to 9 mm long. The flowers range from light blue to bluish or lavender, or may be marked with bright violet. The flowers range from 12 to 15 mm long. The back of the banner lacks hairs and is distinctly well reflexed backwards from the wings and keel (Index = 15-30.) The wings lack hairs and completely cover the curved keel. The calyx is silky to shaggy-haired and lacks a spur or sac. The upper calyx lip is shallowly double-toothed. The seed pods range from 2 to 3 cm long and average 8 mm wide.

Columbia Gorge lupine var. *thompsonianus* are plants of low-mid elevation in the eastern Columbia River Gorge. Plants are covered with whitish to reddish hairs on the calyx, within the inflorescence, and often on the leaves and stems. The keel is nonciliate. Columbia Gorge broad-leaf lupine is often well over 25 cm tall.

SECTION 6

Special-status Wildlife Habitat

6.1 Criteria for Inclusion

In conjunction with the special-status plant species surveys described previously, the CH2M HILL biologist mapped general vegetation communities (habitats) occurring within the proposed project areas and conducted an evaluation of these habitats for potential to support any special-status wildlife species. In addition, the biologist identified and mapped all Sensitive Wildlife areas and Priority Habitat areas occurring within these general habitat areas.

Section 14.600 (General Management Areas) of the NSA-LUDO, Section 14.600 (Wasco County, 2010) requires that new uses in the Scenic Area do not adversely affect sensitive wildlife area and sites. "Sensitive wildlife areas" is defined as the 17 land and water areas that are included in the wildlife inventory of the NSA-MP (Columbia River Gorge Commission, 2011).

"Sensitive wildlife sites" are define as sites that are used by species that are:

1. Listed as endangered or threatened pursuant to federal or state endangered species acts;
2. Listed as sensitive by the Oregon Fish and Wildlife Commission; or
3. Considered to be of special interest to the public, limited to great blue heron, osprey, mountain goat, golden eagle, and prairie falcon.

Table 2 provides a summary of Sensitive Wildlife Areas (17 land and water areas) and Sensitive Wildlife Sites, and presence of these areas or their buffers within the proposed project area. Locations of mapped Sensitive Wildlife Areas and Sites and their buffer areas are shown in Figures 5A – 5C.

TABLE 2
Known Sensitive Wildlife Areas and Sites*

	Mapped within Project Area?	Mapped within 1000 feet of Project Area?
SENSTIVE WILDLIFE AREAS		
Bald eagle habitat	No	No
Deer and elk winter range	Yes	Yes
Elk habitat	Yes	Yes
Mountain goat habitat	No	No
Peregrine falcon habitat	No	No
Pika colony area	No	No
Pileated woodpecker habitat	No	No
Pine marten habitat	No	No
Shallow water fish habitat (Columbia River)	Yes	Yes
Special streams	No	No
Special habitat area	No	No
Spotted owl habitat	No	No
Sturgeon spawning area	No	No
Tributary fish habitat	No	No
Turkey habitat	Yes	Yes

TABLE 2
Known Sensitive Wildlife Areas and Sites*

	Mapped within Project Area?	Mapped within 1000 feet of Project Area?
Waterfowl area	Yes	Yes
Western pond turtle habitat	No	No
SENSITIVE WILDLIFE SITES		
Golden eagle	No	No
Great blue heron	No	No
Larch Mountain salamander	No	No
Northern spotted owl	No	No
Osprey	No	No
Peregrine falcon	No	No
Purple martin	No	No
Western pond turtle	No	No

*These initial determinations are based on Special Habitat geospatial data provided by the Columbia River Gorge Commission

Section 14.610 (Special Management Areas) of the NSA-LUDO requires protection of sensitive wildlife areas and sites for new developments or uses within 1000 feet of a sensitive wildlife site or area. "Sensitive wildlife areas and sites" are those areas depicted in the wildlife inventory or potentially occurring in identified "Priority Habitat" areas as defined in this section of the code and listed in Table 3. Mapped Priority Habitat areas within the proposed project area are shown in Figures 9A – 9R.

TABLE 3
Wasco County Priority Habitats

Priority Habitats	Criteria	Potentially present?
Aspen stands	High fish and wildlife species diversity, limited availability, high vulnerability to habitat alteration.	No
Caves	Significant wildlife breeding habitat, limited availability, dependent species.	No
Old-growth forest	High fish and wildlife density, species diversity, breeding habitat, seasonal ranges, and limited and declining availability, high vulnerability.	No
Oregon white oak woodlands	Comparatively high fish and wildlife density, species diversity, declining availability, high vulnerability	Yes
Prairies and steppe	Comparatively high fish and wildlife density, species diversity, important breeding habitat, declining and limited availability, high vulnerability.	No
Riparian	High fish and wildlife density, species diversity, breeding habitat, movement corridor, high vulnerability, dependent species.	Yes
Wetlands	High species density, high species diversity, important breeding habitat and seasonal ranges, limited availability, high vulnerability.	Yes
Snags and logs	High fish and wildlife density, species diversity, limited availability, high vulnerability, dependent species.	Yes
Talus	Limited availability, unique and dependent species, high vulnerability.	Yes
Cliffs	Significant breeding habitat, limited availability, dependent species.	Yes
Dunes	Unique species habitat, limited availability, high vulnerability, dependent species.	Yes

TABLE 3
Wasco County Priority Habitats

Priority Habitats	Criteria	Potentially present?

Source: Wasco County National Scenic Area Land Use Development Ordinance (Wasco County, 2010)

Habitats were identified according to habitat types described in *Wildlife-Habitat Relationships in Oregon and Washington* (Chappell et al., 2001). Within those habitats, specific vegetation communities identified as Priority Habitats according to the NSA-LUDO, Chapter 14, Section 14.610 (Wasco County, 2010) were also identified and mapped.

Special-status wildlife species included all wildlife species on the above lists potentially occurring in Wasco County, Oregon. Additionally, in designated SMA, special-status species included plant species identified as Forest Service-Sensitive (FS-S) species in the *Columbia River Gorge National Scenic Area Management Plan* (USFS, 2006). A species was determined to have potential to occur in the study area if its known or expected geographic range includes the study area or the vicinity of the study area, and if its known or expected habitat is represented within or adjacent to the study area.

A list of all potentially occurring sensitive wildlife species is provided in the *Special-status Plant Species and Habitat Mapping Report* (CH2M HILL, 2014).

6.2 Sensitive Wildlife Areas and Priority Habitats Identified

Five general habitat types (Chappell, 2001), six Sensitive Wildlife Areas, and five Priority Habitats, as defined above, were identified and mapped within the proposed project area.

Table 4 identifies Sensitive Wildlife Areas and Priority Habitats that may be affected by proposed project activities. Figures 8A – 8R show locations of Sensitive Wildlife Areas & Sites within the proposed project area. Figures 9A-9R show locations of identified Priority Habitat areas.

TABLE 4
Sensitive Wildlife Areas, Priority Habitats, and Buffers within Proposed Project Area [a]

Habitat Type	Potentially Occurring Species	Comments	Habitat Area (acres) [c]	Buffer (acres)
Sensitive Wildlife Areas				
Deer and Elk Winter Range	[redacted]	---		
Elk Habitat	[redacted]	---	0.02 [d]	
Turkey Habitat	[redacted]	---		
Shallow Water Fish Habitat (Columbia River)	NA[b]	---	0.0	5.95 [d]
Waterfowl Area	[redacted]	---	.06	
Priority Habitats				
Cliffs	[redacted]	---	1.14	---
Dunes		---	0.25	---
Oak Woodland	[redacted]	---	2.99	---

TABLE 4
Sensitive Wildlife Areas, Priority Habitats, and Buffers within Proposed Project Area [a]

Habitat Type	Potentially Occurring Species	Comments	Habitat Area (acres) [c]	Buffer (acres)
	[redacted]			
Riparian	[redacted]	---	2.16	---
Talus	[redacted]	---	0.06	---
Wetland	[redacted]	Suitable habitat not present for breeding [redacted]. Ponded areas have little to no submerged vegetation at pond edges. [redacted] structures [redacted] not present	0.75	---

[a] No Sensitive Wildlife Sites are identified within the proposed project area.
[b] Impacts to fish species are discussed in the Biological Evaluation, June 2014
[c] Project area calculations include the proposed area of disturbance within existing UPRR ROW, the proposed ROW acquisition area, and the temporary construction easements.
[d] Sensitive wildlife areas and sites and their buffer zones overlap in several cases, necessitating disturbance to be reported as a combined acreage

6.2.1 Biological Characteristics

Table 5 provides a summary of special-status wildlife species that may be present within the identified habitats on the project site. In addition to the listed sensitive wildlife areas and priority habitats, several areas of black cottonwood forest are present within or immediately adjacent to the proposed project site. Black cottonwood gallery forests may support the State listed sensitive [redacted].

TABLE 5
Sensitive Wildlife Potentially Present within Proposed Project Area

Species	Habitat Requirements	Habitats Present within Proposed Project Site			CRGC Habitat Inventory Mapping[d]
		General Habitat[a]	Sensitive Wildlife Area or Site[b]	Priority Habitat[c]	
Birds					
bald eagle	Shoreline (generally within 1 mile of large water bodies) with large trees and prey base of primarily fish. Diet also includes some waterfowl, turtles, and carrion.	Open Water – Lakes, Rivers, Streams	---	---	---
golden eagle	Generally open habitats such as shrub steppe, grassland, open pine and juniper forest and mixed conifer/deciduous forest. Nests on trees, ledges and cliffs.	Open Water – Lakes, Rivers, Streams	---	---	---
great blue heron	Near water, including rivers, lake and pond edges, and wetlands, as well as dry fields and pastures. Highly adaptable to urban areas Often nests colonially, near water.	Open Water – Lakes, Rivers, Streams	---	Wetland	---
horned grebe	Breeds on marshes and lakes in eastern WA/OR	Open Water – Lakes, Rivers, Streams	Shallow Water Waterfowl	---	Shallow Water Waterfowl
Lewis' woodpecker	Open pine/oak woodland, conifer forests, and riparian woodland; neotropical migrant.	Ponderosa Pine Forest and Woodlands	---	Oak Woodland	---
mountain quail	Generally found in shrub-dominated communities that can be within mixed conifer/deciduous forests, generally near available water.	Ponderosa Pine Forest and Woodlands	---	Oak Woodland	---
osprey	Near freshwater lakes, rivers and reservoirs with fish. Nests almost always within two miles of water.	Open Water – Lakes, Rivers, Streams	---	---	---

TABLE 5
Sensitive Wildlife Potentially Present within Proposed Project Area

Species	Habitat Requirements	Habitats Present within Proposed Project Site			CRGC Habitat Inventory Mapping[d]
		General Habitat[a]	Sensitive Wildlife Area or Site[b]	Priority Habitat[c]	
peregrine falcon	Tall cliff (nest) sites within 1 mile of water with small bird prey base.	Agricultural, Pasture, and Mixed Environs Eastside (Interior) Grasslands Open Water – Lakes, Rivers, Streams Ponderosa Pine Forest and Woodlands	---	Cliffs Oak Woodland	---
pileated woodpecker	Conifer/mixed conifer forests, as well as deciduous stands in valley bottoms with large dead or live trees (or remnants) for foraging and nesting. Primary cavity nester	Ponderosa Pine Forest and Woodlands	---	---	---
purple martin	Cavity/crevice nester, often near water. Forages over open water/fields/ forest canopy.	Agricultural, Pasture, and Mixed Environs Eastside (Interior) Grasslands Open Water – Lakes, Rivers, Streams Ponderosa Pine Forest and Woodlands	---	Cliffs Oak Woodland	---
wild turkey			Turkey habitat	---	Big Game Turkey
willow flycatcher	Associated with shrub habitat. Dependent on willow thickets in riparian zones for nesting and migration.	Eastside (Interior) Riparian-Wetlands	---	Riparian	---
yellow-billed cuckoo	Riparian forests, with cottonwood/thick willow; Neotropical migrant. Considered extirpated from WA and OR.	Eastside (Interior) Riparian-Wetlands	---	Riparian	---
Herptiles					
Columbia spotted frog	In or near permanent slow ponds, streams, marshes with abundant veg. (one known site at Conboy). No currents sites in NSA	Open Water – Lakes, Rivers, Streams	---	Wetland	---

TABLE 5
Sensitive Wildlife Potentially Present within Proposed Project Area

Species	Habitat Requirements	Habitats Present within Proposed Project Site			CRGC Habitat Inventory Mapping[d]
		General Habitat[a]	Sensitive Wildlife Area or Site[b]	Priority Habitat[c]	
Larch Mountain salamander	Largely in moss-covered shady talus slopes, low-mid elevation.	Open Water – Lakes, Rivers, Streams	---		---
northern red-legged frog	In moist forests and forested wetlands. Breeds in cool ponds and slow streams. Adults can be found some distance from water during wet seasons.	Open Water – Lakes, Rivers, Streams	---	Wetland	---
northwestern pond turtle	Streams, large rivers, slow sloughs, and quiet waters with nesting habitat (open meadow) within 0.5 mile.	Open Water – Lakes, Rivers, Streams	---	Wetland	---
painted turtle	Slow water ponds, marshes, rivers.	Open Water – Lakes, Rivers, Streams	---	Wetland	---
sharptail snake	Rocky slopes often in open pine/oak woodland w/prey species of small slugs. Often in moist riparian east of Cascades. Largely subterranean during summer, appearing in spring/fall.	---	---	Oak Woodland Riparian	---
western toad	Most common near marshes and small lakes (breeding sites in mid spring); can travel readily overland and be found along streams/seeps.	Open Water – Lakes, Rivers, Streams	---	Wetland	---
Invertebrates					
Dalles sideband	Within 200 m. of streams, seeps, or springs, in steppe or dry forest plant communities (within talus and moist rocky areas). May be found among rocks, shrubs/veg. and down wood.	Ponderosa Pine Forest and Woodlands	---	Oak Woodland	---
Mammals					
deer		---	Deer and elk winter range Elk habitat	---	Big Game Turkey

TABLE 5
Sensitive Wildlife Potentially Present within Proposed Project Area

Species	Habitat Requirements	Habitats Present within Proposed Project Site			CRGC Habitat Inventory Mapping[d]
		General Habitat[a]	Sensitive Wildlife Area or Site[b]	Priority Habitat[c]	
elk		---	Deer and elk winter range Elk habitat	---	Big Game Turkey
pallid bat[e]	Arid area specialist. Daytime roosts in buildings and crevices, less often in caves and other shelters. Feeds primarily on the ground on large insects, scorpions, and other small prey.	---	---	Cliffs	---
Townsend's big-eared bat[e]	Roost and hibernaculum sites within caves, buildings, mines and bridge undersides, with exacting temp, humidity, and physical requirements. Very intolerant of human disturbance, which results in loss of critical, fat reserves during torpid period.	---	---	---	---
western gray squirrel	Open mixed oak/conifer woodland, typically within 0.5 mile of water source.	Ponderosa Pine Forest and Woodlands	---	Oak Woodland	---
western small footed myotis	Rears its young in cliff-face crevices, erosion cavities, and beneath rocks on the ground as well as hibernating in caves or mines. Relatively little is known about this species.	---	---	Cliffs	---

[a] General Habitat mapping is provided in Figures 4A – 4R
[b] Sensitive Wildlife Area & Site mapping is shown in Figures 8A – 8R
[c] Priority Habitat mapping is shown in Figures 9A – 9R
[d] CRGC Habitat Inventory Mapping is shown in Figures 5A through 5C
[e] ORBIC database notes one element occurrence of this species within one-mile of the proposed project area (Figures 6A – 6C).

SECTION 7

Plant and Wildlife Habitat Impacts

7.1 Special-status Plants

Direct impacts may occur to three special-status plant species. It is likely that all of the identified currant-leaf alumroot plants, one six-foot-diameter clump of Barrett's penstemon, and multiple Columbia Gorge lupine would be removed during project construction. Any individuals not directly impacted by project activities may be indirectly impacted by potential dust, pollutants, trampling by humans as a result of project construction of operation.

Direct impacts to most of the Barrett's penstemon as a result of project activities is not likely because nearly all identified plants occur on the [redacted] of the proposed project footprint, where no activities will occur. Indirect impacts to these plants may include dust or potential pollutants generated by project construction or operation.

7.2 Sensitive Wildlife Areas and Sites

Permanent and temporary impacts will occur within the 1,000-foot buffer zones of five identified sensitive wildlife areas as a result of the proposed construction activities. The project will directly impact three sensitive wildlife area designated as Shallow Water. Table 6 summarizes those impacts.

TABLE 6
Potential Impacts to Sensitive Wildlife Areas

Habitat Type	Direct Impact Area (acres)	Buffer Impact Area (acres)
Shallow water - Waterfowl	0.06	5.95[1]
Special habitat - Waterfowl	0.0	
Turkey Habitat Big Game (Deer & Elk Range)	0.02[1]	

[1] Sensitive wildlife areas and sites and their buffer zones overlap in several cases, necessitating disturbance to be reported as a combined acreage.

Permanent impacts will occur to all or a portion of five of the six mapped Priority Habitat areas listed in Table 7 as a result of the proposed construction activities.

TABLE 7
Impacts to Priority Habitats

Habitat Type	Impact Area (acres)
Oregon white oak woodlands	2.99
Riparian	2.16
Wetlands	0.75
Cliffs	1.14
Dunes	0.25
Talus	0.06

SECTION 8

Wildlife Management Plan

All efforts will be made to avoid disturbance to special-status wildlife species and their habitats. If disturbance cannot be avoided, efforts will be employed to minimize disturbance to the maximum extent practicable.

8.1 Protection

All appropriate best management practices will be employed throughout the construction process and will include the following:

- All tree removal activities will occur between September 1 and March 1 outside the typical nesting period for migratory birds.
- Areas for fuel storage, refueling, and servicing of construction equipment must be located in an upland location.
- Prior to use, clean all equipment to remove external oil, grease, dirt, or mud.
- Wash sites must be located in upland locations so that dirty wash water does not flow into stream channel or wetlands.
- Erosion control measures will be in place at all times during construction. Construction will not start until all temporary control devices (straw bales, silt fences, etc.) are in place downslope or downstream of project site.

8.2 Rehabilitation

Enhancement and rehabilitation measures will be implemented to compensate for unavoidable impacts to sensitive wildlife areas and habitats and buffers. Areas of disturbance will be revegetated and restored to natural condition to the maximum extent possible. The purpose of the rehabilitation will be to achieve no net loss of the integrity of the wildlife areas. Revegetation practices are addressed in Section 9 of this document.

SECTION 9

Protection and Rehabilitation for Sensitive Plants (GMA)

All efforts will be made to avoid disturbance to special-status species and priority habitats. If disturbance cannot be avoided, efforts will be employed to minimize disturbance to the maximum extent practicable.

9.1 Protection

The proposed project will avoid and/or minimize impacts to special-status plant species or habitats as follows:

- Avoid areas of identified special-status plant populations, priority habitats, and sensitive wildlife and plant areas to the maximum extent practicable.
- Implement micrositing slight relocations of proposed project facilities to avoid special-status plant populations or habitats if practicable.
- Remove and conserve plants that will be directly impacted; replant following construction (see Rehabilitation below) to the maximum extent practicable
- For special status plants that cannot be conserved for replanting, replace by seeding at a minimum 3:1 ratio.
- Implement weed control procedures to prevent spread of noxious weeds to native plant habitats.

9.2 Rehabilitation

The purpose of the rehabilitation activities is to revegetate areas of temporary disturbance, enhance altered or degraded plant and wildlife habitat, re-establish populations of special-status plant species, and offset unavoidable impacts that result from project construction activities within sensitive plant buffer zones. Rehabilitation measures include seeding of all areas of temporary disturbance, planting of trees and shrubs for re-establishment of temporarily disturbed priority habitats and sensitive wildlife and plant habitats, replanting of special-status plant species removed for construction, and enhancement of existing vegetation communities within or immediately adjacent to the proposed project to compensate for loss of trees or priority habitats.

The following methods will be used for all areas of temporary ground and/or vegetation disturbance throughout the project area.

9.2.1 General

- Removal of woody vegetation shall be the minimum necessary to achieve the project purposes. Trees that are removed will be replaced with planted stock of the same or equivalent species on a 1 for 1 basis and planted according to supplier specifications.
- Large downed wood will be stockpiled onsite and distributed throughout restoration and enhancement area upon completion of construction.
- Restoration areas will be maintained and monitored as stipulated in the monitoring and maintenance plans for the project to meet success criteria of 80% survival of planted species, and 80% cover of all disturbed soils.

9.2.2 Seeding

Two seed mixtures were developed for use in revegetating all temporarily disturbed areas. Seed mixture #1 was developed for upland habitats within the project area; seed mixture #2 was developed for riparian

habitats (Tables 8 and 9). In order to re-establish plant communities of most value to wildlife, only native species are used. Species were selected based on their tolerance to xeric conditions, the availability of their seed, and a variety of other factors.

- Disturbed soil surfaces will be stabilized with native seed mix immediately after project construction.
- With the exception of areas below ordinary high water of streams, lakes, and ponds, areas of soil disturbance shall be seeded immediately upon project completion with native grasses or legumes, free of weed species. Landscape fabric, cellulose, or straw mulch will be used according to manufacturer/supplier specifications for application for temporary erosion control.
- No topsoil, seeding, or mulch shall be installed below ordinary high water of streams, lakes, and ponds.

TABLE 8
Revegetation Seed Mixture #1 (Temporarily Disturbed Upland Areas)

Specified Seed Mix		Minimum % by Weight Pure Live Seed (PLS)*
Scientific Name	**Common Name**	
Bromus carinatus	California brome	20
Festuca idahoensis	Idahoe fescue	30
Poa secunda ssp. *secunda*	Sandbergs bluegrass	20
Lupinus latifolius var. *thompsonianus*	Columbia broad-leaved lupine	10
Lomatium columbianum	Columbia lomatium	10
Hieracium scouleri	Scouler's hawkweed	10
	Total:	**45 lbs/acre**

Note: This seed mixture is for use in revegetating all upland areas of temporary ground disturbance within the project area.

TABLE 9
Revegetation Seed Mixture #2 (Temporarily Disturbed Wetland and Riparian Areas)

Specified Seed Mix		Minimum lbs/acre Pure Live Seed (PLS)*
Common Name	**Scientific Name**	
Secar Bluebunch Wheatgrass	*Pseudoroegneria spciata* ssp. *spicata*	3
Sherman Big Bluegrass	*Poa ampla (secunda)*	3
Critana Thickspike Wheatgrass	*Elymus lanceolatus*	3
Basin Wildrye	*Elymus cinereus*	3
American Milkvetch	*Astragalus americanus*	0.5
Sulphur Lupine	*Lupinus sulphureus*	0.5
	Total:	**13 lbs/acre**

*Include at least 10 percent of each species by weight. PLS is the amount of living, viable seed in a larger total amount of seed. The amount of seed to be applied is obtained by using the purity and germination percentages from the label on the actual bag of seed to be used on the project.

Note: This seed mixture if for use in revegetating all riparian areas of temporary ground disturbance within the project area.

9.2.3 Seed Planting Methods

The following planting methods should be used within the project area. The choice of methods should be based on site-specific factors such as slope, erosion potential, and the size of the area in need of revegetation. Temporary seeding should be completed in March to April (for disturbance that occurs during the winter and spring), and/or in October to November (for disturbance that occurs in the summer and fall). Permanent seeding should be done in October to November following the onset of seasonal rains. Disturbed, unseeded

ground may require chemical or mechanical weed control in May or June, before weeds have a chance to go to seed.

9.2.3.1 Broadcast Method

1. Obtain the seed from a reputable source to avoid contamination
2. Broadcast the seed mixture at the given rate
3. Apply locally obtained, weed free straw at a rate of 2 tons per acre immediately after broadcasting the seed
4. Crimp straw into the ground using a tractor-mounted straw crimper

9.2.3.2 Hydroseed Method

1. Obtain the seed from a reputable source to avoid contamination
2. Broadcast the seed mixture at the given rate
3. Apply wood cellulose fiber mulch (mixed with a tackifier) at a rate of 1 ton per acre immediately after broadcasting the seed

9.2.3.3 Drill Method

1. Obtain the seed from a reputable source to avoid contamination
2. Plant seed mixture at half the rate given in Tables 7 or 8 using a seed drill
3. Apply locally obtained, weed-free straw at a rate of 2 tons per acre immediately after broadcasting the seed
4. Crimp straw into the ground using a tractor-mounted straw crimper

9.2.4 Habitat Restoration and Enhancement Planting

The goal of the habitat restoration and enhancement planting is to create and enhance upland and riparian habitat native to and typical of undisturbed CRGNSA lands in Wasco County.

Four planting mixes were developed for use in revegetating areas impacted by the proposed project:

- Ponderosa Pine Woodland
- Oregon White Oak Woodland
- Forested Wetland
- Grassland

Table 10 lists the plant species and their specifications for each of the planting mixes. The planting plan includes a variety of native tree, shrub, and herbaceous vegetation. Plants were selected to provide maximum structural and species diversity that are typical of a high-quality natural vegetation in Sensitive Wildlife Areas and Priority Habitats. The project planting plan provides for the variable moisture levels evident within the rehabilitation area. Plant densities are high to ensure long-term success of the planting. The planting is designed to provide at least 75% tree and shrub survival after a 3-year monitoring period.

These plant communities are intended to provide maximum habitat diversity as well as important buffer functions for sensitive plants and wildlife. Shrubs, in particular, were chosen for their high food value for birds and other wildlife. The planting is designed to replicate similar natural vegetation communities in the surrounding area. To accomplish this objective, a total of 1,438 trees (7 species), 5,760 shrubs (6 species), and 1,500 herbs (3 species) will be planted. These will be supplemented by a hydroseed mix throughout the area containing a variety of grasses and other herbaceous species (13 species).

TABLE 10
Revegetation Planting Mixes

Layer	Scientific name	Common Name	Planting Notes	Quantity
I. Ponderosa Pine Woodland				
For revegetation of impact areas identified as **Mixed Coniferous-Deciduous, Mixed Coniferous, Riparian, Black Cottonwood, or Himalayan Blackberry**				
Groundcover				
	Bromus carinatus	California brome	20.0% by weight	45 lbs./ac
	Festuca idahoensis	Idaho fescue	30.0% by weight	
	Poa secunda ssp. *secunda*	Sandberg bluegrass	20.0% by weight	
	Lupinus latifolius var. *thompsonianus*	Columbia broad-leaved lupine	10.0% by weight	
	Lomatium columbianum	Columbia lomatium	10.0% by weight	
	Hieracium scouleri	Scouler's hawkweed	10.0% by weight	
Understory				
	Mahonia aquifolium	tall Oregongrape	1 gal,/18 in, 4-5 ft O.C	1120
	Symphoricarpos albus	snowberry	1 gal,/18 in, 4-5 ft O.C	1120
	Amelanchier alnifolia	serviceberry	1 gal,/18 in, 4-5 ft O.C	1120
Overstory				
	Pinus ponderosa	ponderosa pine	2 gal,/24 in, 10 ft O.C.	690
	Acer macrophyllum	big-leaf maple	2 gal,/24 in, 10 ft O.C.	150
II. Oregon White Oak Woodland				
For revegetation of areas identified as **Oregon White Oak Woodland**				
Groundcover				
	Bromus carinatus	California brome	20.0% by weight	45 lbs/ac
	Festuca idahoensis	Idaho fescue	30.0% by weight	
	Poa secunda ssp. *secunda*	Sandberg bluegrass	20.0% by weight	
	Lupinus latifolius var. *thompsonianus*	Columbia broad-leaved lupine	10.0% by weight	
	Lomatium columbianum	Columbia lomatium	10.0% by weight	
	Hieracium scouleri	Scouler's hawkweed	10.0% by weight	
Understory				
	Ribes sanguineum	red-flowering currant	1 gal,/24 in, 4-5 ft O.C	440
	Mahonia aquifolium	tall Oregongrape	1 gal,/18 in, 4-5 ft O.C	440
	Eriogonum compositum	hear-leaf buckwheat	1 gal,/18 in, 4-5 ft O.C	440
	Amelanchier alnifolia	serviceberry	1 gal,/18 in, 4-5 ft O.C	440
Overstory				
	Quercus garryana	Oregon white oak	2 gal,/24in, 10 ft O.C.	355
	Prunus emarginata	bitter cherry	1 gal,/18 in, 4-5 ft O.C	86
III. Forested Wetland				
For impact areas identified as **Wetland**				
Groundcover				
	Carex utriculata	northwest territory sedge	plugs, clusters of 3, 2 ft. O.C.	500
	Deschampsia cespitosa	tufted hairgrass	plugs, clusters of 3, 2 ft. O.C.	500
	Potentilla gracilis	slender cinquefoil	plugs, clusters of 3, 2 ft. O.C.	500
Understory				
	Salix exigua	narrow-leaf willow	1 gal. container, 10 ft. O.C.	320

TABLE 10
Revegetation Planting Mixes

Layer	Scientific name	Common Name	Planting Notes	Quantity
	Cornus sericea	red-osier dogwood	1 gal. container, 10 ft. O.C.	320
Overstory				
	Fraxinus latifolia	Oregon ash	2 gal,/24 in, 10 ft O.C.	56
	Populus balsamifera	black cottonwood	2 gal,/24 in, 10 ft O.C.	52
	Salix lasiandra	Pacific willow	1 gal. container, 10 ft. O.C.	52
IV. Grassland				
For impact areas identified as **Eastside Grassland & Ruderal Herbaceous**				
Groundcover				
	Bromus carinatus	California brome, native brome	10.0% by weight	65 lbs./ac
	Festuca idahoensis	Idaho fescue	20.0% by weight	
	Lymus cinereus	basin wildrye	20.0% by weight	
	Poa secunda ssp. *secunda*	Sandberg bluegrass	10.0% by weight	
	Balsomorhiza careyana	Carey's balsamroot	5.0% by weight	
	Crocidium multicaule	gold stars	5.0% by weight	
	Eschscholzia californica	California poppy	5.0% by weight	
	Lomatium columbianum	Columbia lomatium	5.0% by weight	
	Lomatium grayii	Gray's lomatium	5.0% by weight	
	Lupinus bicolor	two-color lupine	5.0% by weight	
	Lupinus latifolius var. *thompsonianus*	Columbia broad-leaved lupine	5.0% by weight	
	Trifolium macrocephalum	big-head clover	5.0% by weight	

9.2.4.1 Site Preparation

Site preparation will include selective grading of disturbed areas with a small dozer to minimize impacts. All other preparation will use hand labor. Areas will be selected and staked, holes dug, and soil amendments added according to accepted landscaping techniques. Plants will be obtained from local nurseries and will be individually chosen to ensure the highest quality planting materials.

Planting Schedule. Grading will occur during late summer to fall. Grading at this time will facilitate accurate assessment of the dry season water table. Planting will occur in the late fall after the onset of seasonal rains or in the early spring.

Maintenance. Maintenance of the wetland and buffer plantings will be the responsibility of UPRR. It shall include:

- Watering of the entire site with 1 inch of water every week from July 1 to October 15 during the first 2 years after planting.
- Removal of all non-native invasive species for 5 years after planting, including Himalayan blackberry, reed canarygrass, morning glory, and knapweed.

9.2.4.2 Tree and Shrub Planting

Trees and shrubs selected for the revegetation are species typical of natural plant communities occurring in the CRGNSA in Wasco County. Trees that are removed will be replaced with planted stock of the same or equivalent species on a 2 for 1 basis and planted according to supplier specifications. Planting will be done in late fall (October to November) following the onset of seasonal rains. Planted stock will be installed with browse protection to reduce deer, beaver, and rodent browse activity.

9.2.4.3 Special-status Plant Species Re-establishment

Re-establishment of special-status plants removed during construction shall be accomplished as follows:

- Currant-leaf alumroot and Barrett's penstemon (in the [redacted] portion of the project area)
  - Remove and transplant in suitable areas [redacted] in the same general area as the removal to the greatest extent practicable. Should replanting impact the safe operation of the railroad, these plants will be replaced through seeding;
  - Removal and transplanting shall be conducted according to the recommendations of and under the supervision of a qualified botanist or revegetation specialist
- Columbia Gorge Lupine (in the [redacted] portion of the project area)
  - Replace through seeding in all Ponderosa Pine Woodland and Oregon White Oak Woodland planting area (see planting mixes for these areas in Table 10).

9.2.4.4 Erosion Control

Erosion control measures will include filter bags, sediment fences, silt curtains, sediment traps, or other similar devices; impervious materials to cover stockpiles when unattended or during rainfall; and/or graveled construction access roads. Mats or pallets will be used at wetland accesses if soil compaction is a problem. Erosion control measures will be implemented until soils are stable.

SECTION 10

Mitigation Plan for Impacts to Sensitive Wildlife and Plant Areas (SMA)

All efforts will be made to avoid disturbance to sensitive wildlife and plant areas. If disturbance cannot be avoided, efforts will be employed to minimize disturbance to the maximum extent practicable.

10.1 Protection

All appropriate best management practices will be employed throughout the construction process and will include the following:

- All tree removal activities will occur between September 1 and March 1 outside the typical nesting period for migratory birds.
- Areas for fuel storage, refueling, and servicing of construction equipment must be located in an upland location.
- Prior to use, clean all equipment to remove external oil, grease, dirt, or mud.
- Wash sites must be located in upland locations so that dirty wash water does not flow into stream channel or wetlands.
- Erosion control measures will be in place at all times during construction. Construction will not start until all temporary control devices (straw bales, silt fences, etc.) are in place downslope or downstream of project site.

10.2 Rehabilitation

Enhancement and rehabilitation measures will be implemented to compensate for unavoidable impacts to sensitive wildlife and plant areas. Areas of disturbance will be revegetated and restored to natural condition to the maximum extent possible. The purpose of the rehabilitation will be to achieve no net loss of the integrity of the wildlife areas. Revegetation practices are addressed in Section 9 of this document.

SECTION 11

Success Criteria

The goal of the enhancement and rehabilitation activities is to restore disturbed areas to natural conditions a quickly as possible. The following criteria will be used to evaluate success of the planting according to Wasco County *National Scenic Area Land Use Development Ordinance* (NSA LUDO) Sections 14.600 (D)(5) and 14.610(E) (Wasco County, 2010).

1. For all areas of revegetation: 75% or greater survival of replacement vegetation within 5 years
2. For special-status plant species: 75% or greater survival of replacement plants after 3 years

If any monitoring report shows that mitigation is not meeting these performance standards, UPRR will perform corrective actions appropriate to the mitigation; for example, failing plants will be replaced, other plant species will be substituted, non-native species will be removed by hand without pesticides, etc.

SECTION 12

Maintenance and Monitoring

Monitoring of the rehabilitation and enhancement actions will be conducted for a period of 3 years following final installation by a qualified botanist. The monitoring will document milestones, success, problems, and contingency actions, and will include the following activities:

- In August or September of the year following each seeding, and continuing for 3 years, a qualified independent botanist or revegetation specialist will examine a representative cross-section of the revegetated sites. Care will be taken to survey areas in all the major habitat types and throughout the geographic extent of the project area. At least 20% of the revegetated acreage will be examined.
- Photo documentation from permanent photo points will document site conditions. Annual reports will be prepared and submitted to the appropriate regulatory agencies.
- At each site, the investigator shall evaluate the following parameters:
  - Percent cover for the following four classes: native forbs and grasses, non-native forbs and grasses, shrubs and trees, bare ground and rock.
  - Degree of erosion due to construction activities (high, moderate, or low).

The monitoring report will consist of the following:

1. Documentation of plant species along vegetation transects (randomly selected) for herb, shrub, and tree aerial cover at radii of 1m, 5m, and 10m respectively.
2. Documentation of observed wildlife use of the site.
3. Percent of planted materials surviving, classified by condition (for example, vigorous, living, stressed).
4. Report on invasive vegetation, vandalism, dumping, or other conditions actually or potentially harmful to the mitigation.
5. Identify maintenance concerns (plants need to be replaced, etc.).
6. Representative 4" x 6" original color photographs of the rehabilitation areas taken from photo points drawn on a map of the mitigation area, keyed to lines of sight from those photo points.

This monitoring will result in an annual report that will be sent to the appropriate regulatory agencies by December 31 of each year. The report will include a summary of the condition of the planting. Those areas that do not meet the above criteria will be identified and recommendations will be made for corrective actions to be implemented by UPRR.

SECTION 13

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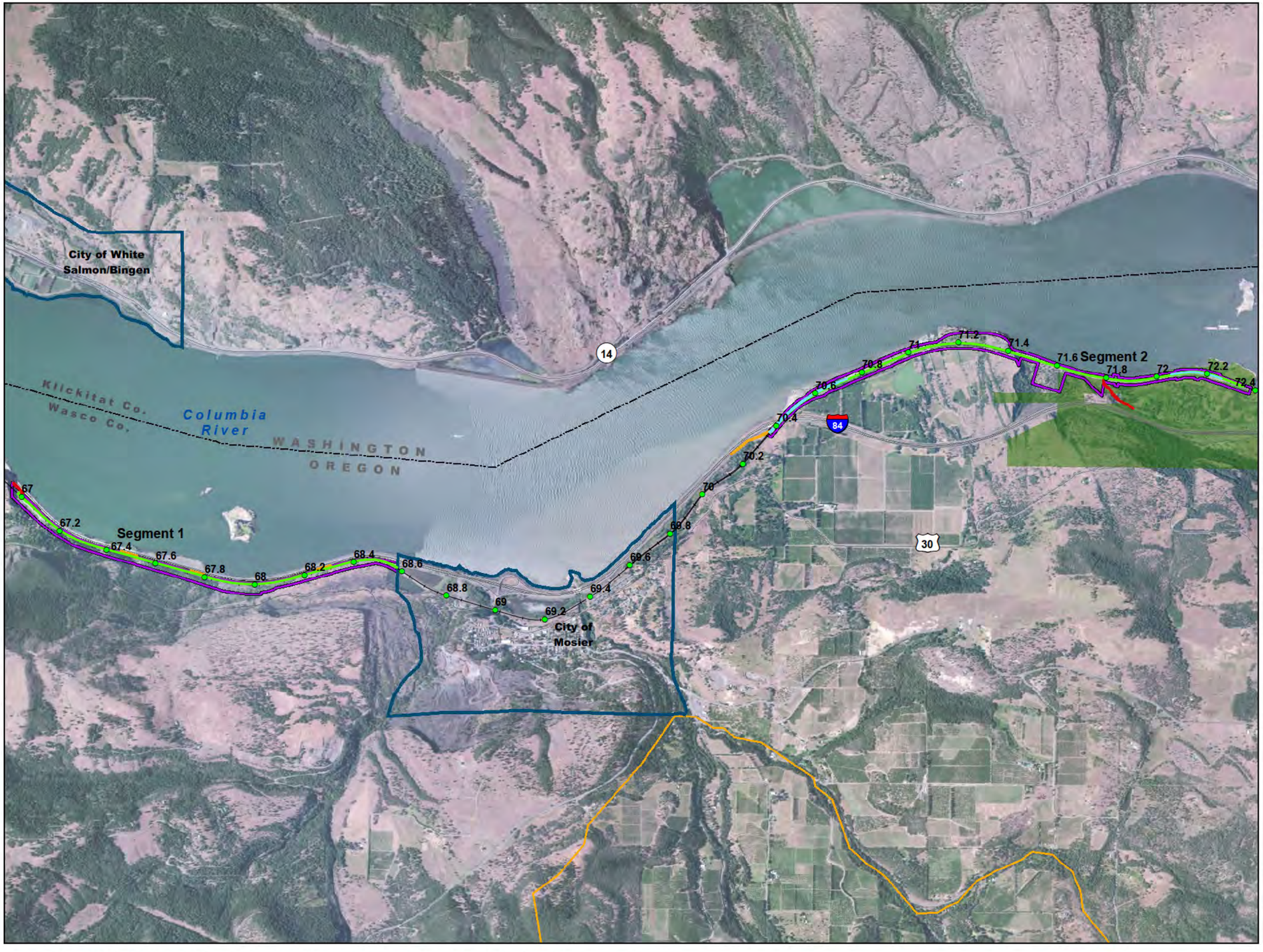
Appendix A
Figures



VICINITY MAP

LEGEND

- Study Area Boundary
- Existing Mainline Track
- Proposed Second Mainline Track
- Proposed Realigned Mainline Track
- Proposed Temporary Construction Access Road
- Proposed Permanent Maintenance/ Construction Access Road
- Track Mileposts
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

N

0 0.5
Miles

Figure 1
Location Map
Second Mainline Track Project
Union Pacific Railroad

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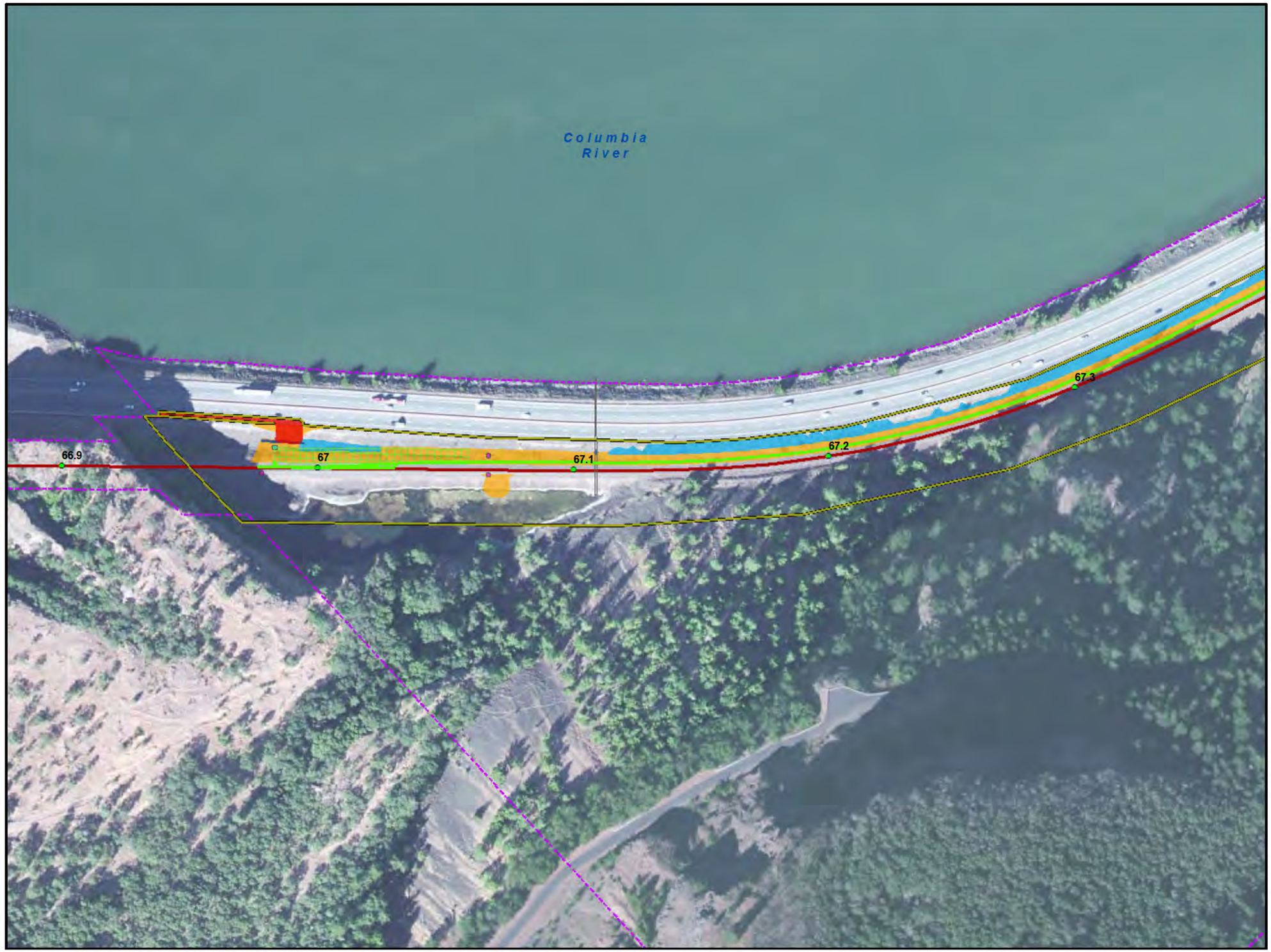

VICINITY MAP

LEGEND

- Study Area Boundary
- Existing Mainline Track
- Proposed Mainline Track
- Proposed Realigned Mainline Track
- Existing UPRR ROW
- Existing Culvert
- Proposed ROW Enhancement
- Proposed Temporary Construction Easement
- Track Mileposts
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Project Features

- Signal Building
- Signal Light
- Retaining Wall
- Guardrail
- Staging Areas
- Drainage Structures
- Track Embankment
- Rock Excavations
- Trackside Ditches
- Proposed Construction Access Road
- Proposed Permanent Maintenance/ Construction Access Road

Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

N

0 200
Feet

Figure 2-A
Project Features
Second Mainline Track Project
Union Pacific Railroad

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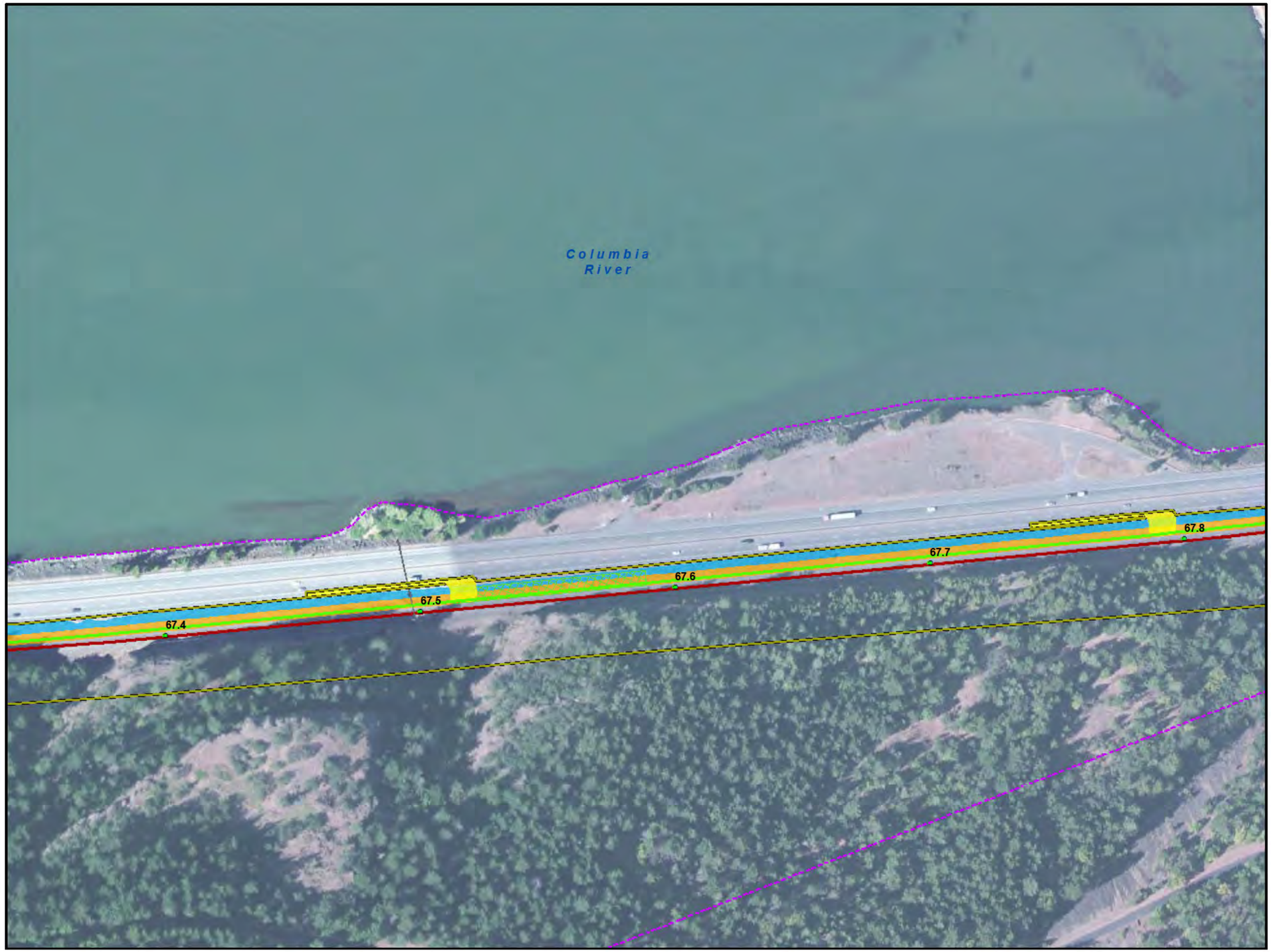

VICINITY MAP

LEGEND

- Study Area Boundary
- Existing Mainline Track
- Proposed Mainline Track
- Proposed Realigned Mainline Track
- Existing UPRR ROW
- Existing Culvert
- Proposed ROW Enhancement
- Proposed Temporary Construction Easement
- Track Mileposts
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Project Features

- Signal Building
- Signal Light
- Retaining Wall
- Guardrail
- Staging Areas
- Drainage Structures
- Track Embankment
- Rock Excavations
- Trackside Ditches
- Proposed Construction Access Road
- Proposed Permanent Maintenance/ Construction Access Road

Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

N

0 200
Feet

Figure 2-B
Project Features
Second Mainline Track Project
Union Pacific Railroad

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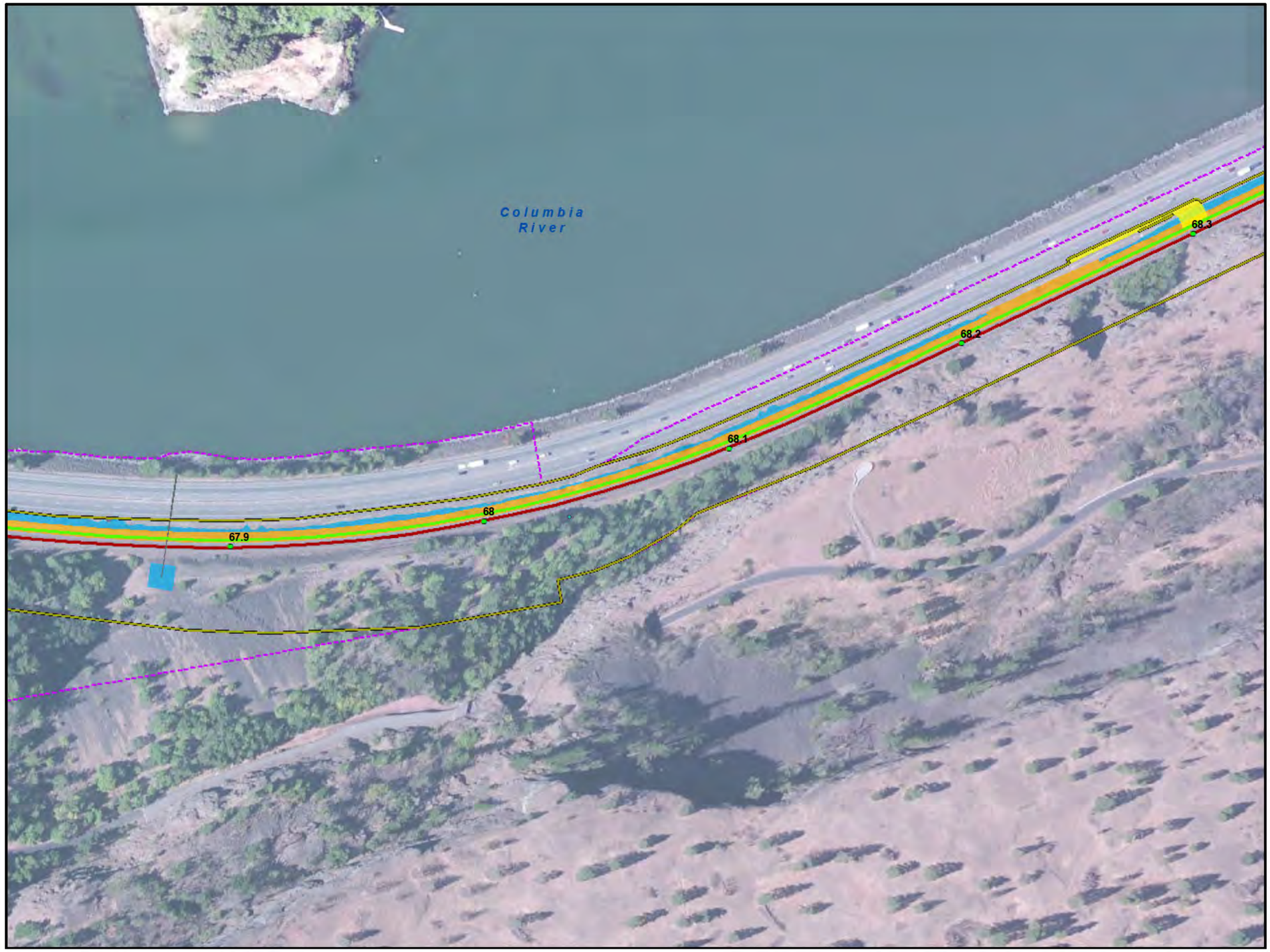

VICINITY MAP

LEGEND

- Study Area Boundary
- Existing Mainline Track
- Proposed Mainline Track
- Proposed Realigned Mainline Track
- Existing UPRR ROW
- Existing Culvert
- Proposed ROW Enhancement
- Proposed Temporary Construction Easement
- Track Mileposts
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Project Features

- Signal Building
- Signal Light
- Retaining Wall
- Guardrail
- Staging Areas
- Drainage Structures
- Track Embankment
- Rock Excavations
- Trackside Ditches
- Proposed Construction Access Road
- Proposed Permanent Maintenance/ Construction Access Road

Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

N

0 200
Feet

Figure 2-C
Project Features
Second Mainline Track Project
Union Pacific Railroad

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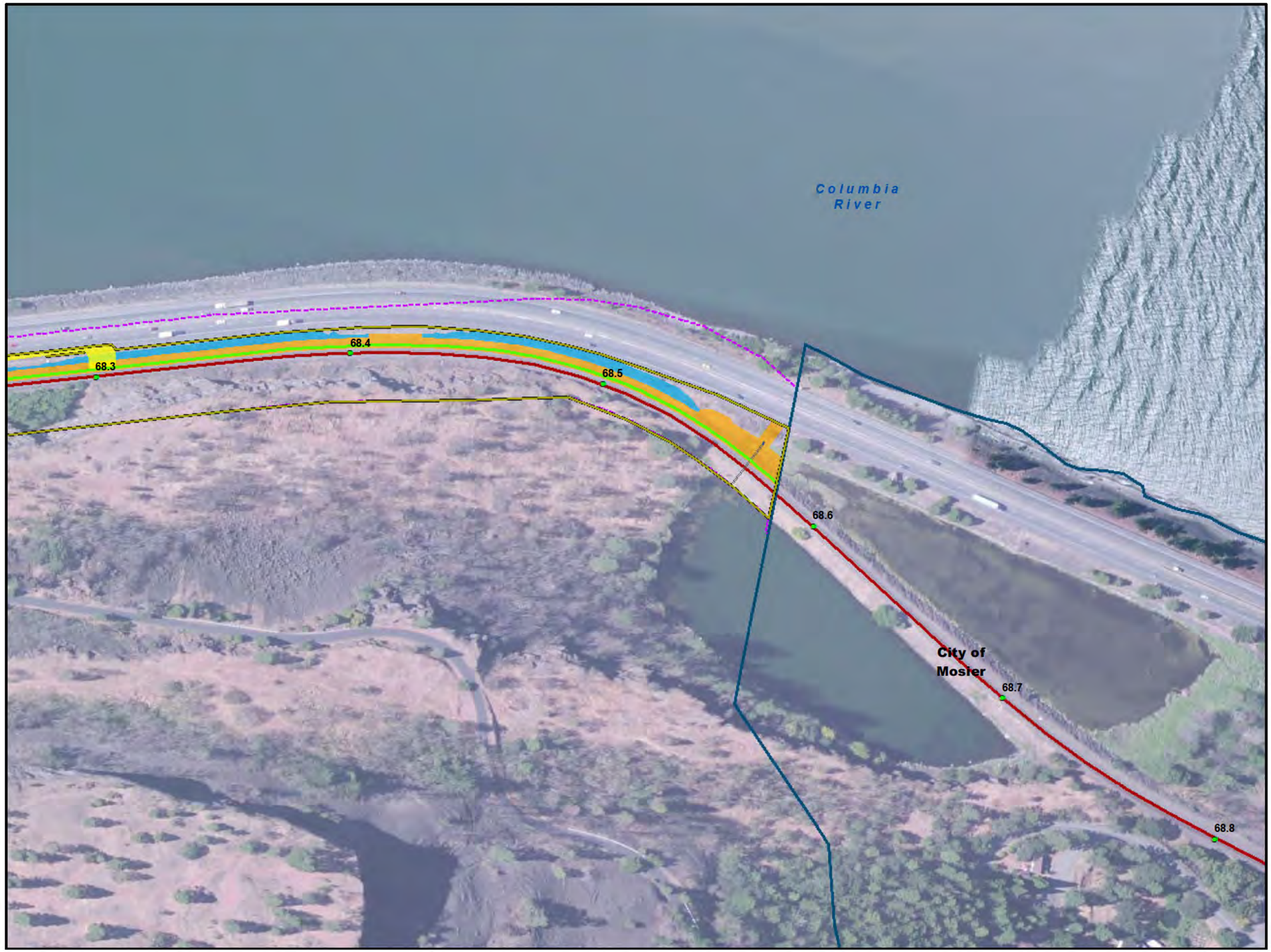

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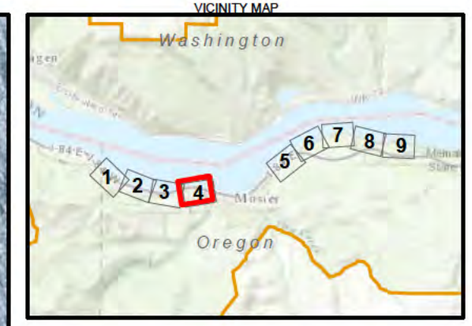

LEGEND

- Study Area Boundary
- Existing Mainline Track
- Proposed Mainline Track
- Proposed Realigned Mainline Track
- Existing UPRR ROW
- Existing Culvert
- Proposed ROW Enhancement
- Proposed Temporary Construction Easement
- Track Mileposts
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Project Features

- Signal Building
- Signal Light
- Retaining Wall
- Guardrail
- Staging Areas
- Drainage Structures
- Track Embankment
- Rock Excavations
- Trackside Ditches
- Proposed Construction Access Road
- Proposed Permanent Maintenance/ Construction Access Road

Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

N

0 200
Feet

Figure 2-D
Project Features
Second Mainline Track Project
Union Pacific Railroad

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VICINITY MAP

LEGEND

- Study Area Boundary
- Existing Mainline Track
- Proposed Mainline Track
- Proposed Realigned Mainline Track
- Existing UPRR ROW
- Existing Culvert
- Proposed ROW Enhancement
- Proposed Temporary Construction Easement
- Track Mileposts
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Project Features

- Signal Building
- Signal Light
- Retaining Wall
- Guardrail
- Staging Areas
- Drainage Structures
- Track Embankment
- Rock Excavations
- Trackside Ditches
- Proposed Construction Access Road
- Proposed Permanent Maintenance/ Construction Access Road

Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

N

0 200
Feet

Figure 2-E
Project Features
Second Mainline Track Project
Union Pacific Railroad

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VICINITY MAP

LEGEND

- Study Area Boundary
- Existing Mainline Track
- Proposed Mainline Track
- Proposed Realigned Mainline Track
- Existing UPRR ROW
- Existing Culvert
- Proposed ROW Enhancement
- Proposed Temporary Construction Easement
- Track Mileposts
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Project Features

- Signal Building
- Signal Light
- Retaining Wall
- Guardrail
- Staging Areas
- Drainage Structures
- Track Embankment
- Rock Excavations
- Trackside Ditches
- Proposed Construction Access Road
- Proposed Permanent Maintenance/ Construction Access Road

Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

N

0 200
Feet

Figure 2-F
Project Features
Second Mainline Track Project
Union Pacific Railroad

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VICINITY MAP

LEGEND

- Study Area Boundary
- Existing Mainline Track
- Proposed Mainline Track
- Proposed Realigned Mainline Track
- Existing UPRR ROW
- Existing Culvert
- Proposed ROW Enhancement
- Proposed Temporary Construction Easement
- Track Mileposts
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Project Features

- Signal Building
- Signal Light
- Retaining Wall
- Guardrail
- Staging Areas
- Drainage Structures
- Track Embankment
- Rock Excavations
- Trackside Ditches
- Proposed Construction Access Road
- Proposed Permanent Maintenance/ Construction Access Road

Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

N

0 200
Feet

Figure 2-G
Project Features
Second Mainline Track Project
Union Pacific Railroad

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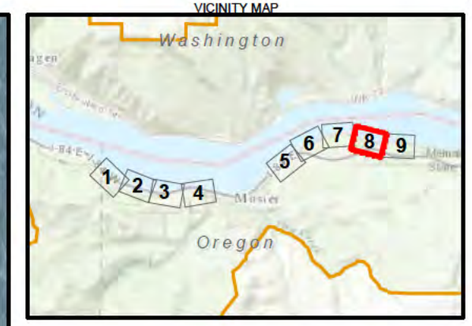

LEGEND

- Study Area Boundary
- Existing Mainline Track
- Proposed Mainline Track
- Proposed Realigned Mainline Track
- Existing UPRR ROW
- Existing Culvert
- Proposed ROW Enhancement
- Proposed Temporary Construction Easement
- Track Mileposts
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Project Features

- Signal Building
- Signal Light
- Retaining Wall
- Guardrail
- Staging Areas
- Drainage Structures
- Track Embankment
- Rock Excavations
- Trackside Ditches
- Proposed Construction Access Road
- Proposed Permanent Maintenance/ Construction Access Road

Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

N

0 200
Feet

Figure 2-H
Project Features
Second Mainline Track Project
Union Pacific Railroad

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VICINITY MAP

LEGEND

- Study Area Boundary
- Existing Mainline Track
- Proposed Mainline Track
- Proposed Realigned Mainline Track
- Existing UPRR ROW
- Existing Culvert
- Proposed ROW Enhancement
- Proposed Temporary Construction Easement
- Track Mileposts
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Project Features

- Signal Building
- Signal Light
- Retaining Wall
- Guardrail
- Staging Areas
- Drainage Structures
- Track Embankment
- Rock Excavations
- Trackside Ditches
- Proposed Construction Access Road
- Proposed Permanent Maintenance/ Construction Access Road

Sources: Oregon Parks and Recreation Department (2010); Columbia River Gorge Commission (2010; 2013)

N

0 200
Feet

Figure 2-I
Project Features
Second Mainline Track Project
Union Pacific Railroad

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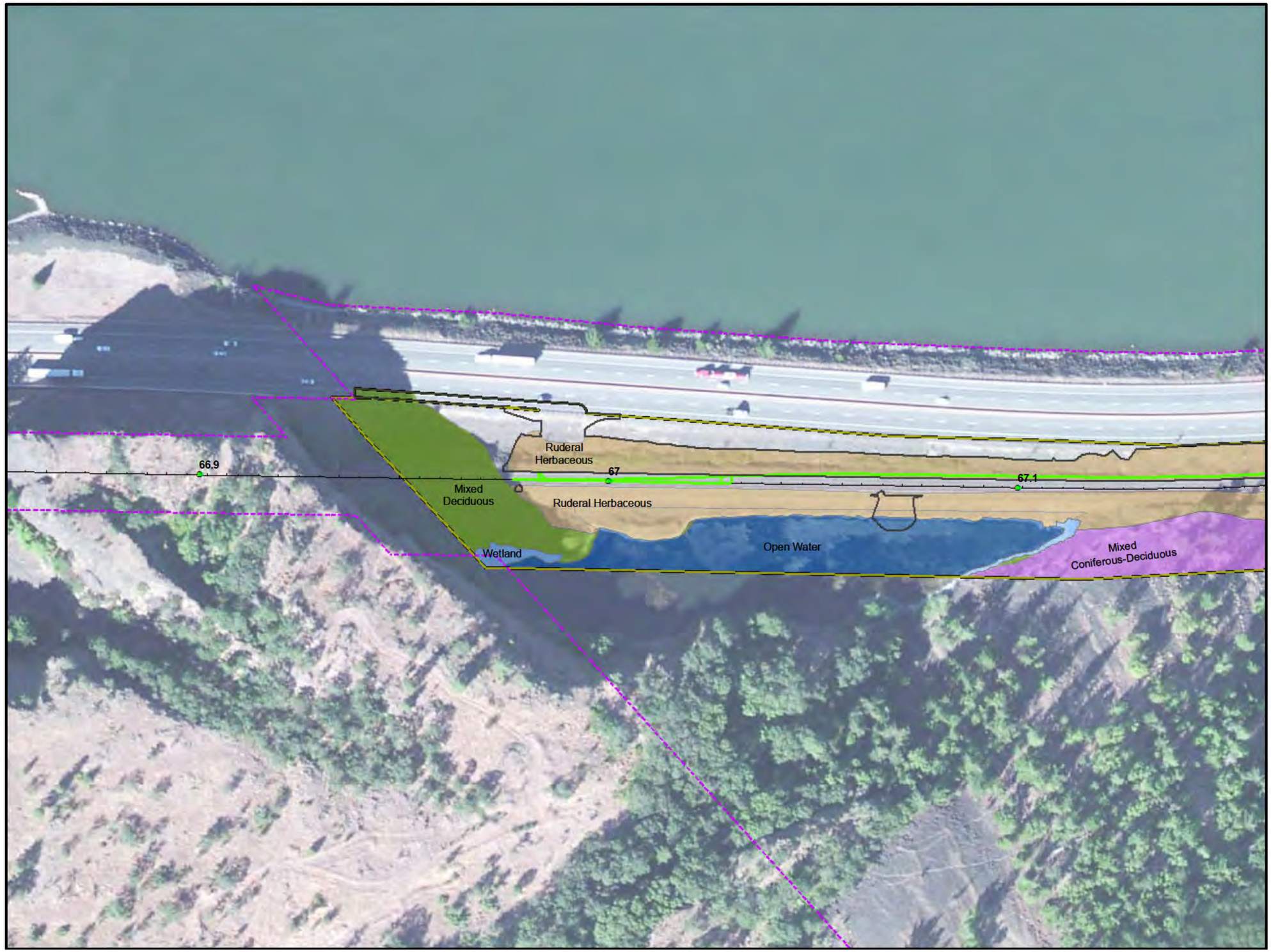

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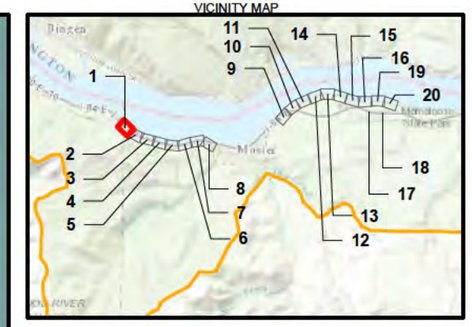

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-A
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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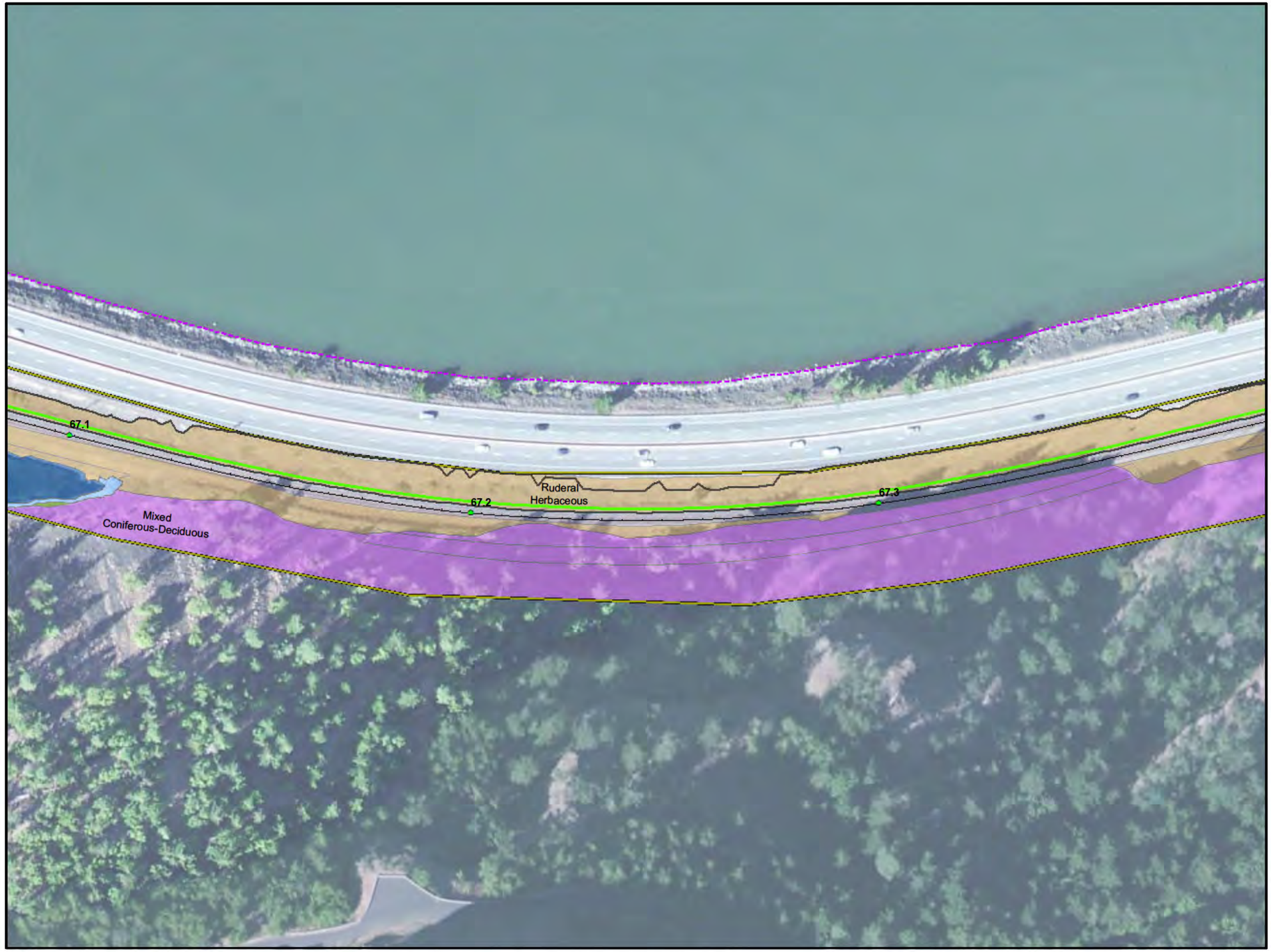

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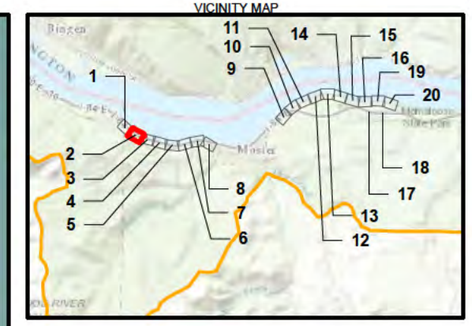

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-B
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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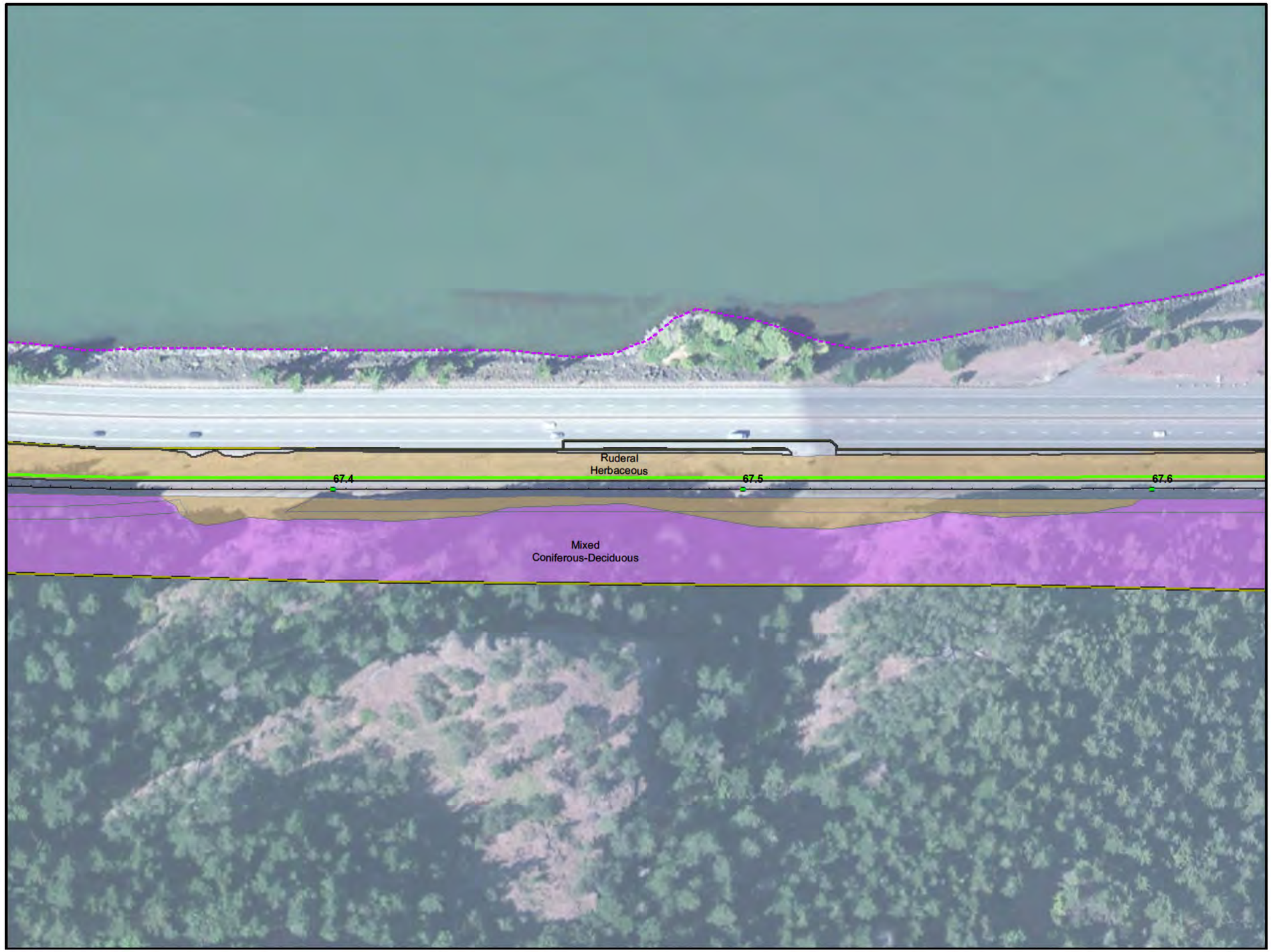

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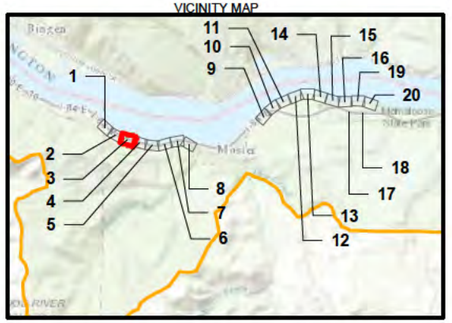

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-C
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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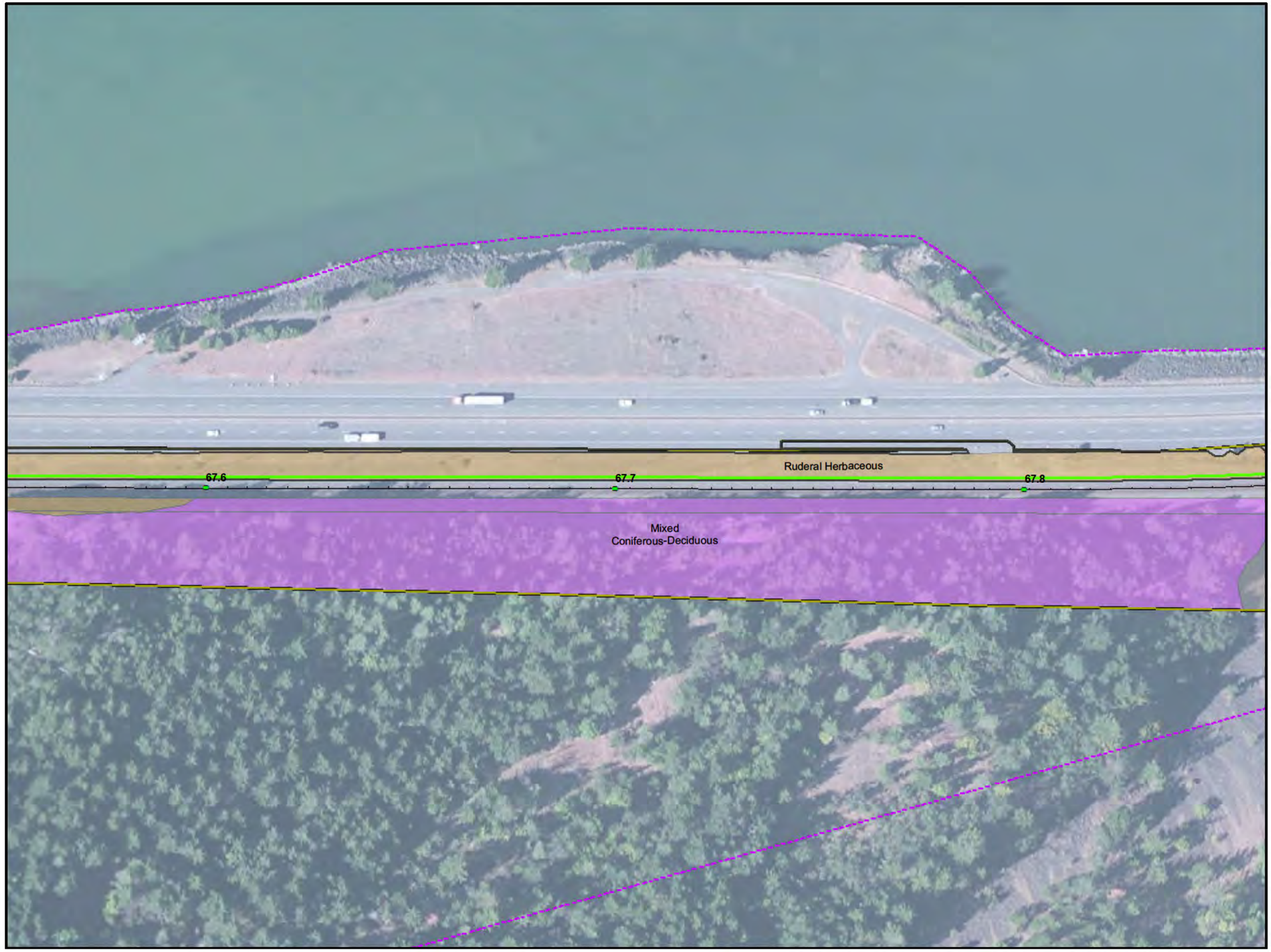

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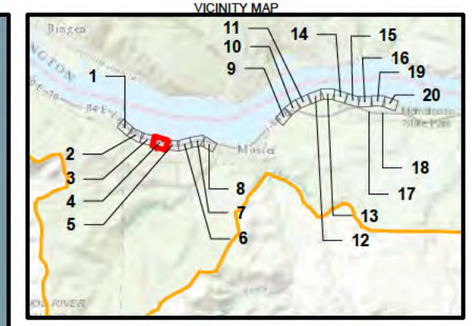

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-D
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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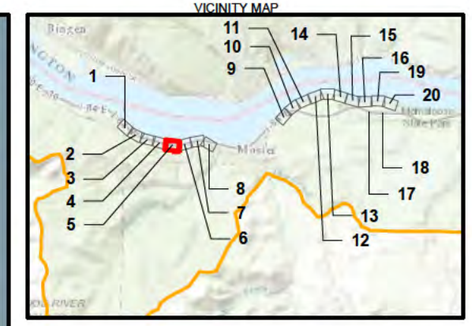
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-E
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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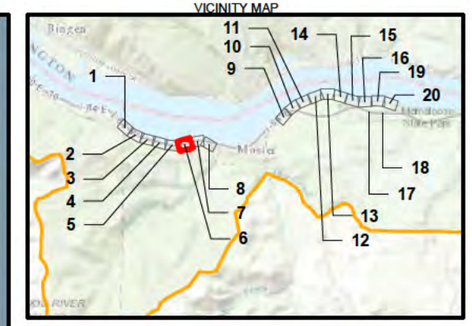
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-F
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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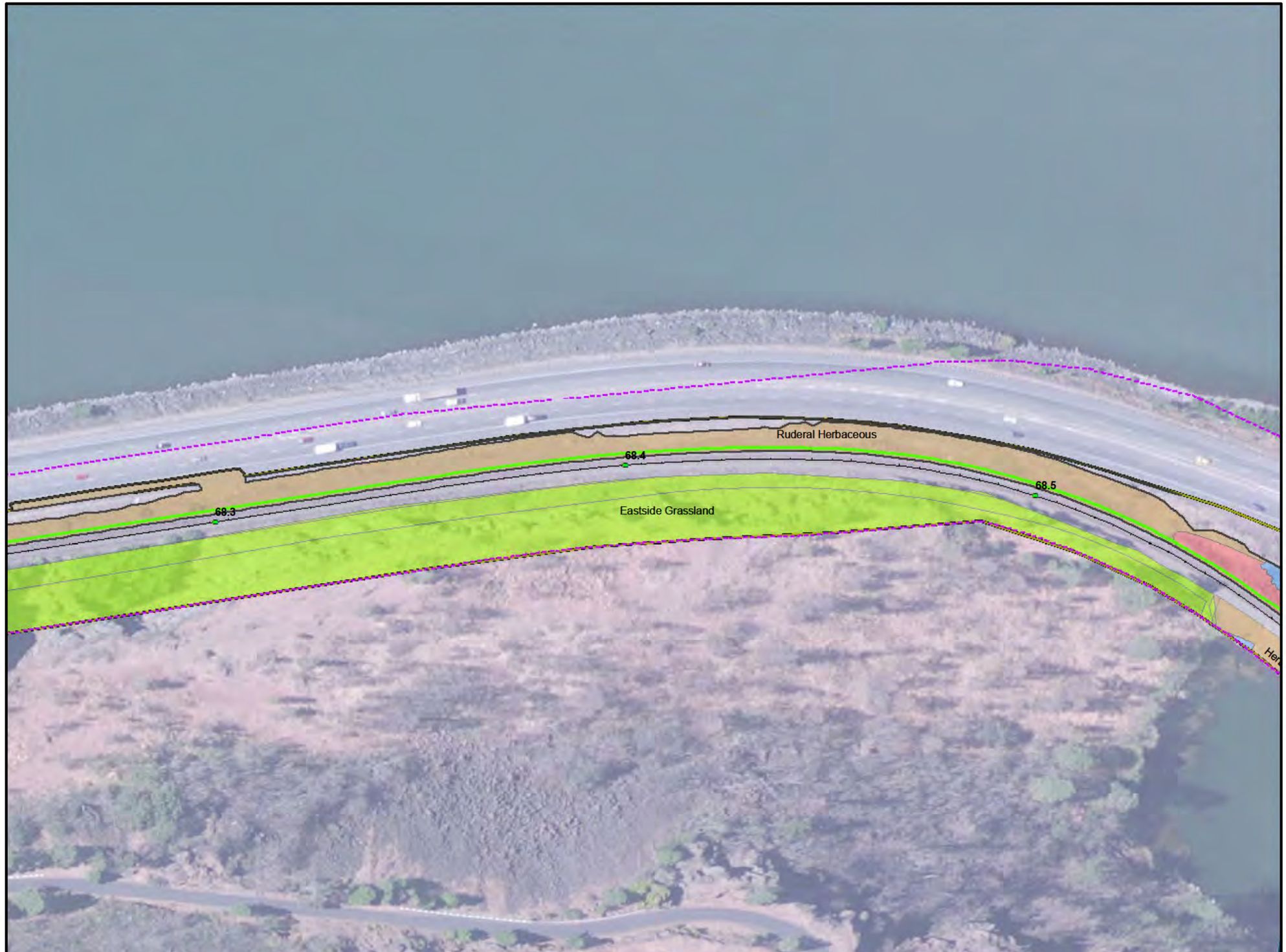
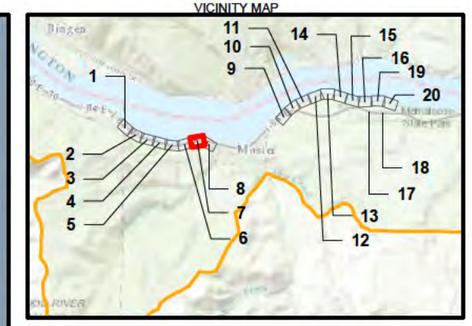


VICINITY MAP



LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-G
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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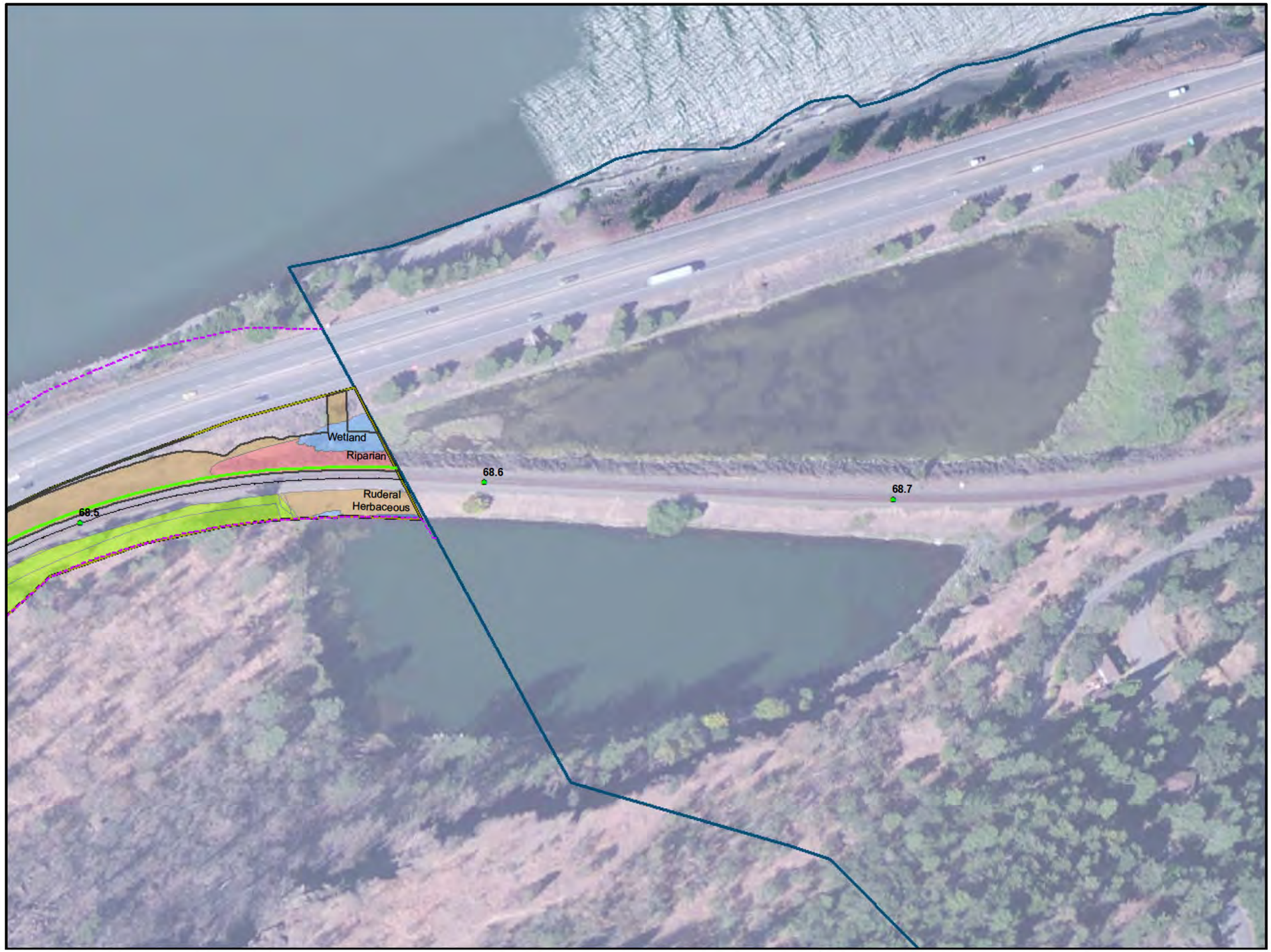

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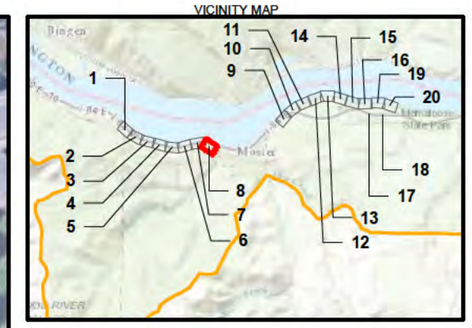

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
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- Designated Urban Area Boundary
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Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-H
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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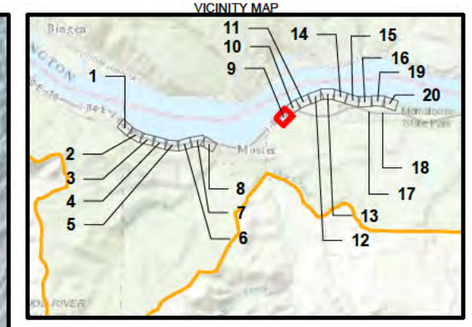

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
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- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-I
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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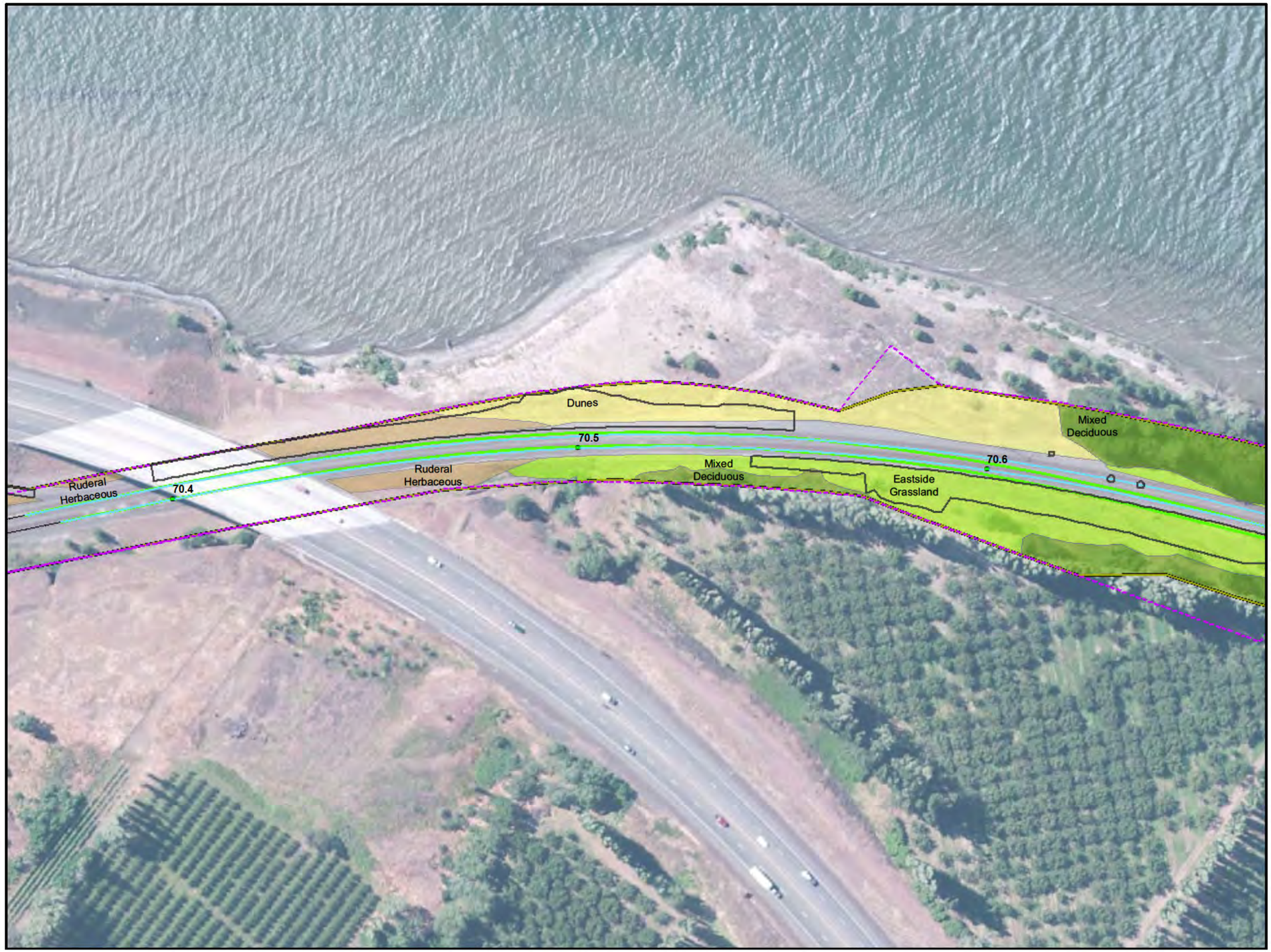

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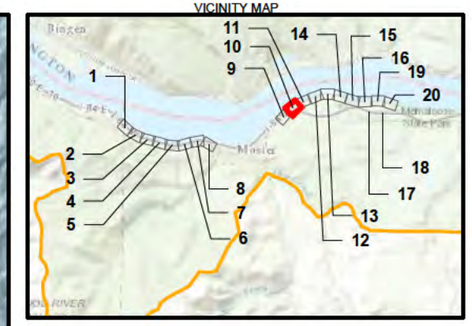

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
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- Designated Urban Area Boundary
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Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-J
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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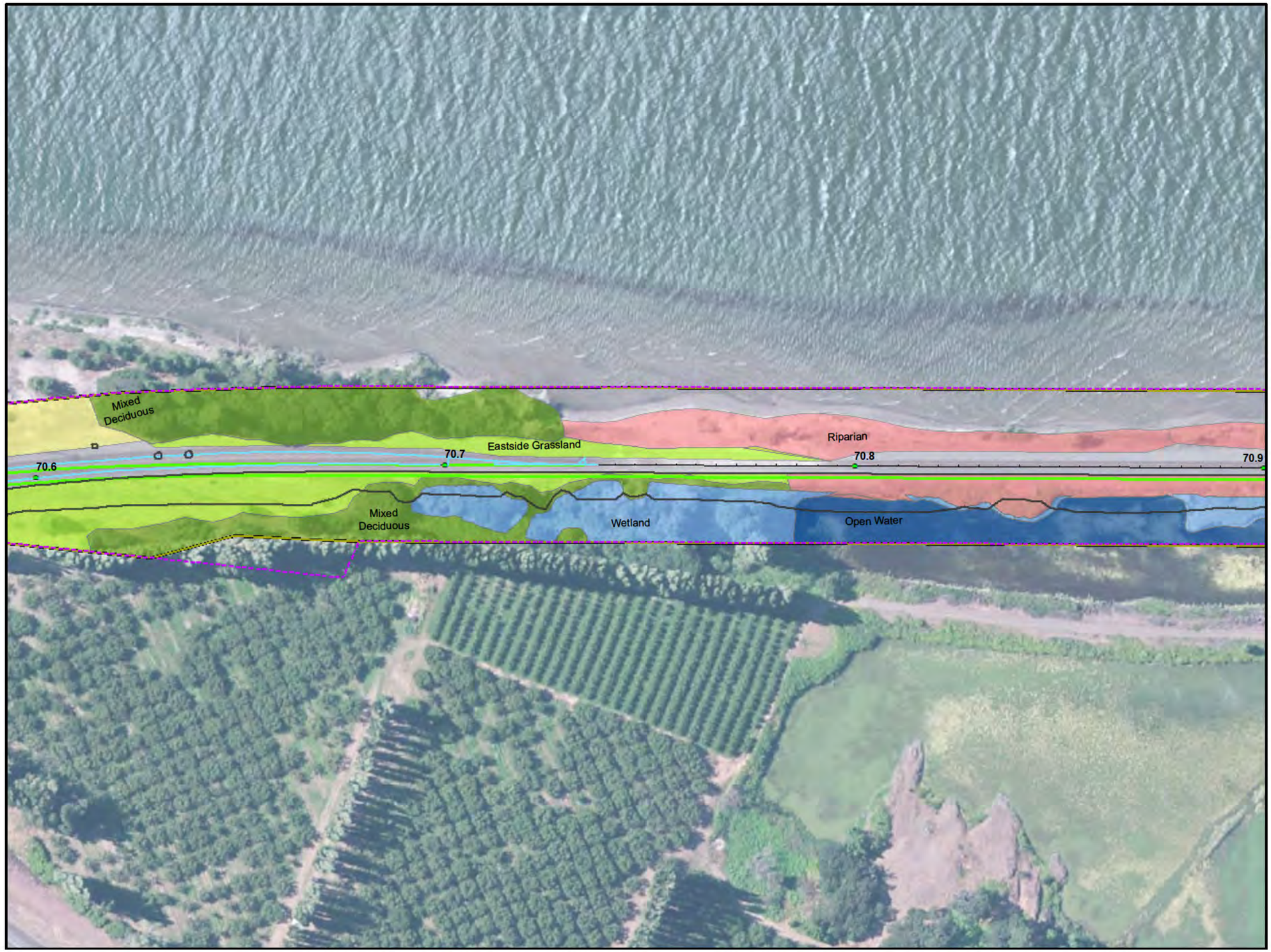

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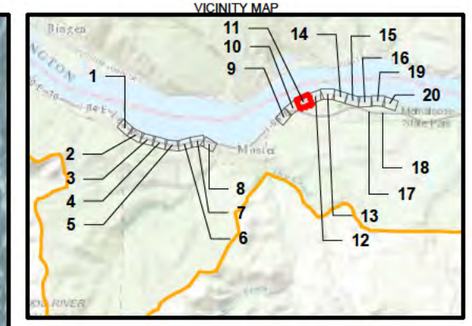

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
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Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

0 100
Feet

Figure 4-K
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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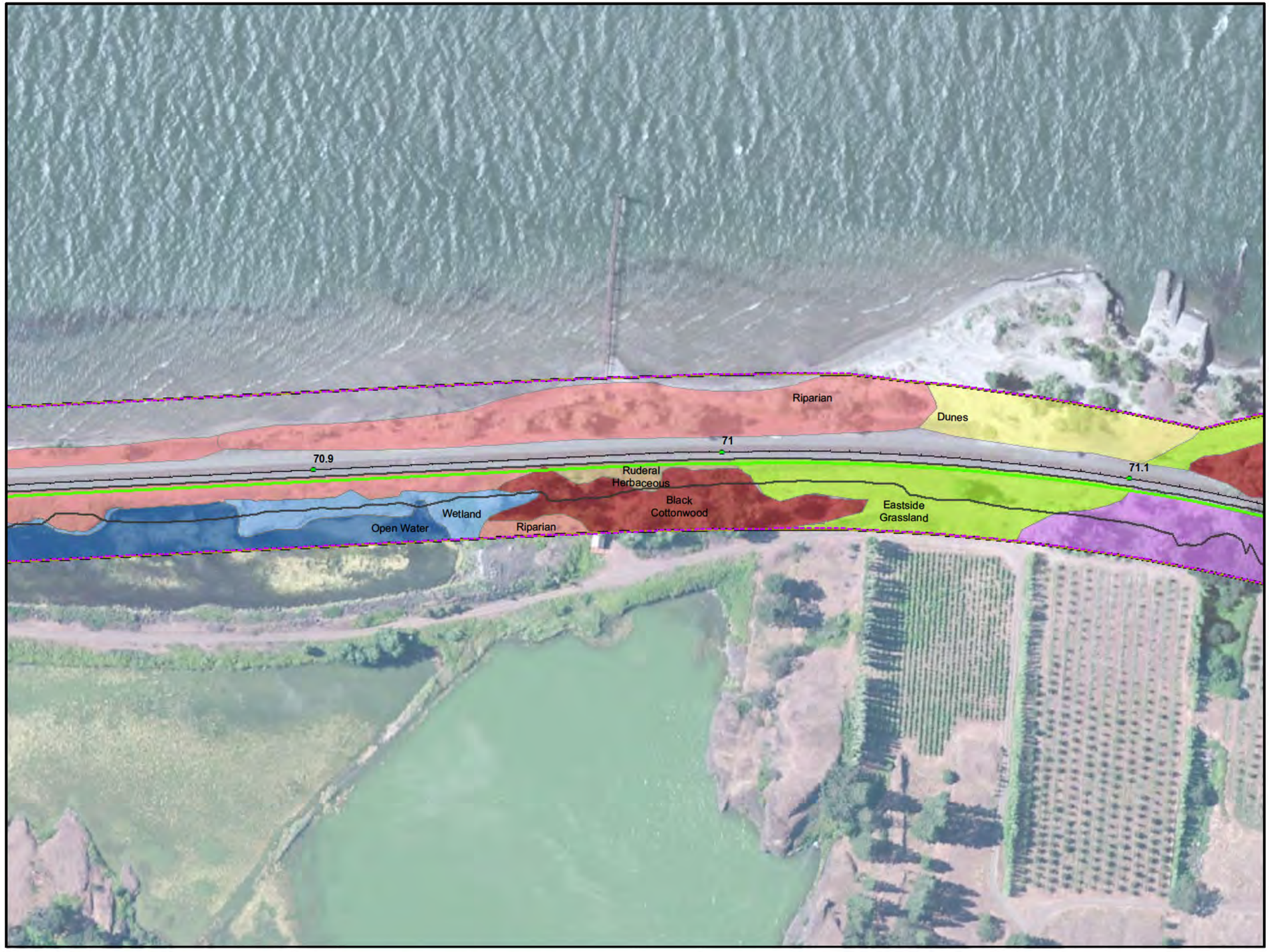

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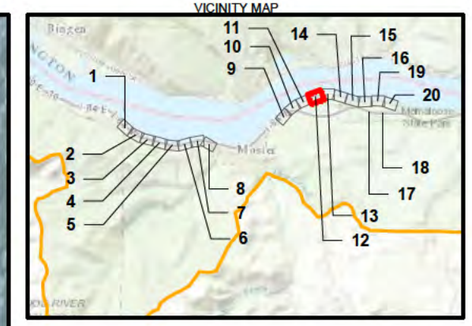

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
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Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

0 100
Feet

Figure 4-L
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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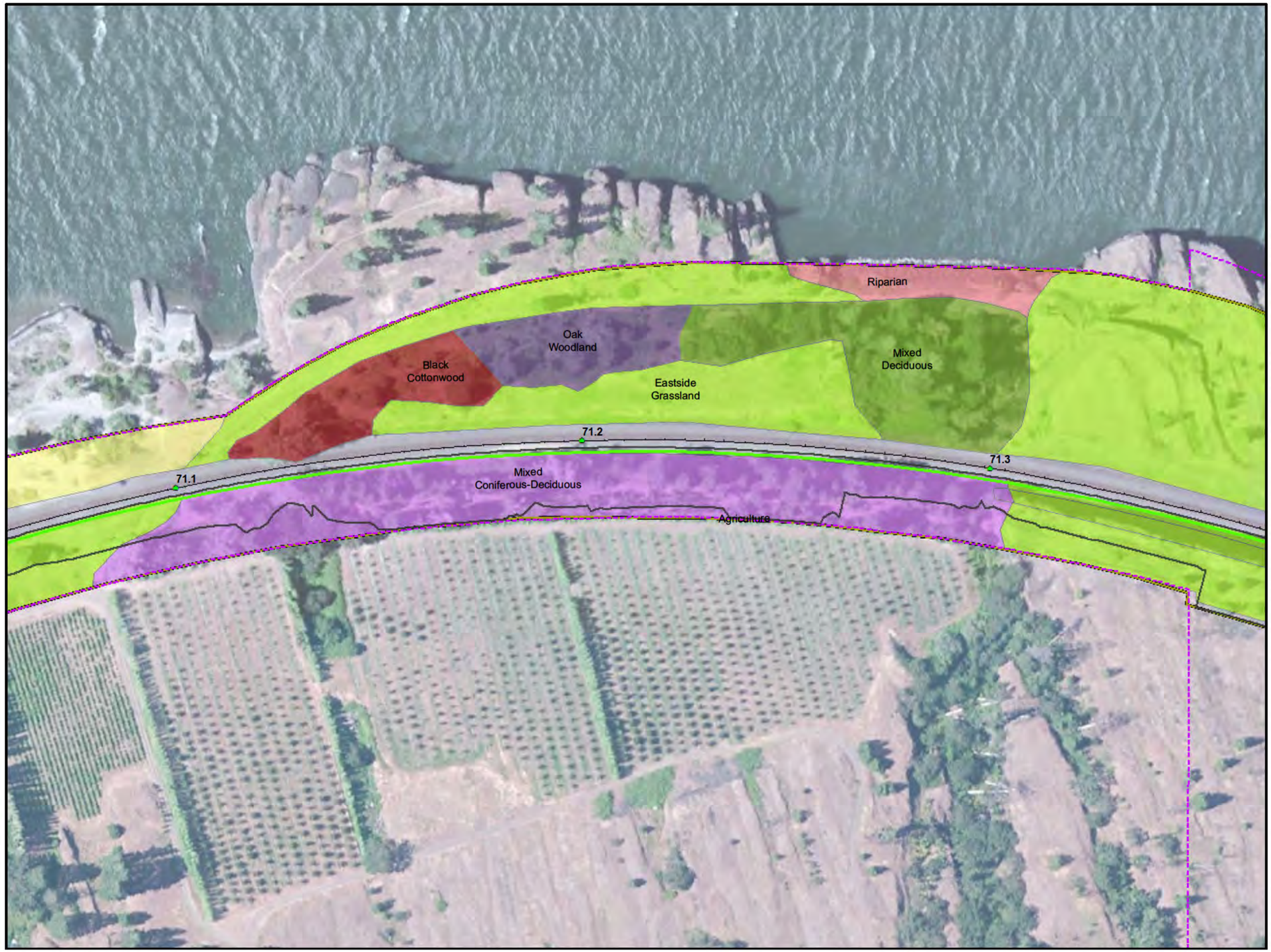

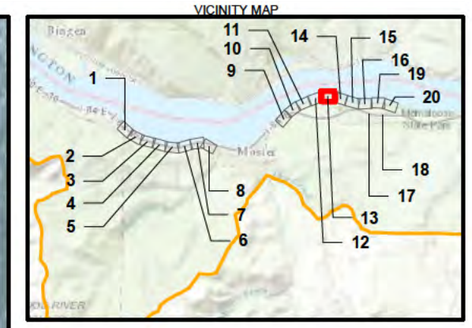

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
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Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

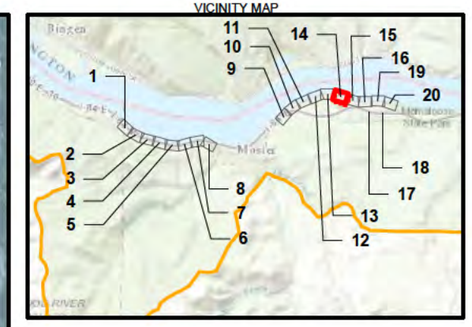
Other
- Talus

N

0 100
Feet

Figure 4-M
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

VICINITY MAP



LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
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- Designated Urban Area Boundary
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Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-N
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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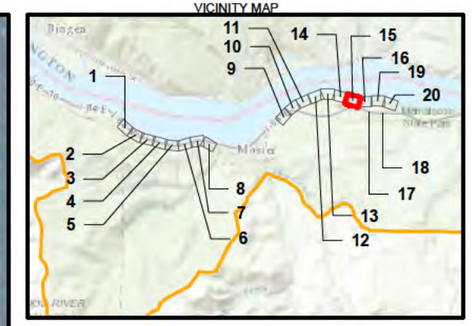

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
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- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-O
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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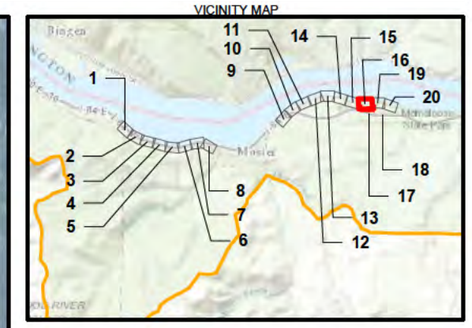

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
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Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-P
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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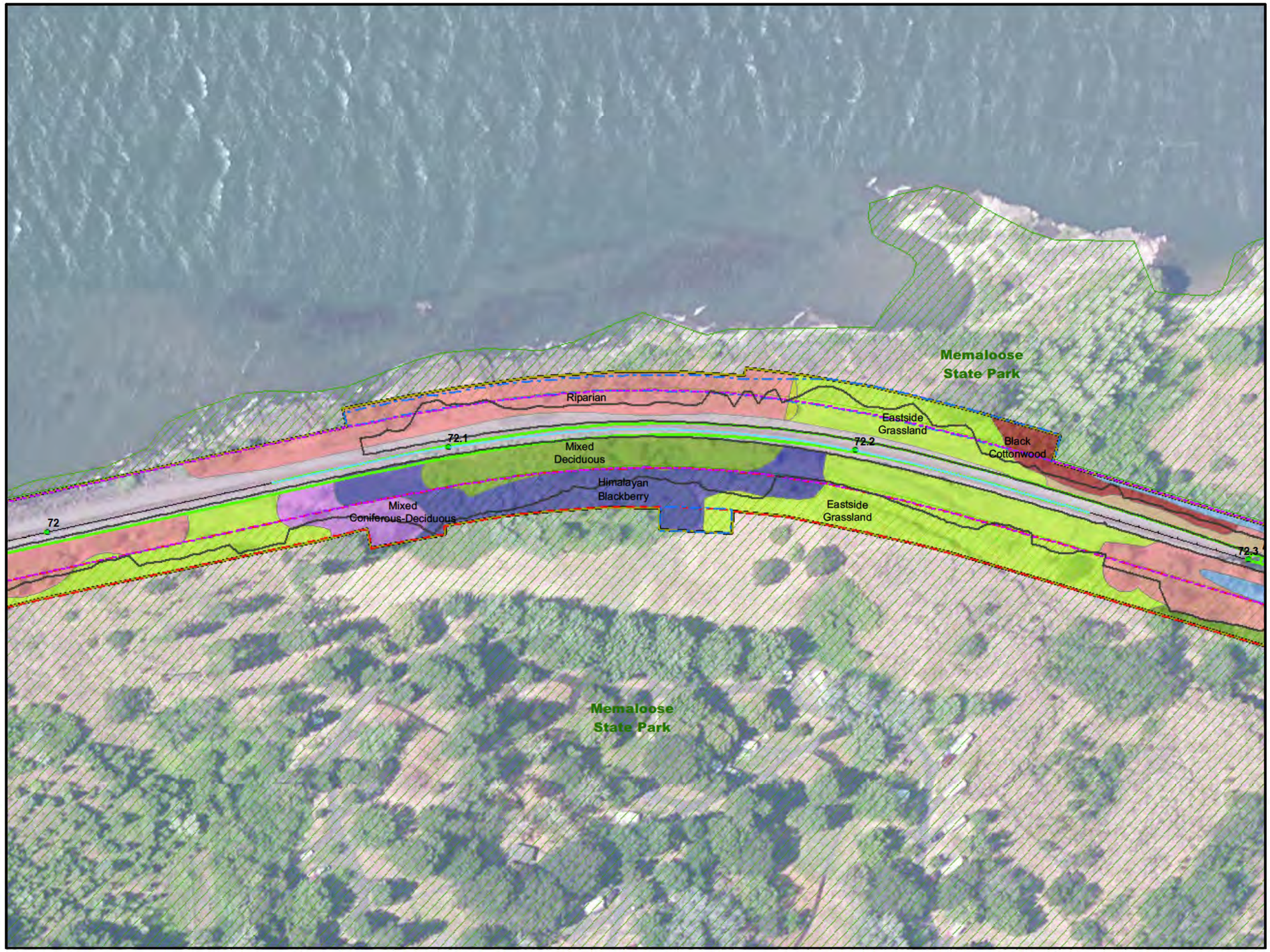

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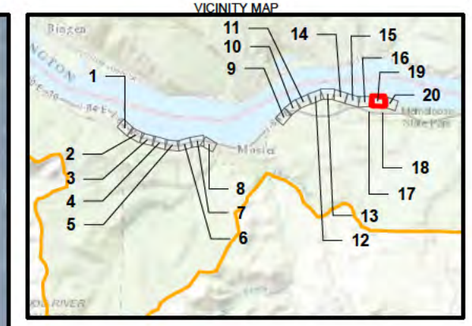

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
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- Proposed Temporary Construction Area
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- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-Q
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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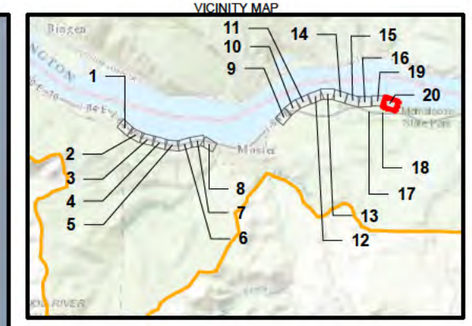

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Agricultural, Pasture, & Mixed Environs
- Agricultural
- Himalayan Blackberry

Eastside (Interior) Grasslands
- Dunes
- Eastside Grassland
- Ruderal Herbaceous

Eastside (Interior) Riparian-Wetland
- Riparian
- Wetland

Open Water - Lakes, Rivers, Streams
- Open Water

Ponderosa Pine Forest & Woodland (Includes Eastside Oak)
- Black Cottonwood
- Mixed Deciduous Forest
- Mixed Coniferous-Deciduous Forest
- Oregon White Oak Woodland

Other
- Talus

N

0 100
Feet

Figure 4-R
General Habitat Maps
Second Mainline Track Project
Union Pacific Railroad

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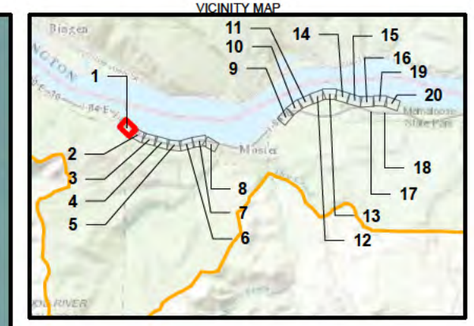

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-A
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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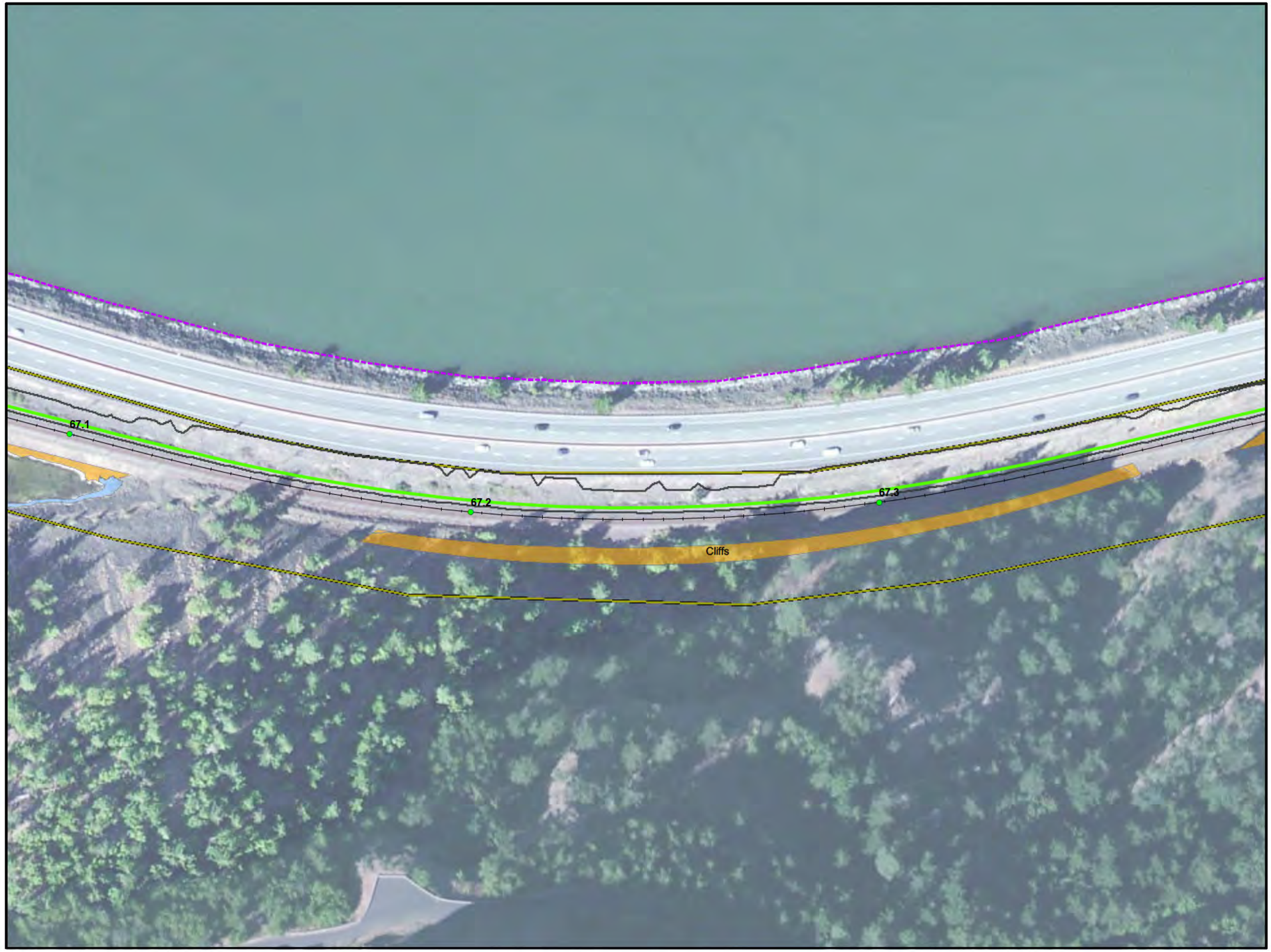

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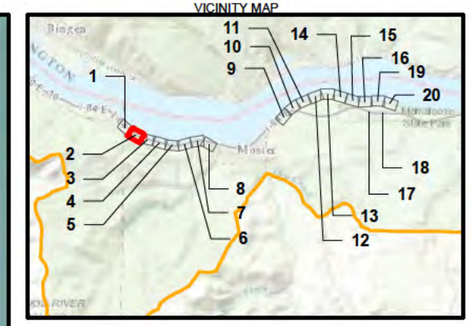

LEGEND

- Study Area Boundary
- Project Grading Limits
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- Existing Mainline Track
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- Proposed Mainline Track
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- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-B
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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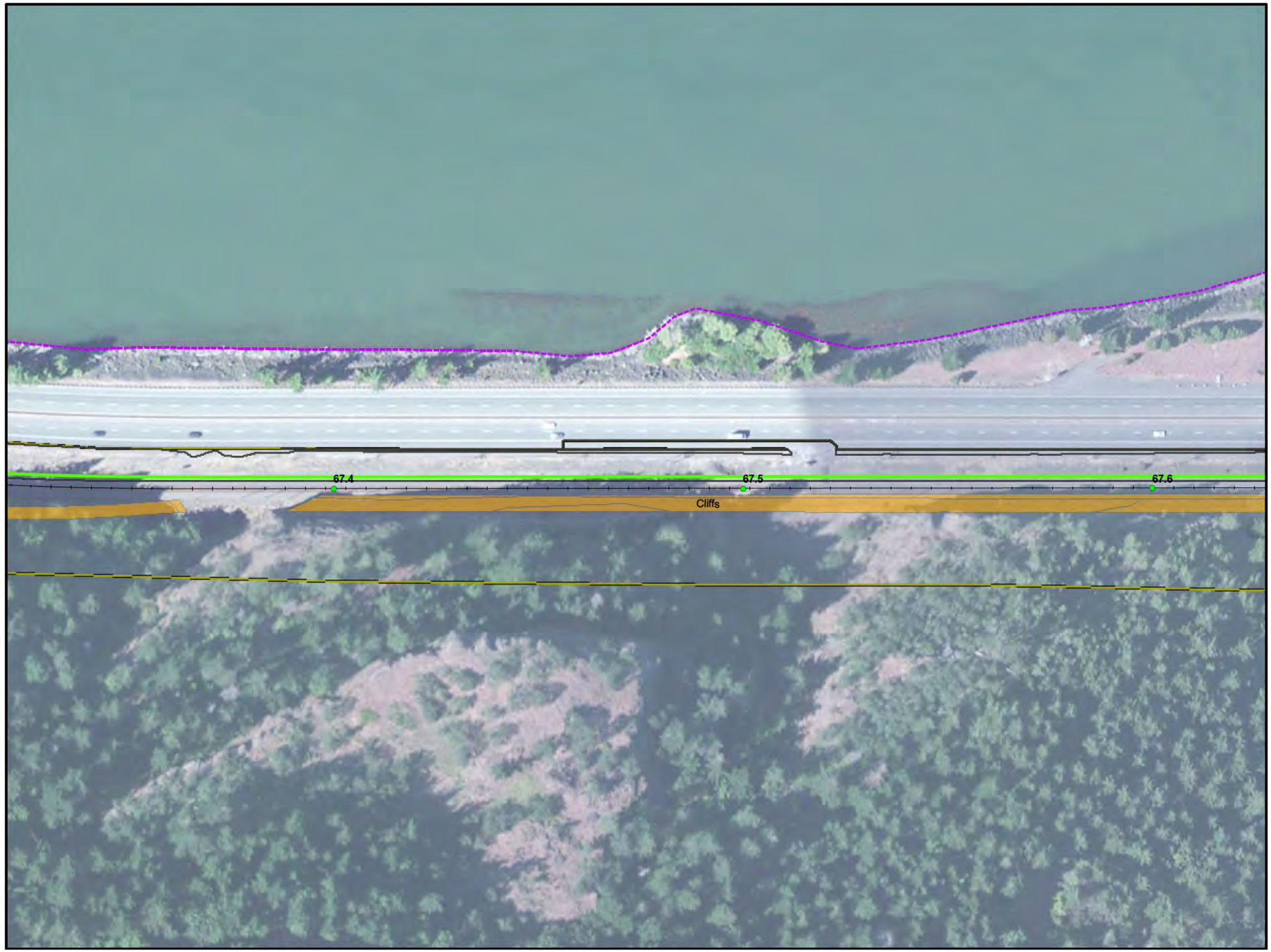

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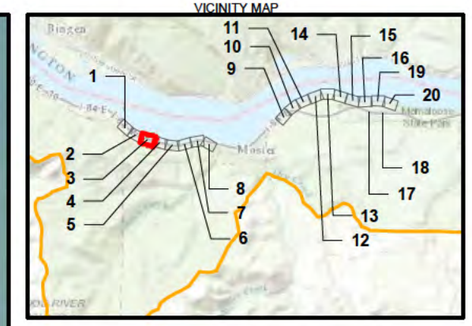

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-C
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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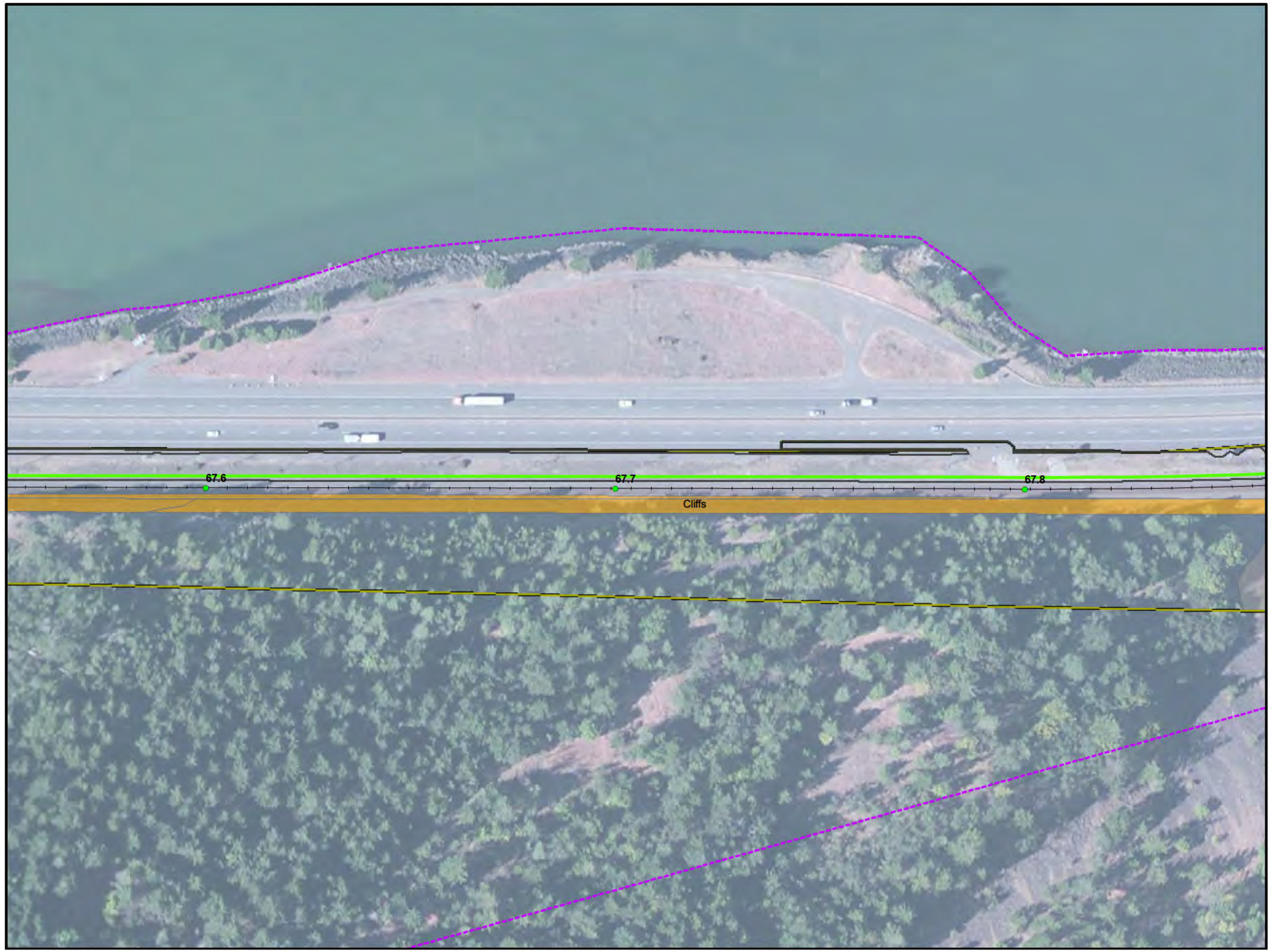

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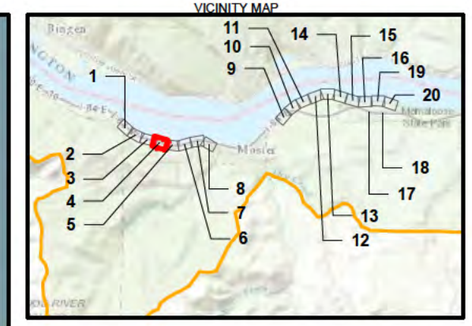

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-D
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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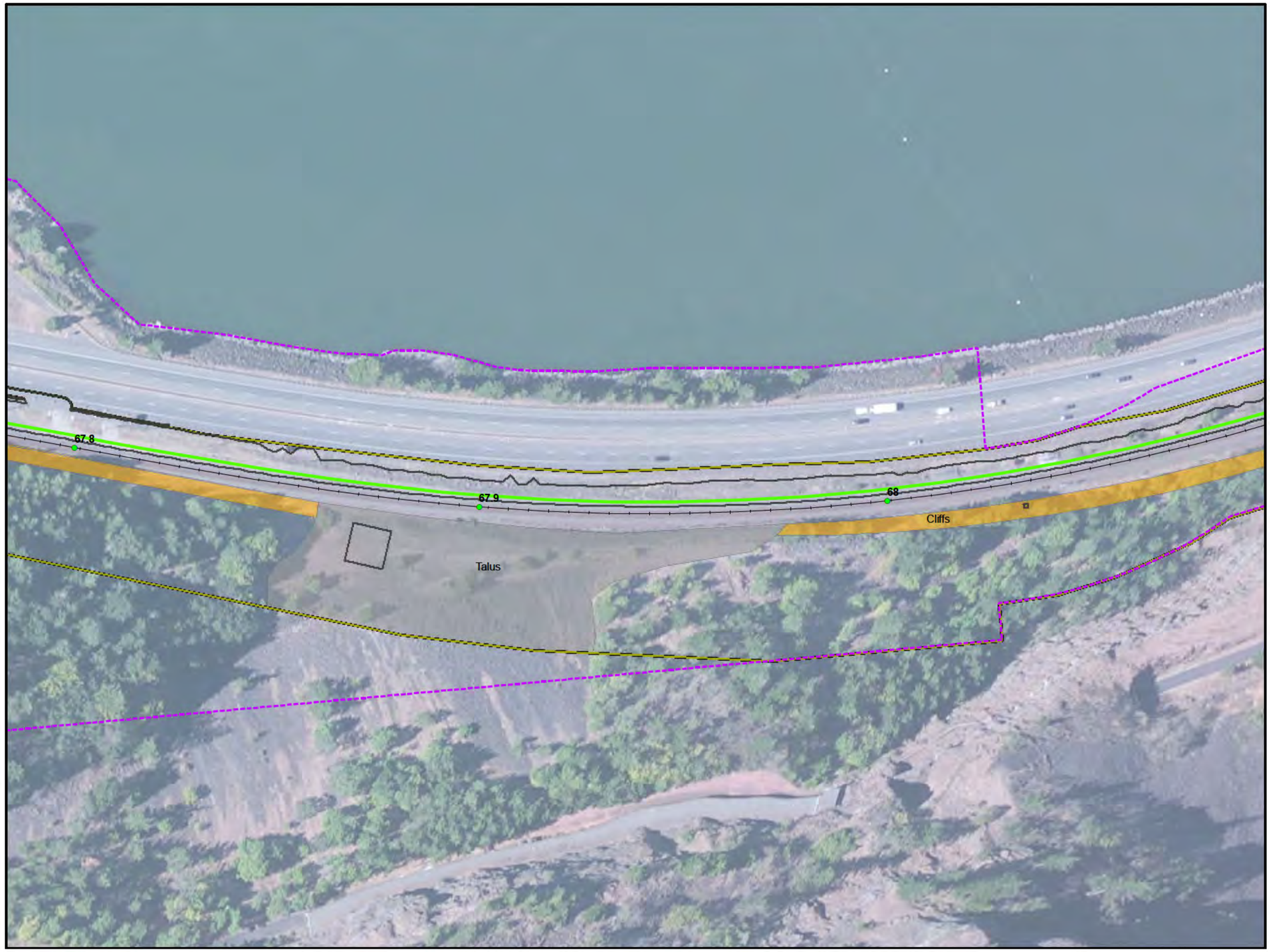

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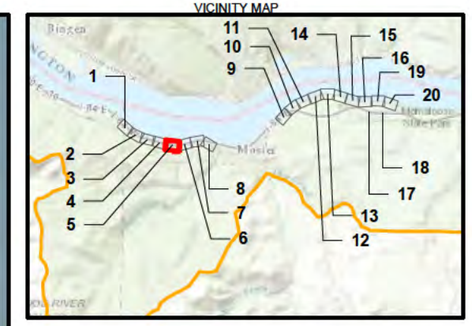

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-E
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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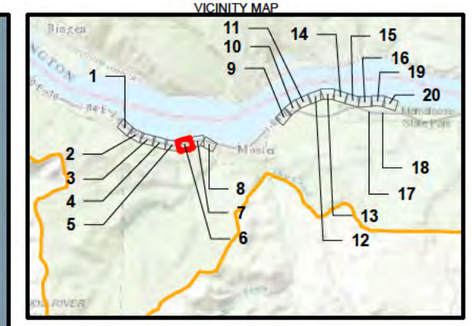

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-F
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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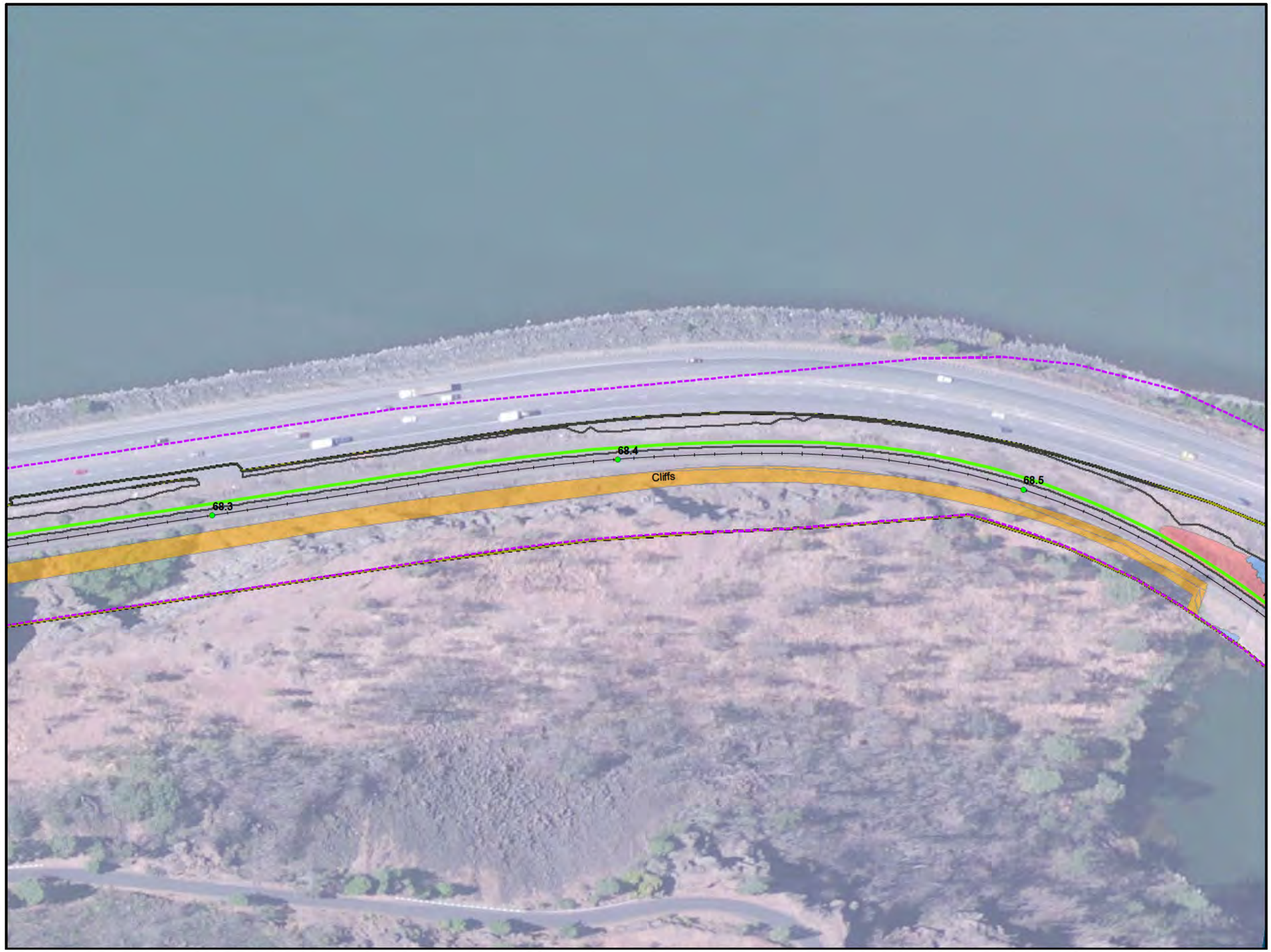

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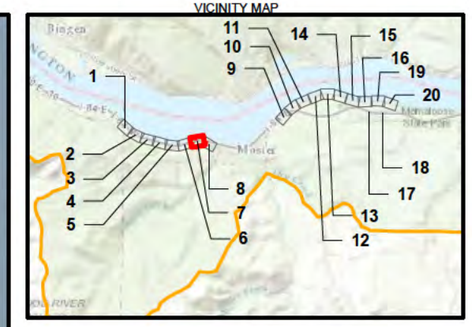

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-G
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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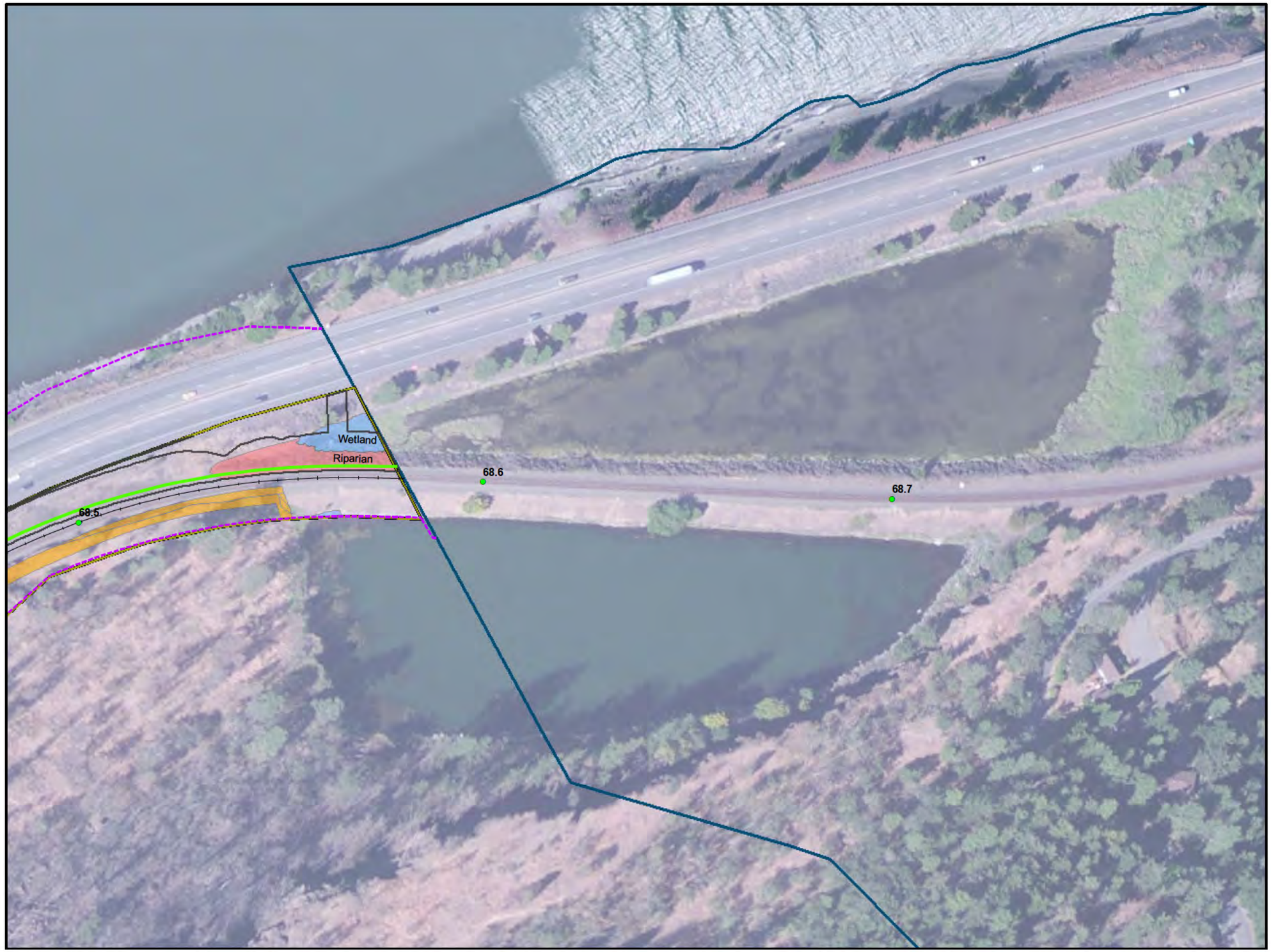

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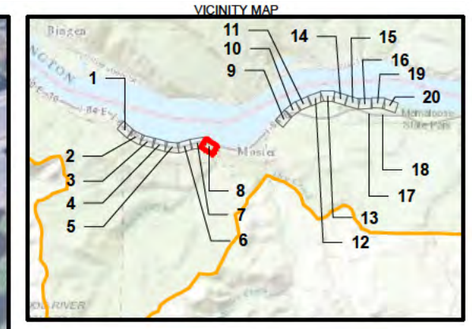

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-H
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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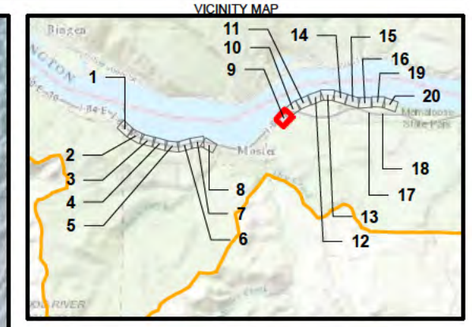

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-I
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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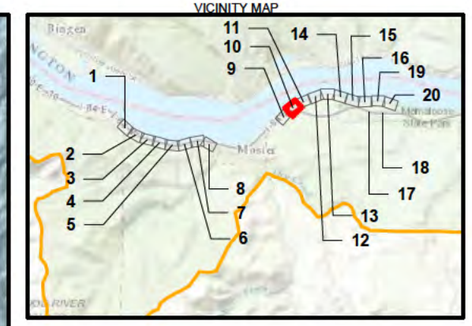

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-J
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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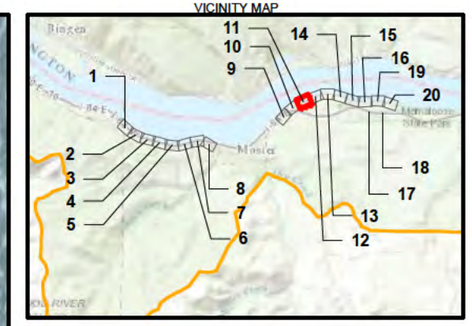
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

0 100
Feet

Figure 9-K
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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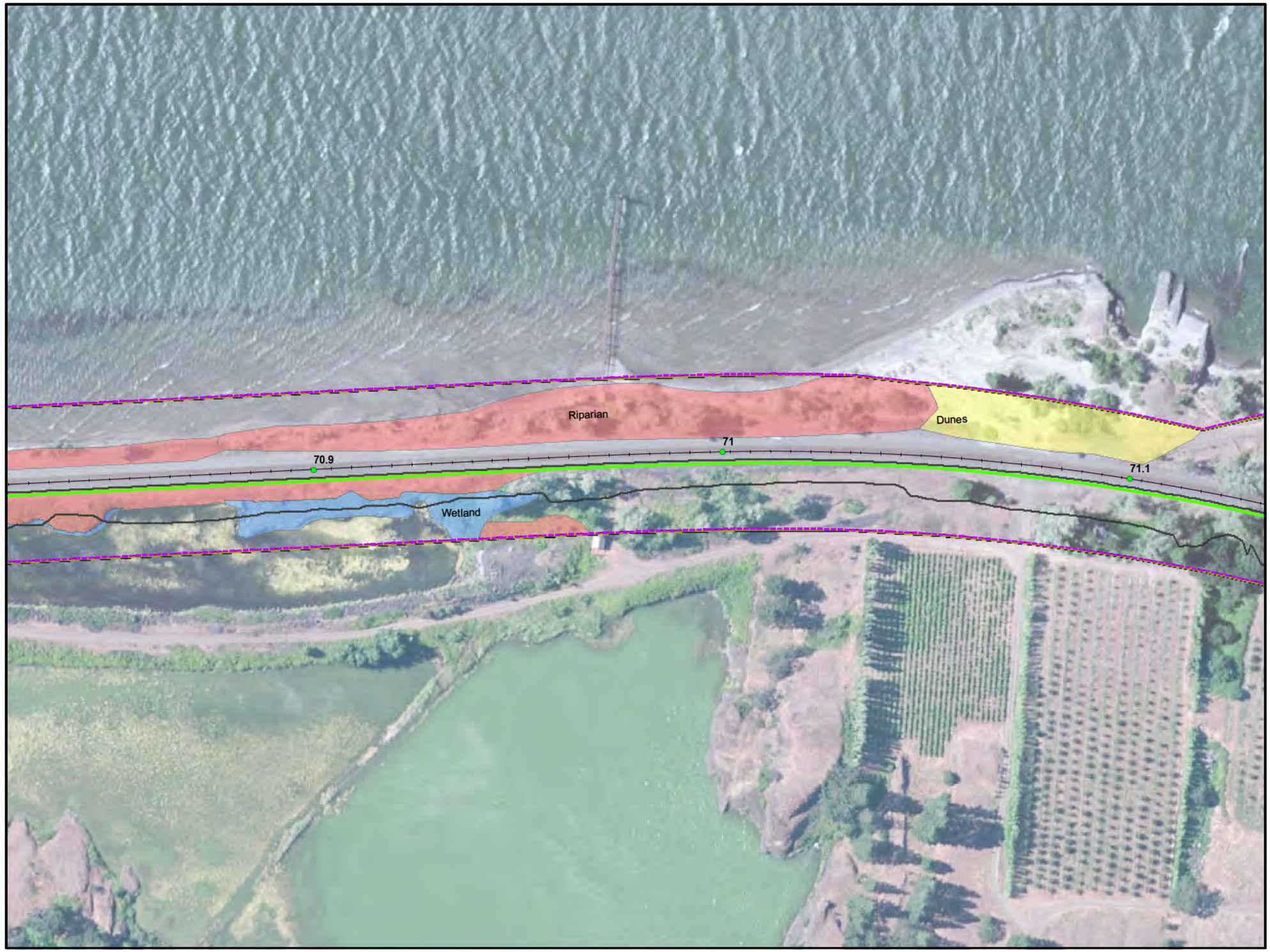

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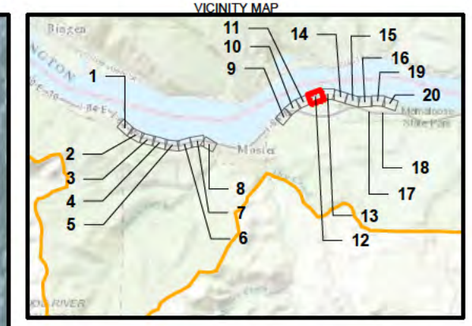

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

0 100
Feet

Figure 9-L
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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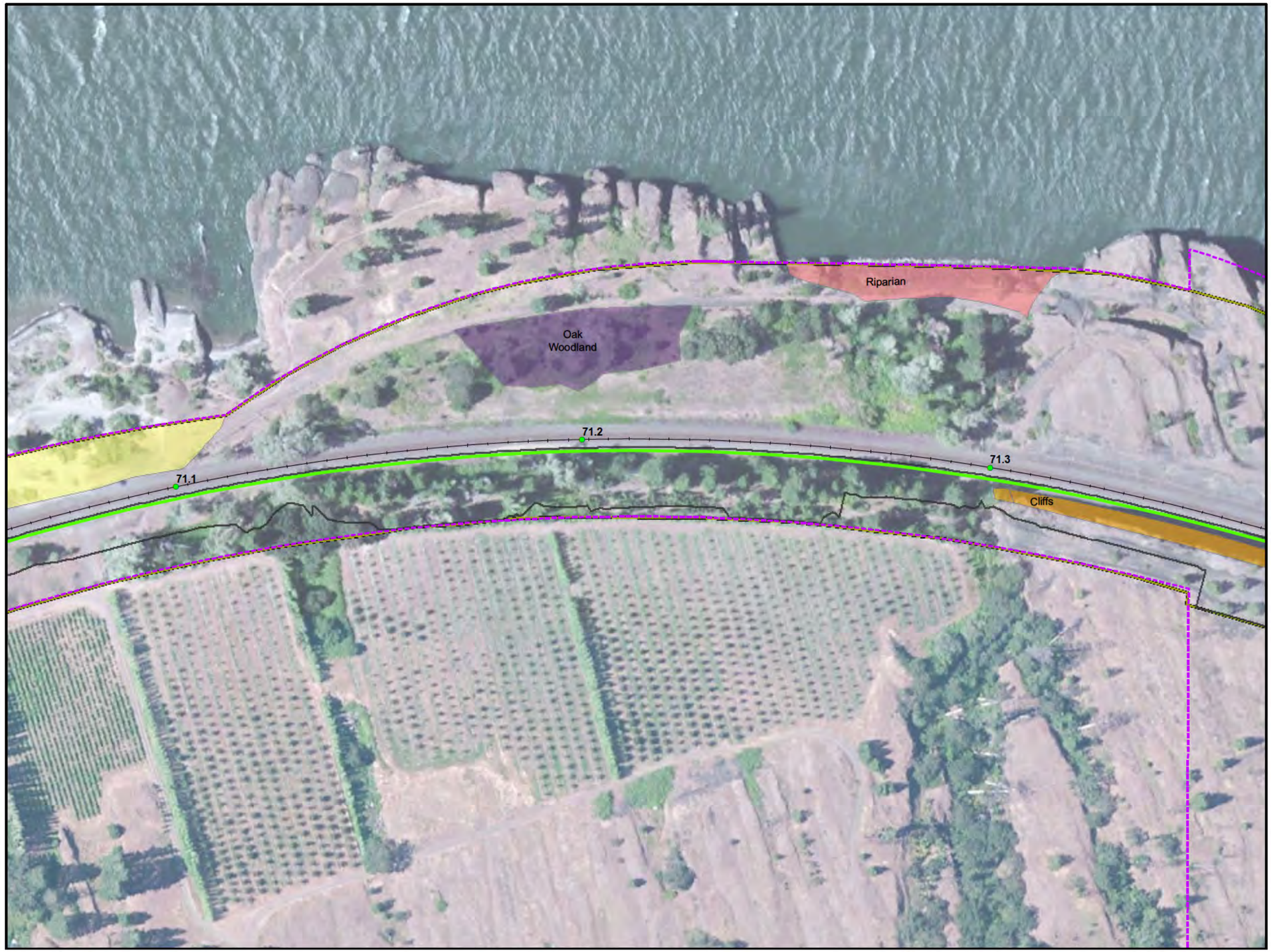

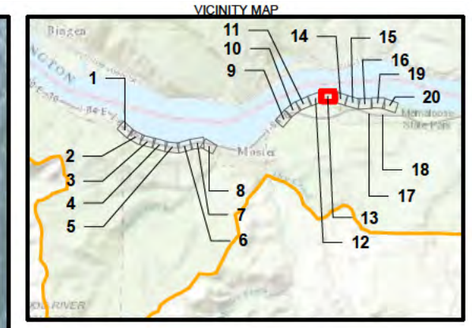

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-M
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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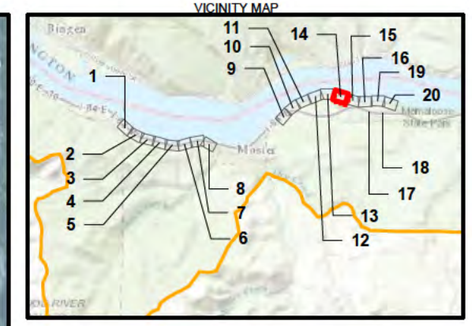
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-N
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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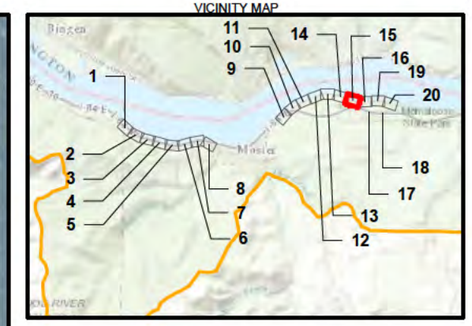

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-O
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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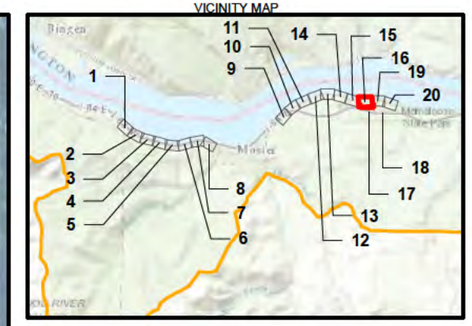

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-P
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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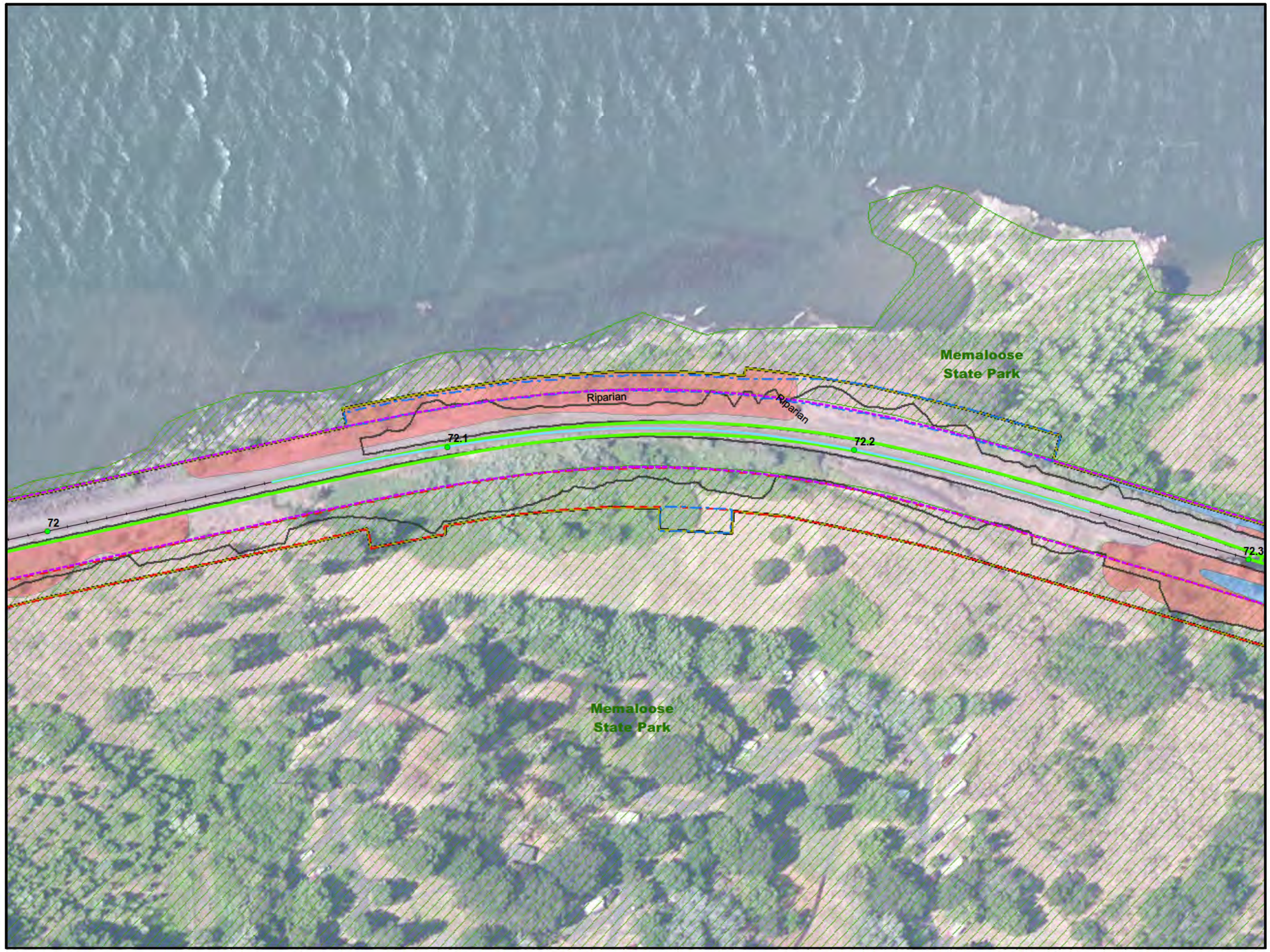

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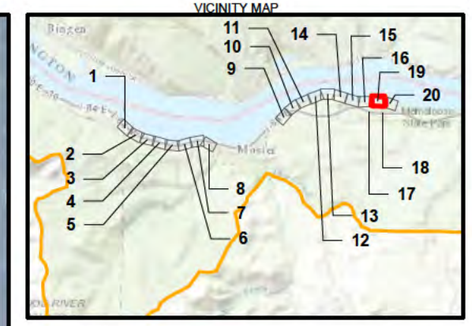

LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-Q
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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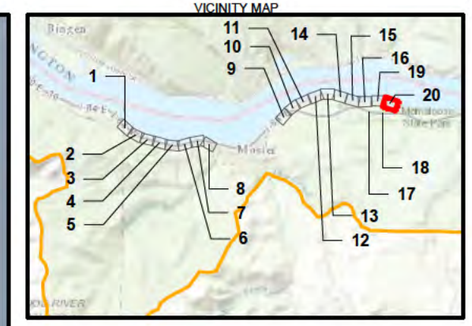
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Grading Limits
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- Existing UPRR ROW
- Proposed ROW Enhancement
- Proposed Temporary Construction Area
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Priority Habitats

- Cliffs
- Dunes
- Talus
- Riparian
- Wetland
- Oregon White Oak Woodland

N

0 100
Feet

Figure 9-R
Field Survey: Priority Habitats
Second Mainline Track Project
Union Pacific Railroad

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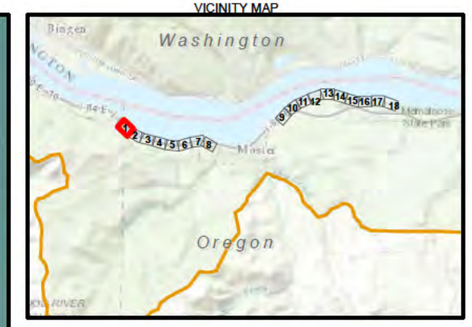

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-A
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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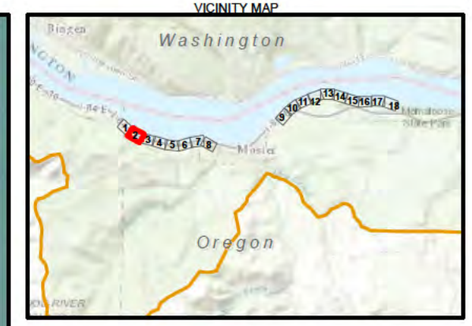
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-B
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

VICINITY MAP

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
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- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-C
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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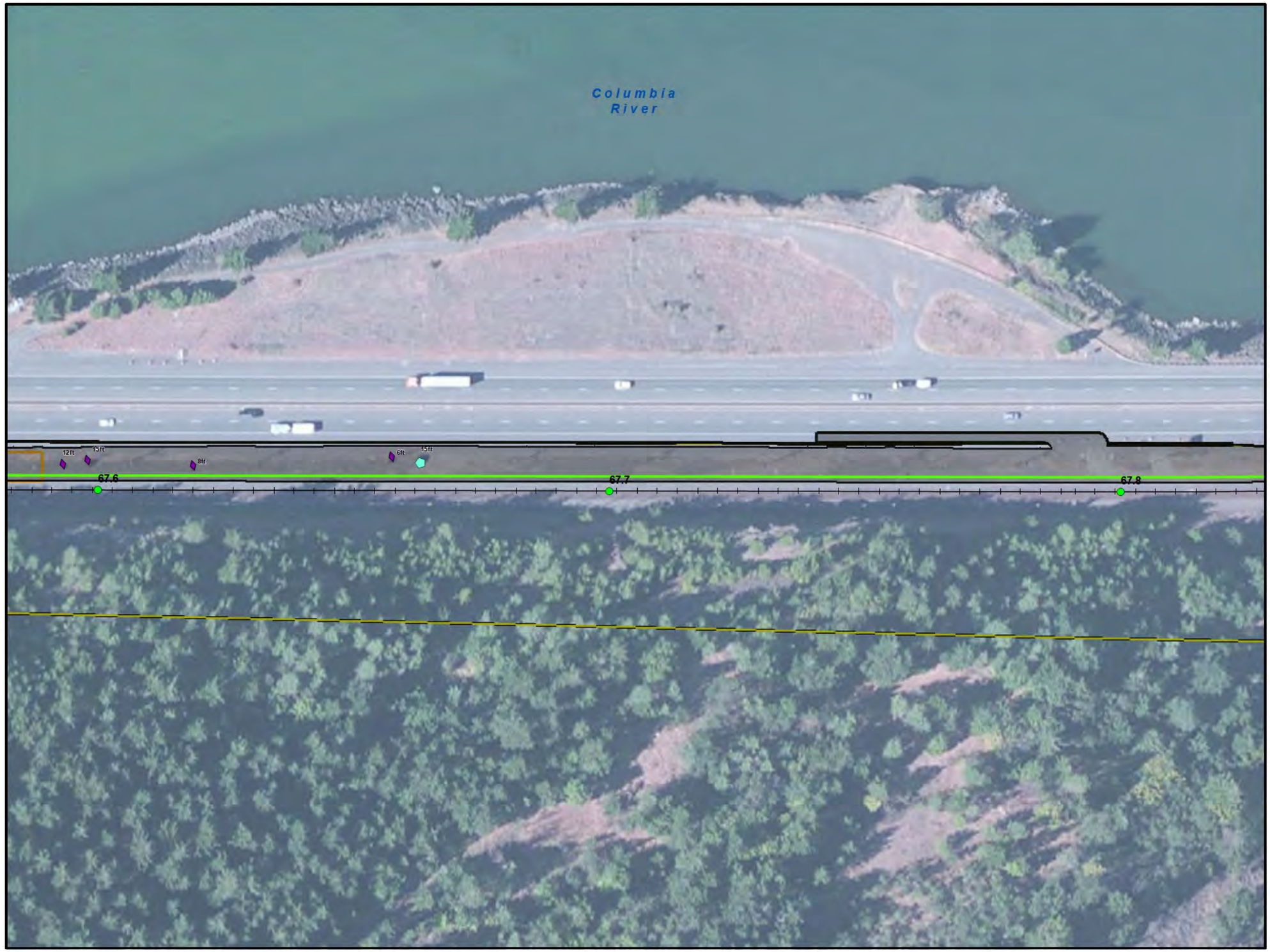

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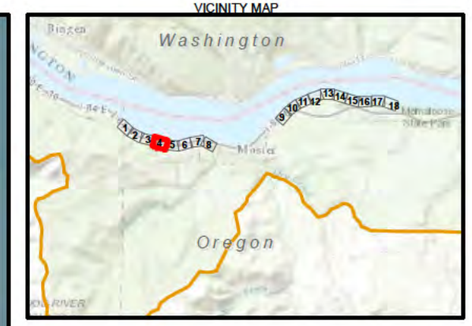

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-D
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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VICINITY MAP

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
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- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

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- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
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- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-E
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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VICINITY MAP

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
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- Memaloose State Park

Surveyed Tree Species

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- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
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- domestic pear (*Pyrus sp.*)
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- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-F
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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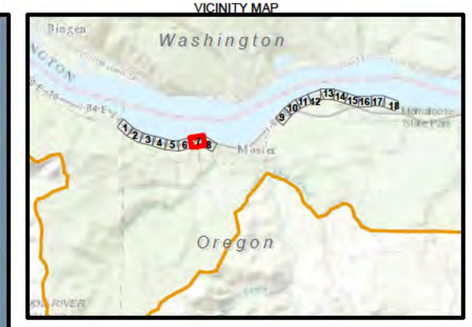
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
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- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

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- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
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- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
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- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-G
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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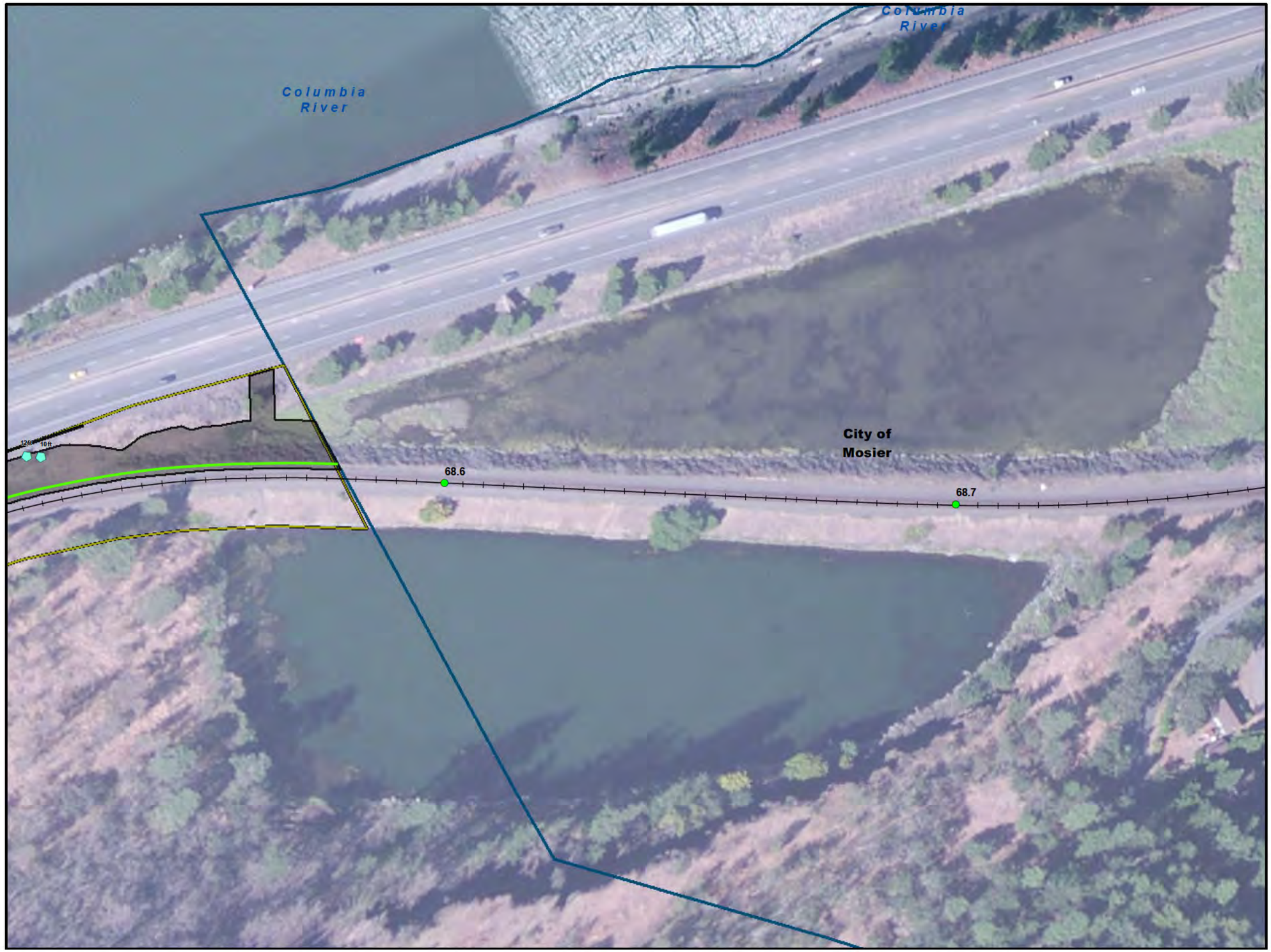

VICINITY MAP

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
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- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-H
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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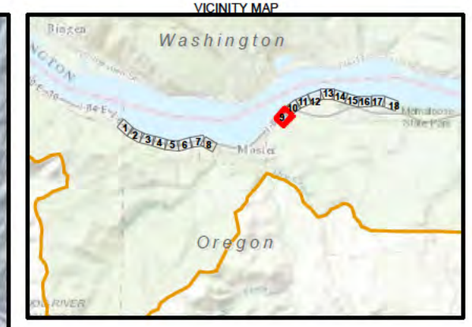
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
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- Memaloose State Park

Surveyed Tree Species

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- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
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- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-I
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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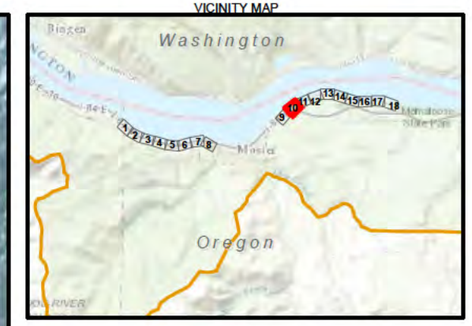
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
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- Proposed Mainline Track
- National Scenic Area Boundary
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- Memaloose State Park

Surveyed Tree Species

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- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-J
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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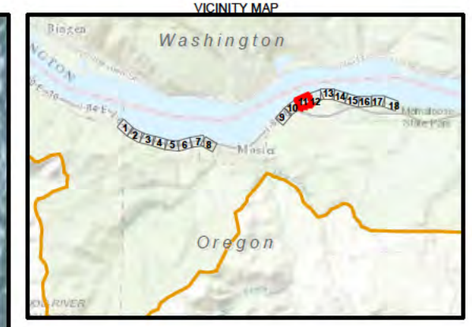
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
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Surveyed Tree Species

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- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
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- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-K
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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VICINITY MAP

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
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- Memaloose State Park

Surveyed Tree Species

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- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
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- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
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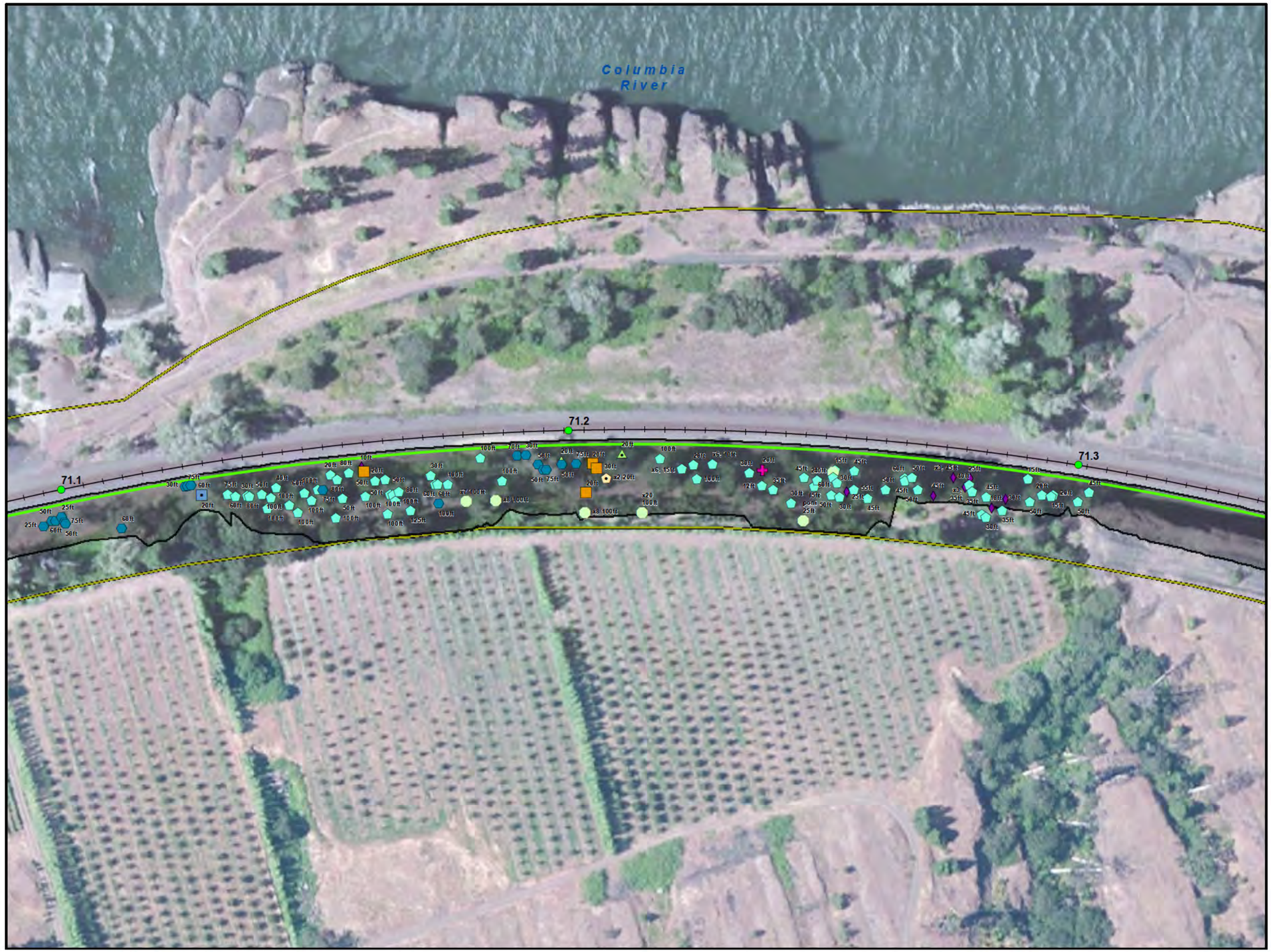
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-L
Tree Survey
Second Mainline Track Project
Union Pacific Railroad



VICINITY MAP

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
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- Proposed Mainline Track
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- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
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- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
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- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-M
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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VICINITY MAP

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
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- Proposed Mainline Track
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- Memaloose State Park

Surveyed Tree Species

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- Douglas hawthorn (*Crataegus douglasii*)
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- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
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- domestic pear (*Pyrus sp.*)
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- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-N
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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VICINITY MAP

LEGEND

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Surveyed Tree Species

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- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-O
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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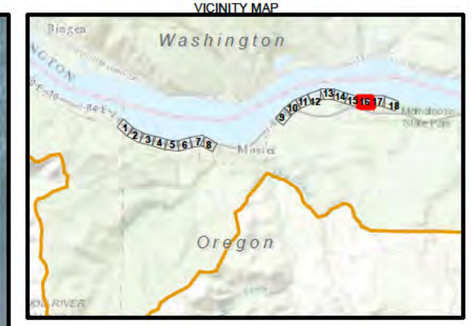
VICINITY MAP



LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
- Oregon ash (*Fraxinus latifolia*)
- domestic apple (*Malus sp.*)
- ponderosa pine (*Pinus ponderosa*)
- black cottonwood (*Populus balsamifera*)
- Lombardy poplar (*Populus nigra*)
- bitter cherry (*Prunus emarginata*)
- domestic plum (*Prunus sp.*)
- domestic pear (*Pyrus sp.*)
- Douglas-fir (*Psedotsuga menzeisii*)
- Oregon white oak (*Quercus garryana*)
- black locust (*Robinia pseudoacacia*)
- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

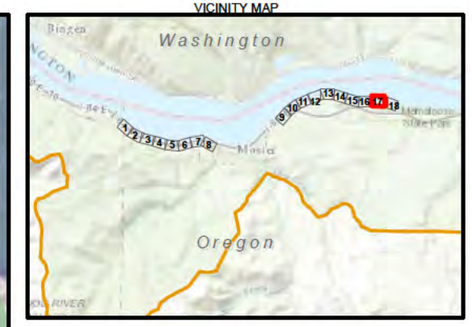
0 100
Feet

Figure 10-P
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

C:\USERS\JGOLMAN\ARCGIS\UPRR_MOSIER\CRITIGEN\MAPF LES\MOSIER_MAPFILES\BIO\FIGURE10A_10R_MOS ER_BIO_TREESURVEY_121814 MXD JGOLMAN 12/18/2014 7:47:51 PM

CH2MHILL

VICINITY MAP



LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

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- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
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- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-Q
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

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CH2MHILL

VICINITY MAP

LEGEND

- Study Area Boundary
- Project Area - Grading Limits
- Staging Areas
- Track Mileposts
- Existing Mainline Track
- Proposed Realigned Mainline Track
- Proposed Mainline Track
- National Scenic Area Boundary
- Designated Urban Area Boundary
- Memaloose State Park

Surveyed Tree Species

- bigleaf maple (*Acer macrophyllum*)
- red alder (*Alnus rubra*)
- beaked hazelnut (*Corylus cornuta*)
- Douglas hawthorn (*Crataegus douglasii*)
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- Sitka willow (*Salix sitchensis*)
- narrow-leaf willow (*Salix exigua*)
- Columbia River willow (*Salix fluviatilis*)
- Pacific willow (*Salix lasiandra*)
- Scouler's willow (*Salix scouleriana*)

N

0 100
Feet

Figure 10-R
Tree Survey
Second Mainline Track Project
Union Pacific Railroad

C:\USERS\JGOLMAN\ARCGIS\UPRR_MOSIER\CRITIGEN\MAPFILES\MOSIER_MAPFILES\BIO\FIGURE10A_10R_MOSIER_BIO_TREESURVEY_121814.MXD JGOLMAN 12/18/2014 7:47:51 PM

CH2MHILL

OLSSON ASSOCIATES

TECHNICAL MEMORANDUM

TO:	Wasco County Planning Department
CC:	Steve Cheney, UPRR
FROM:	Branden Strahm, PE, CFM
RE:	**UPRR's Mosier 2nd Mainline Track Project – Floodplain Application MP 66.98 to MP 72.35: Portland Subdivision**
DATE:	20 May 2016
PROJECT #:	2013-0974

This technical memorandum (TM) has been prepared to provide supporting documentation for the floodplain development permit application for UPRR's Mosier 2nd Mainline Track project located in Wasco County, Oregon. More specifically, this TM provides documentation that the proposed project meets the no-rise condition during the 100-year event. The proposed 2nd Mainline project involves widening of the existing track embankment approximately 30-ft along the north embankment for 12,200 feet to the west between MP 66.98 to 69.54 and 10,500 feet to the south between MP 70.45 and MP 72.35 to accommodate the new mainline track and access road. In addition, the project involves the extension of four culverts, two new bridges and a new culvert at Thompson's Lake. The proposed Mosier 2nd Mainline Track parallels the Columbia River along its left floodplain, with flow traversing in a southwesterly direction.

Project Location

The Mosier 2nd Mainline Track Project is located in rural Wasco County with a section of the project going through the City of Mosier. More specifically, the project is centered at latitude 45° 41" 27" N and longitude 121° 23' 8" W. The track runs generally in an east to west direction through the study area. The area in the immediate vicinity of the project is partially located within a FEMA-designated floodplain, as shown on the Special Flood Hazard Areas (SFHA) for Wasco, Oregon (Community Number 410229 B 01/02, effective date 24, September 1984) and the City of Mosier (Map Number 410234 0001 B, effective date 17 February 1989). Based on the SFHA, the Columbia River is shown as Zone A. The UPRR tracks are parallel to flow along the Columbia River floodplain. The list of drainage structures impacted by the 2nd Mainline are shown below:

UPRR Mile Post (MP)	Existing	Proposed Replacement Structures	Floodplain
Culvert 68.57	1 @ 42-inch CMP	8-ft Extension of existing CMP	A
Bridge 68.88	90-ft long, Bridge	Maintain existing and construct a new 90-ft Bridge over Rock Creek	AE
Bridge 69.35	100-ft long, Bridge	Maintain existing and construct a new 210-ft Bridge over Mosier Creek	A
Culvert 70.67	1 @ 24-inch CMP	16-ft Extension of existing CMP	X
Culvert 70.93	1 @ 36-inch CMP	12-ft Extension of existing CMP	X
Culvert 71.84	None	2 @ 60-inch SSPs added for fish passage	A
Culvert 71.89	1 @ 42-inch CMP	28-ft Extension of existing CMP	A

Columbia River

Olsson's obtained the most up to date LIDAR data available from the United States Geological Survey National Map Data Server. Cross Section were obtained from the LIDAR data and importing into HEC-RAS (Pre-Project). Proposed track embankment profile were then updated into the exiting LIDAR data to incorporate UPRR's proposed 2nd Mainline Track (Post-Project). To calibrate the model Olsson's also obtained the U.S. Army Corps of Engineers' Hydrologic & River Engineering Section – Bonneville Dam & Reservoir Hydrologic & Hydraulic Analysis report, for the Columbia River System, dated October 1990. The USACE report documents the Columbia River 100-year Water Surface Elevations (WSE). The proposed Mosier 2nd Mainline Track Project is located between River Mile (RM) 173.1 and RM 178.3. For comparison purposes, Table 2 shows the UPRR Mile Post (MP), Columbia River Mile (RM), and the corresponding Pre-Project and Post- Project Columbia River 100-year WSE.

Table 2: USACE Columbia River 100-year Water Surface Elevations (WSE) in NAVD 1988.

UPRR Mile Post (MP)	Columbia River Mile (RM)	Columbia River Pre-Project WSE_{100} (ft)	Columbia River Post-Project WSE_{100} (ft)	Δ WSE_{100}
MP 67.48	173.1	92.49	92.49	0.00
MP 68.30	174.0	92.67	92.67	0.00
MP 68.90	174.6	92.83	92.83	0.00
MP 69.50	175.2	92.88	92.88	0.00
MP 70.65	176.4	93.24	93.24	0.00
MP 70.90	176.6	93.34	93.34	0.00
MP 71.30	177.0	93.39	93.39	0.00
MP 71.65	177.4	93.93	93.93	0.00
MP 71.95	177.7	94.02	94.02	0.00
MP 72.60	178.3	94.14	94.14	0.00

See attached Sheets 1 - 2, showing topographic work map with the Columbia River HEC-RAS cross sections and the location of the proposed Mosier 2nd Mainline Track project. The fill required for the proposed 2nd Mainline Track does not encroach into the Columbia River channel and is located only in areas where the Columbia River Storage areas are located along the UPRR tracks, thus the amount of fill is negligible. The project was designed such that it minimizes impacts to the Columbia River and meets the no-adverse impact condition during the 100-year runoff event. Additionally, please find attached the proposed Mosier 2nd Mainline Track Plans, and the FEMA Flood Insurance Rate Map (FIRM).

UPRR Bridge 68.88: Portland Subdivision

Presently, Bridge 68.88 consists of a 3-span, 90-ft long Steel Beam – Open Deck (BM-OD) Bridge. The proposed structure consists of maintaining existing mainline bridge and use 3 @ 30-ft spans of Prestressed Concrete Box Girder bridge, for a total length of 90 feet for the 2nd Mainline immediately upstream. A hydraulic evaluation was performed on the existing and proposed bridges. The 100-year design discharge of 1,705 cfs was taken directly from the published regulatory discharges used in the City of Mosier Flood Insurance Study (FIS) for Rock Creek.

Based on the hydrologic and hydraulic evaluation, the WSE_{100} at the upstream face of the existing bridge was computed to be 94.99 ft (NAVD 1988). It is noted that the lowest low chord elevation of the existing bridge is 99.14 ft, and the lowest base-of-rail elevation is 102.99 ft. The proposed bridge low chord elevation is 99.14, equal to the existing. The corresponding computed WSE_{100} associated with the proposed bridge is 94.98 ft. As such, the proposed bridge results in a 0.01' reduction in WSE, meeting the regulatory no-rise requirement during the 100-year runoff event.

UPRR Bridge 69.35: Portland Subdivision

Presently, Bridge 69.35 consists of a 1-span, 100-ft long Through Plate Girder – Open Deck (TPG-OD) Bridge with vertical abutments. The proposed structure consists of maintain existing mainline bridge and use 2 @ 30-ft PCB Girder (east), 1 @ 120-ft TPG-BD, and 1 @ 30-ft PCB (west) bridge, for a total length of 210 feet for the 2nd Mainline immediately upstream. A hydraulic evaluation was performed on the existing and proposed bridges. The 100-year design discharge of 9,920 cfs was computed based on the State of Oregon Water Resources Department – Open File Report SW 6-001: *Estimation of Peak Discharges for rural, unregulated streams in Eastern Oregon* for Mosier Creek.

Based on the hydrologic and hydraulic evaluation, the WSE_{100} at the upstream face of the existing bridge was computed to be 94.59 ft (NAVD 1988). It is noted that the lowest low chord elevation of the existing bridge is 100.06 ft, and the lowest base-of-rail elevation is 103.18 ft. The proposed bridge low chord elevation is 98.49. The corresponding computed WSE_{100} associated with the proposed bridge is 94.62 ft. As such, the proposed bridge results in a 0.03' increase in WSE, meeting the regulatory requirements during the 100-year runoff event.

Summary

In summary, the proposed Mosier 2nd Mainline Track Project which involves widening of the existing track embankment, extension of four culverts, two new bridges and a new culvert at Thompson's Lake meets the no-adverse impact condition during the 100-year runoff event along the Columbia River. In addition the new bridge at MP 68.88 over Rock Creek meets the regulatory no-rise requirement along Rock Creek.

If you have any questions concerning this project, or need additional information, please contact me at (402) 458-5015 or bstrahm@olssonassociates.com, at your earliest convenience. Please refer your future correspondence to **UPRR's Mosier 2nd Mainline Track Project.**

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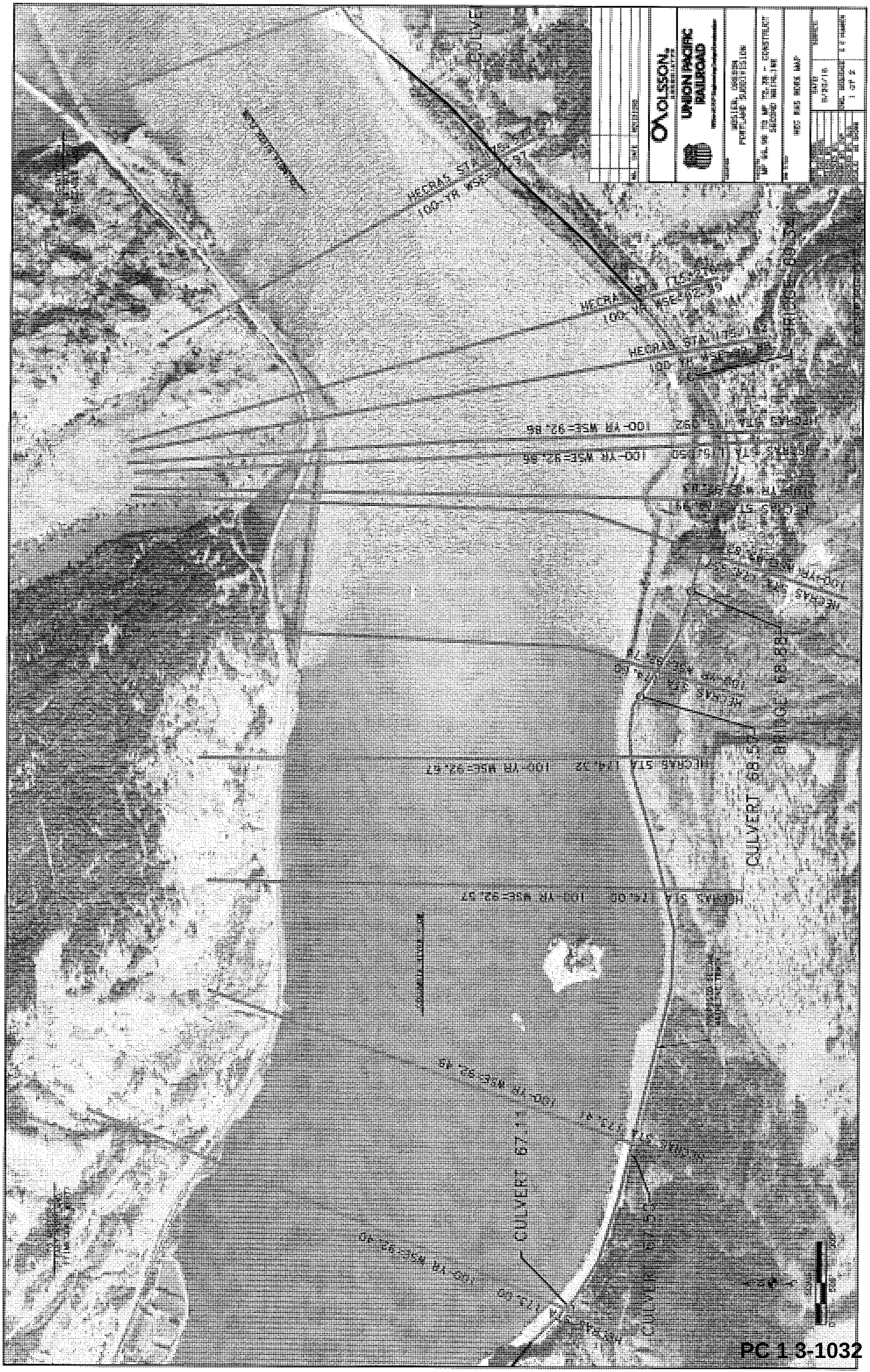
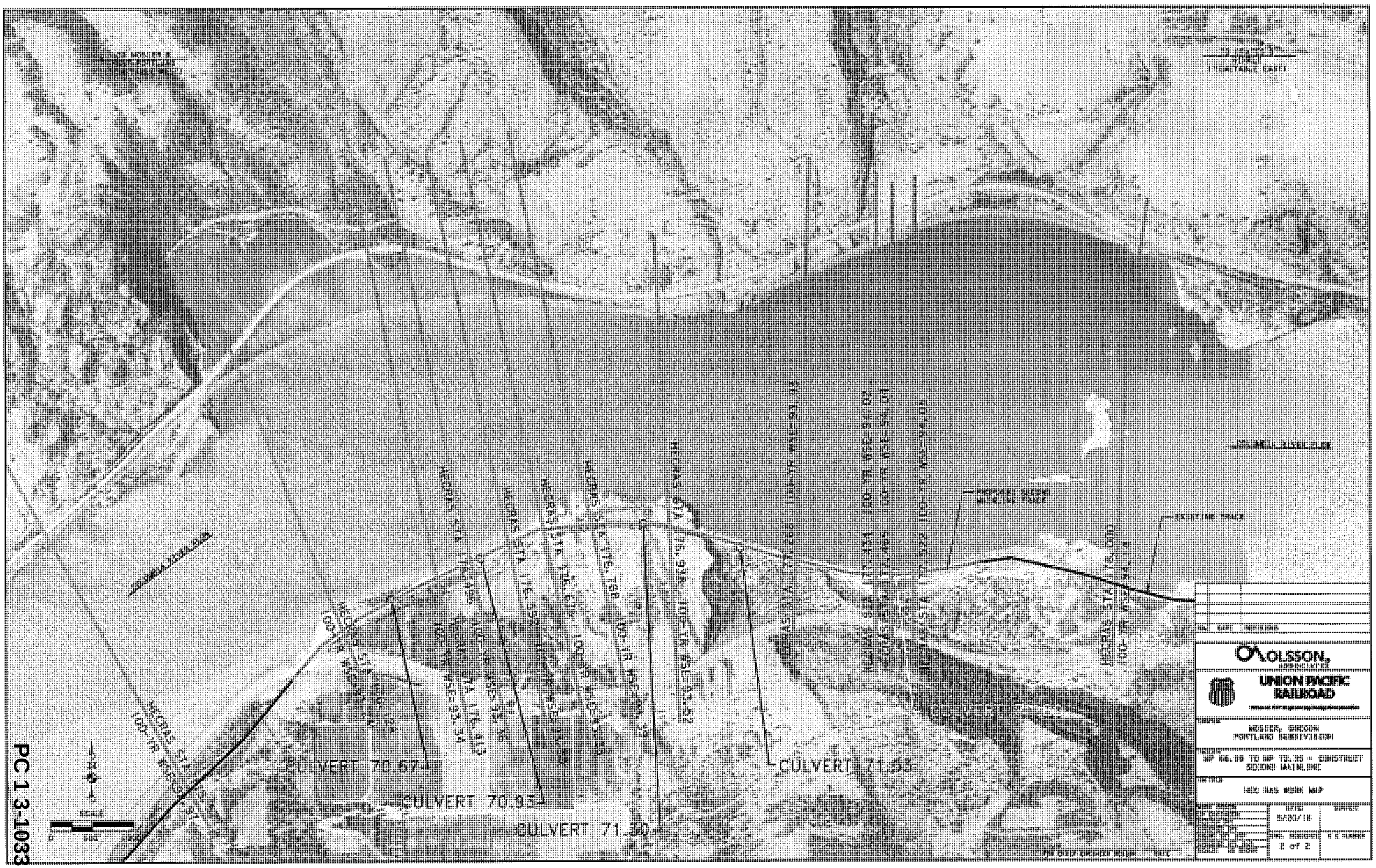
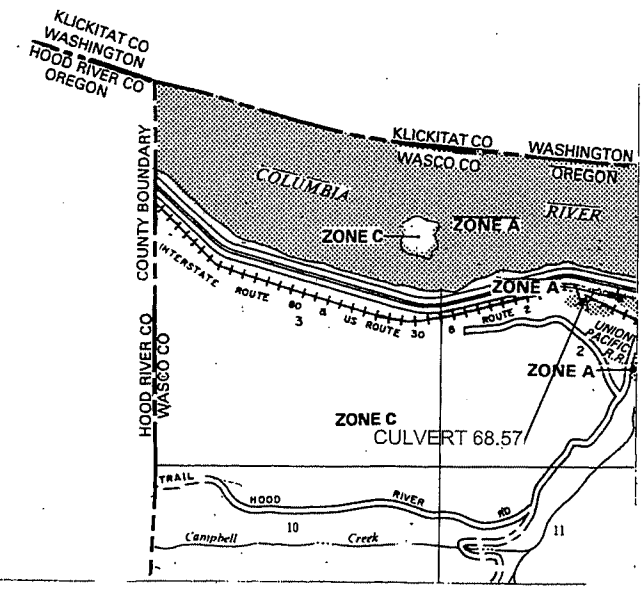

OLSSON
UNION PACIFIC RAILROAD
HECRAS STA 174.32 100-YR WSE=92.67
HECRAS STA 174.00 100-YR WSE=92.57
100-YR WSE=92.86
100-YR WSE=92.86
CULVERT 68.52
BRIDGE 68.88
CULVERT 67.41

PC 1 3-1032


COLUMBIA RIVER FLOW
EXISTING TRACK
HECRAS STA 178.000 100-YR WSE=94.14
HECRAS STA 177.522 100-YR WSE=94.05
HECRAS STA 177.469 100-YR WSE=94.04
HECRAS STA 177.434 100-YR WSE=94.02
HECRAS STA 177.268 100-YR WSE=93.93
HECRAS STA 176.938 100-YR WSE=93.62
HECRAS STA 176.788 100-YR WSE=93.39
HECRAS STA 176.670 100-YR WSE=93.38
HECRAS STA 176.592 100-YR WSE=93.38
HECRAS STA 176.496 100-YR WSE=93.36
HECRAS STA 176.413 100-YR WSE=93.34
HECRAS STA 176.124 100-YR WSE=93.24
CULVERT 70.57
CULVERT 70.93
CULVERT 71.30
CULVERT 71.55
SCALE
OLSSON ASSOCIATES
UNION PACIFIC RAILROAD
MOSIER, OREGON
PORTLAND SUBDIVISION
MP 64.99 TO MP 73.35 - CONSTRUCT SECOND MAINLINE
HEC RAS WORK MAP
5/20/16
2 of 2

PC 1 3-1033

UPRR Mosier Second Mainline Project



APPROXIMATE SCALE
2000 0 2000 4000 6000 FEET

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASCO CO., OR
(UNINC. AREA)

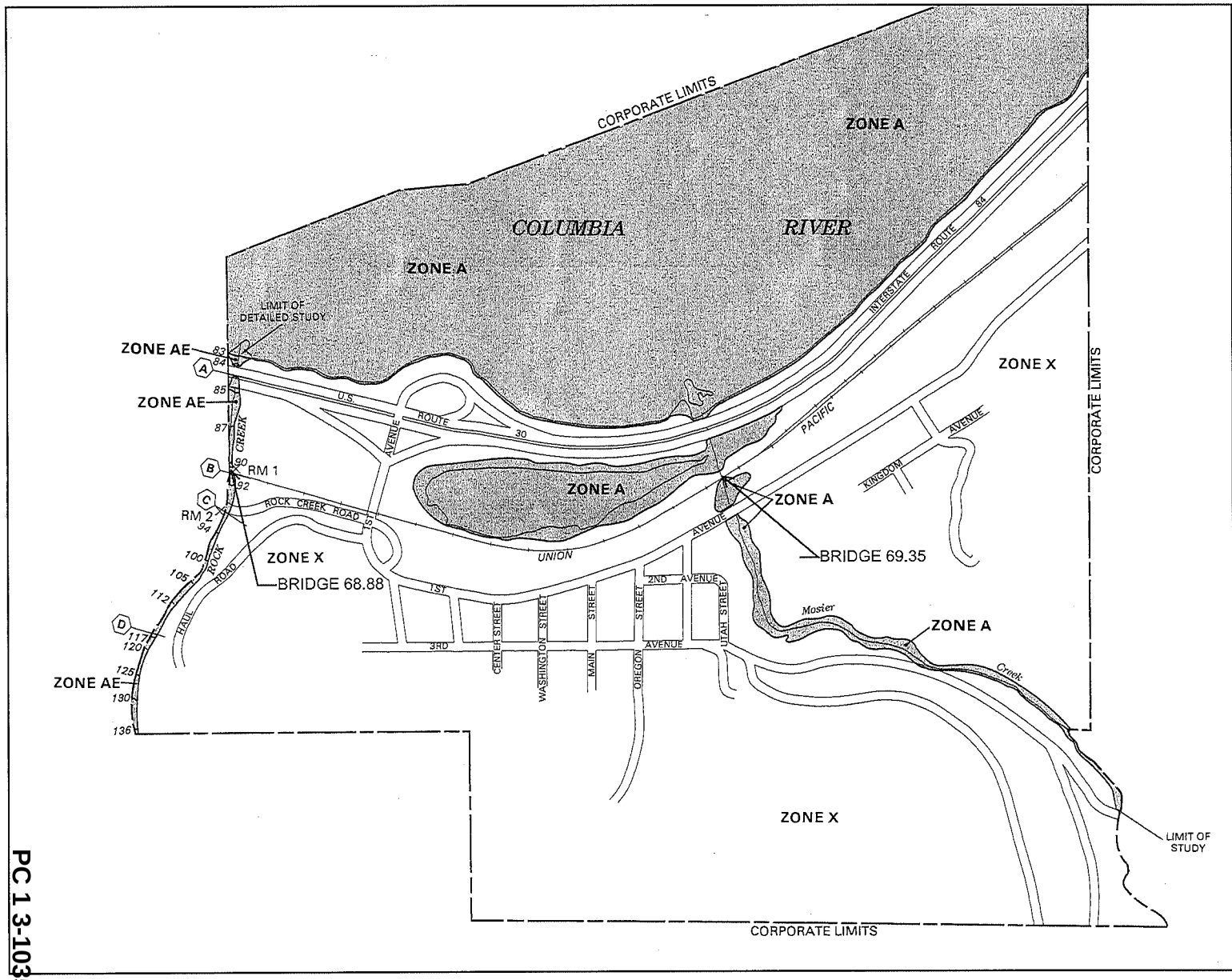
EFFECTIVE DATE
SEPTEMBER 24, 1984

01

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

PC 1 3-1034

UPRR Mosier Second Mainline Project



APPROXIMATE SCALE IN FEET
500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
MOSIER,
OREGON
WASCO COUNTY

ONLY PANEL PRINTED

COMMUNITY-PANEL NUMBER
410234 0001 B

EFFECTIVE DATE:
FEBRUARY 17, 1989

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

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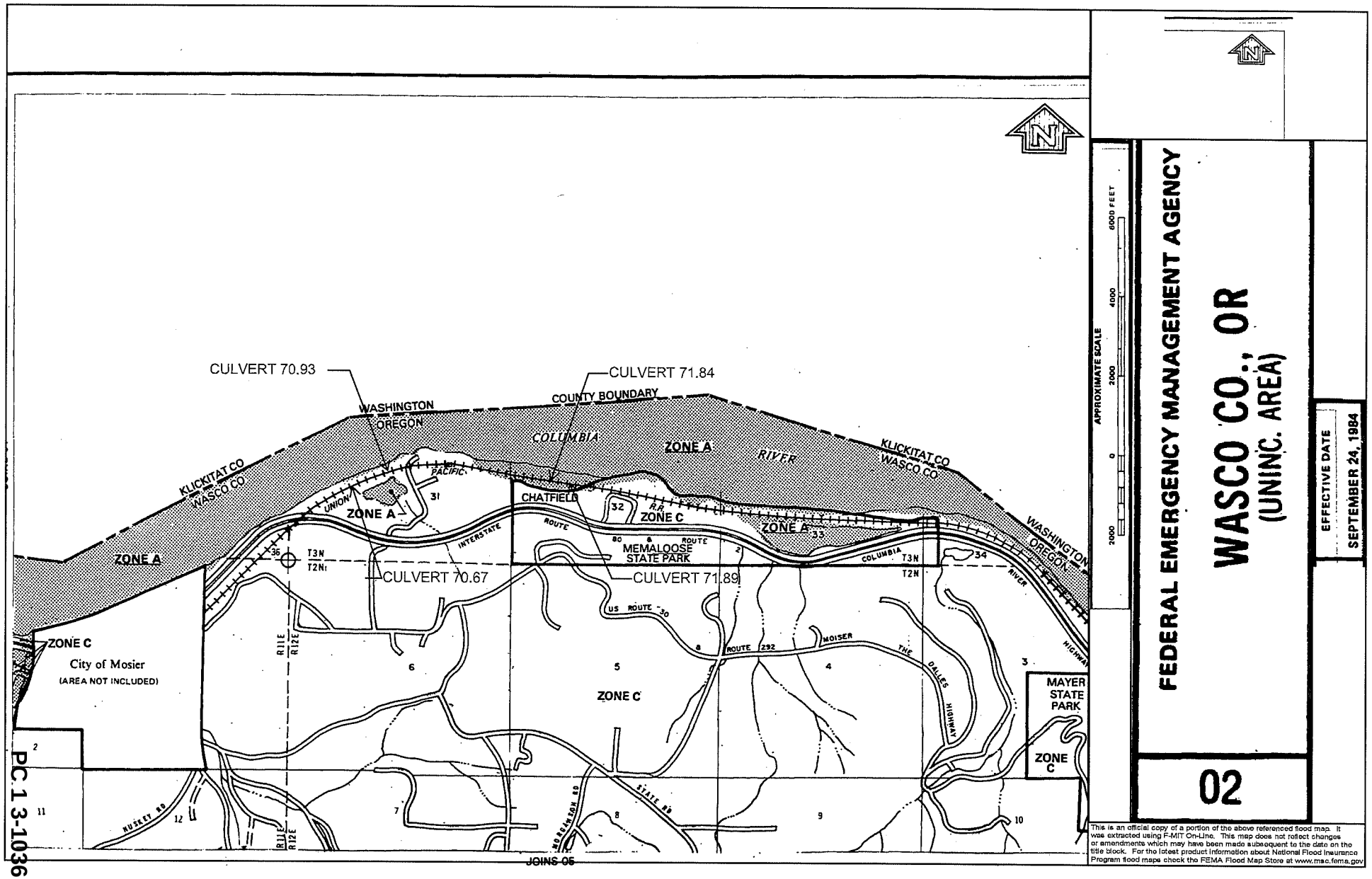
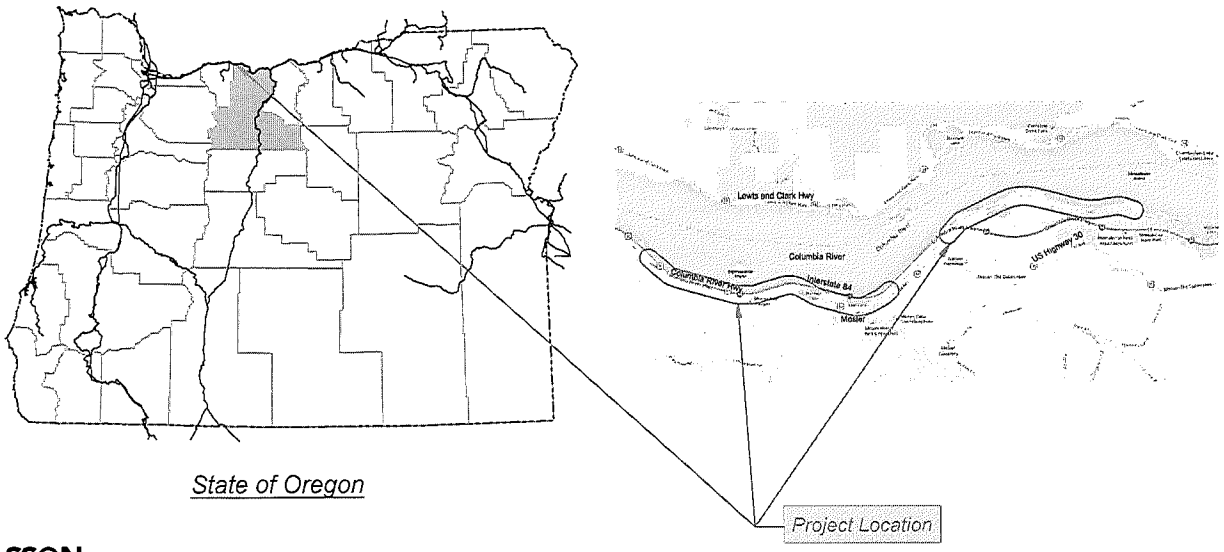

CULVERT 70.93
CULVERT 71.84
COUNTY BOUNDARY
WASHINGTON
OREGON
COLUMBIA
RIVER
ZONE A
KLICKITAT CO
WASCO CO
UNION
PACIFIC
CHATFIELD
ZONE C
INTERSTATE
ROUTE
80 & ROUTE
MEMALOOSE STATE PARK
CULVERT 70.67
CULVERT 71.89
US ROUTE 30
ROUTE 292
MOISER
THE DALLES HIGHWAY
COLUMBIA RIVER HIGHWAY
MAYER STATE PARK
City of Mosier
(AREA NOT INCLUDED)
T3N
T2N
R11E
R12E
KUSKEY RD
MOUNTAIN RD
STATE RD
JOINS 05
APPROXIMATE SCALE
2000 0 2000 4000 6000 FEET
FEDERAL EMERGENCY MANAGEMENT AGENCY
WASCO CO., OR
(UNINC. AREA)
02
EFFECTIVE DATE
SEPTEMBER 24, 1984
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

ENGINEERING DESIGN/CONSTRUCTION



State of Oregon

Project Location Map

OLSSON ASSOCIATES

MOSIER, OREGON
PORTLAND SUBDIVISION
MILE POST 66.98 TO 72.35
CONSTRUCT SECOND MAINLINE

90% PLANS

NOT FOR CONSTRUCTION

LAST REVISED
3/16/2015

WORK ORDER: 19099
PROJECT NUMBER: 81791
BUDGET REFERENCE: 12CP460

ABBREVIATIONS

MISCELLANEOUS

Ac.	Acres
Ave.	Avenue
Blvd.	Boulevard
Bldg.	Building
BNSF	BNSF Railway
C.Y.	Cubic Yards
Conc.	Concrete
°	Degree (s)
Dia.	Diameter
Dr.	Drive
Dwg.	Drawing
E	East
Elev.	Elevation
Exist.	Existing
'	Foot, Feet or Minute (s)
F.S.	Finished Surface
Horiz.	Horizontal
"	Inch, Inches or Second (s)
Inv.	Invert
Lt.	Left
L	Length
L.F.	Lineal Feet
Max.	Maximum
Min.	Minimum
N	North
NTS	Not to Scale
No.	Number
OH	Overhead
Prop.	Proposed
RR	Railroad
Rwy	Railway
R/W	Right of Way
Rt.	Right
S	South
S.F.	Square Feet
Sta.	Station
Std.	Standard
St.	Street
Twp.	Township
Typ.	Typical
UG	Underground
UPRR	Union Pacific Railroad
V	Velocity
Wt.	Weight
W	West
X-ing	Crossing

SIGNAL

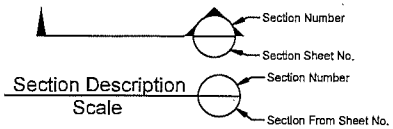
ABS	Automatic Block Signal
ATC	Automatic Train Control
CTC	Centralized Traffic Control
DED	Dragging Equipment Detector
DTC	Direct Traffic Control
ELTO	Electric Lock Turnout
HBD	Hot Box Detector
HTTO	Hand Throw Turnout
HWD	High Wide Dectector
POTO	Power Operated Turnout
TWC	Track Warrant Control
WILD	Wheel Impact Load Dectector

STRUCTURES

Bldg.	Building
Br.	Bridge
CB	Catch Basin
CPT	Concrete Pile Trestle - Ballast Deck
CIP	Cast Iron Pipe
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Pipe Arch
CSP	Corrugated Steel Pipe
Culv.	Culvert
DI	Drop Inlet
DPGBD	Deck Plate Girder - Ballast Deck
DPGOD	Deck Plate Girder - Open Deck
EBW	East Backwall
F.L.	Flowline
F.F.	Finished Floor
GIP	Galvanized Iron Pipe
Hdwl	Headwall
NBW	North Backwall
PSCT	Prestressed Concrete Trestle
RCA	Reinforced Concrete Arch
RCB	Reinforced Concrete Box
RCP	Reinforced Concrete Pipe
SBW	South Backwall
SSP	Smooth Steel Pipe
SPTBD	Steel Pile Trestle - Ballast Deck
SPTOD	Steel Pile Trestle - Open Deck
SPP	Structural Plate Pipe
TPGBD	Through Plate Girder - Ballast Deck
TPGOD	Through Plate Girder - Open Deck
TPTBD	Timber Pile Trestle - Ballast Deck
TPTOD	Timber Pile Trestle - Open Deck
TTBD	Through Truss - Ballast Deck
TTOD	Through Truss - Open Deck
TWB	Treated Wood Box
VCP	Vitrified Clay Pipe
Viad.	Viaduct
WBW	West Backwall
WIP	Wrought Iron Pipe

TRACK

ATR	Above Top of Rail
Align.	Alignment
BBR	Below Base of Rail
Cntrs.	Centers
CWR	Continuous Welded Rail
DSPD	Double Switch Point Derail
EOT	End of Track
HH	Head Hardened
Jtd.	Jointed Rail
LH	Left Hand
ML	Main Line
MM	Mile Marker
MP	Mile Post
NSC	Not Sufficient Clearance
OTM	Other Track Material
PCC	Point of Compound Curve
PC	Point of Curve
PCS	Point of Curve to Spiral
POC	Point on Curve
PF	1/2" Point of Frog
PI	Point of Intersection
PITO	Point of Intersection of Turnout
PS	Point of Spiral
PSC	Point of Spiral to Curve
POS	Point on Spiral
PT	Point of Tangent
POT	Point on Tangent
Pt. Sw.	Point of Switch
PVC	Point of Vertical Curve
PVI	Point of Vertical Intersection
PVT	Point of Vertical Tangent
RH	Right Hand
SH	Second Hand
SSPD	Single Switch Point Derail
TC	Track Centers
T.F.	Track Feet
Trk.	Track
UXO	Universal Cross-Over
X-Over	Cross-Over



UTILITIES

- AIR — Compressed Air
- F/O — Fiber Optic Cable
- G — Gas Pipeline
- O/P — Overhead Power Line
- SS — Sanitary Sewer
- Overhead Signal Line
- UGS — Underground Signal Line
- Steam Line
- S — Storm Sewer
- T — Telephone
- UGE — Underground Electric
- W — Water Main
- Underground Wire
- Under Drain
- V. — Valve
- M.H. — Manhole
- C.B. — Catch Basin
- F.H. — Fire Hydrant
- Junction Box
- Electric Meter
- Gas Meter
- Water Meter
- M.W. — Monitoring Well
- PUMP — Pump

TRACK

- Existing Mainline
- Existing Siding or Spur
- Proposed
- Remove
- Shift
- Relay
- Future
- Foreign Railroad or Industry
- In Buildings or Under Structures
- Turnout
- Wheel Stop
- Bumping Post
- Earthen Bumper
- 56' Inert Retarder
- 52' Dowty Retarder
- Derail
- Switch Point Derail or Double Switch Point Derail

PROPERTY

- Section Line
- Center Section Line
- Parcel or Easement Line
- Right of Way
- Former Right of Way
- Right of Way to be Acquired
- Foreign Right of Way
- Temp. Const. Easement

SYMBOLS

ROAD CROSSING WARNING DEVICES

- Crossbuck Sign
- Flashing Light Warning Device
- Flashing Light Warning Device with Gate
- Cantilever Flashing Light Warning Device
- Cantilever Flashing Light Signal with Gate

SIGNAL

- Absolute Signal
- Signal Bridge
- Cantilever Signal
- ACS or CTC Signal
- Dwarf Signal
- Begin CTC
- Microwave Tower
- AEI — AEI
- BB — Battery Box
- Dragging Equipment Detector
- GEN. — Generator
- Hot Box Detector

STRUCTURES

- Culvert
- Culvert with Headwalls
- Double Culvert
- Railroad Bridge
- Highway Overpass
- Highway Underpass
- Tunnel
- Building
- FP — Flag Pole

LIGHTING

- Light Pole
- Light Tower

SIGNS

- Stop
- Yard Limit
- 1 Mile to Yard Limit
- Whistle Post
- Flanger
- Station
- Reduce Speed
- Resume Speed
- General Purpose

FENCES

- Barbed Wire
- Chain Link
- Snow / Sand
- Cattle Guard

ROADS

- Paved Road
- Unimproved Road
- 70 — Interstate Highway
- 26 — Federal Highway
- 58 — State Highway
- 53 — County Highway

OTHER

- Wetlands
- River or Lake
- Ordinary High Water Mark
- Embankment
- Flow Line
- Milepost
- Milemarker
- 15 — Control Point
- 1 — Revision Number
- Revision Cloud

CONSTRUCTION

- Note — Note (Work by Contractor)
- Note — Note (Work by Others)
- Cut Lines
- Fill Lines

OLSSON ASSOCIATES

DRAWN BY:	BWG
CHECKED BY:	RCK
DATE:	3/16/2015
SHEET NUMBER	G004 of 005

UNION PACIFIC RAILROAD

Office of Assistant Vice President Engineering Design/Construction

LOCATION & DESCRIPTION: Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE: ABBREVIATIONS & LEGEND

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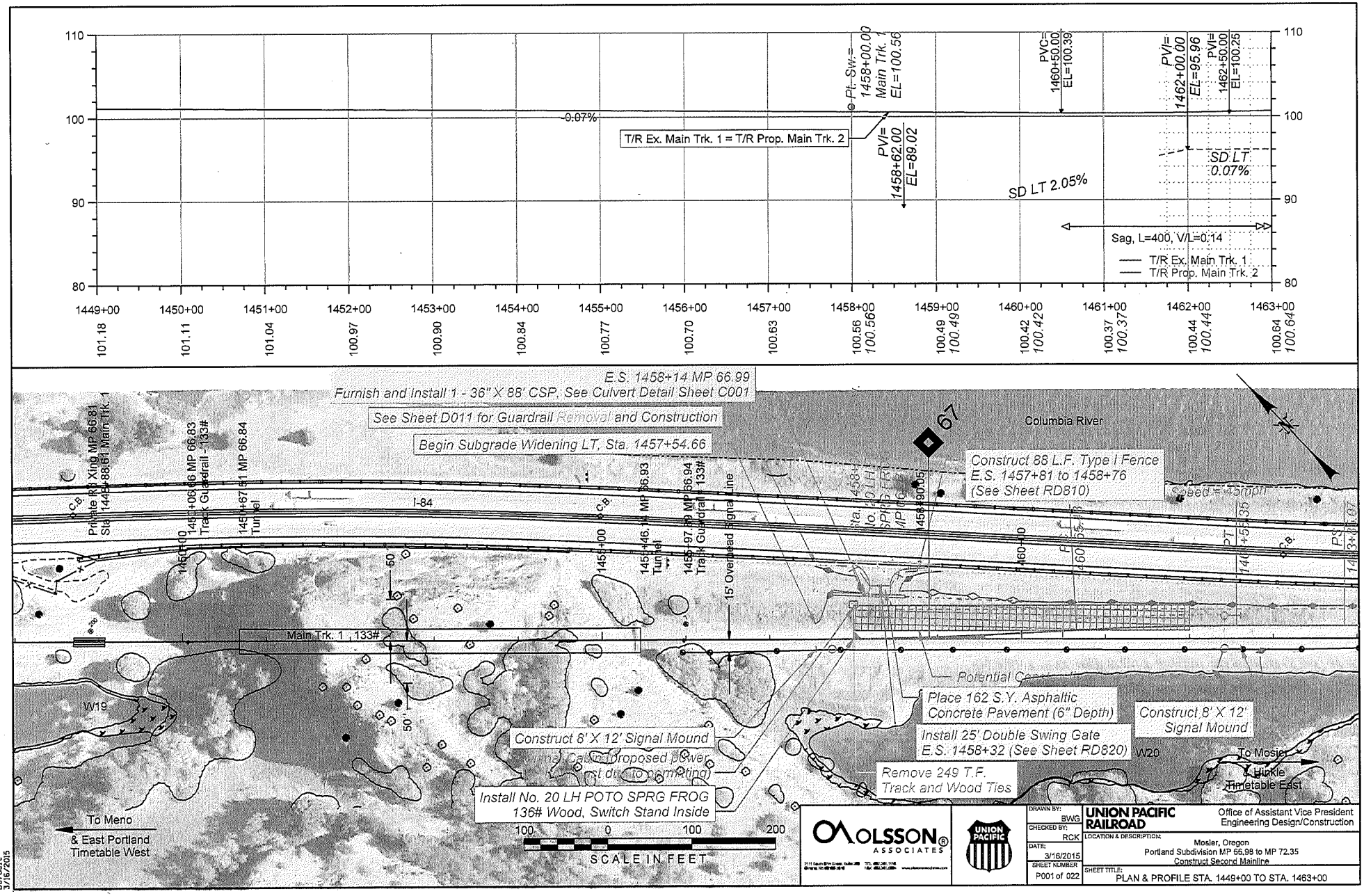

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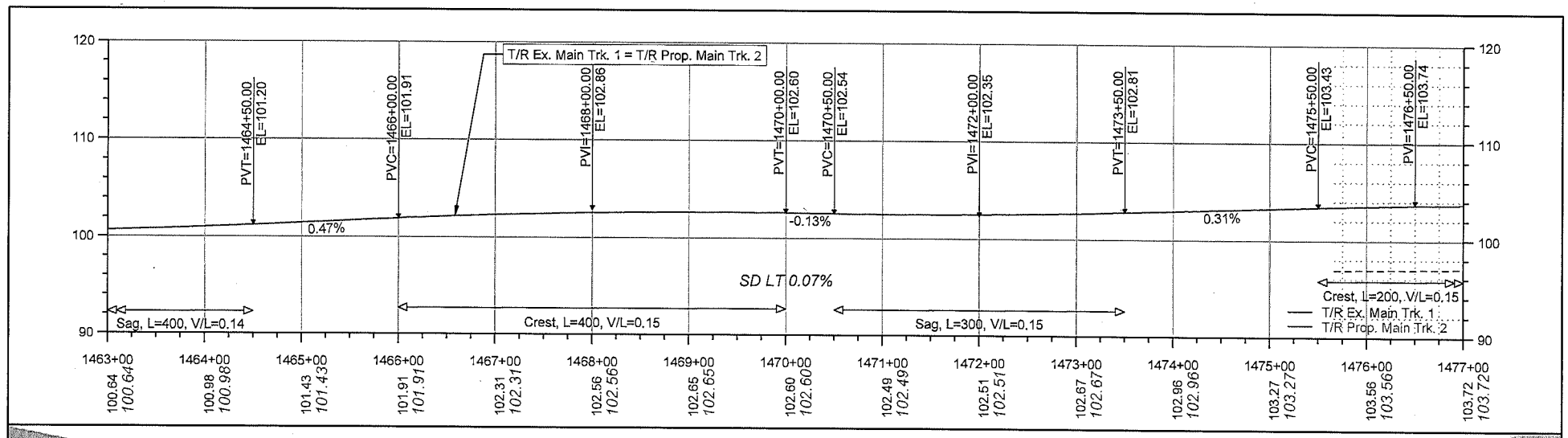

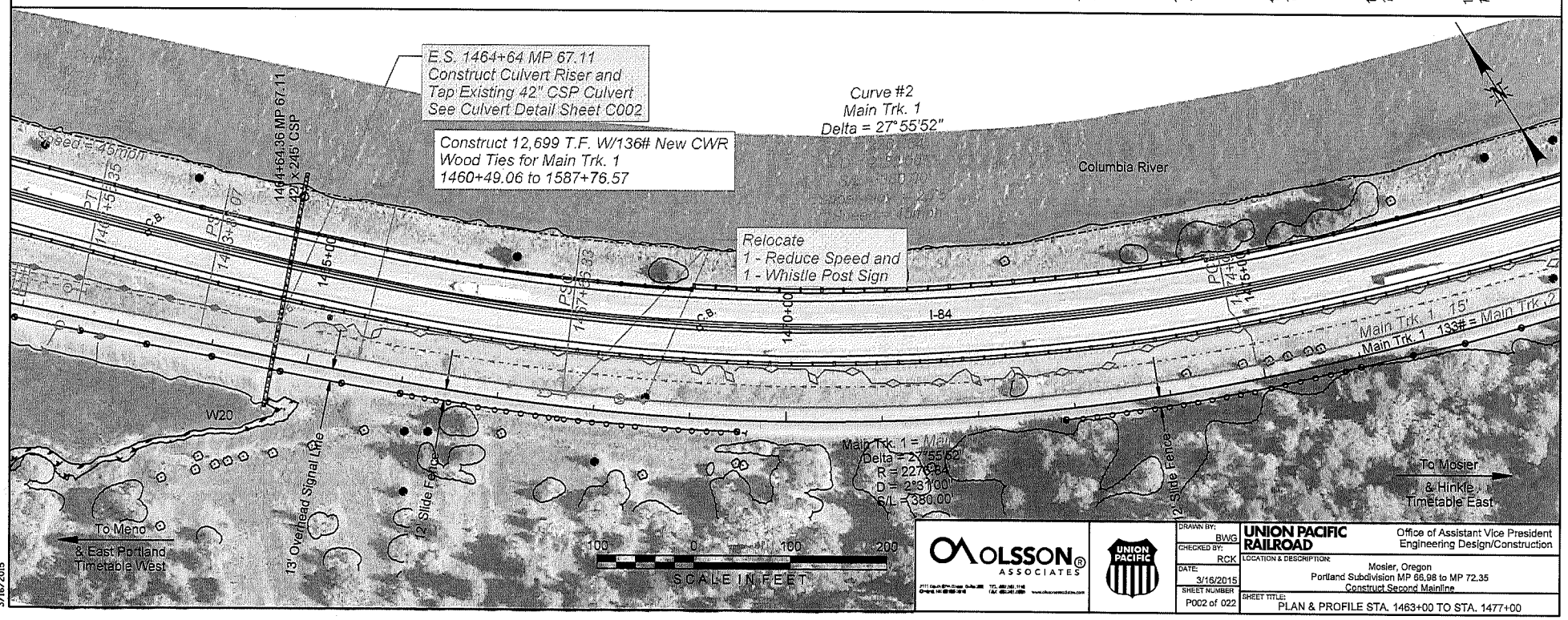

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UNION PACIFIC

DRAWN BY: BWG	UNION PACIFIC RAILROAD — Office of Assistant Vice President Engineering Design/Construction
CHECKED BY: RCK	LOCATION & DESCRIPTION: Mosier, Oregon; Portland Subdivision MP 66.98 to MP 72.35; Construct Second Mainline
DATE: 3/16/2015	
SHEET NUMBER: P002 of 022	SHEET TITLE: PLAN & PROFILE STA. 1463+00 TO STA. 1477+00

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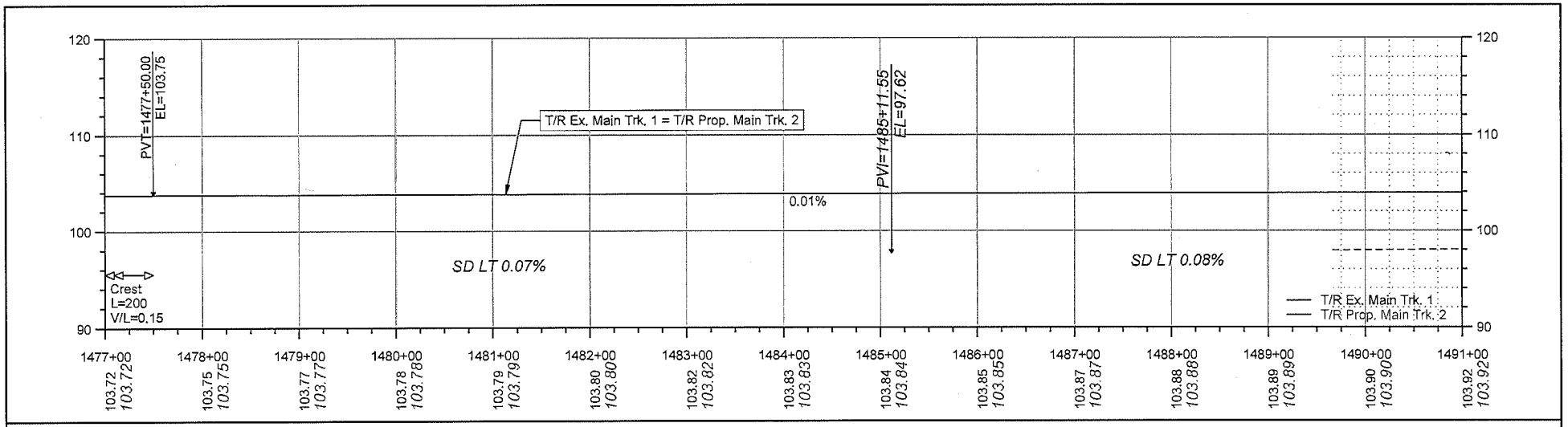
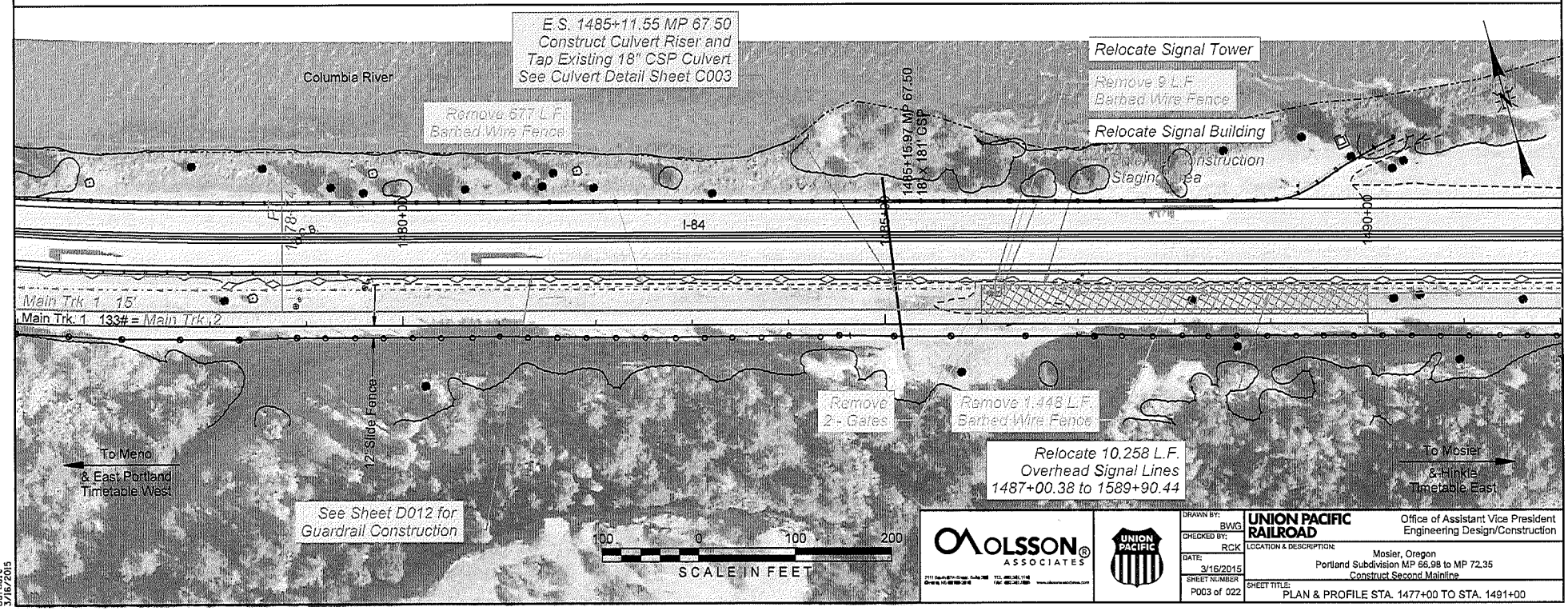
3/16/2015

PC 2 1





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UNION PACIFIC

DRAWN BY: BWG	UNION PACIFIC RAILROAD — Office of Assistant Vice President Engineering Design/Construction
CHECKED BY: RCK	LOCATION & DESCRIPTION: Mosier, Oregon; Portland Subdivision MP 66.98 to MP 72.35; Construct Second Mainline
DATE: 3/16/2015	
SHEET NUMBER: P003 of 022	SHEET TITLE: PLAN & PROFILE STA. 1477+00 TO STA. 1491+00

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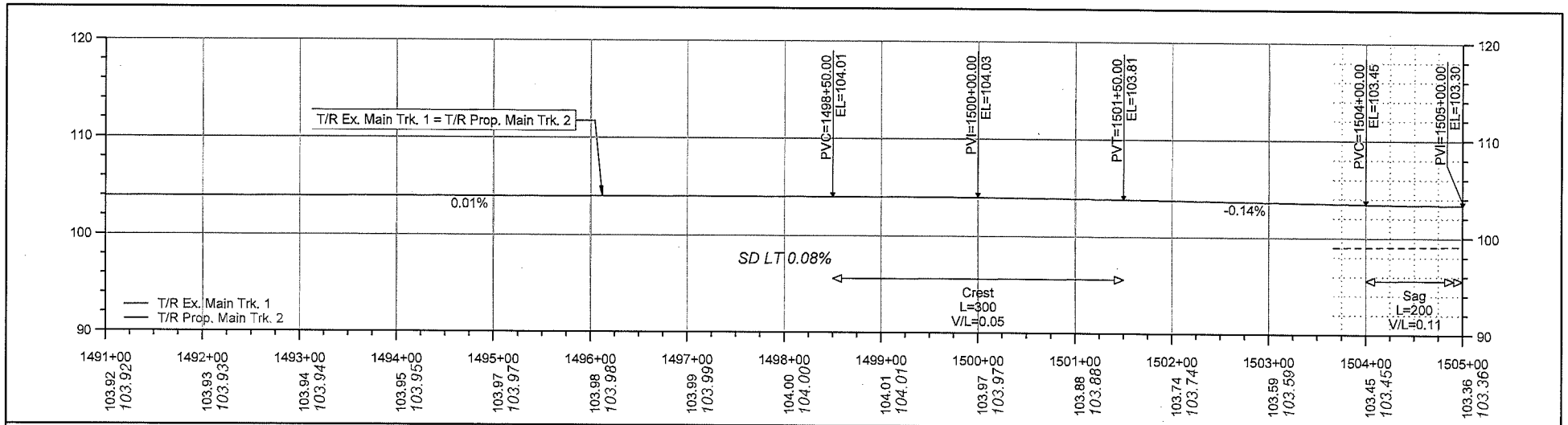
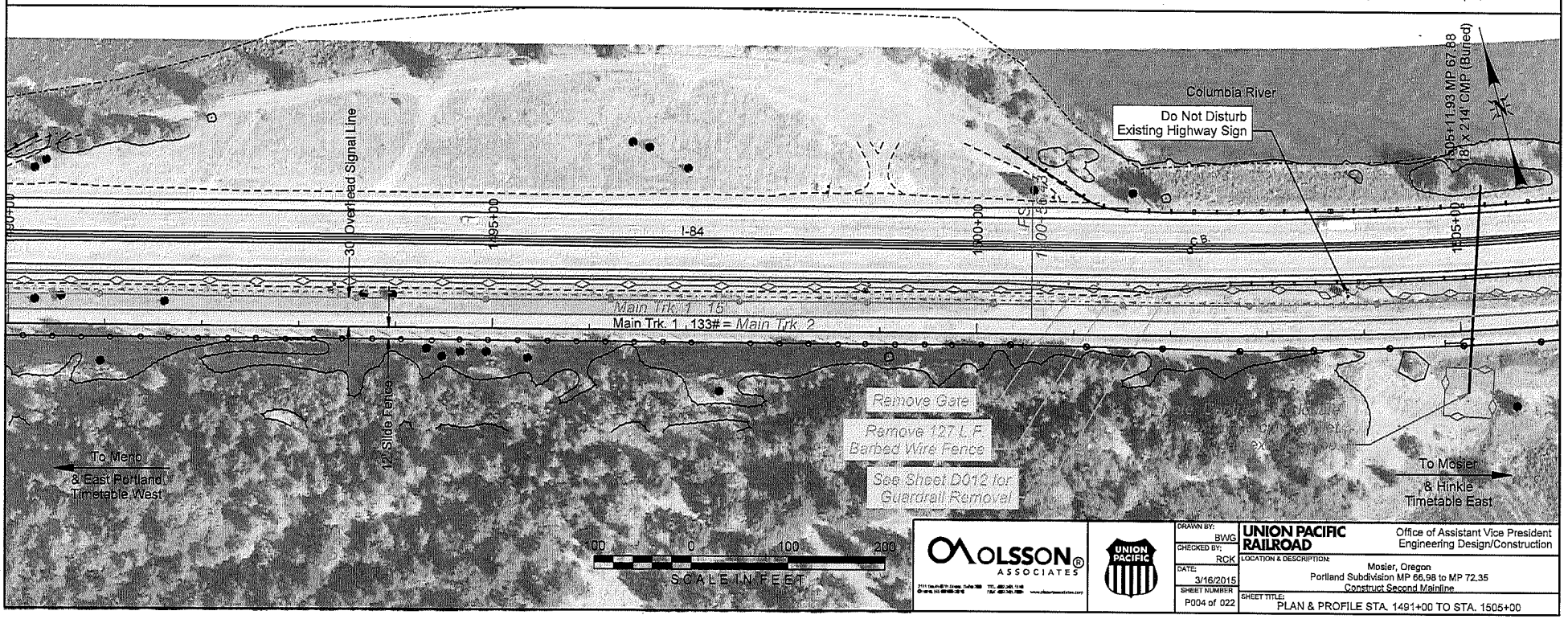
P003





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DRAWN BY: BWG	UNION PACIFIC RAILROAD — Office of Assistant Vice President Engineering Design/Construction
CHECKED BY: RCK	LOCATION & DESCRIPTION: Mosier, Oregon; Portland Subdivision MP 66.98 to MP 72.35; Construct Second Mainline
DATE: 3/16/2015	
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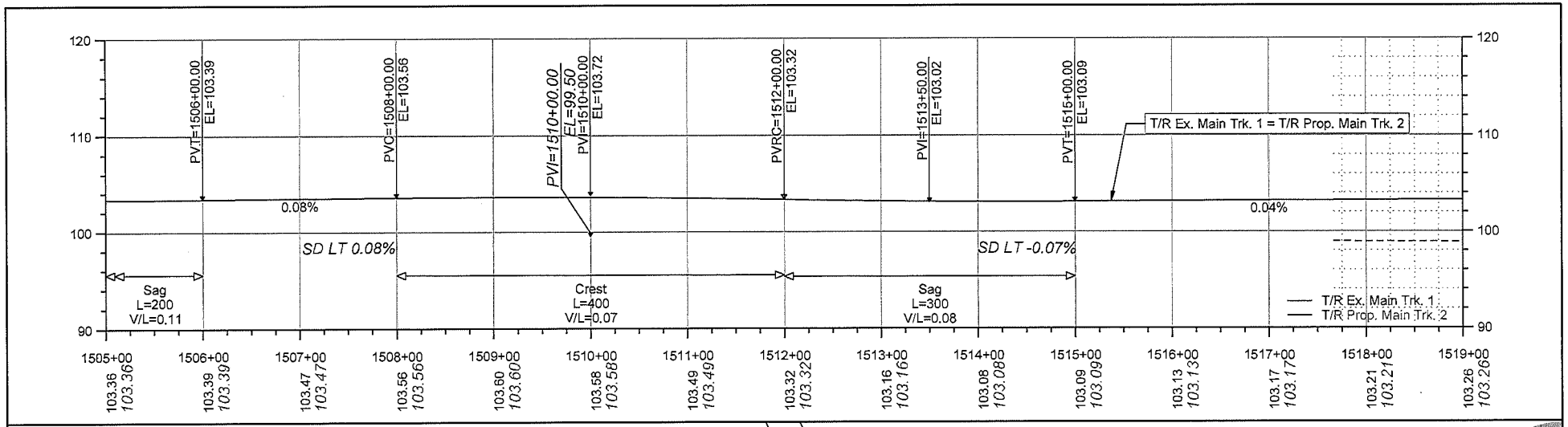

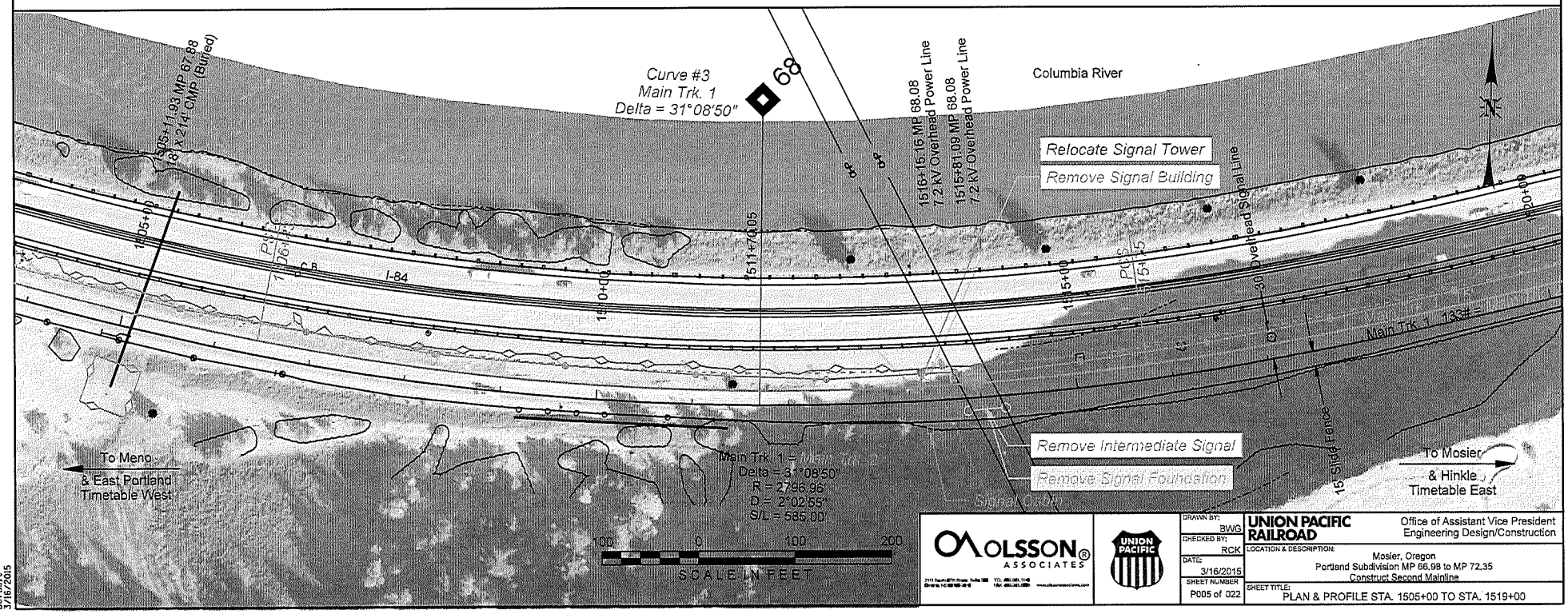

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DRAWN BY: BWG	UNION PACIFIC RAILROAD — Office of Assistant Vice President Engineering Design/Construction
CHECKED BY: RCK	LOCATION & DESCRIPTION: Mosier, Oregon; Portland Subdivision MP 66.98 to MP 72.35; Construct Second Mainline
DATE: 3/16/2015	
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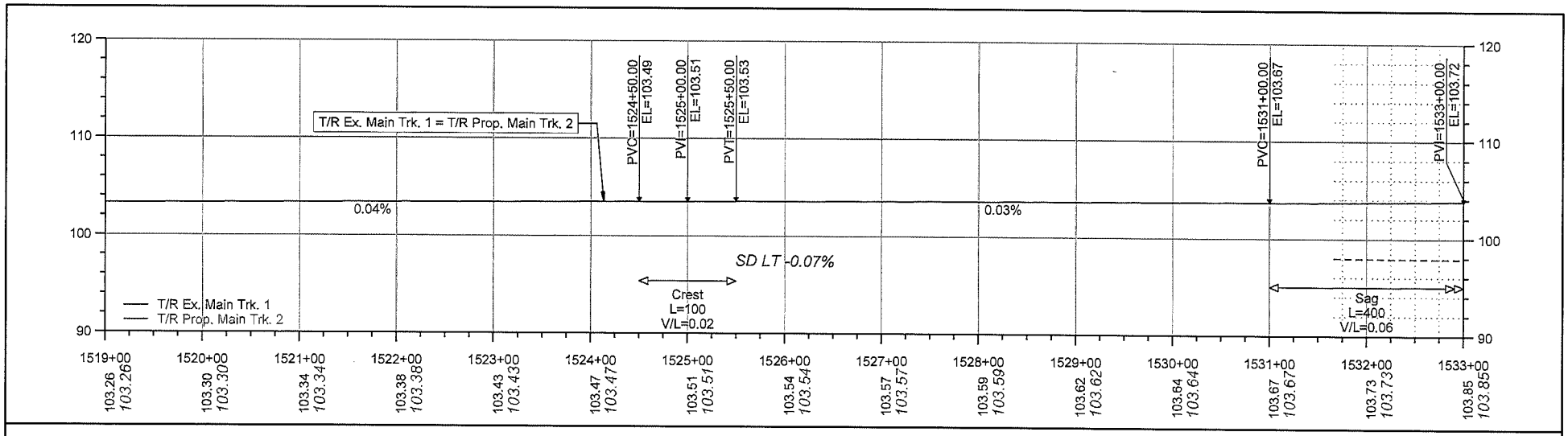

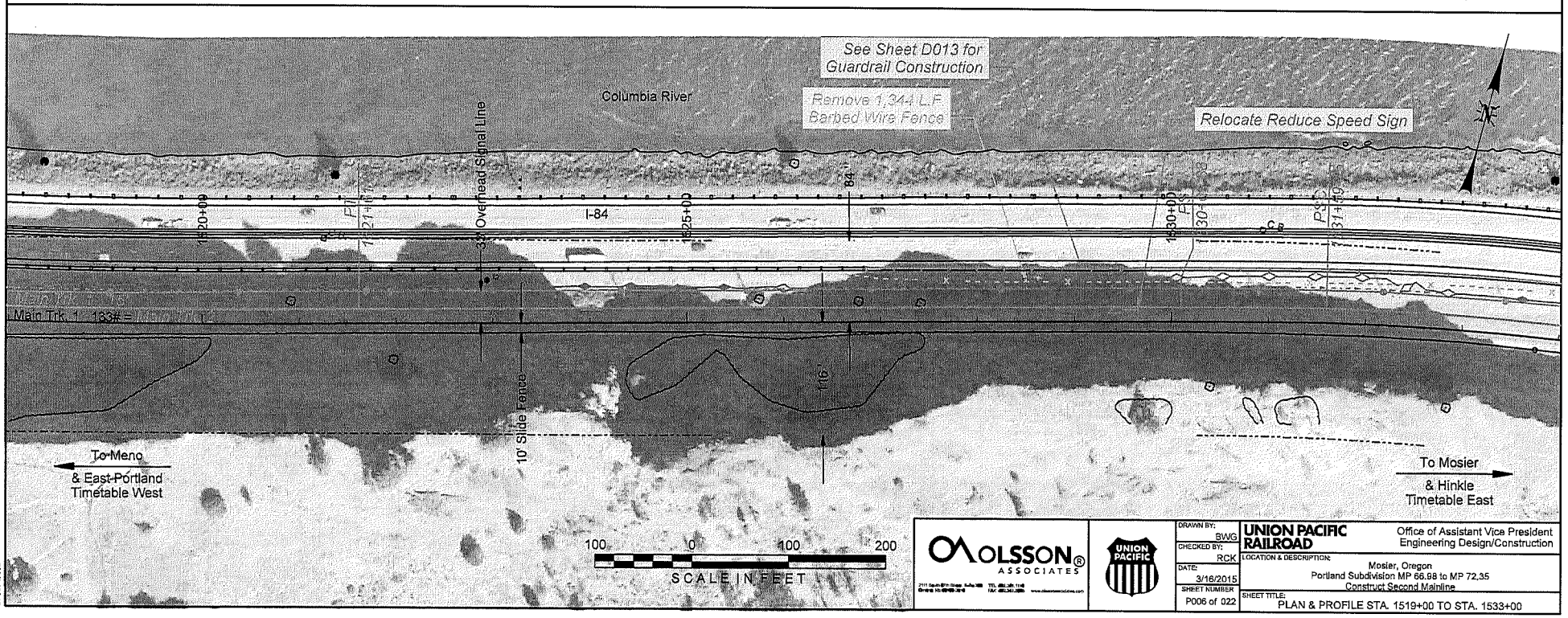

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UNION PACIFIC

DRAWN BY:	BWG
CHECKED BY:	RCK
DATE:	3/16/2015
SHEET NUMBER	P006 of 022

UNION PACIFIC RAILROAD

Office of Assistant Vice President
Engineering Design/Construction

LOCATION & DESCRIPTION:
Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE:
PLAN & PROFILE STA. 1519+00 TO STA. 1533+00

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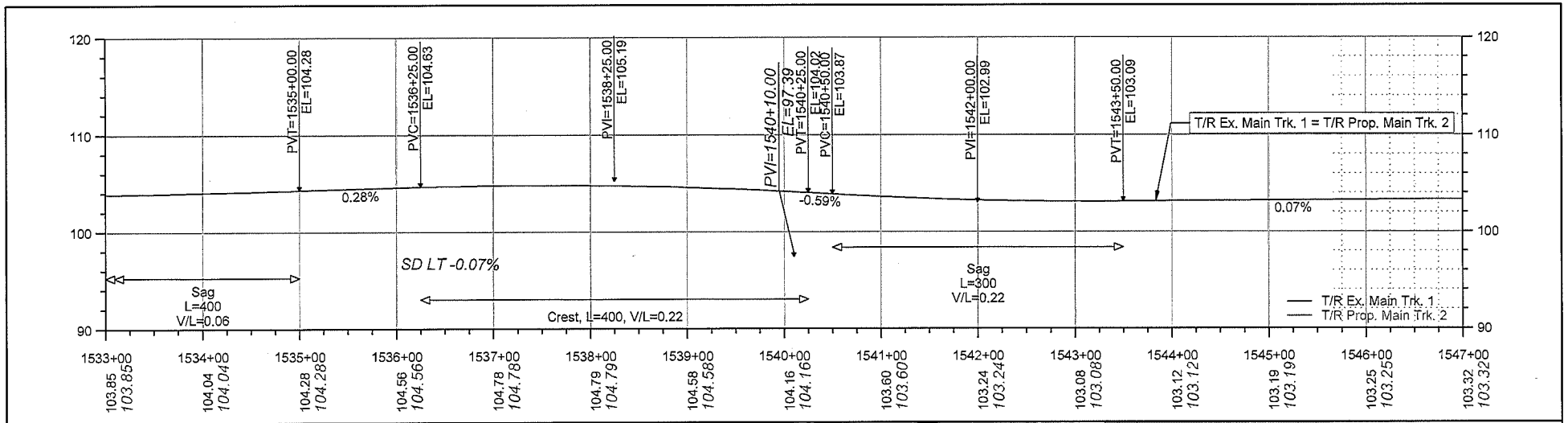

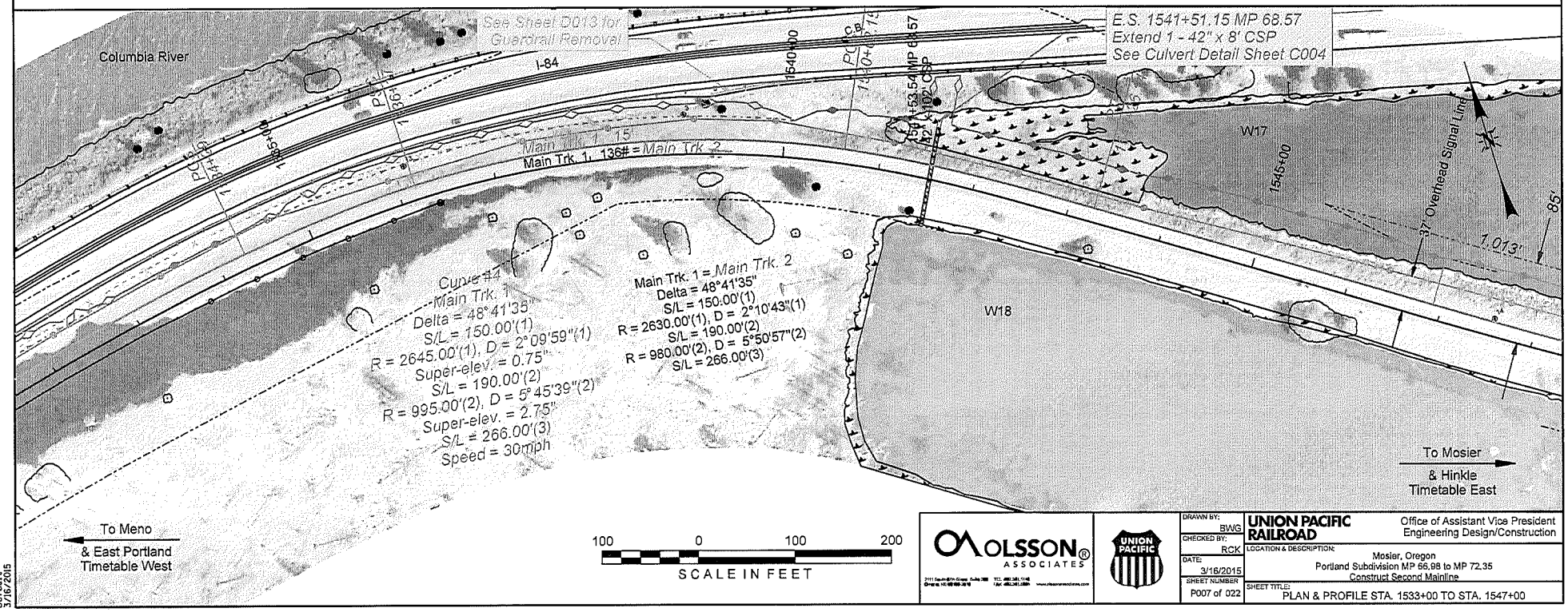

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DRAWN BY:	BWG
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DATE:	3/16/2015
SHEET NUMBER	P007 of 022

UNION PACIFIC RAILROAD

Office of Assistant Vice President
Engineering Design/Construction

LOCATION & DESCRIPTION:
Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE:
PLAN & PROFILE STA. 1533+00 TO STA. 1547+00

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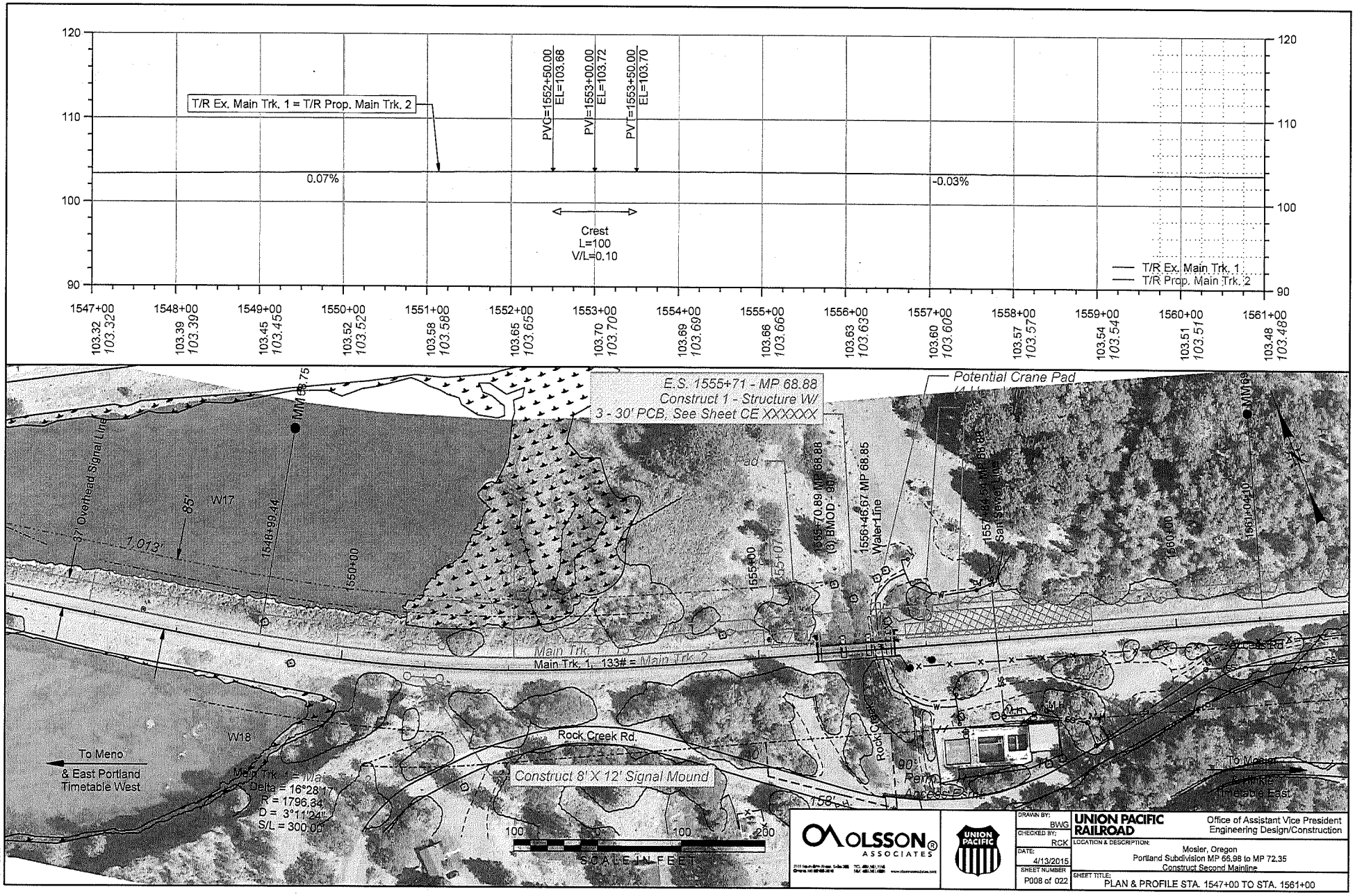

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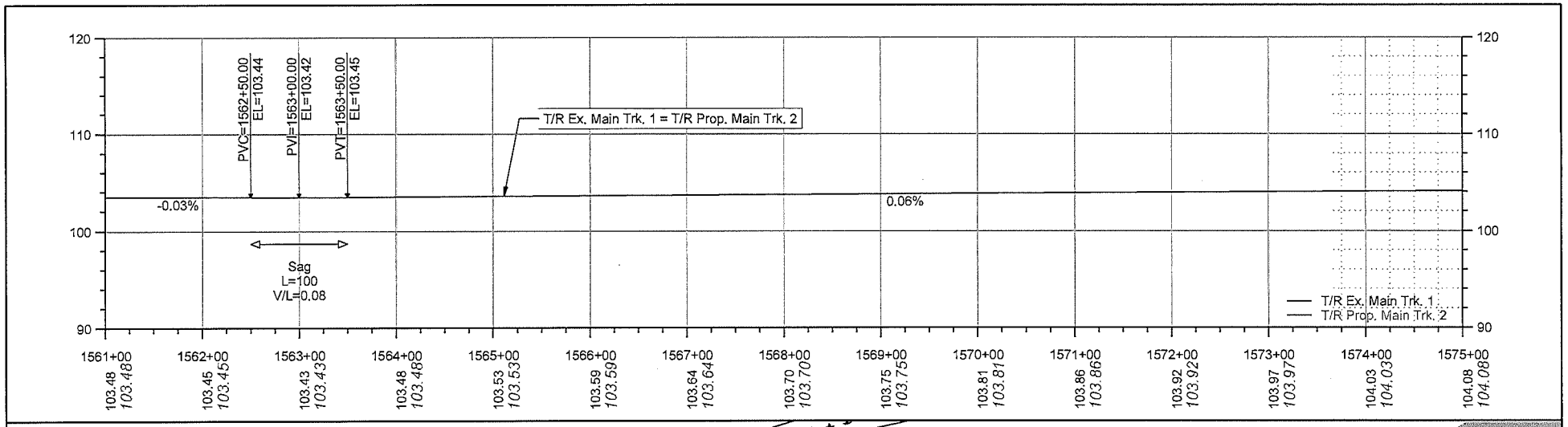

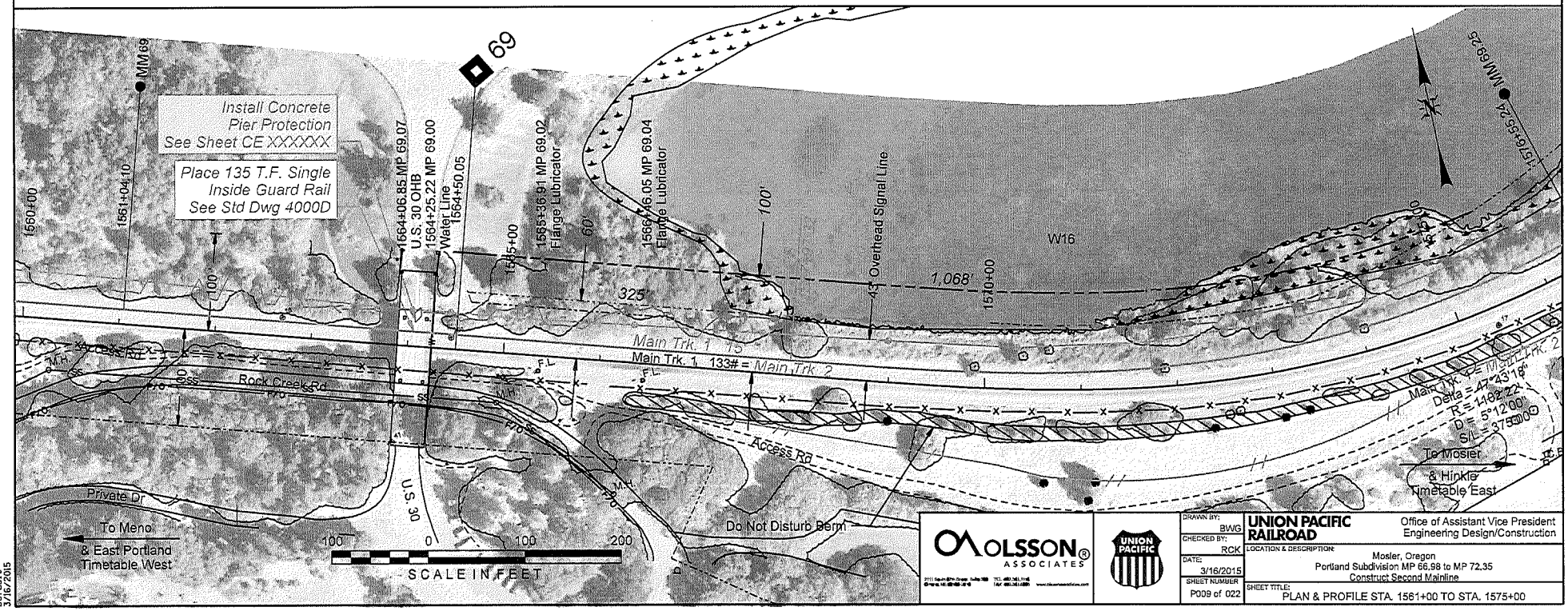

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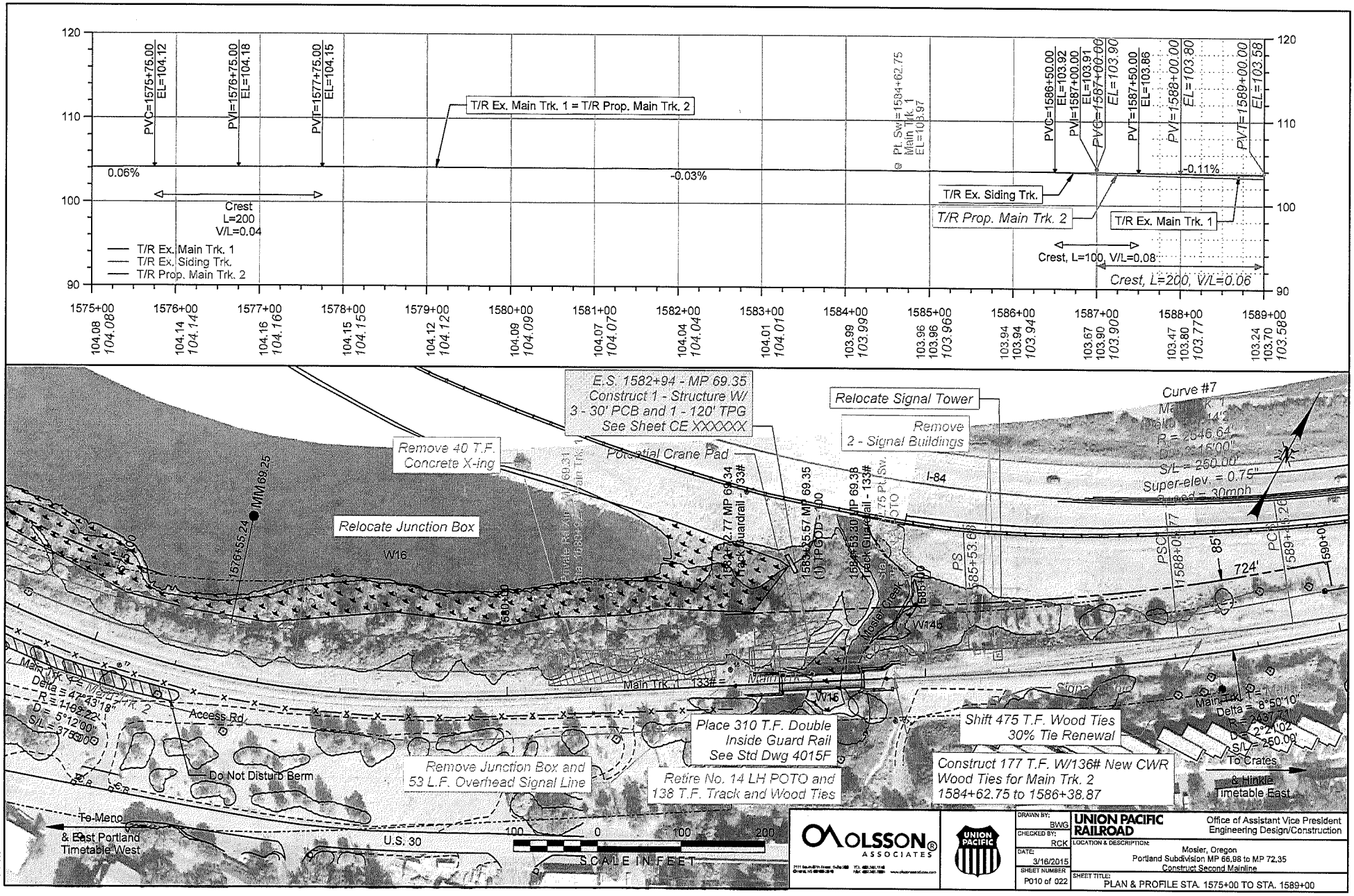
PVC=1575+75.00 EL=104.12
PVI=1576+75.00 EL=104.18
PVT=1577+75.00 EL=104.15
T/R Ex. Main Trk. 1 = T/R Prop. Main Trk. 2
Pt. Sw.=1584+62.75 Main Trk. 1 EL=103.97
PVC=1586+50.00 EL=103.92
PVI=1587+00.00 EL=103.91
PVC=1587+00.00 EL=103.90
PVT=1587+50.00 EL=103.86
PVI=1588+00.00 EL=103.80
PVT=1589+00.00 EL=103.58
0.06%
-0.03%
-0.11%
Crest L=200 V/L=0.04
T/R Ex. Siding Trk.
T/R Prop. Main Trk. 2
T/R Ex. Main Trk. 1
Crest, L=100, V/L=0.08
Crest, L=200, V/L=0.06
T/R Ex. Main Trk. 1
T/R Ex. Siding Trk.
T/R Prop. Main Trk. 2
E.S. 1582+94 - MP 69.35
Construct 1 - Structure W/
3 - 30' PCB and 1 - 120' TPG
See Sheet CE XXXXXX
Relocate Signal Tower
Remove
2 - Signal Buildings
Remove 40 T.F.
Concrete X-ing
Potential Crane Pad
Relocate Junction Box
W16
I-84
Curve #7
R = 2846.64'
S/L = 250.00'
Super-elev. = 0.75"
Speed = 30mph
Main Trk. 1 133# =
Access Rd.
Do Not Disturb Berm
Place 310 T.F. Double
Inside Guard Rail
See Std Dwg 4015F
Remove Junction Box and
53 L.F. Overhead Signal Line
Retire No. 14 LH POTO and
138 T.F. Track and Wood Ties
Shift 475 T.F. Wood Ties
30% Tie Renewal
Construct 177 T.F. W/136# New CWR
Wood Ties for Main Trk. 2
1584+62.75 to 1586+38.87
To Crates
& Hinkle
Timetable East
To Meno
& East Portland
Timetable West
U.S. 30
SCALE IN FEET
OLSSON ASSOCIATES
UNION PACIFIC
DRAWN BY: BWG
CHECKED BY: RCK
DATE: 3/16/2015
SHEET NUMBER P010 of 022
UNION PACIFIC RAILROAD
Office of Assistant Vice President
Engineering Design/Construction
LOCATION & DESCRIPTION:
Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline
SHEET TITLE:
PLAN & PROFILE STA. 1575+00 TO STA. 1589+00

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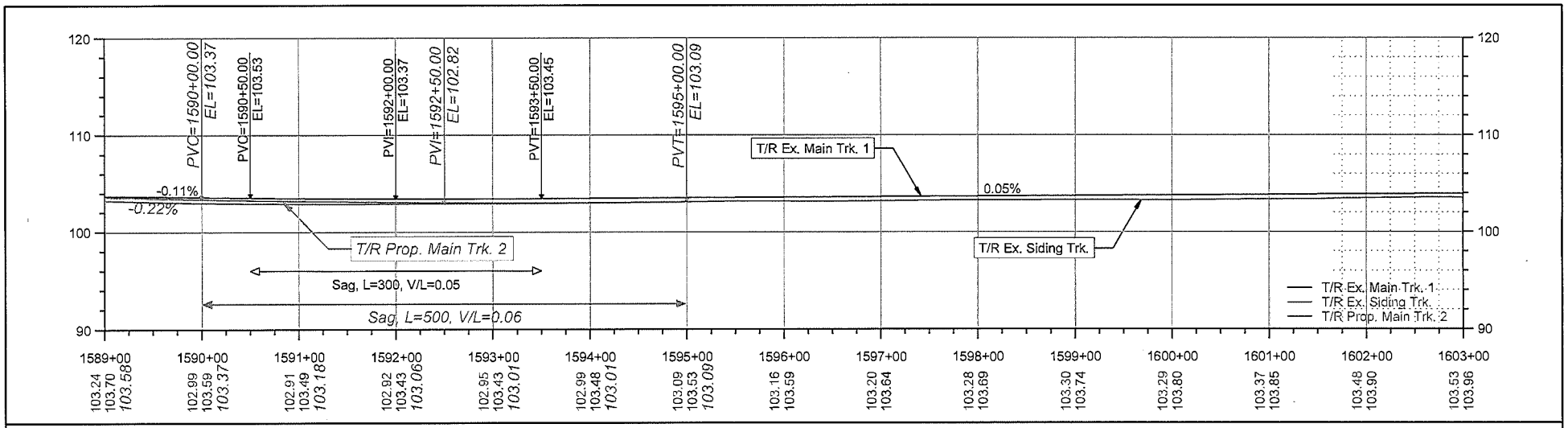

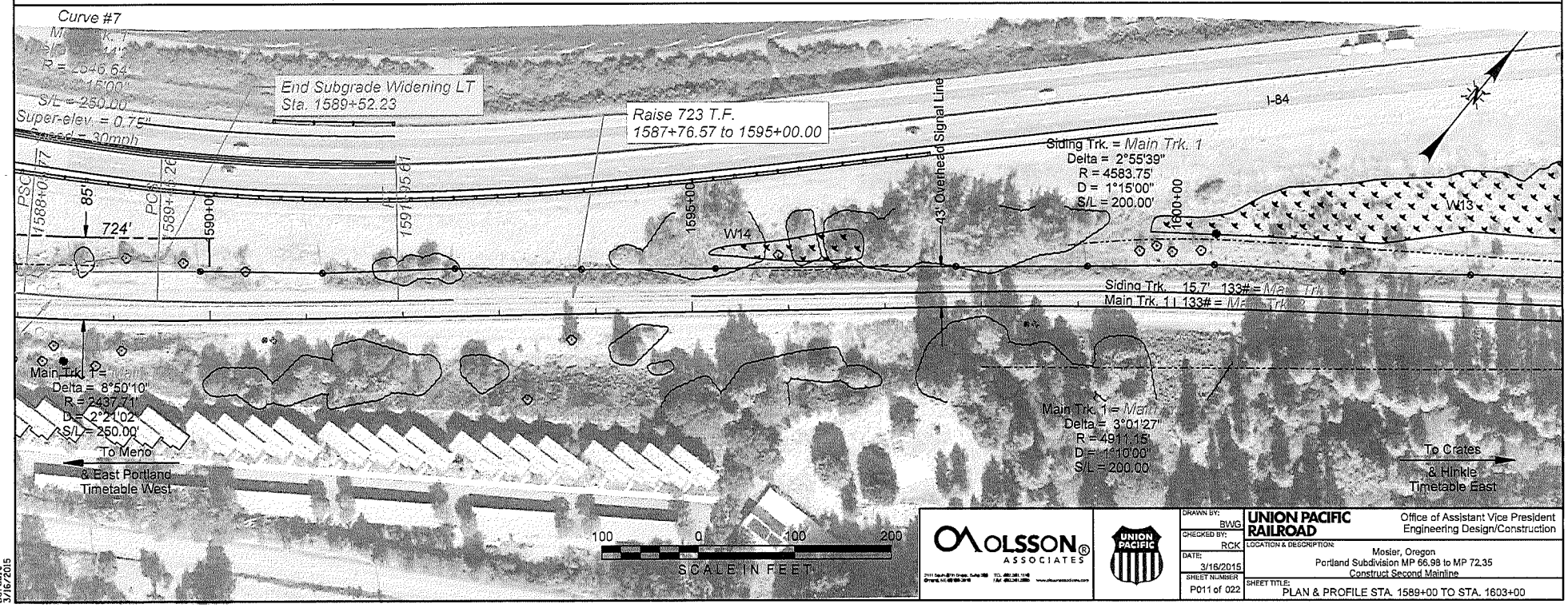

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UNION PACIFIC

DRAWN BY: BWG	UNION PACIFIC RAILROAD — Office of Assistant Vice President Engineering Design/Construction
CHECKED BY: RCK	LOCATION & DESCRIPTION: Mosier, Oregon; Portland Subdivision MP 66.98 to MP 72.35; Construct Second Mainline
DATE: 3/16/2015	
SHEET NUMBER: P011 of 022	SHEET TITLE: PLAN & PROFILE STA. 1589+00 TO STA. 1603+00

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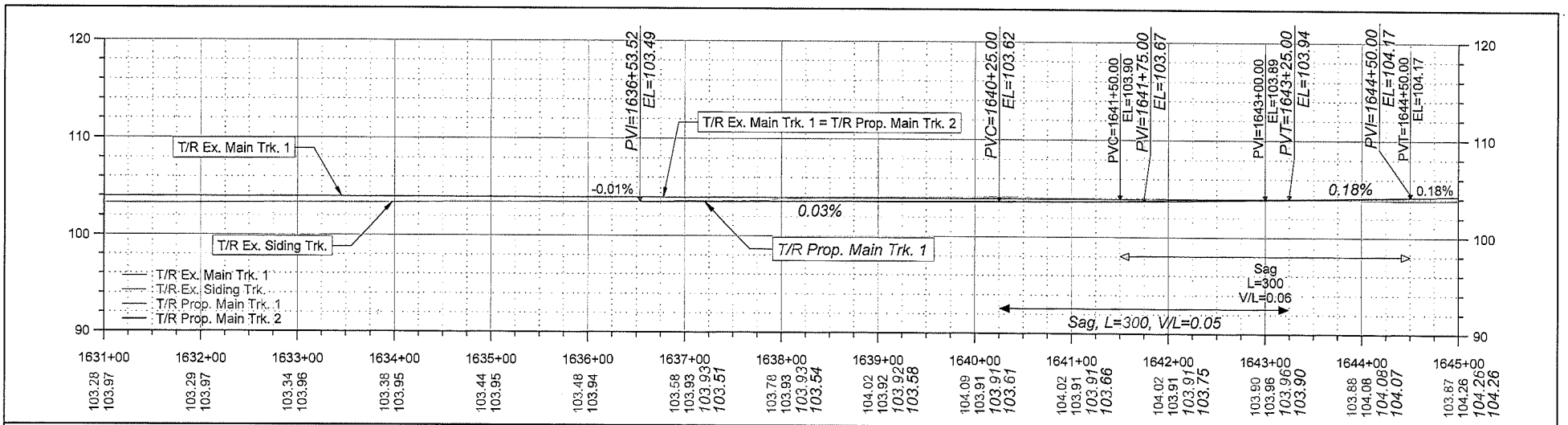

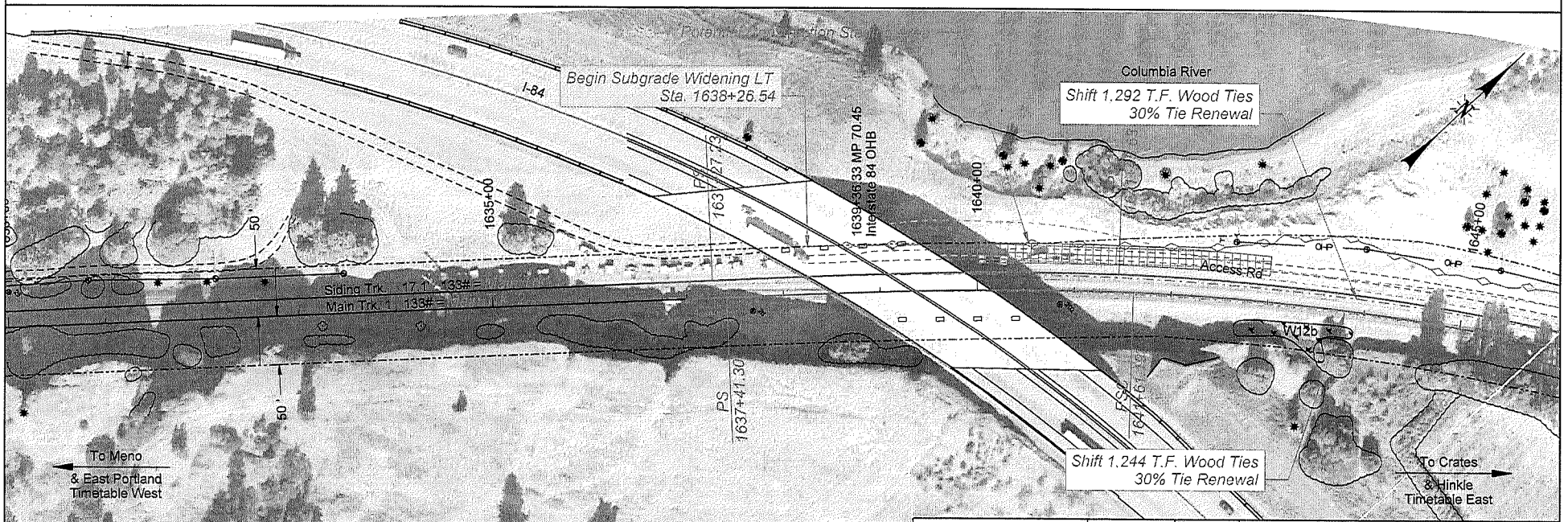

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DRAWN BY: BWG	UNION PACIFIC RAILROAD — Office of Assistant Vice President Engineering Design/Construction
CHECKED BY: RCK	LOCATION & DESCRIPTION: Mosier, Oregon; Portland Subdivision MP 66.98 to MP 72.35; Construct Second Mainline
DATE: 3/16/2015	
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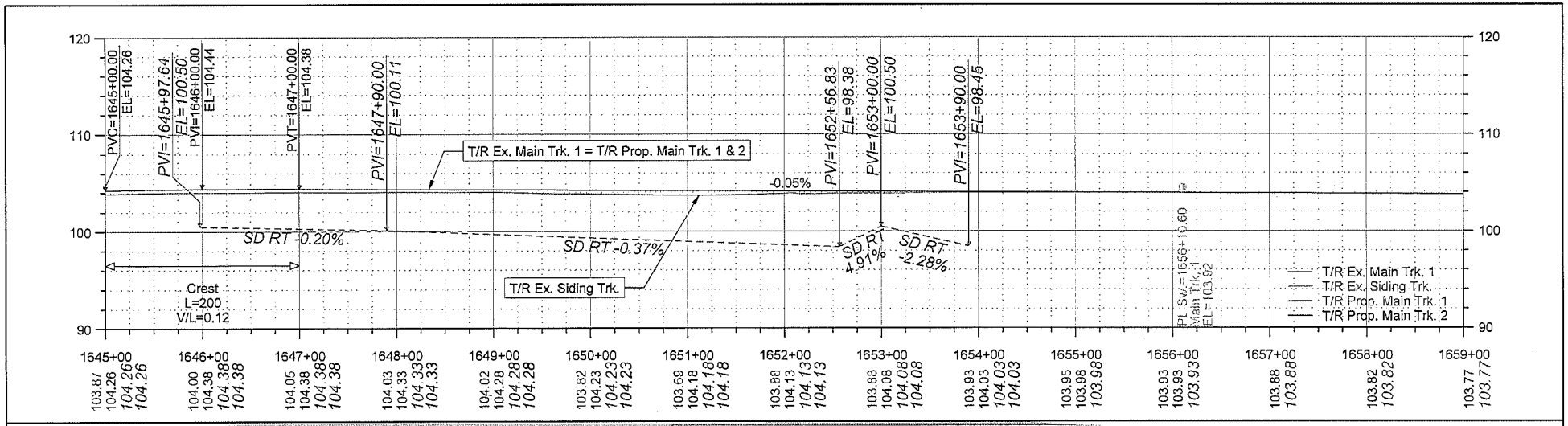

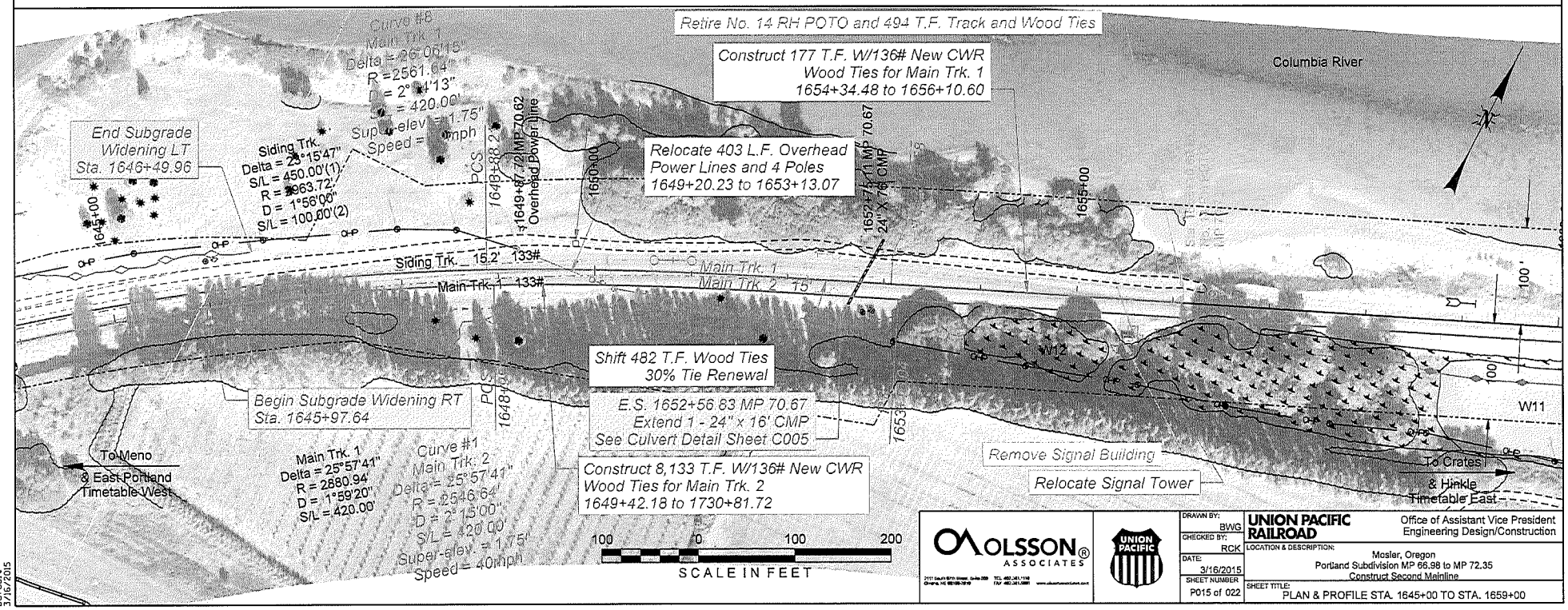

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UNION PACIFIC

DRAWN BY:	BWG
CHECKED BY:	RCK
DATE:	3/16/2015
SHEET NUMBER	P015 of 022

UNION PACIFIC RAILROAD

Office of Assistant Vice President Engineering Design/Construction

LOCATION & DESCRIPTION: Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE: PLAN & PROFILE STA. 1645+00 TO STA. 1659+00

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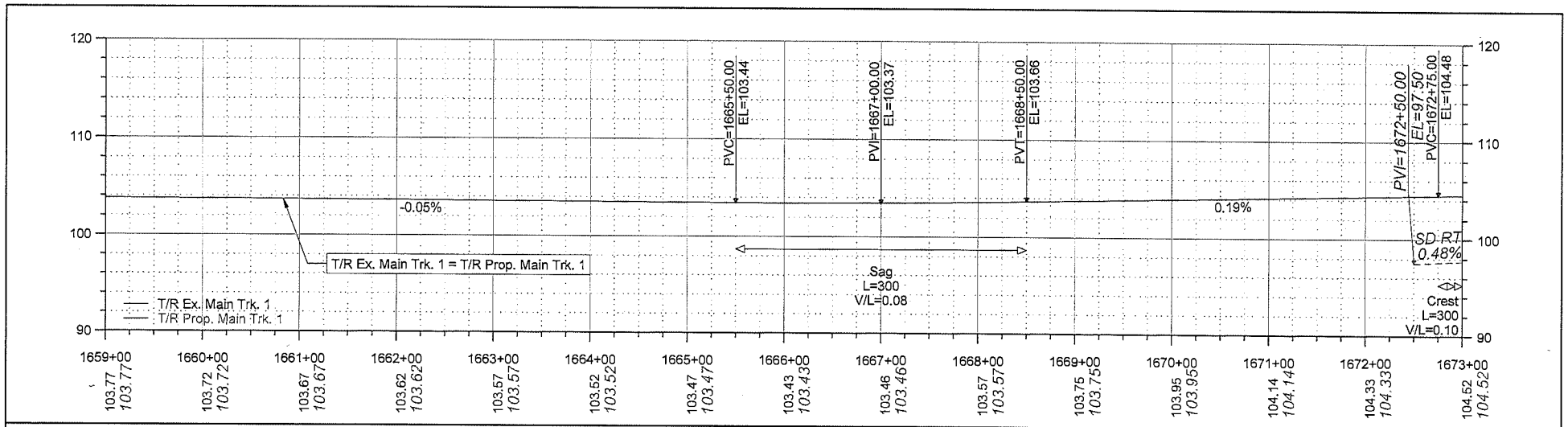

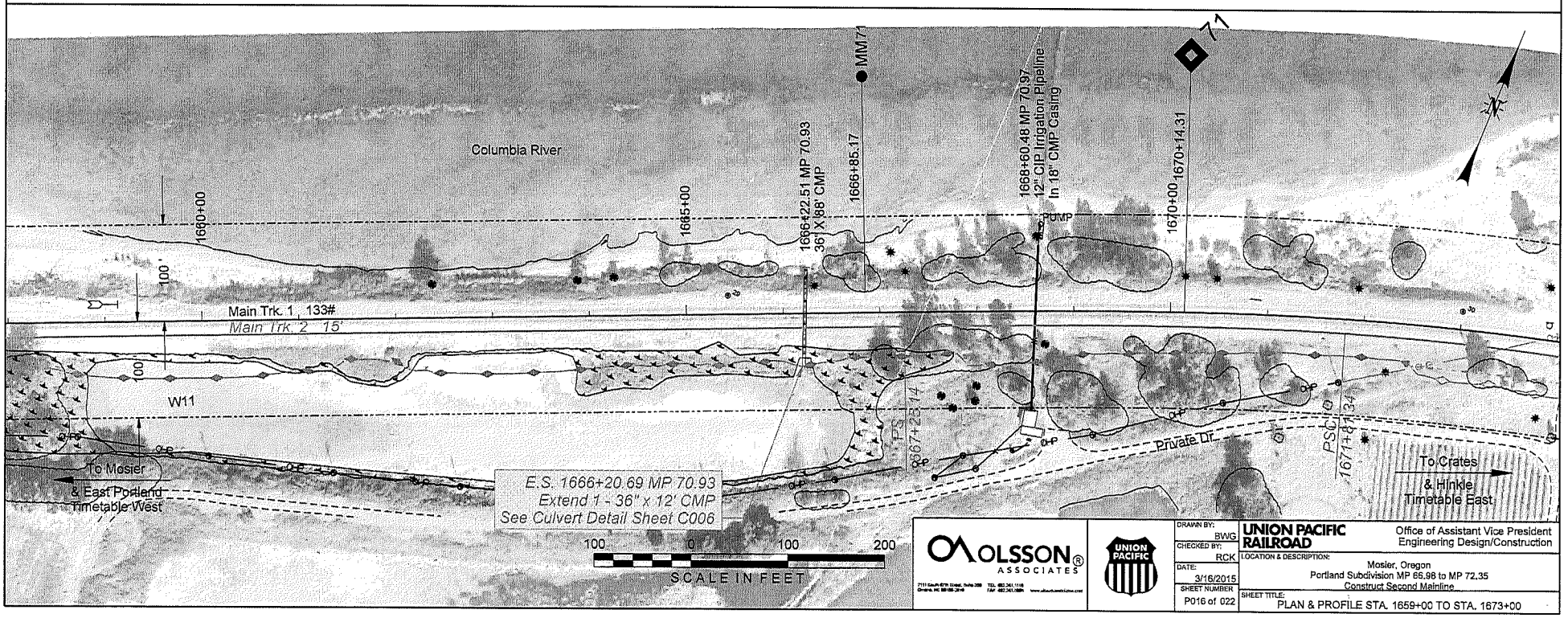

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UNION PACIFIC

DRAWN BY:	BWG
CHECKED BY:	RCK
DATE:	3/16/2015
SHEET NUMBER	P016 of 022

UNION PACIFIC RAILROAD

Office of Assistant Vice President
Engineering Design/Construction

LOCATION & DESCRIPTION:
Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE:
PLAN & PROFILE STA. 1659+00 TO STA. 1673+00

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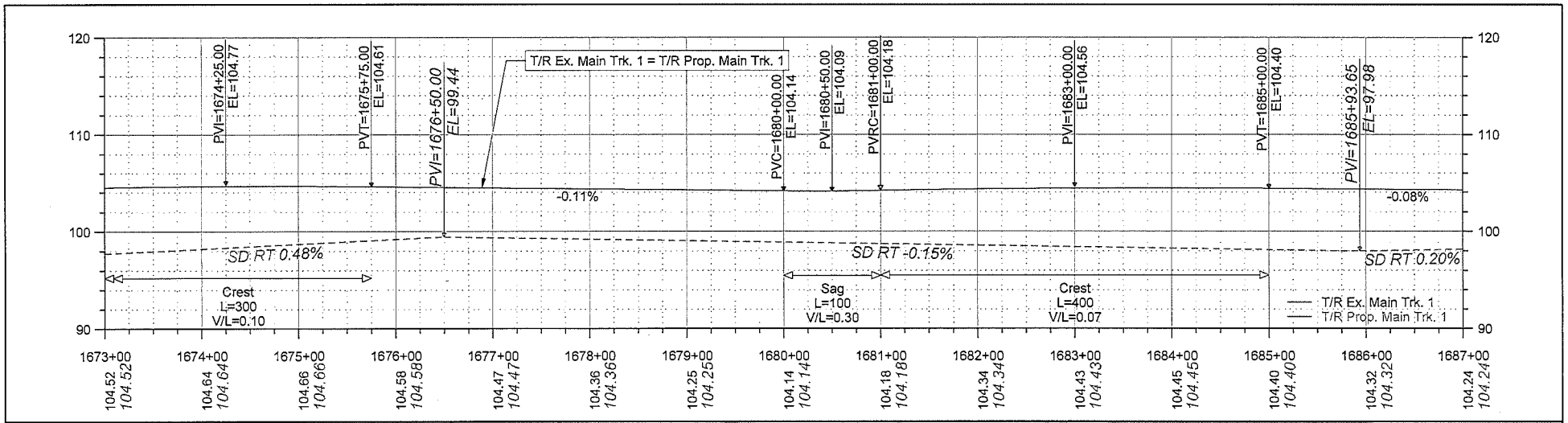

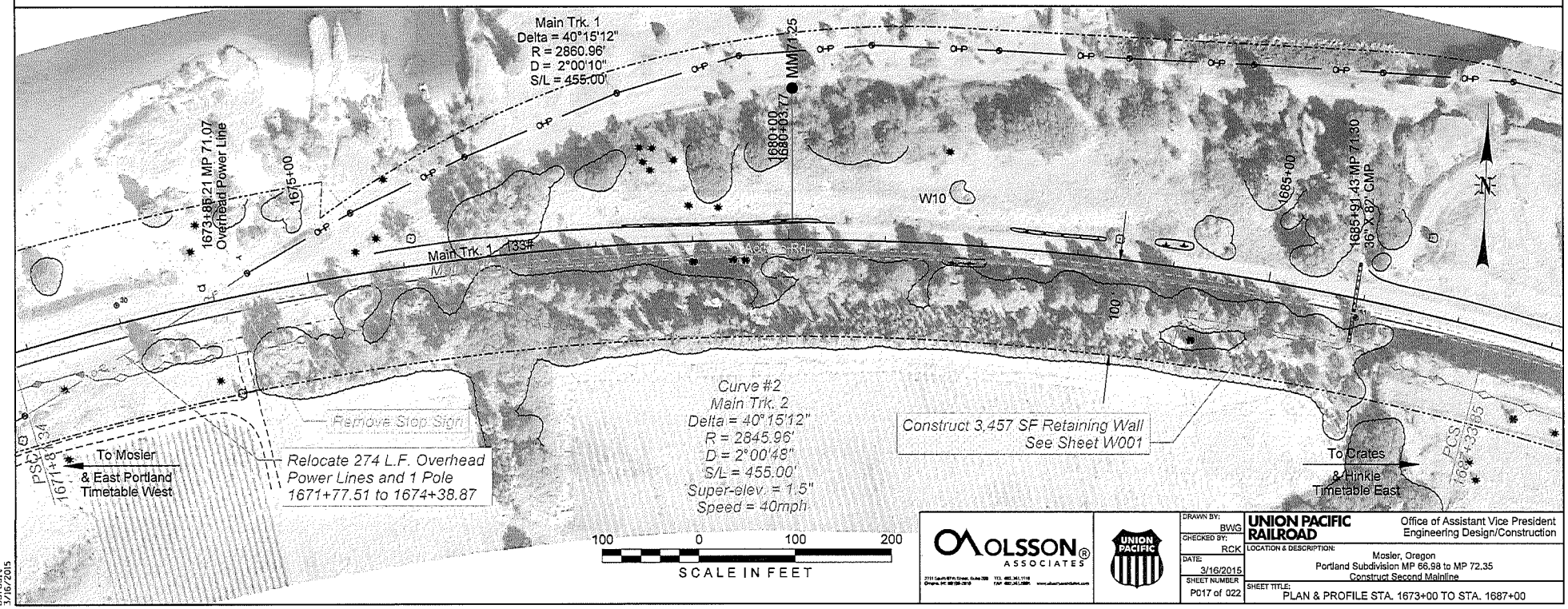

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DRAWN BY:	BWG
CHECKED BY:	RCK
DATE:	3/16/2015
SHEET NUMBER	P017 of 022

UNION PACIFIC RAILROAD

Office of Assistant Vice President Engineering Design/Construction

LOCATION & DESCRIPTION: Mosler, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE: PLAN & PROFILE STA. 1673+00 TO STA. 1687+00

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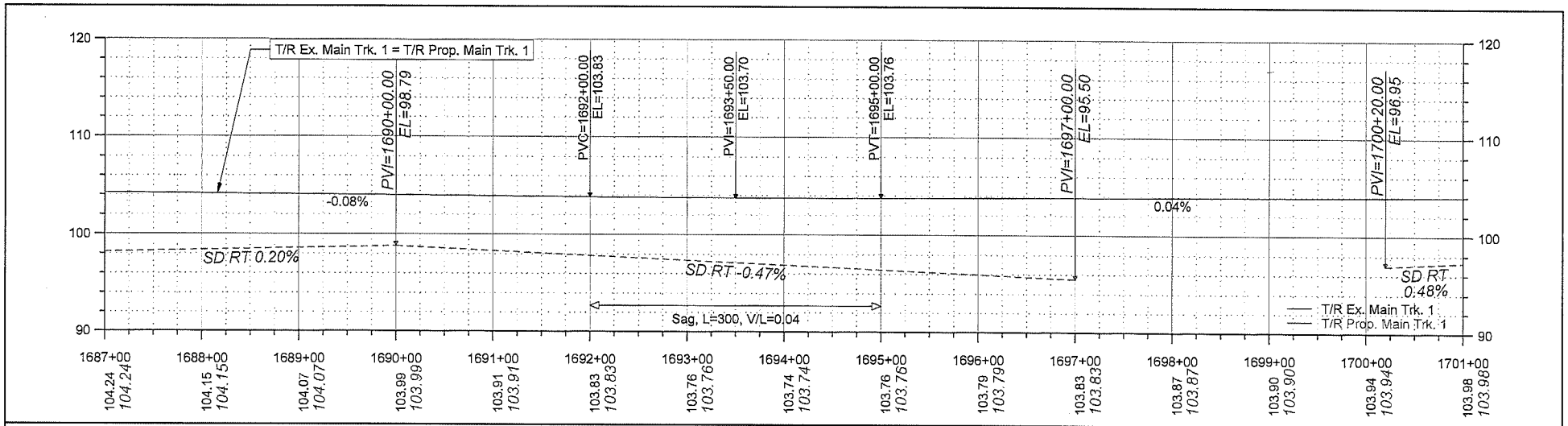

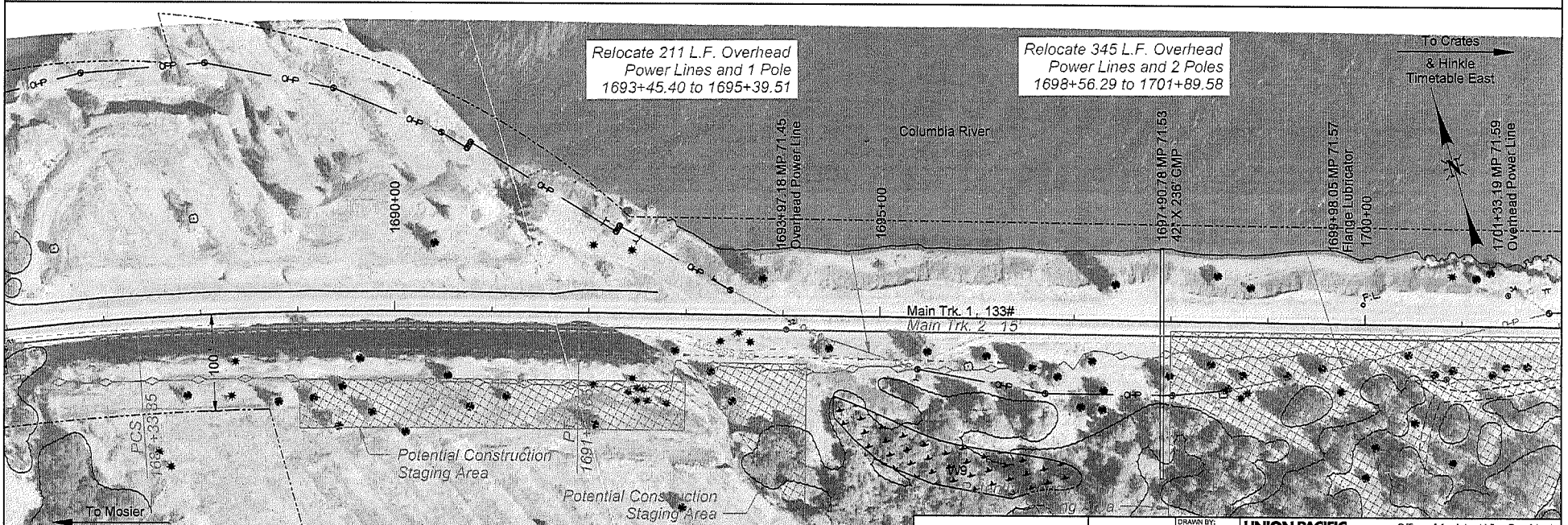

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DRAWN BY: BWG	UNION PACIFIC RAILROAD — Office of Assistant Vice President Engineering Design/Construction
CHECKED BY: RCK	LOCATION & DESCRIPTION: Mosier, Oregon; Portland Subdivision MP 66.98 to MP 72.35; Construct Second Mainline
DATE: 3/16/2015	
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3/16/2015

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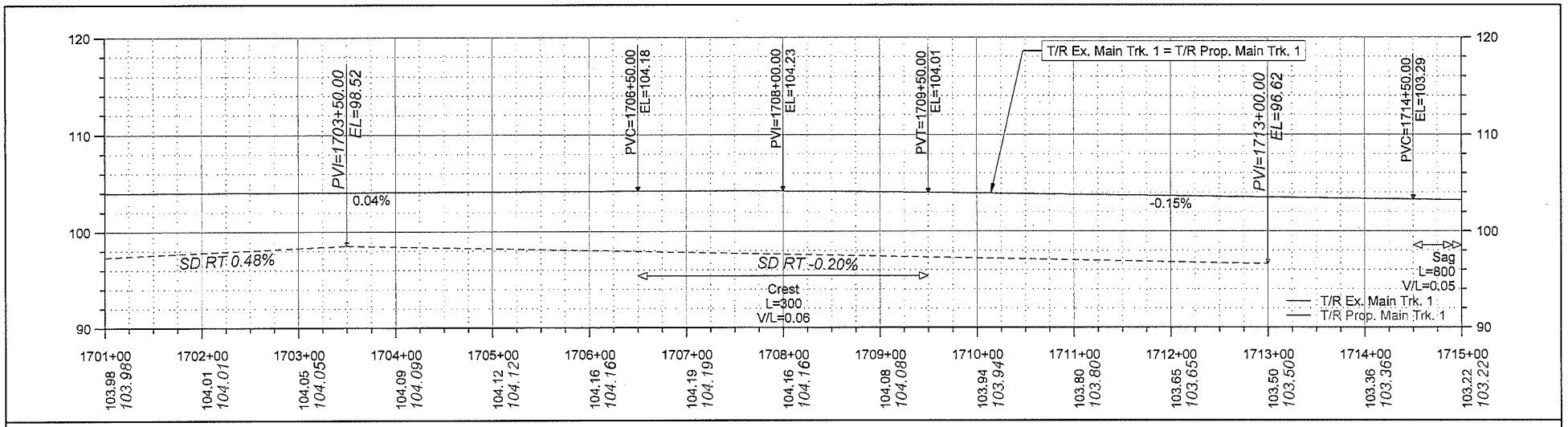

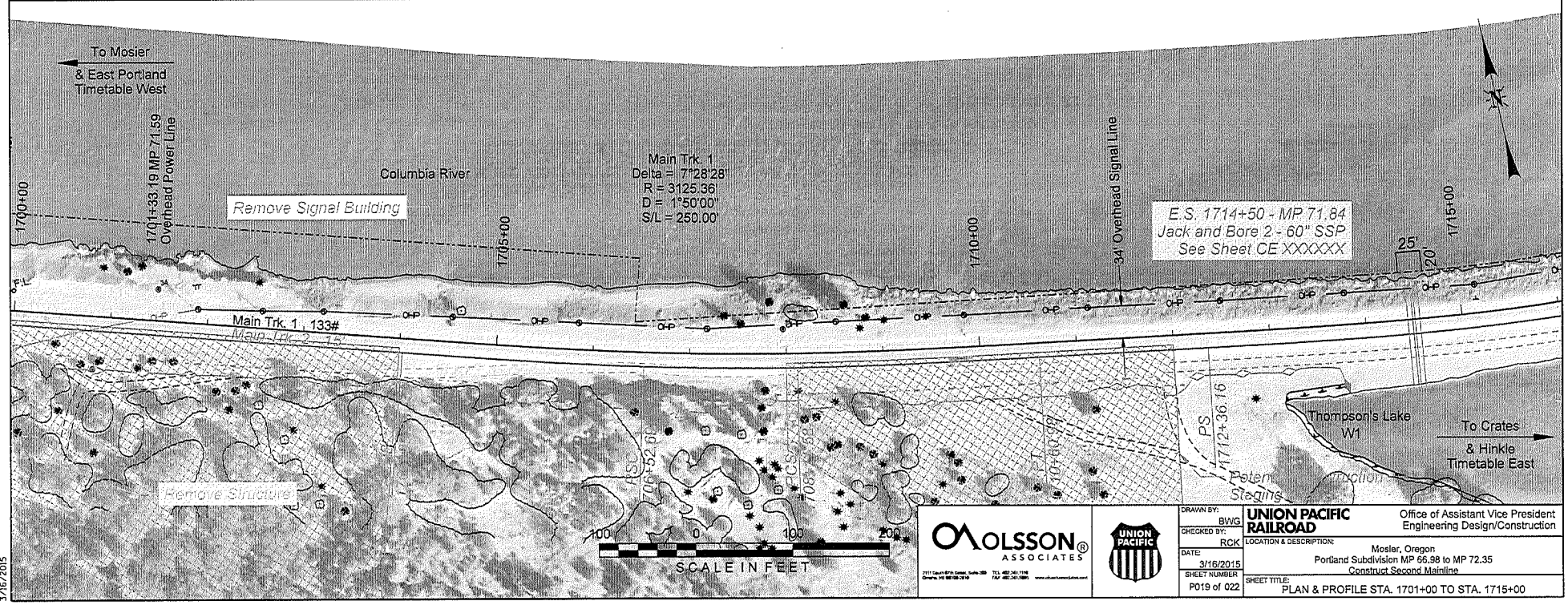

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UNION PACIFIC

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CHECKED BY: RCK	LOCATION & DESCRIPTION: Mosier, Oregon; Portland Subdivision MP 66.98 to MP 72.35; Construct Second Mainline
DATE: 3/16/2015	
SHEET NUMBER: P019 of 022	SHEET TITLE: PLAN & PROFILE STA. 1701+00 TO STA. 1715+00

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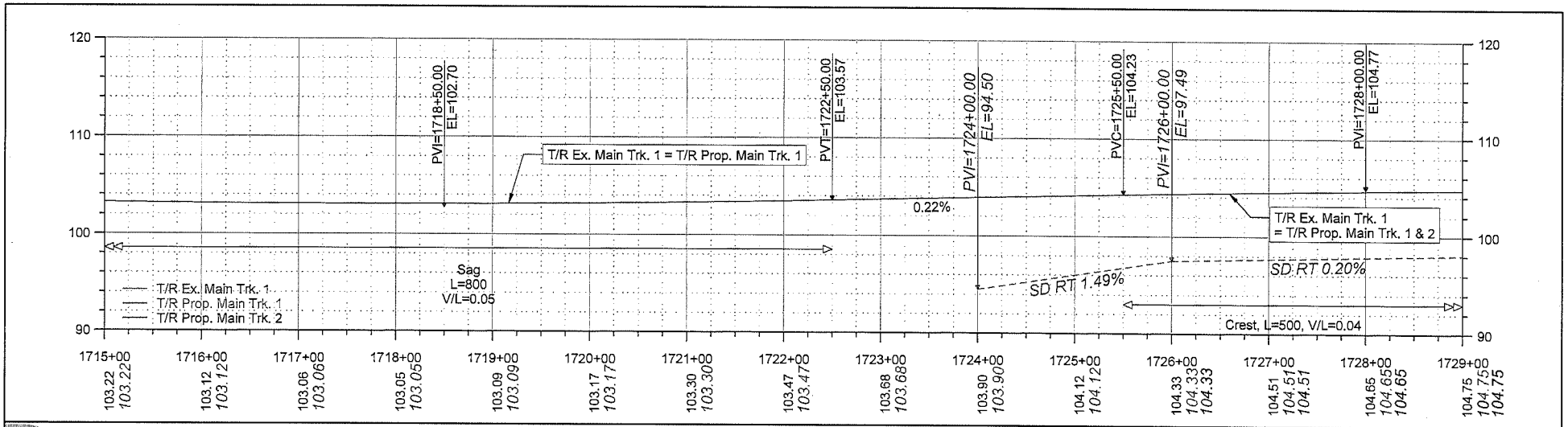
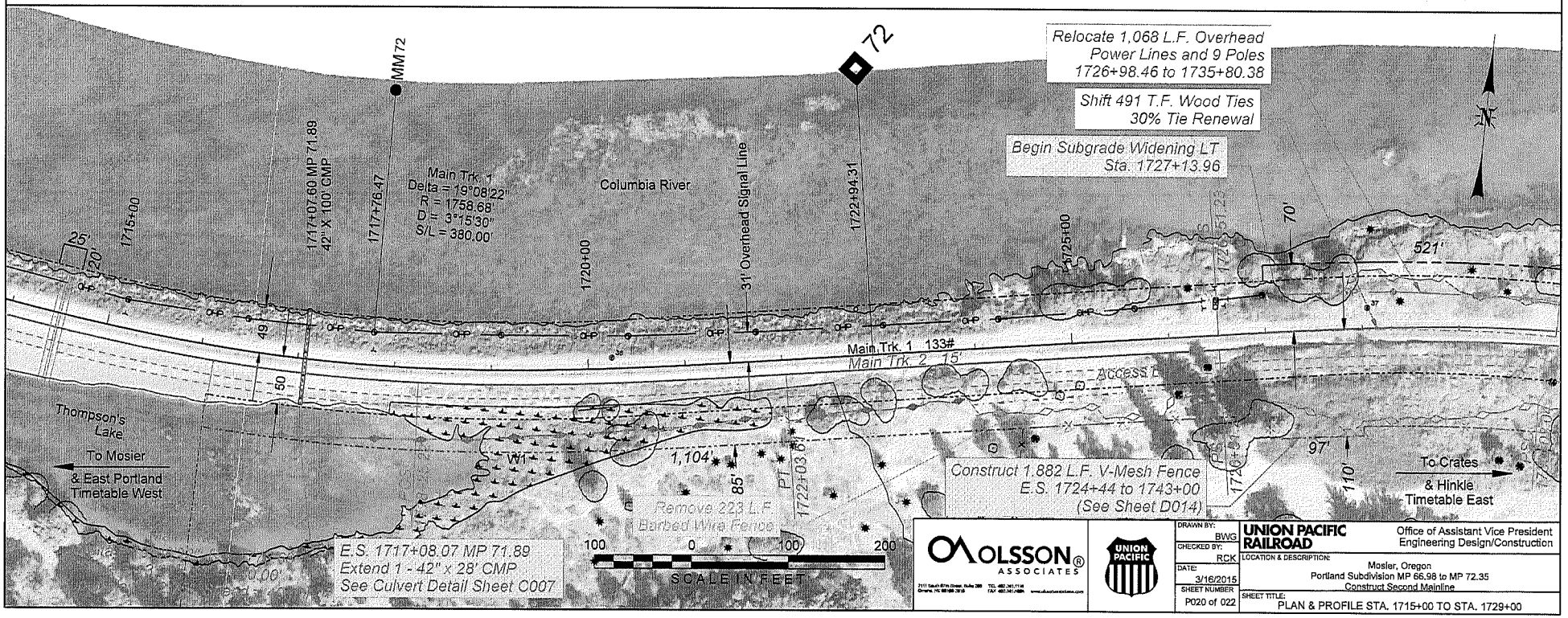
PO 13105





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CHECKED BY: RCK	LOCATION & DESCRIPTION: Mosier, Oregon; Portland Subdivision MP 66.98 to MP 72.35; Construct Second Mainline
DATE: 3/16/2015	
SHEET NUMBER: P020 of 022	SHEET TITLE: PLAN & PROFILE STA. 1715+00 TO STA. 1729+00

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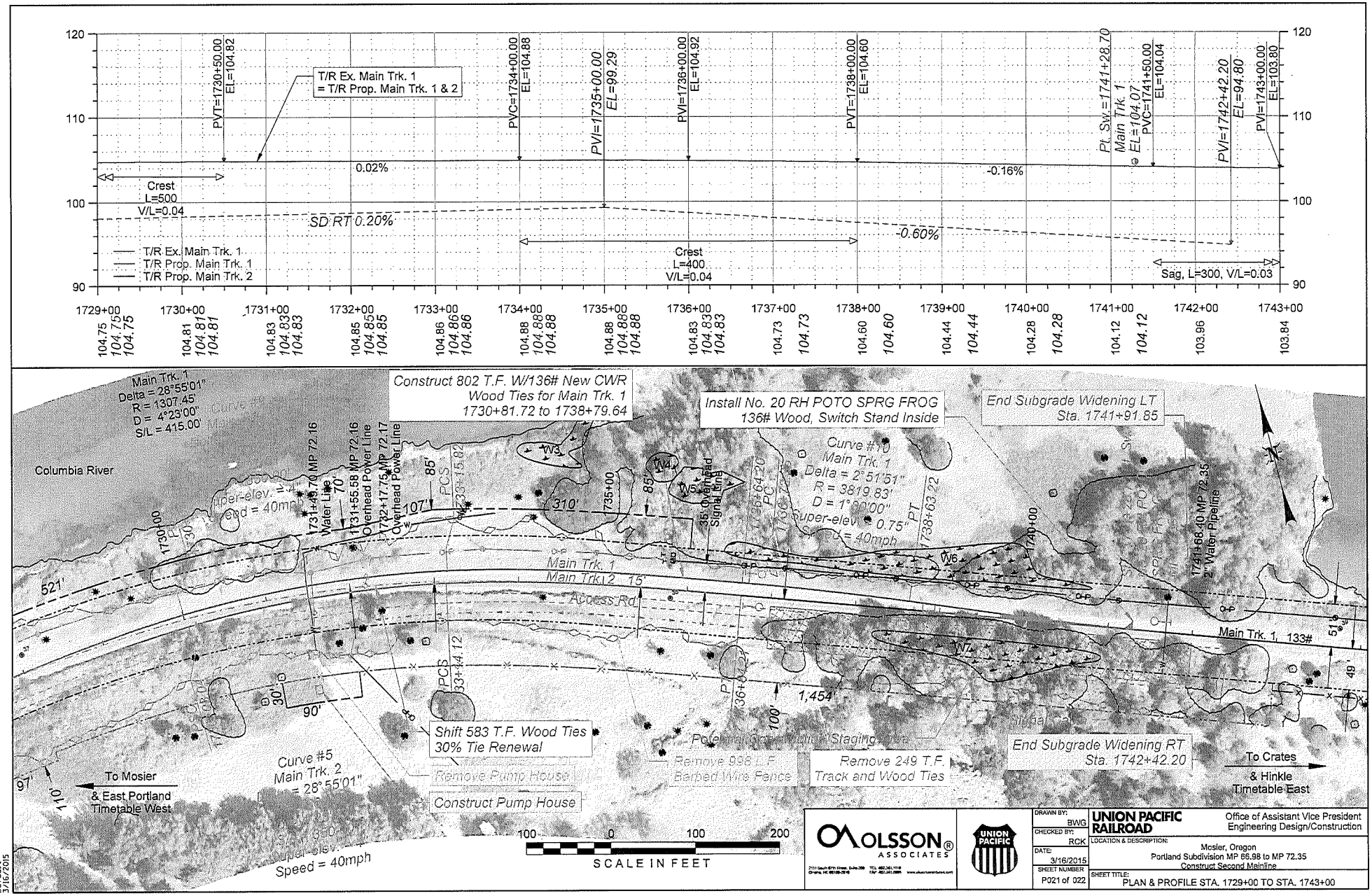
3/16/2015

PG 1 3 1056


T/R Ex. Main Trk. 1
= T/R Prop. Main Trk. 1 & 2
PVT=1730+50.00
EL=104.82
PVC=1734+00.00
EL=104.88
PVI=1735+00.00
EL=99.29
PVI=1736+00.00
EL=104.92
PVT=1738+00.00
EL=104.60
Pt. Sw.=1741+28.70
Main Trk. 1
EL=104.07
PVC=1741+50.00
EL=104.04
PVI=1742+42.20
EL=94.80
PVI=1743+00.00
EL=103.80
0.02%
-0.16%
Crest
L=500
V/L=0.04
SD RT 0.20%
-0.60%
Crest
L=400
V/L=0.04
Sag, L=300, V/L=0.03
T/R Ex. Main Trk. 1
T/R Prop. Main Trk. 1
T/R Prop. Main Trk. 2
Construct 802 T.F. W/136# New CWR
Wood Ties for Main Trk. 1
1730+81.72 to 1738+79.64
Install No. 20 RH POTO SPRG FROG
136# Wood, Switch Stand Inside
End Subgrade Widening LT
Sta. 1741+91.85
Main Trk. 1
Delta = 28°55'01"
R = 1307.45
D = 4°23'00"
S/L = 415.00'
Columbia River
Curve #6
Main Trk. 1
Delta = 2°51'51"
R = 3819.83'
D = 1°30'00"
Super-elev. = 0.75"
Speed = 40mph
Main Trk. 1
Main Trk. 2
Access Rd.
Main Trk. 1, 133#
Shift 583 T.F. Wood Ties
30% Tie Renewal
Remove Pump House
Construct Pump House
Remove 998 L.F.
Barbed Wire Fence
Remove 249 T.F.
Track and Wood Ties
End Subgrade Widening RT
Sta. 1742+42.20
To Mosier
& East Portland
Timetable West
To Crates
& Hinkle
Timetable East
Curve #5
Main Trk. 2
= 28°55'01"
Speed = 40mph
SCALE IN FEET
OLSSON ASSOCIATES
UNION PACIFIC
DRAWN BY: BWG
CHECKED BY: RCK
DATE: 3/16/2015
SHEET NUMBER: P021 of 022
UNION PACIFIC RAILROAD
Office of Assistant Vice President
Engineering Design/Construction
LOCATION & DESCRIPTION:
Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline
SHEET TITLE:
PLAN & PROFILE STA. 1729+00 TO STA. 1743+00

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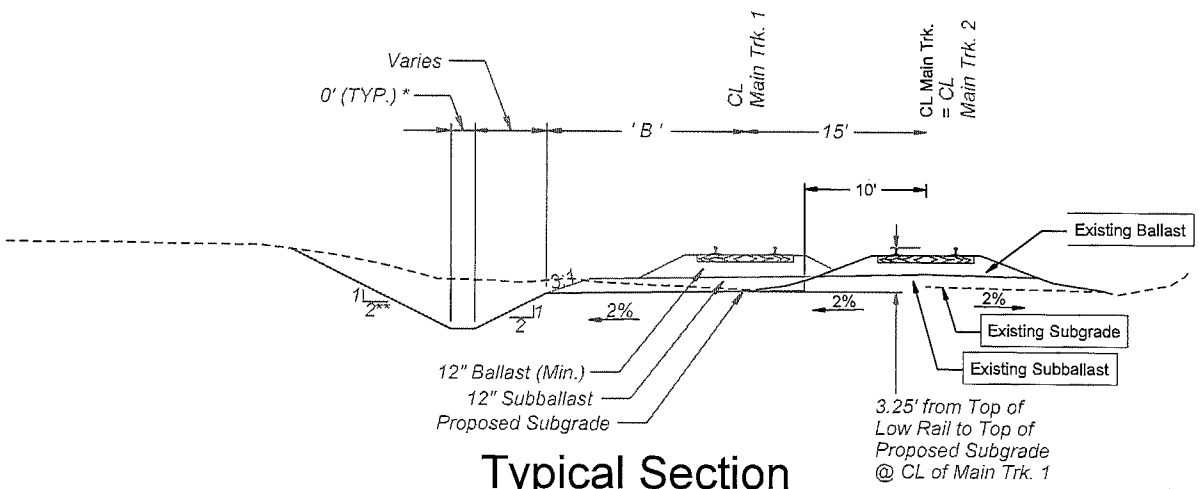
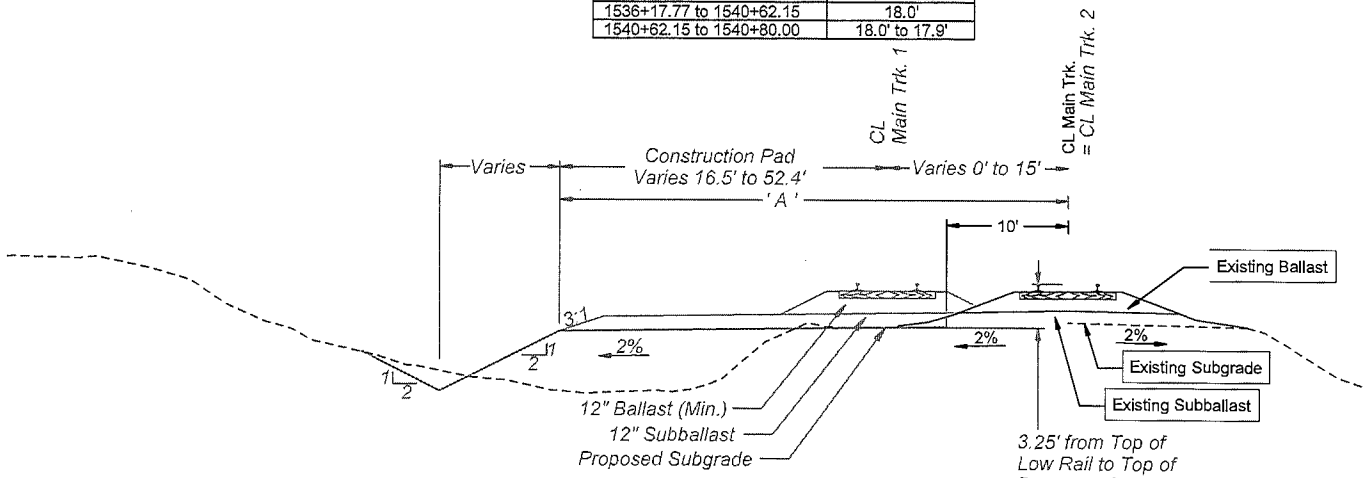


Typical Section

STA. TO STA.	'B'
1464+13.50 to 1530+09.88	16.5'
1530+09.88 to 1531+59.45	16.5' to 17.0'
1531+59.45 to 1534+29.75	17.0'
1534+29.75 to 1536+17.77	17.0' to 18.0'
1536+17.77 to 1540+62.15	18.0'
1540+62.15 to 1540+80.00	18.0' to 17.9'

* 2' Flat Bottom Ditch from Sta. 1504+00.00 to Sta. 1523+00.00
** Slope Varies Over the Following Station Ranges:
Sta. 1466+33.40 to Sta. 1468+91.54
Sta. 1474+79.43 to Sta. 1477+73.47
Sta. 1501+63.21 to Sta. 1502+28.14
Sta. 1535+76.26 to Sta. 1537+83.40
See Cross Sections for Slope.



Typical Section

STA. TO STA.	'A'
1457+54.66 to 1457+91.00	16.5' to 52.4'
1457+91.00 to 1458+44.00	52.4'
1458+44.00 to 1464+10.00	35.0'
1464+10.00 to 1464+13.50	35.0' to 31.5'

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SHEET NUMBER: T 001 of 009

UNION PACIFIC RAILROAD
Office of Assistant Vice President Engineering Design/Construction

LOCATION & DESCRIPTION: Mosler, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE: TYPICAL SECTIONS

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10/20/2014

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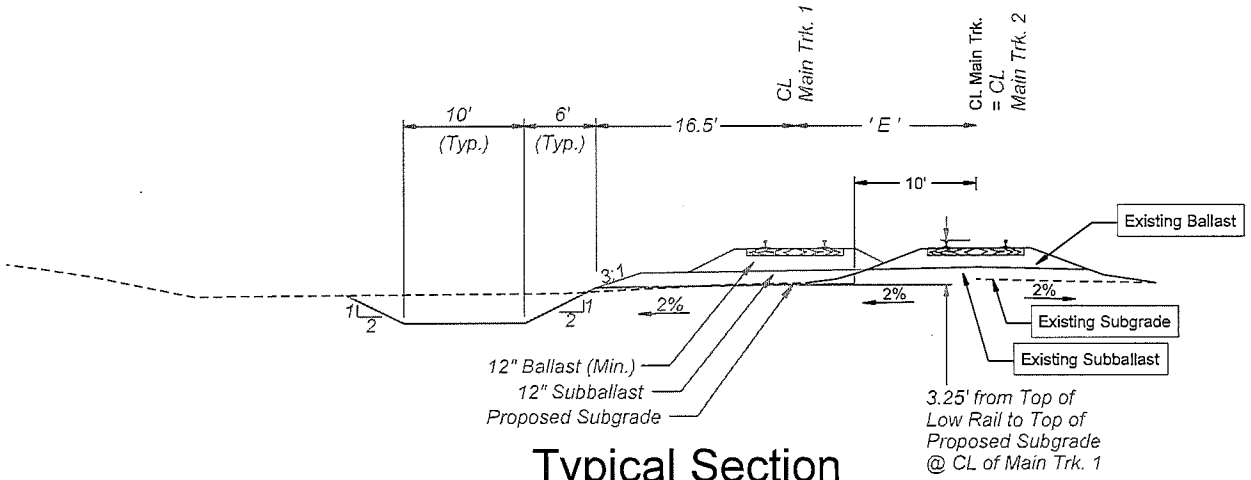
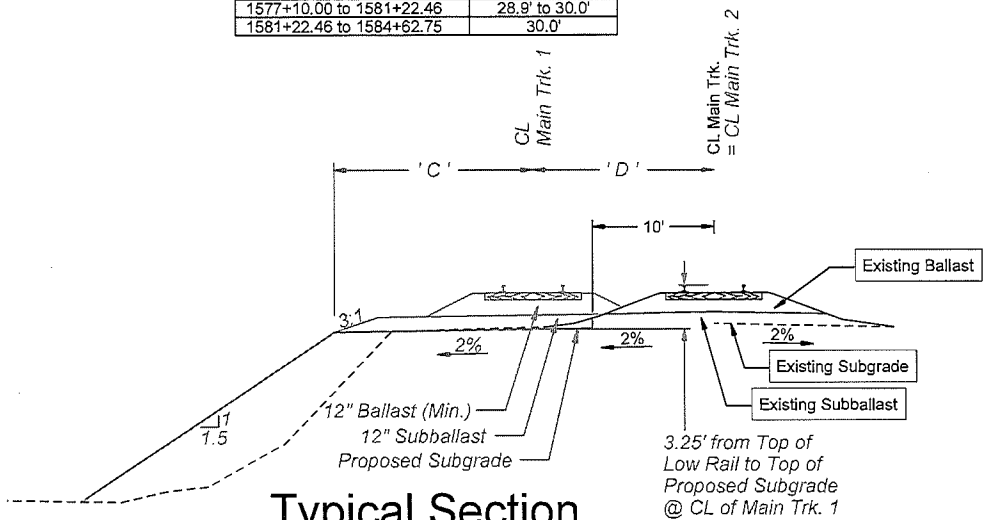


Typical Section

STA. TO STA.	'E'
1552+60.00 to 1563+00.00	15.0'
1564+80.00 to 1565+30.00	15.0'
1572+50.00 to 1575+00.00	21.5' to 26.4'
1577+10.00 to 1581+22.46	28.9' to 30.0'
1581+22.46 to 1584+62.75	30.0'



Typical Section

STA. TO STA.	'C'	'D'
1540+80.00 to 1543+26.14	17.9' to 16.5'	15.0'
1543+26.14 to 1552+60.00	16.5'	15.0'
1567+10.00 to 1567+97.32	16.5'	15.0'
1567+97.32 to 1572+50.00	16.5'	15.0' to 21.5'
1575+00.00 to 1577+10.00	16.5'	26.4' to 28.9'

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DATE:	10/20/2014
SHEET NUMBER	T 002 of 009

UNION PACIFIC RAILROAD

Office of Assistant Vice President Engineering Design/Construction

LOCATION & DESCRIPTION: Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE: TYPICAL SECTIONS

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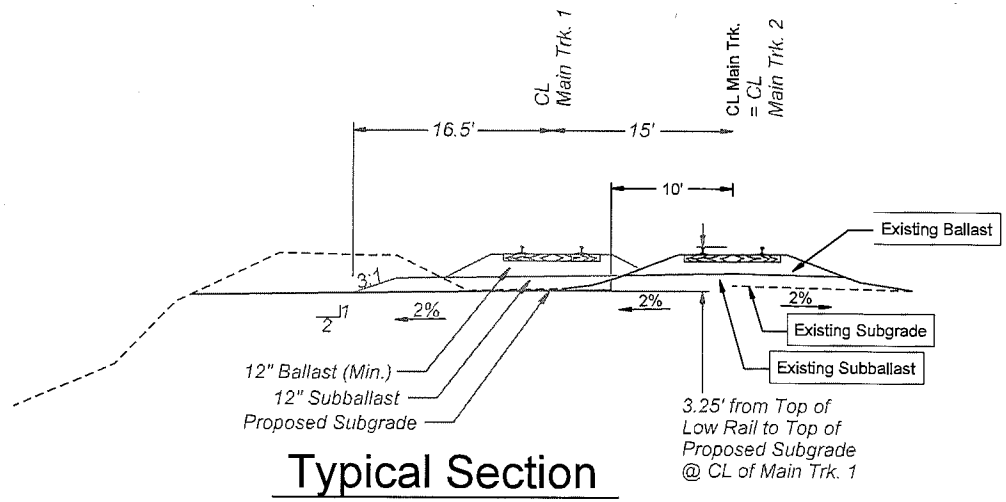
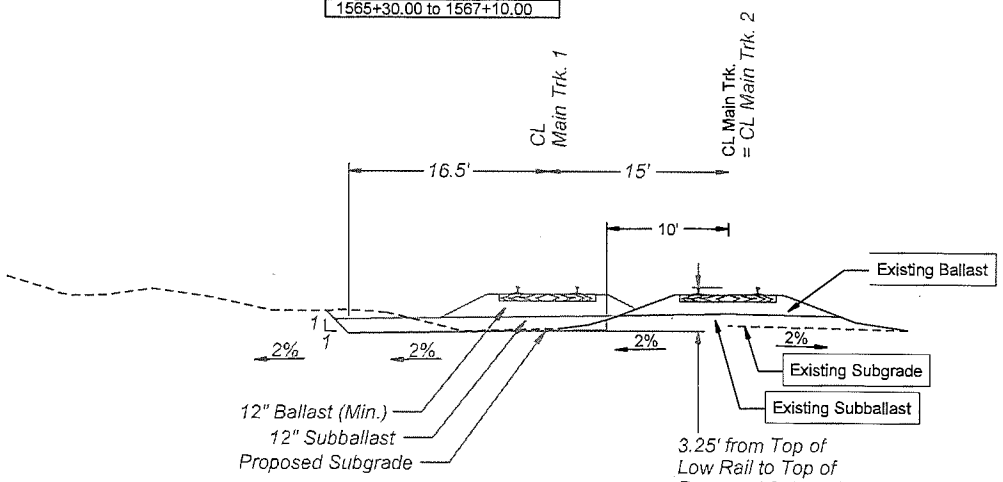


Typical Section

STA. TO STA.
1552+60.00 to 1563+00.00
1565+30.00 to 1567+10.00



Typical Section

Sta. 1563+00.00 to Sta. 1564+80.00

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UNION PACIFIC RAILROAD

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LOCATION & DESCRIPTION: Mosler, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE: TYPICAL SECTIONS

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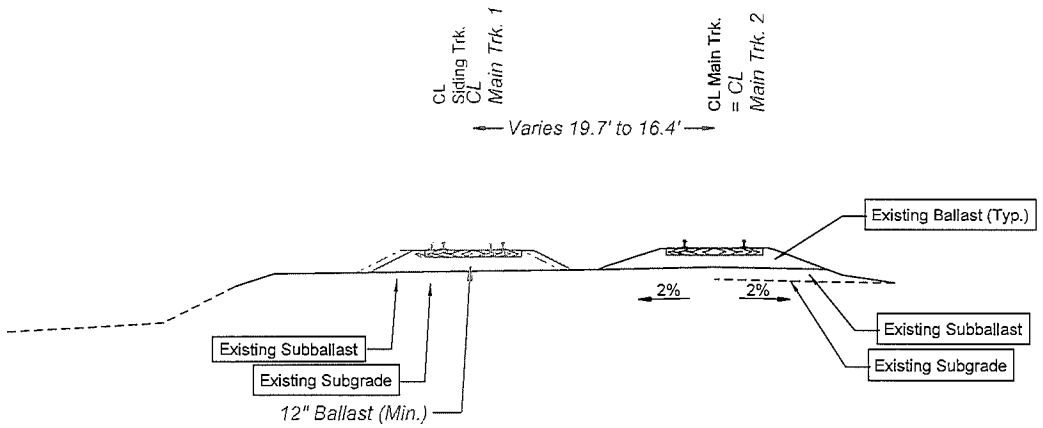
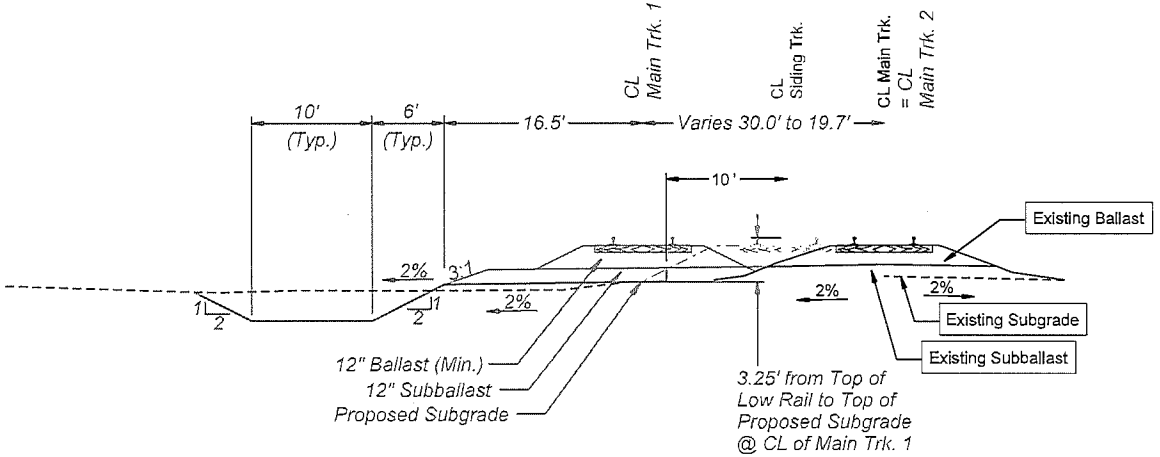
10/20/2014

PG 1 3 1 of 59



Typical Section

Sta. 1589+52.23 to Sta. 1592+52.72



Typical Section

Sta. 1584+62.75 to Sta. 1589+52.23

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UNION PACIFIC RAILROAD

Office of Assistant Vice President Engineering Design/Construction

LOCATION & DESCRIPTION: Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE: TYPICAL SECTIONS

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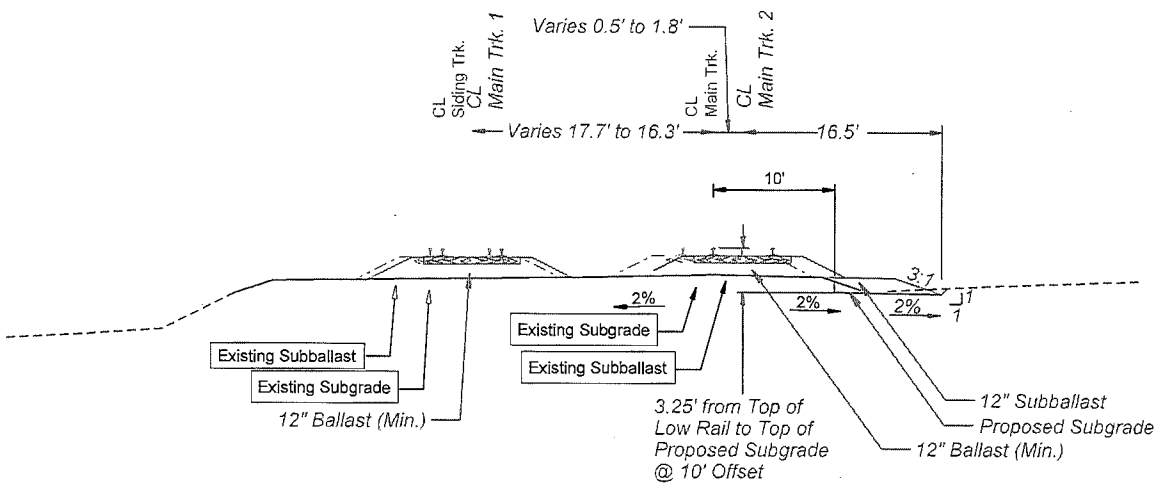
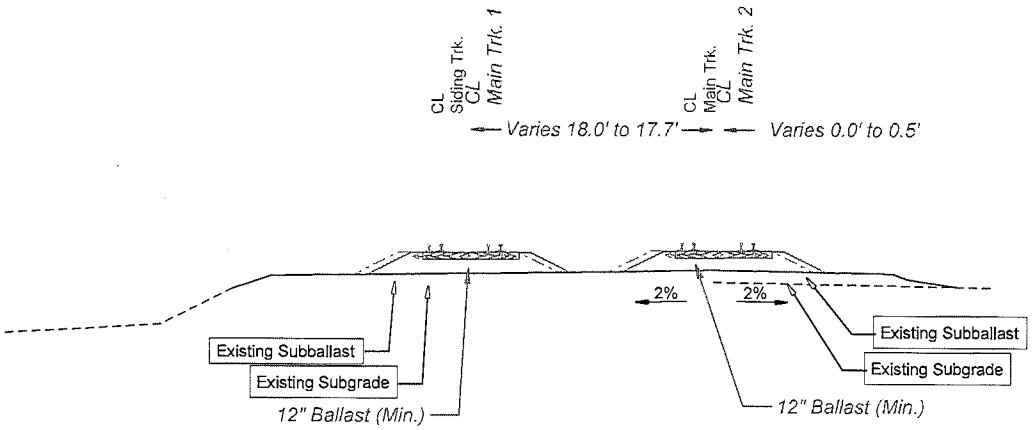


Typical Section

Sta. 1638+84.85 to Sta. 1640+50.00



Typical Section

Sta. 1636+53.52 to Sta. 1638+84.85

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DATE:	10/20/2014
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UNION PACIFIC RAILROAD

Office of Assistant Vice President Engineering Design/Construction

LOCATION & DESCRIPTION: Mosler, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE: TYPICAL SECTIONS

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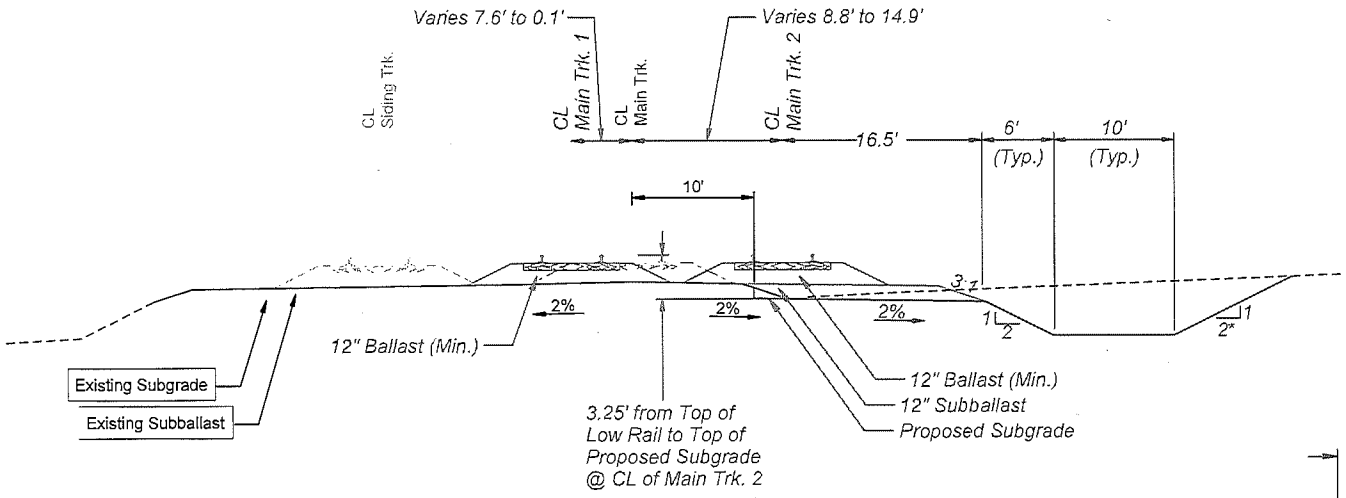
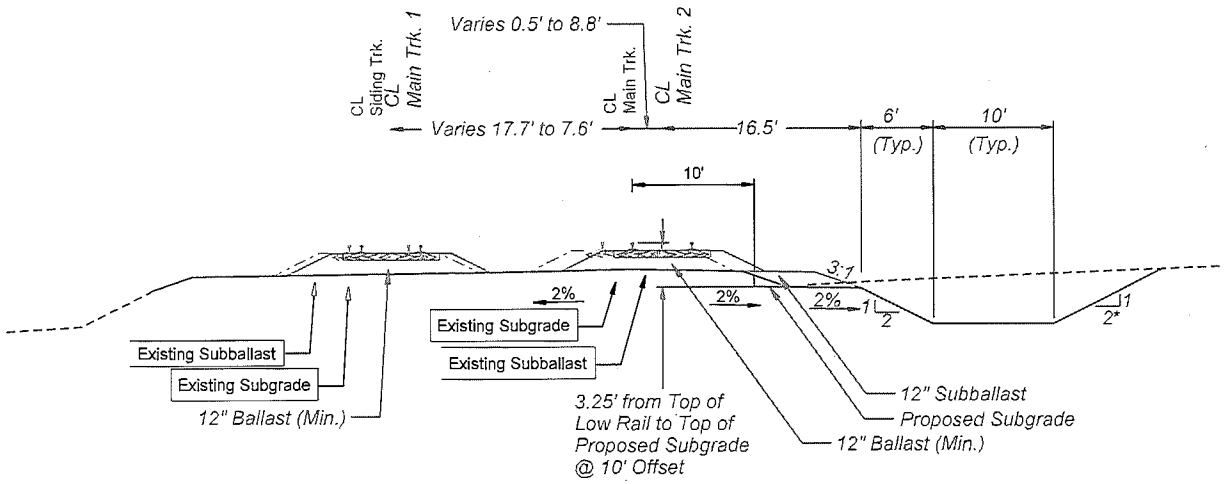


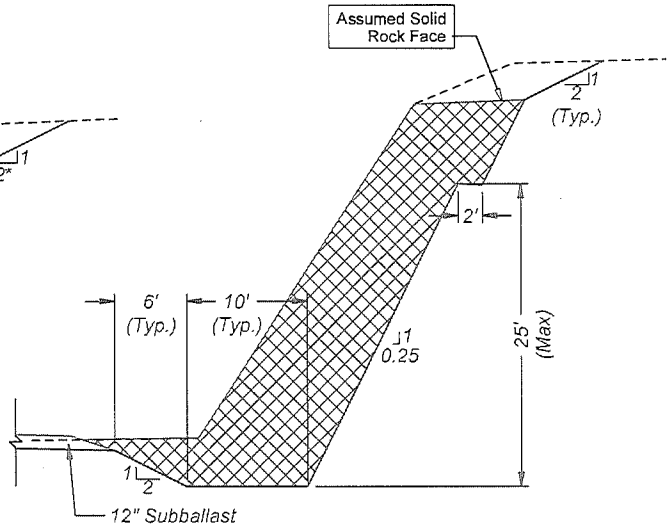
Typical Section

Sta. 1646+76.80 to Sta. 1654+00.00



Typical Section

Sta. 1640+50.00 to Sta. 1646+76.80



Rock Excavation

STA. TO STA.
1643+70.00 to 1647+50.00
1677+10.00 to 1684+70.00
1686+10.00 to 1692+95.00
1704+00.00 to 1708+11.58
1726+00.00 to 1736+00.00

* See Rock Excavation Detail This Sheet

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DATE: 10/20/2014	
SHEET NUMBER: T 006 of 009	SHEET TITLE: TYPICAL SECTIONS

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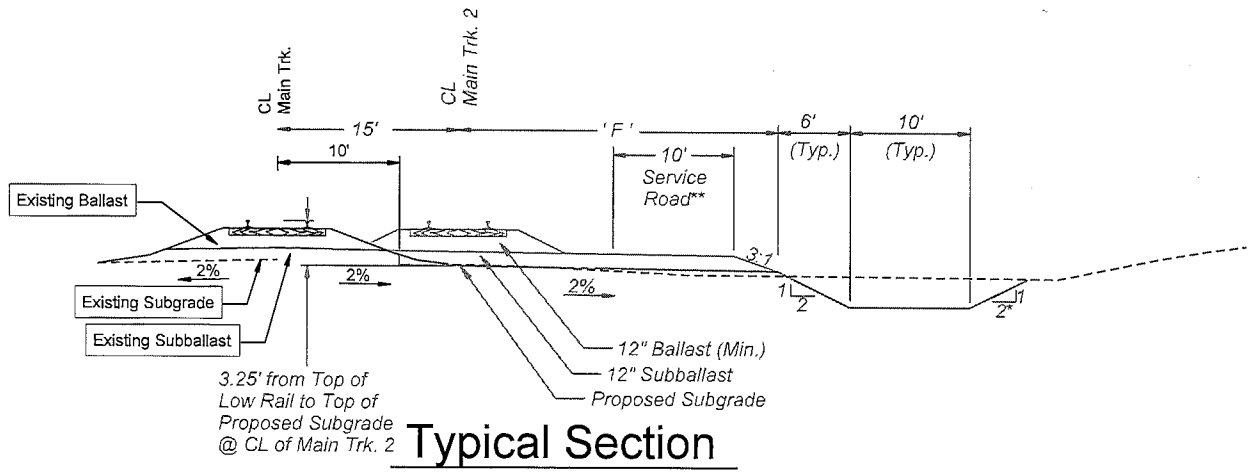
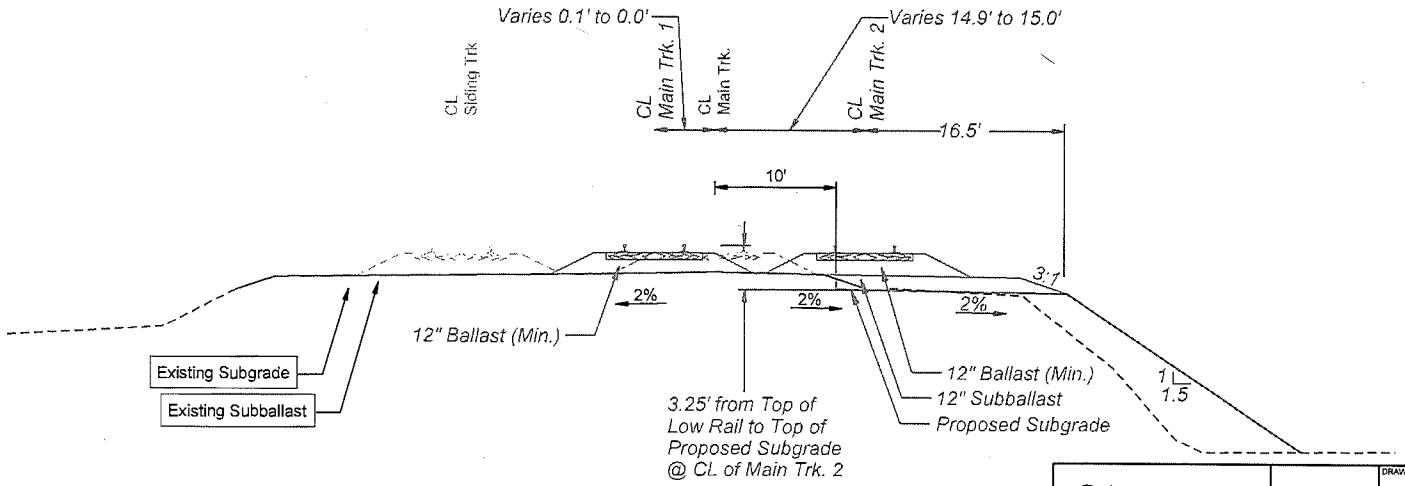


Typical Section

STA. TO STA.	'F'
1667+80.00 to 1704+03.28	16.5'
1704+03.28 to 1706+52.69	16.5' to 17.5'
1706+52.69 to 1708+11.58	17.5'
1708+11.58 to 1710+60.98	17.5' to 16.5'
1710+60.98 to 1711+80.00	16.5'
1711+80.00 to 1711+90.00	16.5' to 26.5'
1711+90.00 to 1712+36.16	26.5'
1712+36.16 to 1713+60.00	26.5' to 27.0'
1722+03.61 to 1725+91.23	26.5'



Typical Section

Sta. 1654+00.00 to Sta. 1656+10.60

* See Rock Excavation Detail on Sheet T006
** Service Road from Sta. 1711+90.00 to 1725+91.23 only

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SHEET NUMBER	T 007 of 009

UNION PACIFIC RAILROAD — Office of Assistant Vice President Engineering Design/Construction

LOCATION & DESCRIPTION: Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE: TYPICAL SECTIONS

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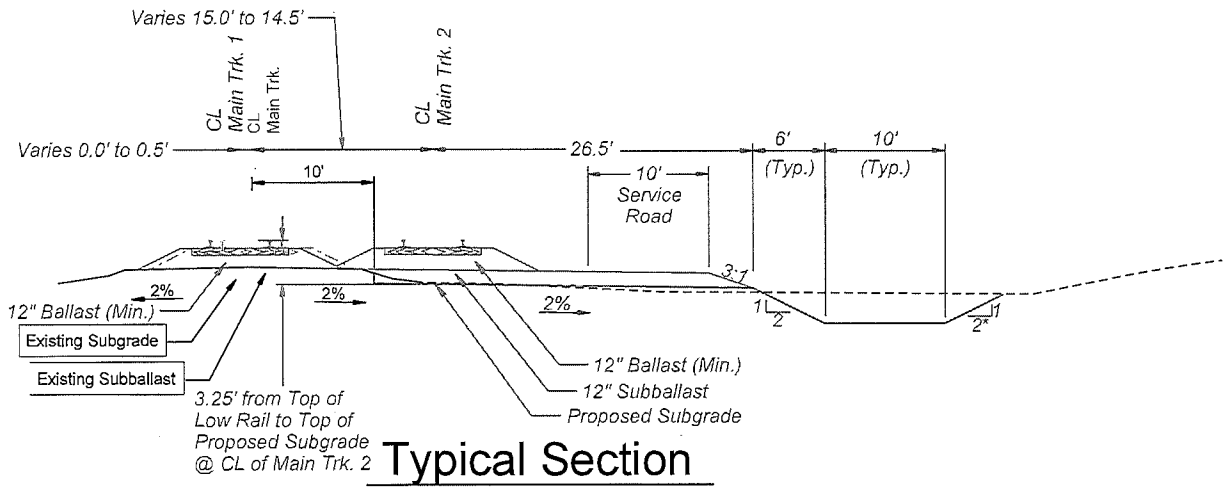
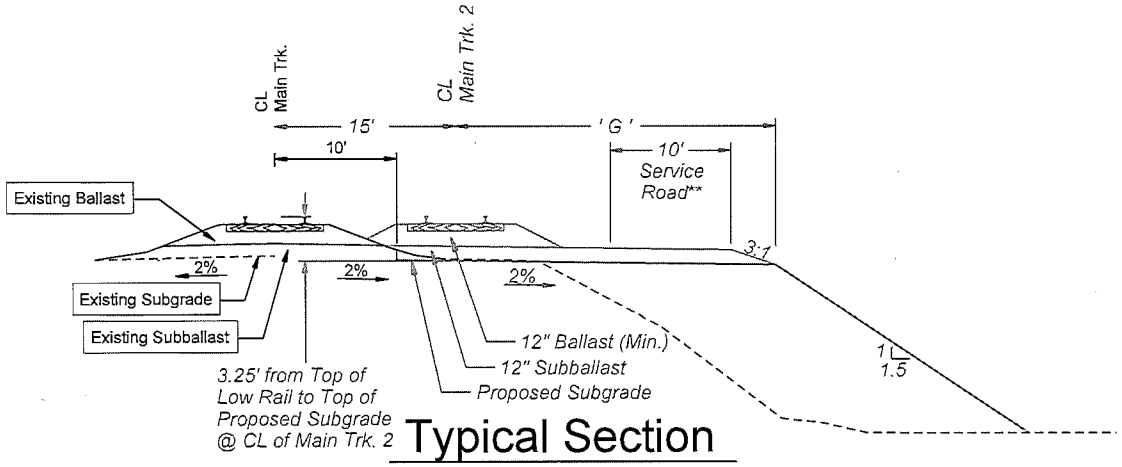


Typical Section

Sta. 1725+91.23 to Sta. 1727+13.96



Typical Section

STA. TO STA.	'G'
1656+10.60 to 1667+80.00	16.5'
1713+60.00 to 1716+14.56	27.0' to 28.0'
1716+14.56 to 1718+25.22	28.0'
1718+25.22 to 1722+03.61	28.0' to 26.5'

* See Rock Excavation Detail on Sheet T006
** Service Road from Sta. 1711+90.00 to 1725+91.23 only

OLSSON ASSOCIATES

UNION PACIFIC

DRAWN BY: BWG	UNION PACIFIC RAILROAD — Office of Assistant Vice President Engineering Design/Construction
CHECKED BY: RCK	LOCATION & DESCRIPTION: Mosier, Oregon; Portland Subdivision MP 66.98 to MP 72.35; Construct Second Mainline
DATE: 10/20/2014	
SHEET NUMBER: T 008 of 009	SHEET TITLE: TYPICAL SECTIONS

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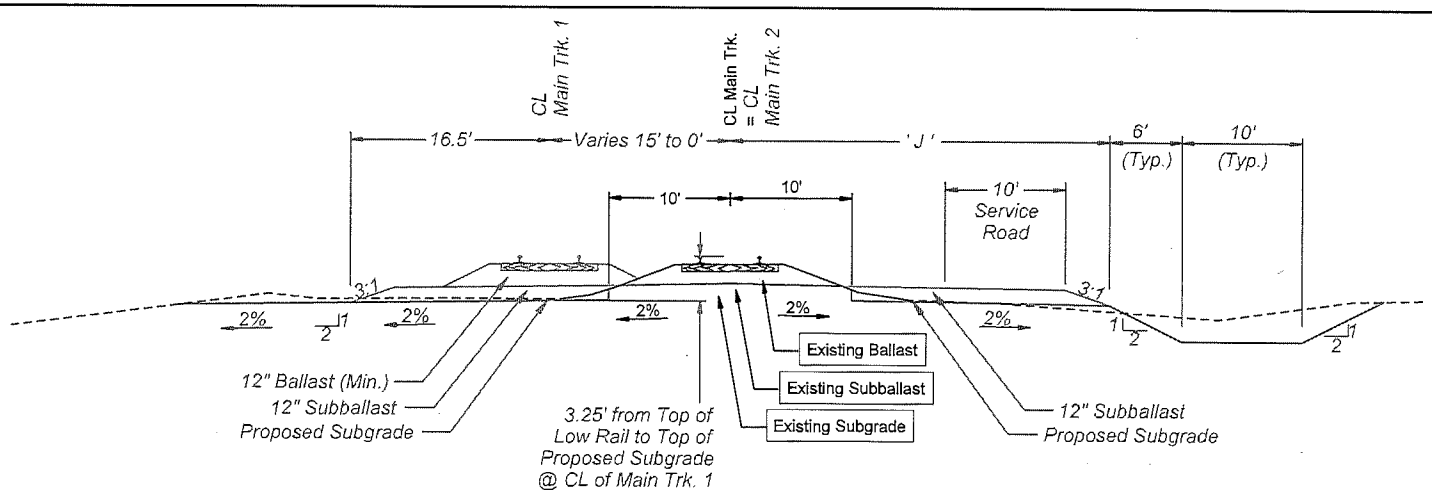
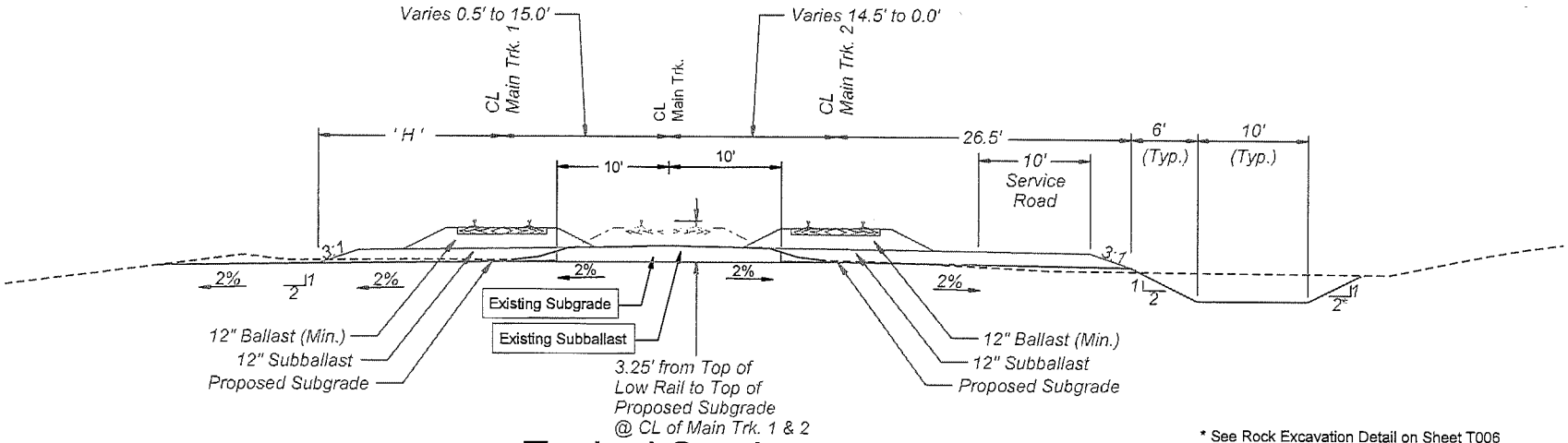


Typical Section

STA. TO STA.	'J'
1736+64.21 to 1737+61.50	26.5'
1737+61.50 to 1738+00.00	26.5' to 65.0'
1738+00.00 to 1741+93.70	65.0'
1741+93.70 to 1742+42.21	65.0' to 16.5'



Typical Section

STA. TO STA.	'H'
1727+13.96 to 1730+00.71	16.9' to 18.5'
1730+00.71 to 1733+15.82	18.5'
1733+15.82 to 1736+64.21	18.5' to 16.5'

* See Rock Excavation Detail on Sheet T006

OLSSON ASSOCIATES

DRAWN BY:	BWG
CHECKED BY:	RCK
DATE:	10/20/2014
SHEET NUMBER	T 009 of 009

UNION PACIFIC RAILROAD

Office of Assistant Vice President Engineering Design/Construction

LOCATION & DESCRIPTION: Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE: TYPICAL SECTIONS

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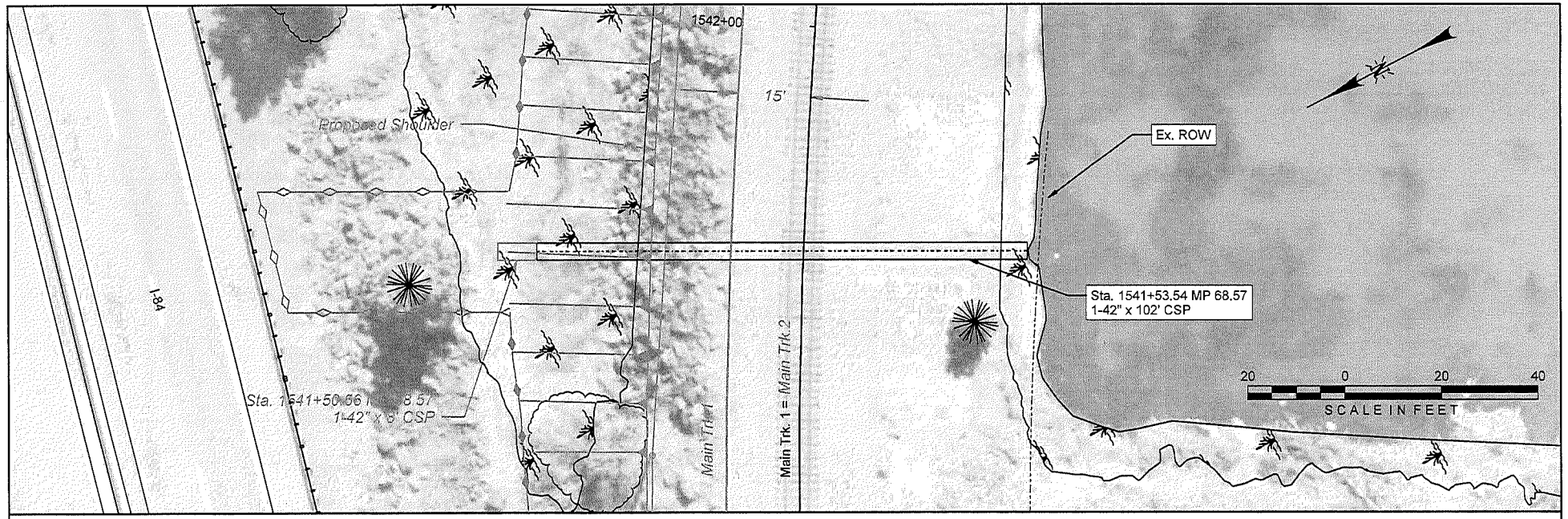
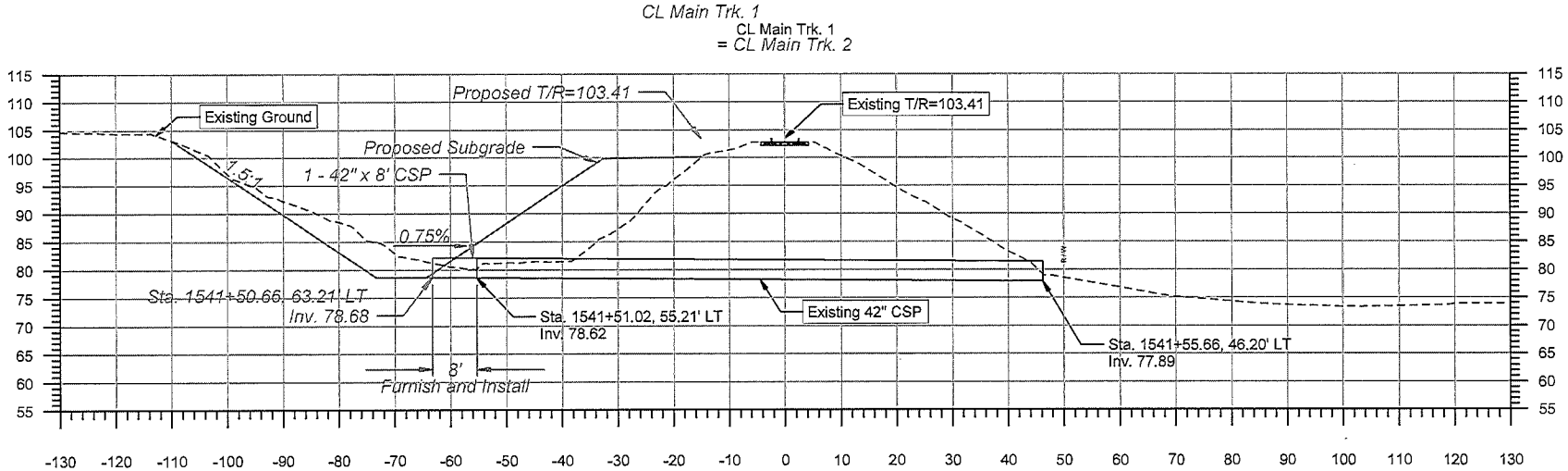
10/20/2014

PG 1 3 1065





42" CSP - Sta. 1541+53.54 - MP 68.57

OLSSON ASSOCIATES

DRAWN BY:	BWG
CHECKED BY:	RCK
DATE:	3/16/2015
SHEET NUMBER	C004 of 007

UNION PACIFIC RAILROAD

Office of Assistant Vice President
Engineering Design/Construction

LOCATION & DESCRIPTION:
Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE:
CULVERT STA. 1541+54 - EXTEND 42" CSP

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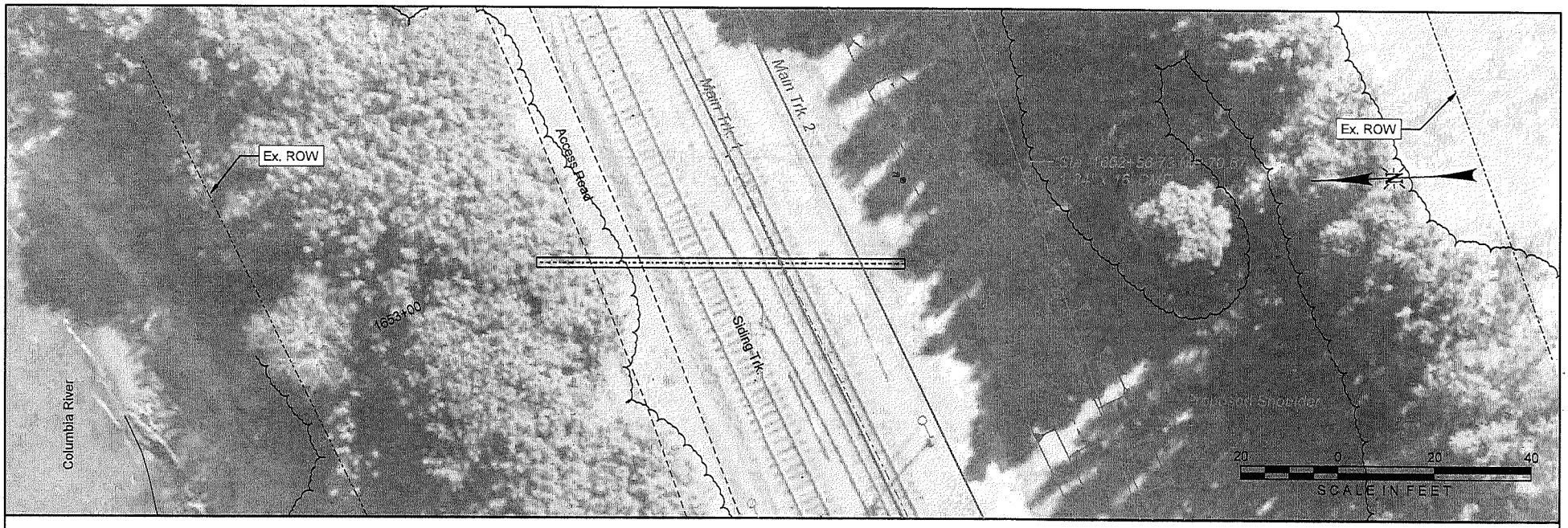
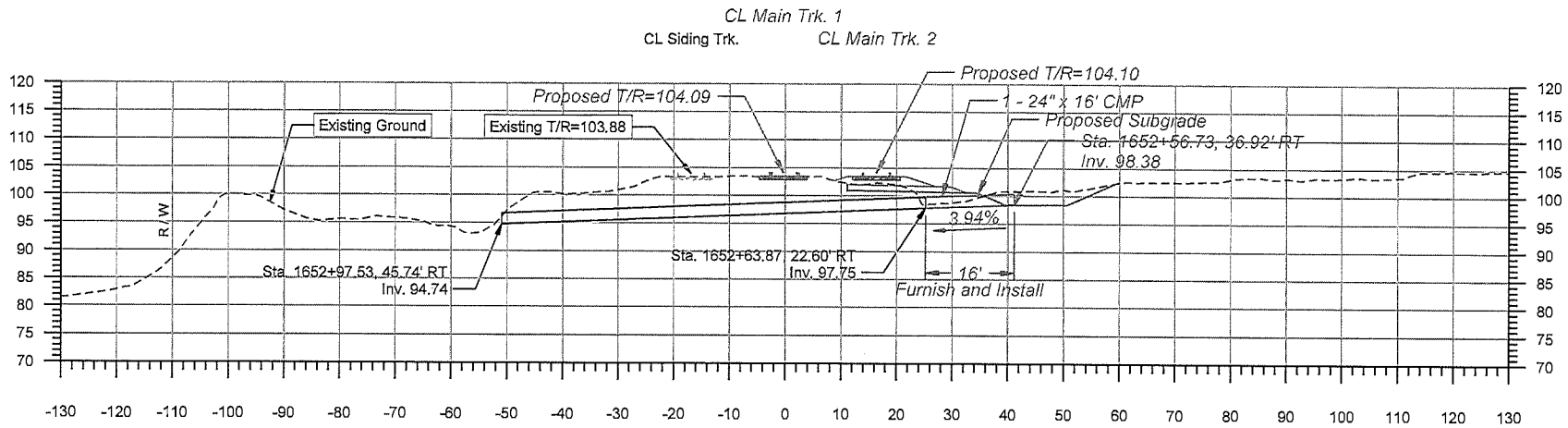
Date: 3/16/2015

PC 13-0159





Extend 24" CMP - Sta. 1652+75 - MP 70.67

OLSSON ASSOCIATES

DRAWN BY: BWG	UNION PACIFIC RAILROAD — Office of Assistant Vice President Engineering Design/Construction
CHECKED BY: RCK	LOCATION & DESCRIPTION: Mosler, Oregon; Portland Subdivision MP 66.98 to MP 72.35; Construct Second Mainline
DATE: 3/16/2015	
SHEET NUMBER: C005 of 007	SHEET TITLE: CULVERT STA. 1652+75.11 - EXTEND EXISTING 24" CMP

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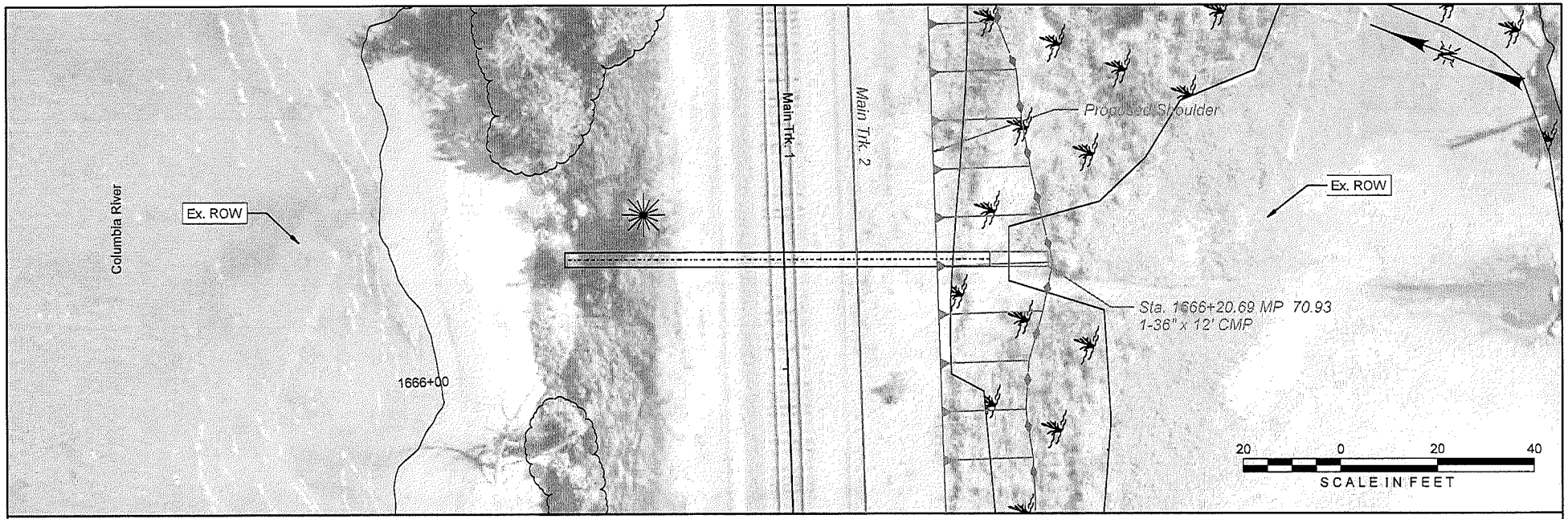
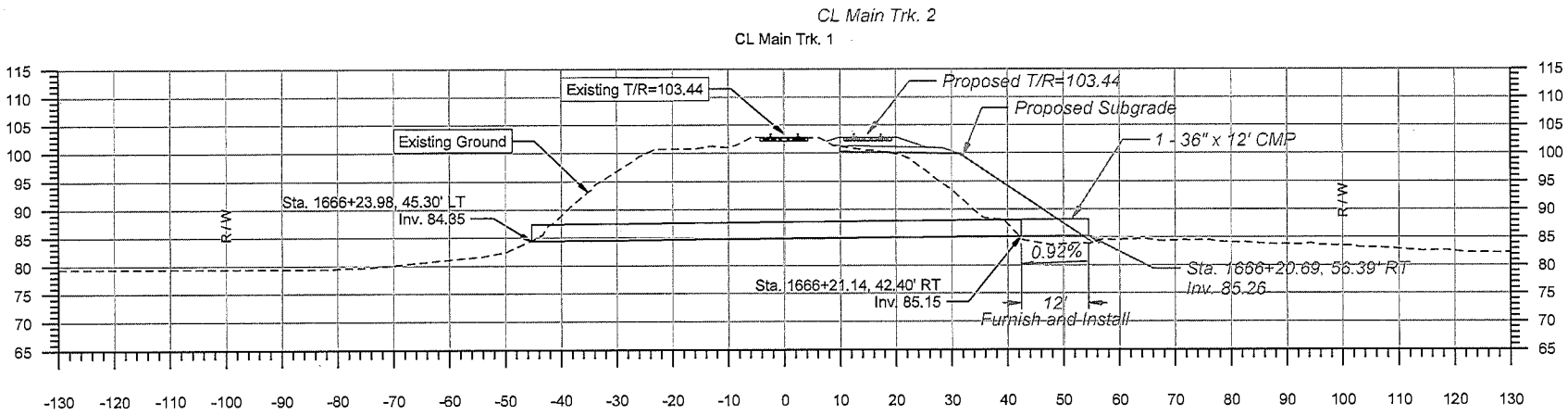
3/16/2015

DC 1 3 1068





Extend 36" CMP - Sta. 1666+23 - MP 70.93

OLSSON ASSOCIATES

DRAWN BY:	BWG
CHECKED BY:	RCK
DATE:	3/16/2015
SHEET NUMBER	C006 of 007

UNION PACIFIC RAILROAD

Office of Assistant Vice President
Engineering Design/Construction

LOCATION & DESCRIPTION:
Mosier, Oregon
Portland Subdivision MP 66.98 to MP 72.35
Construct Second Mainline

SHEET TITLE:
CULVERT STA. 1666+22.51 - EXTEND EXISTING 36" CMP

Color table: F:\PROJECTS\011-1346\color\UPRR.tbl
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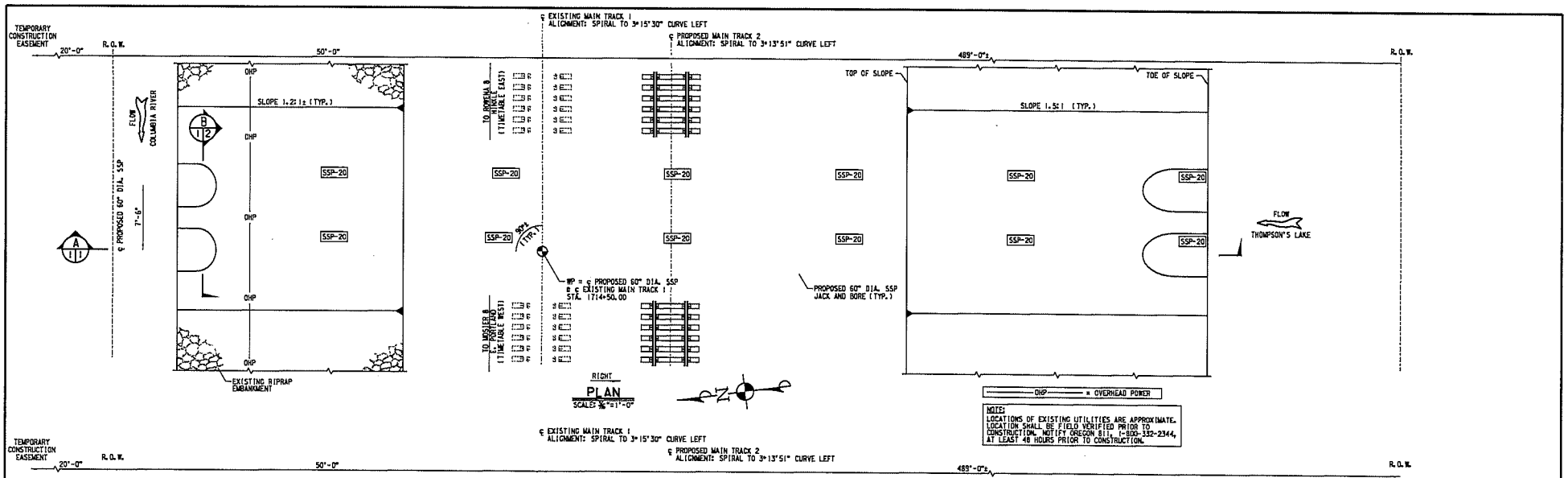
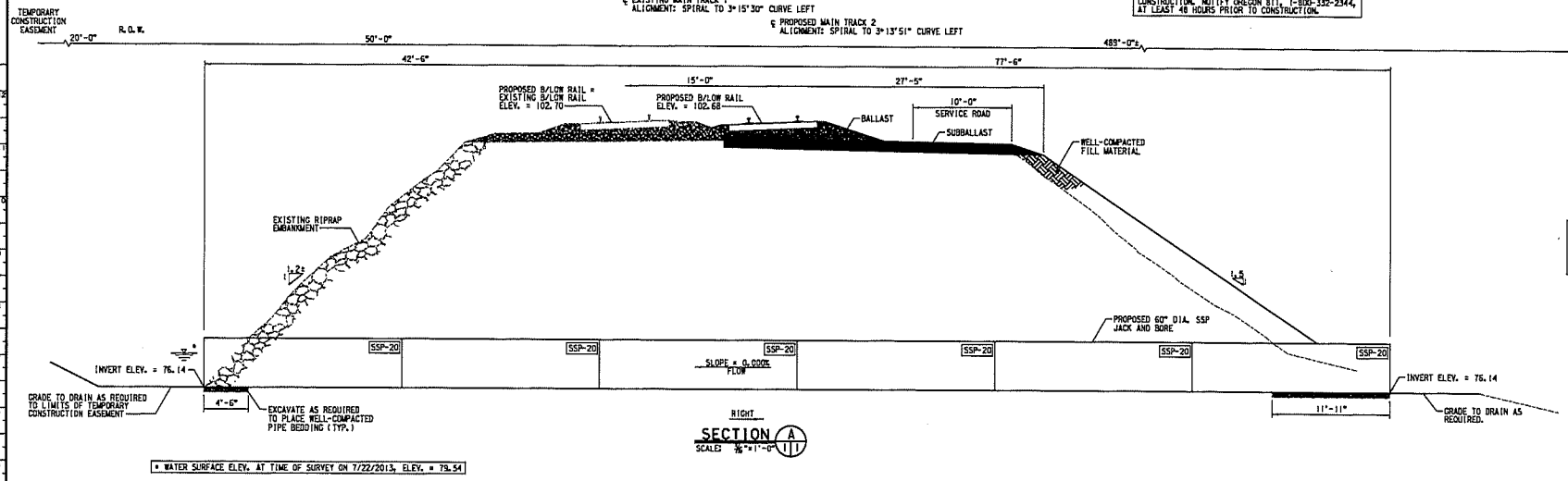
Date: 3/16/2015

C006





NOTE:
INVERT ELEVATION PROVIDES 12" WATER DEPTH IN THE CULVERT AT 90% EXCEEDANCE WATER SURFACE ELEVATION BASED ON BONNEVILLE FOREBAY HISTORICAL DATA AND RIVER GRADIENT BETWEEN THE CULVERT AND BONNEVILLE FOREBAY.

LETTER SERIES
SHEET NO. CUT ON — SHEET NO. SHOWN ON

SECTION DESIGNATION

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
	/ /	

DRAWING SCHEDULE

THIS SET	SHEET NO.	DESCRIPTION
1	1	GENERAL ARRANGEMENT
2	2	BILL OF MATERIAL, CULVERT SECTION AND NOTES

REF.	NO.	DWG. NO.	SHEET NO.	REV. NO.	DESCRIPTION
	1	680000	2 & 3	C	GENERAL NOTES AND DETAILS FOR ROUND STEEL PIPE CULVERTS
	2	680010	1	-	CONSTRUCTION NOTES AND TABLE FOR SMOOTH STEEL PIPE CULVERTS
	3	-	P019 & P020 OF 22	-	MOSIER, OREGON, PORTLAND SUBDIVISION MP 66.98 TO 72.35, CONSTRUCT SECOND MAINLINE, 90% PLANS, DATED 10-20-2014

POSTCONSTRUCTION COMPLIANCE

Contractor or UPRR Manager in charge of construction to provide to the office of the Director Structures Design as-built drawings confirming that the project was constructed in compliance with the plans and indicating any construction variances.

SIGNED

In Charge of Construction — Date

APPROVED FOR UNION PACIFIC RAILROAD CO. BY OLSSON ASSOCIATES

BY: K.H. Jennison

DATE: FEBRUARY 9, 2015

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design/Construction

LOCATION: CULVERT 71.84 — PORTLAND SUB.
1.0 MILE EAST OF MOSIER, OR

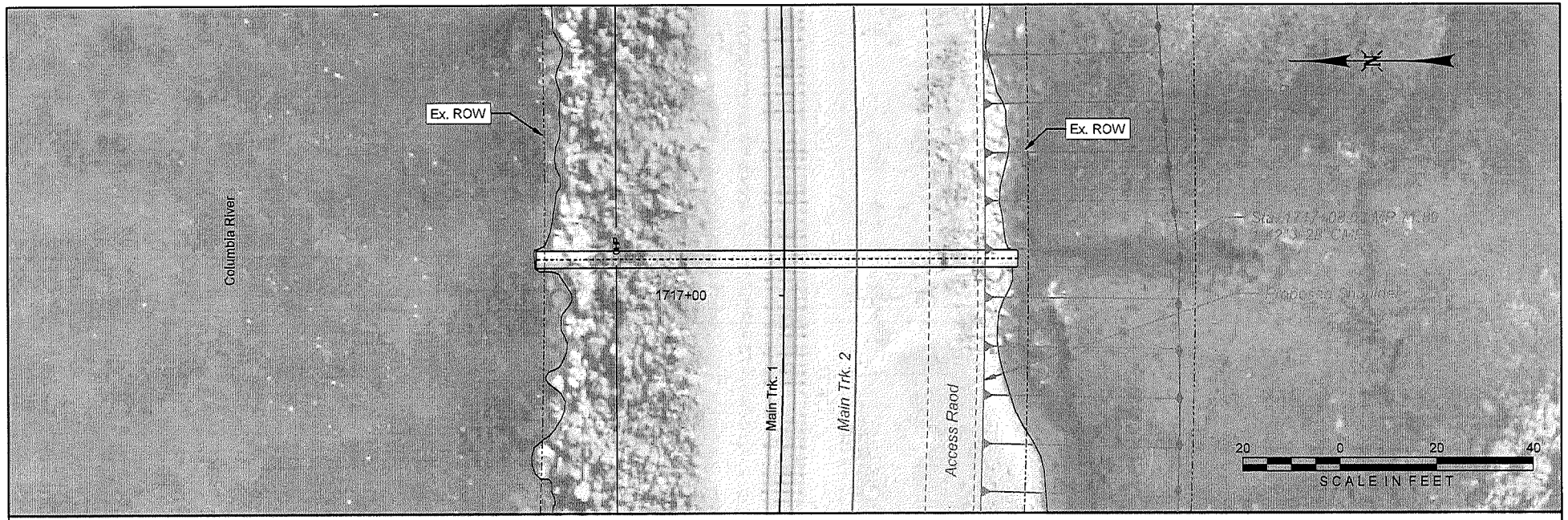
FACILITY: 2 - 60" DIA. SSP x 120' MITIGATION CULVERT

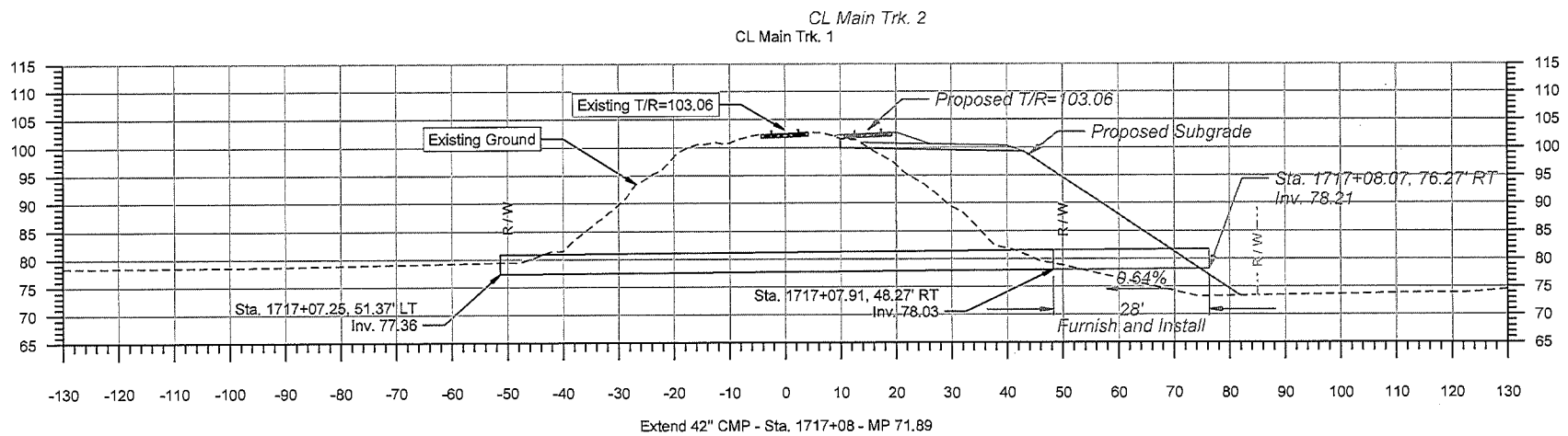
DWG TITLE: GENERAL ARRANGEMENT

PROJECT ID: 81791	UP ENGINEER: UP-MAB	LATITUDE: 45°41'54" N	
WORK ORDER: 14099	OLSSON-RAJ	LONGITUDE: 121°21'06" W	
DESIGN BY: RAJ			
CHECKED BY: CWT			
DRAWN BY: MDL	SHEET NO. 1 of 2	C E NUMBER 120105	
CHECKED BY: CWT			
SCALE: 1/16"=1'-0"			

PLOTTED: 5/23/2015 9:56:57 AM

PC 13-1070





Extend 42" CMP - Sta. 1717+08 - MP 71.89

OLSSON ASSOCIATES

DRAWN BY: BWG	UNION PACIFIC RAILROAD — Office of Assistant Vice President Engineering Design/Construction
CHECKED BY: RCK	LOCATION & DESCRIPTION: Mosier, Oregon; Portland Subdivision MP 66.98 to MP 72.35; Construct Second Mainline
DATE: 3/16/2015	
SHEET NUMBER: C007 of 007	SHEET TITLE: CULVERT STA. 1717+08 - EXTEND 42" CMP

Color table: F:\PROJECTS\011-1345\color\UPRR.tbl
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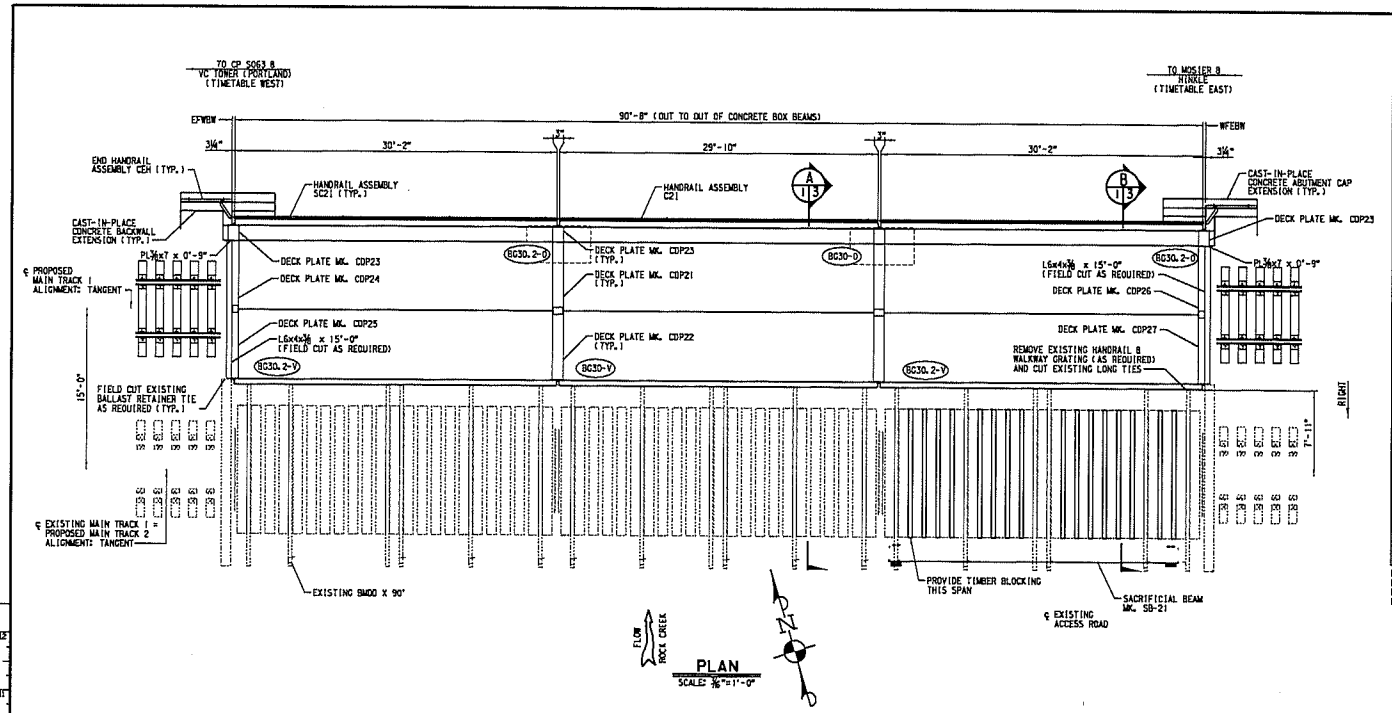
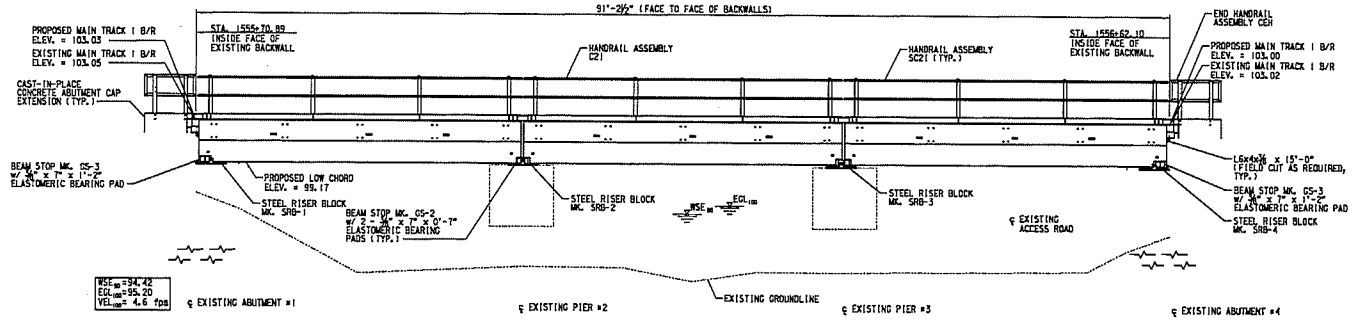
Date: 3/16/2015



PLAN

SCALE: ⅜"=1'-0"



ELEVATION

SCALE: ⅜"=1'-0"

(EXISTING BMOD AND SACRIFICIAL BEAM NOT SHOWN FOR CLARITY)

BILL OF MATERIAL

REQ'D	UNIT	DESCRIPTION	STORE ITEM NO	ORDERED BY
1	EA.	30" x 29'-10" PRESTRESSED CONCRETE BOX BEAM MK. BG30-0, TYPE I w/ SLOPED CURB (REF. 3)	511-7828	MANAGER TRACK PROJECTS
1	EA.	30" x 29'-10" PRESTRESSED CONCRETE BOX BEAM MK. BG30-V, TYPE I w/ VERTICAL CURB (REF. 3)		
2	EA.	30" x 30'-2" PRESTRESSED CONCRETE BOX BEAM MK. BG30.2-0, TYPE I w/ SLOPED CURB (PER DATA, SHEET NO. 3 & DETAILS AND NOTES, REF. 3)		
2	EA.	30" x 30'-2" PRESTRESSED CONCRETE BOX BEAM MK. BG30.2-V, TYPE I w/ VERTICAL CURB (PER DATA, SHEET NO. 3 & DETAILS AND NOTES, REF. 3)		
8	EA.	HP14x89 x 40'-0" STEEL PILE w/ POINTS (ASTM A572 GR. 50, PLAIN)	510-7559	
1	EA.	STEEL RISER BLOCK MK. SRB-1 (PER DETAILS, SHEET NO. 7)		
1	EA.	STEEL RISER BLOCK MK. SRB-2 (PER DETAILS, SHEET NO. 7)		
1	EA.	STEEL RISER BLOCK MK. SRB-3 (PER DETAILS, SHEET NO. 7)		
1	EA.	STEEL RISER BLOCK MK. SRB-4 (PER DETAILS, SHEET NO. 7)		
4	EA.	BEAM STOP MK. GS-2 (REF. 5)	510-0595	
4	EA.	BEAM STOP MK. GS-3 (REF. 5)	510-0596	
1	EA.	HANDRAIL ASSEMBLY C21 FOR 29'-10" CONCRETE INTERIOR SPAN (REF. 5)	510-0472	
2	EA.	END HANDRAIL ASSEMBLY CEH FOR CONCRETE SPAN (REF. 5)	513-3020	
1	LOT	MISCELLANEOUS STEEL (PER SCHEDULE, SHEET NO. 8)		
1	LOT	SACRIFICIAL BEAM MATERIAL (PER SCHEDULE, SHEET NO. 9)		
24	EA.	⅜" x 8" x 0'-10" ELASTOMERIC BEARING PAD (PER NOTES, SHEET NO. 2)		
12	EA.	⅜" x 10" x 1'-2" ELASTOMERIC BEARING PAD (PER NOTES, SHEET NO. 2)		
8	EA.	⅜" x 7" x 0'-7" ELASTOMERIC BEARING PAD	510-3635	
4	EA.	⅜" x 7" x 1'-2" ELASTOMERIC BEARING PAD	510-3637	
50	EA.	½"x28" x 6'-4" PREMOLDED EXPANSION JOINT FILLER PER ASTM D1751	511-8213	
23.2	CU. YD.	4000 PSI CONCRETE FOR CAST-IN-PLACE CONCRETE EXTENSIONS, 4.5 CU. YD. PER PIER CAP EXTENSION (2 REQ'D.), 6.0 CU. YD. PER ABUTMENT CAP EXTENSION (2 REQ'D.) AND 1.1 CU. YD. PER BACKWALL EXTENSION (2 REQ'D.)		
1	LOT	REINFORCING STEEL FOR CAST-IN-PLACE CONCRETE PIER CAP EXTENSION (PER NOTES AND DETAILS, SHEET NO. 4)		
1	LOT	REINFORCING STEEL FOR CAST-IN-PLACE CONCRETE ABUTMENT CAP EXTENSION (PER NOTES, SHEET NO. 4 AND DETAILS, SHEET NO. 5)		
1	LOT	REINFORCING STEEL FOR CAST-IN-PLACE CONCRETE BACKWALL EXTENSION (PER NOTES, SHEET NO. 4 AND DETAILS, SHEET NO. 6)		
16	EA.	4" x 10" x 12'-0" TIMBER TIE (TIMBER BLOCKING)		
80	EA.	⅝" DIA. x 8" HEAVY-DUTY SPIKE (FOR TIMBER BLOCKING)	514-6132	
1	EA.	BRIDGE MARKER AND NO TRESPASSING SIGNS, MOUNTING POSTS AND MOUNTING HARDWARE PER ENGINEERING STANDARD DRAWINGS 0502, 0507, 0538 AND 0599	P00-2616	
1	LOT	PL 400 HEAVY DUTY CONSTRUCTION ADHESIVE		MANAGER BRIDGE CONST.
6	CU. YD.	WELL-GRADED 1½" MINUS CRUSHED ROCK		

EST. WT. OF STEEL PILING = 28,480 LB.
EST. WT. OF STEEL RISER BLOCKS = 14,680 LB.
EST. WT. OF MISCELLANEOUS STEEL (NOT INCLUDING BOLTS) = 3,115 LB.
EST. WT. OF SACRIFICIAL BEAM STEEL (NOT INCLUDING BOLTS) = 2,570 LB.

DRAWING SCHEDULE

	SHEET NO.	DESCRIPTION
THIS SET	1	GENERAL ARRANGEMENT AND BILL OF MATERIAL
	2	SUBSTRUCTURE LAYOUT AND GENERAL NOTES
	3	SECTIONS, GIRDER MODIFICATION DATA AND DIVISION OF RESPONSIBILITY
	4	CAST-IN-PLACE CONCRETE PIER CAP EXTENSION DETAILS
	5	CAST-IN-PLACE CONCRETE ABUTMENT CAP EXTENSION DETAILS
	6	CAST-IN-PLACE CONCRETE BACKWALL EXTENSION DETAILS
	7	RISER BLOCKS MK. SRB-1, SRB-2, SRB-3 & SRB-4 DETAILS
	8	MISCELLANEOUS STEEL DETAILS
	9	SACRIFICIAL BEAM DETAILS
	10	BORING LOGS

	NO.	DWG. NO.	SHEET NO.	REV. NO.	DESCRIPTION
REF.	1	530000	A1-A7	A	BOX AND SLAB BEAM, CONSTRUCTION PLANS
	2	530000	B1-B3	A	30" BOX BEAM, CONSTRUCTION DETAILS
	3	500000	BG1, BG2	F	30" DOUBLE BOX BEAM, FABRICATION PLANS
	4	501000	A1	-	PRECAST END CAP FOR 30" BOX BEAM
	5	502000	1-4	B	STEEL HARDWARE AND HANDRAIL ASSEMBLIES
	6	-	-	-	MOSIER, OREGON - PORTLAND SUBDIVISION MP. 66.98 TO MP. 72.35 CONSTRUCT SECOND MAINLINE, 90% PLANS DATED 10/20/2014
	7	-	-	-	MOSIER 2ND MAINLINE BRIDGE 68.88 - PORTLAND SUBDIVISION (SURVEY) DATED 2/24/2014

LETTER SERIES
SHEET NO. CUT ON — SHEET NO. SHOWN ON

SECTION DESIGNATION

EST. WT. OF PRECAST CONCRETE
BEAM MK. BG30-0 = 52,300 LB. EA. (26.2 TON)
BEAM MK. BG30-V = 48,000 LB. EA. (24.0 TON)
BEAM MK. BG30.2-0 = 53,300 LB. EA. (26.7 TON)
BEAM MK. BG30.2-V = 48,900 LB. EA. (24.5 TON)

POSTCONSTRUCTION COMPLIANCE

Contractor or UPRR Manager in charge of construction to provide to the office of the Director Structures Design as-built drawings confirming that the project was constructed in compliance with the plans and indicating any construction variances.

In Charge of Construction — Date

DA STRUCTURAL DESIGN QC		
12-1-14	DESIGN	JEJ
1-19-15	DESIGN CHECK	KAS
.	PEER REVIEW	.
.	SR. ENG.	.
.	FINAL QC	.

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
	/ /	

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design/Construction

LOCATION: BRIDGE 68.88 — 1.9 MILES WEST OF MOSIER, OR — PORTLAND SUB.

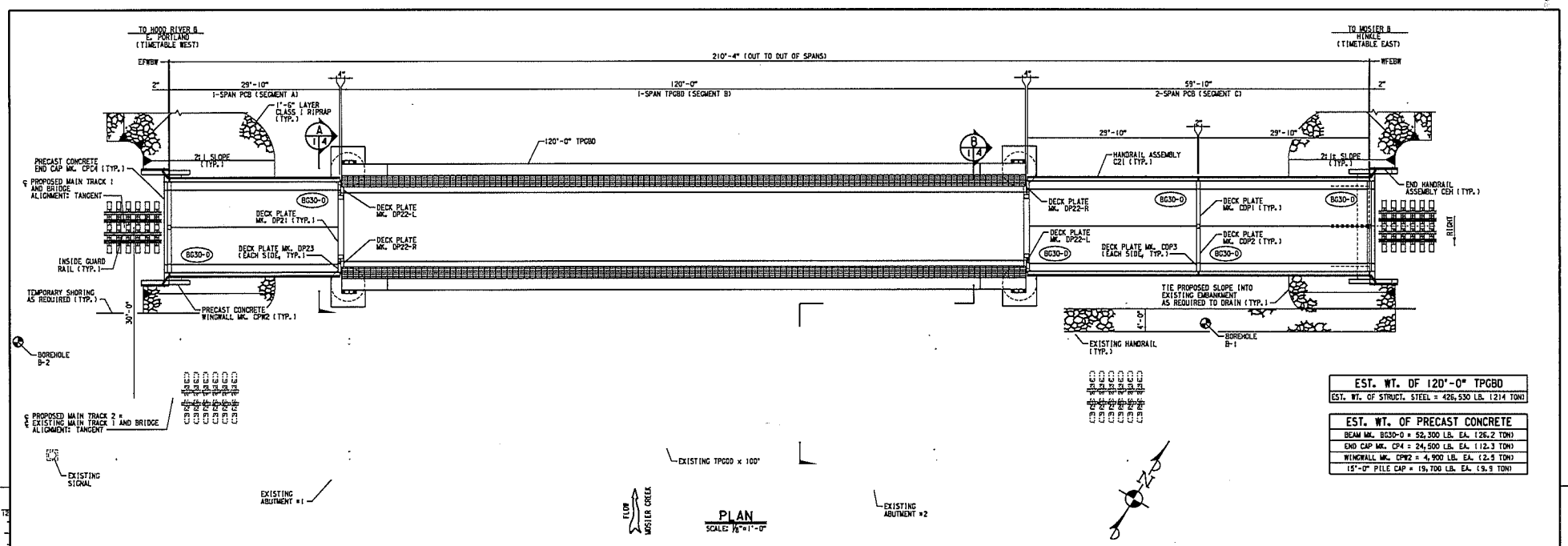
FACILITY: 3 - SPAN PCB x 90' 2ND MAIN LINE MATCHING 3 - SPAN BMOD x 90'

DWG TITLE: GENERAL ARRANGEMENT AND BILL OF MATERIAL

PROJECT ID:	UP ENGINEER:	LATITUDE: 45°41'05" N
WORK ORDER:	UP-MAB	LONGITUDE: 121°24'21" W
DESIGN BY: KAS	OLSSON-KAJ	
CHECKED BY: TMS		
DRAWN BY: JEJ	SHEET NO.	C E NUMBER
CHECKED BY: KAS	1 of 10	
SCALE: ⅜"=1'-0"		

PLOTTED: 1/19/2015 10:39 AM

PC 13-1072

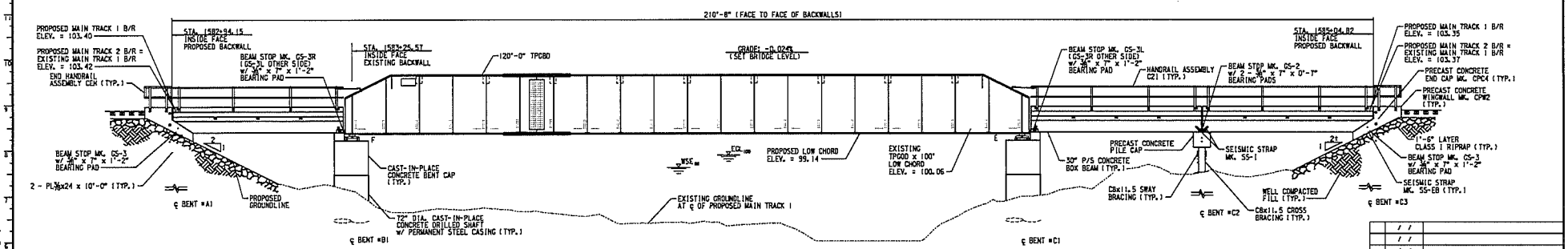


PLAN

SCALE: 1/8"=1'-0"

EST. WT. OF 120'-0" TPGBD
EST. WT. OF STRUCT. STEEL = 426,530 LB. (214 TON)

EST. WT. OF PRECAST CONCRETE
BEAM MK. BG30-D = 52,300 LB. EA. (26.2 TON)
END CAP MK. CP4 = 24,500 LB. EA. (12.3 TON)
WINGWALL MK. CPW2 = 4,900 LB. EA. (2.5 TON)
15'-0" PILE CAP = 19,700 LB. EA. (9.9 TON)



ELEVATION

SCALE: 1/8"=1'-0"
(EXISTING TPGBD NOT SHOWN FOR CLARITY)

WSE$_{100}$ = 93.32
EGL$_{100}$ = 95.44
VEL$_{100}$ = 8.1 fps

LETTER SERIES
SHEET NO. CUT ON
SHEET NO. SHOWN ON

SECTION DESIGNATION

DRAWING SCHEDULE

SHEET NO.	DESCRIPTION
1	GENERAL ARRANGEMENT
2	SUBSTRUCTURE LAYOUT
3	GENERAL NOTES AND BILL OF MATERIAL
4	TYPICAL SECTIONS AND DETAILS
5	DRILLED SHAFT CONSTRUCTION AND STRUCTURAL STEEL NOTES
6	DRILLED SHAFT DETAILS
7	CAST-IN-PLACE BENT CAP DETAILS
8	MISCELLANEOUS STEEL DETAILS
9	TPG FRAMING PLAN
10	TPG GIRDER DETAILS
11	TPG DETAILS (SHEET 1 OF 21)
12	TPG DETAILS (SHEET 2 OF 21)
13	TPG LATERAL BRACING DETAILS
14	TPG BALLAST PAN DETAILS (SHEET 1 OF 21)
15	TPG BALLAST PAN DETAILS (SHEET 2 OF 21)
16	TPG WALKWAY AND MISC. DETAILS (SHEET 1 OF 21)
17	TPG WALKWAY AND MISC. DETAILS (SHEET 2 OF 21)
18	TPG BEARING DETAILS (SHEET 1 OF 21)
19	TPG BEARING DETAILS (SHEET 2 OF 21)
20	TPG WATERPROOFING DETAILS
21	BORING LOGS

REFERENCE DRAWING SCHEDULE

REF. NO.	DWG. NO.	SHEET NO.	REV. NO.	DESCRIPTION
1	-	PD10 OF 0022 G005 OF 005	-	MOSIER, OREGON - PORTLAND SUBDIVISION MP. 65.98 TO MP. 72.35 CONSTRUCT SECOND MAINLINE, 90% PLANS DATED 10/20/2014
2	-	1-4		MOSIER 2ND MAINLINE, BRIDGE 69.40 - PORTLAND SUBDIVISION (SURVEY) DATED 2/24/2014
3	4015F	1-2	-	DOUBLE GUARD RAIL FOR BALLAST DECK BRIDGES
4	530000	A1-A7	B	BOX AND SLAB BEAM, CONSTRUCTION PLANS
5	530000	B1-B4	A	30" BOX BEAM, CONSTRUCTION DETAILS
6	500000	BG1, BG2	F	30" DOUBLE BOX BEAM, FABRICATION PLANS
7	501000	A1	A	PRECAST END CAP FOR 30" BOX BEAM
8	501000	C1, C2	A	PRECAST CONCRETE PILE CAP
9	531010	1	A	PRECAST CONCRETE PILE CAP BEARING PADS
10	502000	1-4	B	STEEL HARDWARE AND HANDRAIL ASSEMBLIES
11	531800	8	A	CAPMASTER PRECAST CONCRETE 15' PILE CAP WITH COIL INSERT DETAILS
12	581000	D1	F	W36 & W40 BEAM SPAN, 31' TO 69' LENGTHS

POSTCONSTRUCTION COMPLIANCE

Contractor or UPRR Manager in charge of construction to provide to the office of the Director Structures Design as-built drawings confirming that the project was constructed in compliance with the plans and indicating any construction variances.

In Charge of Construction — Date

M.K. Brockner 4-7-15
APPROVED FOR UNION PACIFIC RAILROAD CO. BY OLSSON ASSOCIATES
BY: K.H. Jennison
DATE: FEBRUARY 4, 2015

NO.	DATE	REVISIONS
	/ /	
	/ /	
	/ /	
	/ /	

OLSSON ASSOCIATES

UNION PACIFIC RAILROAD
Office of AVP Engineering Design/Construction

LOCATION: BRIDGE 69.35 — PORTLAND SUBL. — 1.5 MILES WEST OF MOSIER, OR
FACILITY: 1-SPAN PCB x 30', 1-SPAN TPGBD x 120' & 2-SPAN PCB x 60' MATCHING 1-SPAN TPGDD x 100'
DWG TITLE: GENERAL ARRANGEMENT

PROJECT ID: 81781	UP ENGINEER: UP-MAS	LATITUDE: 45°41'06" N
WORK ORDER: 15099	OLSSON-KAJ	LONGITUDE: 121°23'45" W
DESIGN BY: KAS		
CHECKED BY: THS		
DRAWN BY: JJJ	SHEET NO. 1 of 21	C E NUMBER 120086
CHECKED BY: KAS		
SCALE: AS NOTED		

PLOTTED: 4/16/2015 12:50:26 PM

PC 13-1073