

COMPENSATORY WETLAND MITIGATION PLAN

FOR

NEXT RENEWABLE FUELS OREGON

FEBRUARY 2022

REVISED SEPTEMBER 2022

REVISED MAY 2023



Prepared for the
NEXT RENEWABLE FUELS OREGON, LLC

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ANDERSON PERRY & ASSOCIATES, INC.

**La Grande, Redmond, Hermiston, and Enterprise, Oregon
Walla Walla, Washington**

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Section 1.0 - Compensatory Wetland Mitigation Plan Overview

1.1 Introduction and Background

This Compensatory Wetland Mitigation Plan (CWMP) details compensatory mitigation for unavoidable wetland impacts associated with the NEXT Renewable Fuels Oregon project located in Columbia County, Oregon.

NEXT Renewable Fuels Oregon, LLC, proposes to construct a renewable fuels facility at Port Westward, near the City of Clatskanie in Columbia County, Oregon. The facility will produce renewable fuel by recycling various cooking oils, greases, and other animal and vegetable fats. Storage facilities for raw oil feedstocks and renewable fuel, processing facilities, waste handling facilities, administrative buildings, and other structures required for facility operation will be included. In addition, an access road will be constructed west of the facility to connect with Hermo Road, the existing gravel access road to the north will be improved, and an electrical connection will be constructed to tie into the existing power lines to the north. Also, pipelines will be constructed to transport raw materials and renewable fuel to and from the existing terminaling provider, and a rail connector will be constructed to the south and east to tie into the existing rail line near Kallunki Road.

Figures 1 through 5 provide location and vicinity maps, an aerial photograph, a tax lot map, site photographs, and a map of the impacted wetlands to aid in review of the proposed project.

1.2 Historical Conditions

Historically, the proposed renewable fuels facility site was a bottomland depression connected to annual high flows from the Columbia River. The proposed renewable fuels facility site was drained in the early 1900s, primarily with surface ditches. This coincided with drainage for agriculture for a large portion of the historic Port Westward area. Seasonal flooding of the area continued until the 1940s, when the Columbia River dams were constructed upriver along with more sophisticated local pumping and dike construction by the Beaver Drainage District (BDD). With the site cut off from the river due to dike construction, hydrology is now influenced primarily by direct precipitation, management of the BDD by the Beaver Drainage Improvement Company, Inc. (BDIC) and hydrostatically to an unknown extent by the seasonal rise and fall of the nearby Columbia River.

The proposed compensatory wetland mitigation (CWM) site is covered by hybrid poplar plantations of varying ages, which are also used for grazing. The younger plantation areas have extensive areas of Himalayan blackberry thickets, as well as smaller openings with no poplars that support herbaceous vegetation communities. A wetland delineation was completed in which two wetlands were identified that cover the majority of the CWM site. Disturbance within the proposed CWM site is a result of past and current agricultural use on the property and construction and maintenance of roads and drainage ditches. Lands outside the proposed CWM site have been altered by past and current activities associated with agriculture, industrial development, and the construction and maintenance of roads and the railroad.

1.3 Ecological Goals and Objectives

The overall purpose of the project is to produce renewable fuel. Construction of the renewable fuels facility will result in permanent impacts to wetlands; however, the proposed CWM site will be constructed concurrently with construction of the new facility. Proposed mitigation for wetland impacts associated with the project will involve enhancement of degraded wetlands located southwest of the proposed renewable fuels facility site. The goal of this mitigation activity is to offset permanent, unavoidable impacts to wetlands by enhancing Palustrine Emergent (PEM), Palustrine Scrub-Shrub (PSS), and Palustrine Forested (PFO) wetland areas with essentially similar or better attributes as the impacted wetlands.

In addition to offsetting permanent wetland impacts resulting from the proposed project, the proposed CWM site is designed to provide benefits to local wildlife populations, in particular Columbian white-tailed deer, various avian species, and amphibians. Using an integrated, comprehensive ecological enhancement approach with a robust planting plan, focused on multiple species of wildlife, is anticipated to provide a maximum benefit to wildlife through improved habitat, landscape diversity, and food source opportunities.

Further benefits resulting from enhanced wetland habitat include improved water storage and drought resiliency. One function of a healthy wetland ecosystem includes slowing down the momentum of water as it travels across the landscape and through the soil. This effect, a result of the construction of dendritic channels within the proposed CWM site, decreases the erosive potential of surface water and allows for improved groundwater recharge. This perpetual recharge of groundwater aids in maintaining the base flow of surface water further into the dry season, thereby improving drought resiliency. Slower velocity and slower release of water resulting from the dendritic channels also offer the benefit during wetter months of not overloading the BDIC pump station.

Contrasting the effect of the existing straight drainage ditches in the proposed CWM site, the dendritic channels are designed to retain water on site longer, which would allow precipitation to better infiltrate into the ground and help increase groundwater elevation on site. Improved infiltration is due to the dendritic channels having more sinuosity, a higher invert elevation than the drainage ditches, and a greater wetted surface area. The dendritic channels are also designed to distribute water more evenly throughout the site and increase groundwater elevation in localized areas within the CWM site currently experiencing lower groundwater. Additional information on how the proposed CWM site meets these goals and objectives is included in Section 6.0.

Similarly, the capacity for water storage of a wetland can also reduce flood levels within an aquatic system, resulting in greater flood protection for surrounding areas. Additionally, wetlands improve water quality by removing pollutants and excessive nutrients. This beneficial function of wetlands also occurs as water velocity slows within a wetland, allowing sediment that potentially contains pollutants to settle to the wetland substrate. As the slowing water settles around vegetation, pollutants and accumulated nutrients are absorbed by plant roots and microorganisms in the soil. In addition to enhanced wetland habitat providing ecological benefits, improved drought resiliency and flood protection can also result in economic benefits for property owners.

1.4 Description of Compensatory Wetland Mitigation Concept

The concept of this CWMP is to replace the functions and values of wetlands lost from construction of the renewable fuels facility, through enhancement of a wetland in an area southwest of the proposed renewable fuels facility site and impacted wetlands (see Figure 5 and Appendix A). Enhancement of the vegetation and hydrology at this proposed CWM site is anticipated to re-establish a native Columbia River bottomland emergent and shrubby wetland community.

The proposed CWM site was selected due to its proximity to the impacted wetlands and its ability to provide naturally functioning hydrology and long-term sustainability. NEXT Renewable Fuels Oregon, LLC, has entered into a long-term lease agreement for the site and will be able to control activities on it to ensure long-term viability of the wetlands. The wetlands being enhanced consist of PEM and PSS wetlands found in historical floodplains along the Columbia River. These wetlands are supported by precipitation, groundwater, and/or surface runoff. A 17-acre wetland mitigation site constructed in 2018 is located approximately 1 mile north of the proposed mitigation site. The 17-acre site was used as a reference site for the design of this proposed CWM site.

According to local Oregon Department of Fish and Wildlife staff, the proposed CWM site currently contains marginal habitat for the wildlife species mentioned above. With enhancement of the proposed CWM site, wildlife in the area will have greatly improved habitat that will help promote healthier populations.

1.5 Site Preparation

The mitigation project will conduct one year of control measures prior to establishing native plant populations. The project will take an agricultural approach to controlling noxious weeds and non-native plant species, using a combination of tillage and chemical applications to prepare the site for planting. Prior to the start of the mitigation site construction, NEXT Renewable Fuels Oregon will conduct tree removal to clear the existing hybrid poplar plantations. Tree removal will occur beginning in summer 2022 and be completed in spring 2023.

Following tree removal, the site will be tilled and a minimum of eight shallow groundwater monitoring wells and nine stilling wells will be installed across the site and in critical perimeter ditches and sloughs. Groundwater monitoring is not required; however, the design team believes the information will assist in refining the final project design and ensure success of the project. The monitoring information will also be used later to assess performance standards. The site will not be tilled again to quiet the existing seed bank and minimize further weed seed germination. Anticipated regrowth from reed canarygrass rhizomes and the exposed portion of the weed seed bank will be treated with glyphosate herbicide (Rodeo®). The first herbicide application will occur in summer 2023. Because glyphosate is non-selective, some damage to remnant native plants will likely occur. This will be acceptable to obtain a "clean" site, rather than attempt to work around the few existing native plants (these species will be re-established during planting). A second herbicide application will occur in spring 2024 to target weed regrowth, which will enhance control. Site grading and seeding will occur early fall 2024 and planting will begin in fall 2025.

To construct the proposed CWM site, the upper 6 to 12 inches of topsoil is anticipated to be removed, shallow pools will be constructed, and dendritic channels will be added. Depending on results from the

groundwater monitoring wells, dendritic channels and pools will be excavated approximately 2 to 5 feet to create and provide greater hydrologic diversity across the site while maintaining hydraulic connectivity with the adjacent McLean Slough. The excavated material will be disposed of at an approved off-site location.

Additionally, some interior linear ditches will be modified or filled to prepare the site for grading. The potential presence of fish species in these ditches may warrant fish salvage or relocation activities be conducted prior to modifying or filling these ditches. Although some of the interior ditches go dry in the summer, others may contain native or introduced fish species that will require relocation. Due to mud and deep water, electroshocking with backpack units as a method for any potential fish salvage activities is neither feasible nor safe. Alternative methods for potential relocation of fish will be performed to ensure safe working conditions for personnel while meeting fish salvage requirements. Salvage operations may be conducted using seine nets to relocate or exclude fish as necessary.

Depending on the size of the ditch, relocating fish present in interior ditches may require two methods of seine netting. Small drainages to be filled would be seined moving from one end of the drainage to the other end in the direction of filling. This method would involve personnel operating the seine nets from each side of the bank, which would require all brush be removed from the banks prior to seining operations. Large drainages to be modified by deepening or widening would be seined with two nets positioned in both (opposing) directions, moving away from the work area. Depending on the depth, steepness of the bank, and substrate conditions of the ditch, personnel may operate the seine nets from either the bank or from the water.

Monitoring of shallow groundwater elevations at the proposed CWM site will be initiated following tilling and tree removal and will continue through the final design process. Groundwater elevation data will enable a precise understanding of the range and duration of the shallow groundwater fluctuations and how they are tied to precipitation events and, potentially, to Columbia River surface elevations. Electronic data loggers will be used to automatically record water levels on a twice-daily basis. A minimum of eight data loggers will be individually housed in slotted polyvinyl chloride tubes installed to a depth of approximately 10 feet below ground surface. Monitoring groundwater data for approximately one year through the design process will aid in determining dendritic channel depths that can maintain wetland vegetation without the need for artificial hydrology. In addition to groundwater monitoring, surface water elevations will also be measured using stilling wells at nine strategic locations along the sloughs adjacent to the CWM site. The stilling wells will help define how the existing site interacts with the wider BDD.

Following construction, the proposed CWM site will be monitored for a minimum of five years and adaptive maintenance will be provided to help establish a thriving and robust wetland area. Fencing will be installed around the perimeter of the site to discourage the local deer population from damaging young plantings and vegetation. Site fencing will remain throughout the first five years following construction of the mitigation site, to protect the plantings as they become established.

Adaptive wildlife management measures will also be implemented in conjunction with the development of the proposed CWM site. This approach is designed to function as an ongoing, dynamic examination of the goals and objectives of a project and whether or not they are being met. Project management is informed by a process of monitoring, evaluation, and management adjustment, a cycle that may be repeated, if necessary, throughout a project's timeline. The design of a project may then be modified to

respond to any impediments to achieving the desired objectives. Adaptive management is a learning-based process that will help guide and inform decision making pertaining to the wildlife populations that the proposed CWM site is designed to benefit. Adaptive management will be used throughout the long-term management of the mitigation site.

1.6 Summary of Compensatory Wetland Mitigation Acreages

Using the Draft Compensatory Mitigation Eligibility and Accounting Determination Form developed by the Oregon Department of State Lands (DSL) and in coordination with DSL staff, it was determined that 3.9 acres of mitigation will be required per acre of impact (3.9:1 ratio).

The proposed renewable fuels facility will require permanent fill in two wetlands, with an area of permanent wetland impact of 104.30 acres (requiring a minimum of 406.77 acres of mitigation using the 3.9:1 ratio). To mitigate this impact, 466.10 acres of wetland will be enhanced southwest of the proposed renewable fuels facility (see Appendix A).

In terms of mitigation credits, the 466.10 acres of enhancement mitigation represents 119.51 acres of mitigation credit, which exceeds the minimum required (104.30 acres) under the 3.9:1 mitigation ratio, as shown on Table 1-1.

**TABLE 1-1
WETLAND MITIGATION SUMMARY**

Wetland ID	Impact Site			Proposed CWM Site					
	Cowardin	HGM ¹	Acres	Mitigation Method	Cowardin	HGM	Acres	Mitigation Ratio	Mitigation Credits Gained
1	PEM/PSS	Flats	104.30						
2	PEM	Flats	0.003						
CWM				Enhance	PEM	Flats	226.20	3.9:1	58.00
CWM				Enhance	PSS	Flats	177.43	3.9:1	45.49
CWM				Enhance	PFO	Flats	62.47	3.9:1	16.02
Total			104.30				466.10		119.51

¹HGM = Hydrogeomorphic classification

1.7 Summary of Function and Value Gains and Losses

The Oregon Rapid Wetland Assessment Protocol was used to assess the functions and values of the wetland impact and wetland mitigation sites (see Appendix B). A loss of wetland functions and values will occur as a result of the proposed construction; these losses will be offset by the anticipated functions and values from the proposed CWM site. For details of each attribute's function and value, see Section 5.0 of this CWMP.

Section 2.0 - Compensatory Wetland Mitigation Site Information

2.1 Site Owner Information

The proposed renewable fuels facility site is located on property that will be owned by NEXT Renewable Fuels Oregon, LLC, and on property owned by the Port of Columbia County, which will be leased to NEXT Renewable Fuels Oregon, LLC. The proposed compensatory wetland mitigation (CWM) site is located on property that will be owned by Oregon Port AG Investors, LLC, and leased to NEXT Renewable Fuels Oregon, LLC. Contact information is provided below:

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Property owners adjacent to the proposed CWM site are provided in Appendix C.

2.2 Physical Location Information

The proposed renewable fuels facility and CWM sites are located approximately 4 miles northeast of Clatskanie, Oregon, between Kallunki Road and Quincy-Mayger Road to the east, Hermo Road to the west, and the Port Westward industrial area to the north. The legal description of the proposed project site is Township 8 North, Range 4 West, Section 16 (Tax Lot 200), Section 21 (Tax Lot 700), Section 22 (Tax Lots 100, 200, 300, and 1100), and Section 23 (Tax Lots 700 and 800, at approximate Latitude 46.16676791 and Longitude -123.16346365. The legal description of the proposed CWM site is Township 8 North, Range 4 West, Section 27 (Tax Lots 100, 200, 400, and 1600), Section 28 (Tax Lots 300 and 1400), Section 33 (Tax Lot 100) and Section 34 (Tax Lot 300). The proposed CWM site will be constructed southwest of the proposed project site, at approximate Latitude 46.152259 and Longitude -123.172541.

Section 3.0 - Description of How the Compensatory Wetland Mitigation Addresses the Principal Objectives

3.1 Wetland Objectives

3.1.1 Function and Value Replacement

The impacted wetlands are classified as Palustrine Emergent (PEM) and Palustrine Scrub-Shrub (PSS) (Cowardin et al., 1979). The proposed compensatory wetland mitigation (CWM) site is anticipated to be classified as PEM, PSS, and Palustrine Forested (PFO). As shown in Section 5.0, the functions and values of the proposed CWM site will be equal to or better than the functions and values of the impacted wetlands.

3.1.2 Local Replacement of Locally Important Functions and Values

The proposed CWM site is expected to provide similar or better functions and values as the impacted wetlands. The proposed CWM site is located southwest of the impact site, in the same 6th field HUC subwatershed (Lower Beaver Creek - Frontal Columbia River: 170800030207) as the impact site. The impact site and the proposed CWM site are both located within the Beaver Drainage District and have similar hydrologic conditions. Both sites receive the same amount of annual rainfall, are hydraulically connected to the Columbia River and Beaver Dredge Cut, to a degree, through groundwater flow, and are managed by the Beaver Drainage Improvement Company, Inc., for drainage and irrigation in a similar manner.

Regulations require that a mitigation site be located within the same 4th field HUC (17080003, Lower Columbia-Clatskanie). The only viable site with sufficient acreage found within the area was the proposed site, which is also within the same 6th field HUC as the proposed facility (170800030207, Lower Beaver Creek-Frontal Columbia River). While not required by the Oregon Department of State Lands, siting the mitigation within the same 6th Field HUC provides a more localized function and value replacement, as the mitigation will be within the same drainage district and in close proximity to the impacts associated with the facility development.

Once established, the proposed CWM site will provide a number of ecological benefits resulting from wetland enhancement. Wetland habitat improves water quality from the absorption and filtration of pollutants, and allows increased water storage that is naturally released for a longer duration, possibly into the dry season. Similarly, functions and values pertaining to flood control and drought resiliency are anticipated to be improved following establishment of the CWM site.

3.1.3 Self-Sustaining/Minimum Maintenance Needs

The proposed CWM site will be self-sustaining since it will receive the same surface/subsurface water input from the natural groundwater and precipitation that is sustaining the existing wetland. The proposed CWM site will have wetland channels slightly lower than existing channels to collect and convey water to all areas within the mitigation site and rewater areas

that have been drained by the perimeter drainage ditch. The new channels will have an appropriate bank slope for stability and vegetation establishment.

The existing ditches located around the perimeter of the site will remain in place to avoid raising groundwater elevations in the field adjacent to the mitigation site. As a contingency plan for the hydrology to the site, small adjustable check structures will be provided at strategic locations to help ensure plant establishment and adjust the groundwater levels within the mitigation site. The check structures will help plant establishment by allowing wooden stop logs to be installed to help control water flowing into or out of the mitigation site where the dendritic channels will connect to the main sloughs. Other future maintenance needs may include periodic weed control. The site hydrology is further described in the description of existing and proposed hydrology.

3.1.4 Siting Considerations

The proposed renewable fuels facility project has been designed to minimize wetland impacts to the extent possible. Permanent impacts to wetlands on the proposed renewable fuels facility site were unavoidable, and the proposed CWM site is located southwest of the proposed renewable fuels facility and within the same subwatershed (HUC12: 170800030207, Lower Beaver Creek-Frontal Columbia River).

The proposed CWM site was selected due to its ability to provide naturally functioning hydrology and long-term sustainability, and its location on property that is leased long-term to NEXT Renewable Fuels Oregon, LLC, ensuring control of activities on it and long-term viability of the wetlands.

Existing ditches and channels below the ordinary high water elevation are considered jurisdictional Waters of the State/U.S. and impacts to these areas are anticipated when existing channels are filled and new channels are constructed.

3.1.5 Minimize Temporal Loss

The greatest temporal loss is associated with disturbance to hydric soil. This unavoidable temporal loss is accounted for in the mitigation ratio. The mitigation site will be constructed prior to or concurrently with construction of the renewable fuel facility.

3.2 Wildlife Habitat Objectives

3.2.1 Columbian White-tailed Deer Habitat

Once listed as endangered under the Endangered Species Act, Columbian white-tailed deer have been identified as occurring in only two locations in the U.S.: in Douglas County in southern Oregon and along the lower Columbia River in western Oregon and Washington. Although the southern Oregon population has been delisted, the lower Columbia River population of Columbia white-tailed deer remains listed as threatened. Columbian white-tailed deer have evolved with particular habitat needs that are vital to successful recovery of the population and this mitigation plan is designed with these habitat needs in mind.

The habitat preferred by Columbian white-tailed deer consists of deciduous forest with an open understory, as well as open grasslands and woodland edges (Oregon Department of Fish and Wildlife [ODFW], 2016). As such, the mitigation site is designed to resemble a mosaic of these varying habitats, which will provide the deer with optimal cover and food sources. A robust planting strategy involving a variety of native vegetation will be utilized to achieve this objective. Although Columbian white-tailed deer have a preference for forested upland areas, they have also adapted to use lower elevation floodplain areas, where they seek out deciduous forests and woodland edges (Washington Department of Fish and Wildlife, 2021). These features are incorporated into the CWM design as a component of the PFO and PSS wetland areas, which will be planted with a variety of woody vegetation species.

Although the lower elevation floodplains the Columbian white-tailed deer have been relegated to using is suboptimal compared to the historically used habitat of prairie edges and woodland habitat, there are benefits that result from such habitat being available at the proposed CWM site. Columbian white-tailed deer populations are generally small, isolated, and vulnerable; having a large intact parcel of land that will be protected from future development will benefit the deer, particularly as habitat fragmentation is an increasing overall threat to the species. With habitat connectivity in increasingly short supply, this species would stand to benefit from the enhancement of the CWM site. The higher elevation areas of the CWM site are slightly dryer than the surrounding area and will be planted as a palustrine forested wetland, which will provide woodland-type habitat for the Columbian white-tailed deer. Brush piles will be installed throughout the CWM site, and the palustrine forested areas will also help provide habitat diversity for the Columbian white-tailed deer. Columbian white-tailed deer depend on floodplain habitat as their suitable habitat; to have floodplain habitat available that is protected from flooding is an ancillary benefit unique to this site that may not be available at other similar habitats in the region utilized by the deer. Furthermore, NEXT Renewable Fuels Oregon, LLC, is in consultation with the U.S. Fish and Wildlife Service regarding additional habitat requirements for the Columbian white-tailed deer.

Successful establishment of the proposed CWM site is dependent on the installation and maintenance of a perimeter fence around the site, which will prevent deer and other wildlife from damaging or destroying young plantings before they are able to mature. Columbian white-tailed deer are known for their jumping ability, so it is imperative that fencing installed around the CWM site be an appropriate height to successfully exclude the deer. ODFW recommends the following for appropriately effective deer fencing:

- Seven- to 8-foot tall woven wire fencing is recommended for perimeter fencing.
- Woven wire should have 14.5-gauge filler wire and 11-gauge top and bottom wires, with vertical stays no more than 6 inches apart.
- Corner fence posts should be wooden posts at least 9.5 feet long and 5 inches in diameter.
- Line posts are recommended to be either 3-inch in diameter wooden posts or 8-foot studded steel T-posts.

- Any wooden posts used should have at least the bottom 3 feet treated with a preservative, being sure to avoid any copper-type wood preservatives. Wooden posts should be sunk approximately 2.5 feet in the ground.
- Line posts should be spaced no greater than 15 feet apart; however, using even shorter intervals between line posts will yield greater success at keeping the fence taut.

The fence design proposed in this Compensatory Wetland Mitigation Plan incorporates elements that meet or exceed the recommendations of ODFW. The proposed fence design will utilize 6-foot woven wire fencing with three strands of smooth wire installed above the wire fence at 5-inch intervals, to achieve a fence height of approximately 7.5 feet. The fence material will be commercial-grade, rectangular galvanized woven wire fabric with 12.5-gauge filler wire and 10-gauge top and bottom wire. Corner posts will be treated wood, either 6-inch by 6-inch lumber posts or 6-inch diameter round posts, 12 feet in length, and be set 4 feet in the ground. Line posts to be used will either be 10-foot T-posts or 10-foot treated wooden posts that are either 4-inch by 4-inch lumber posts or 4-inch diameter round posts, with maximum spacing set 8 feet apart.

Considering the varying topography of the site, it is recommended that attention be given to keeping the fence flush with the ground, as gaps as narrow as 6 inches can be used by deer to push underneath fencing. Similarly, to deter deer from attempting to jump the fence, polyvinyl chloride pipe, flagging, or some other high-visibility attachment will be secured to the top of fence lines to prevent deer from misjudging the fence height. Cross braces will be utilized at corners, angles, adjacent to gates, and at intervals along longer sections of fence. Gates are recommended to be placed at or near each fence corner and will also be of equal height to the fence to deter deer from jumping. The location of the fence is shown on the Drawings, Sheets 4 through 6, and the fence details are shown on Sheets 16 and 17. The fence design meets or exceeds ODFW recommendations outlined above.

Once established, the proposed CWM site will provide this threatened species with improved habitat availability, and in particular, improved habitat connectivity, which will be of greater benefit to the deer compared to the sporadic habitat and monoculture currently available on the surrounding farmlands.

3.2.2 Waterfowl Habitat

Numerous species of waterfowl exist in the lower Columbia River basin. Overall, these species rely on diverse water features; however, two main habitat components are essential to waterfowl: open water for security and adjacent floodplain fields for feeding (ODFW, 2016). The proposed CWM site is designed with diverse water features such as shallow dendritic channels, deeper main channels, shallow pools, and deeper pools. These features will provide food sources necessary to waterfowl populations, such as aquatic plants, macroinvertebrates, and fish. Additionally, a robust planting plan that incorporates planting native shrubs along the edges of waterbodies would facilitate nutrient loading through decomposition of organic matter in the water. In turn this would benefit benthic macroinvertebrate communities, creating an improved food source for waterfowl.

3.2.3 Amphibian Habitat

Wetland ecosystems offer ideal habitat for amphibians. Many amphibian species require shallow and still waterbodies with ample sunlight. Waterbodies used for breeding must retain water for at least five months for the tadpoles to metamorphose, and also be free of predators and disturbance. Upland habitat with brush piles and downed logs is needed for cover during the non-breeding season. Maintaining native wetland vegetation is also essential for amphibian populations, specifically, availability of aquatic vegetation with sturdy stems used for attaching eggs and eventually habitat for tadpole rearing (ODFW, 2016). With the network of wetland channels varying in size and depth and the planting plan incorporating numerous native grass, shrub, and tree species, the proposed CWM site is designed to incorporate these habitat features essential to amphibian populations.

Components of successful amphibian habitat include appropriate pool depths and bank slopes for aquatic habitat, appropriate vegetative plantings, and suitable terrestrial habitat in the form of brush piles and large wood structures. Optimal aquatic habitat for amphibians involves varying water depths for wetland ponds and pools, with ideal depths for breeding habitat ranging from 1.5 to 6 feet, and ideal depths for incubation of egg masses ranging from 6 to 36 inches. The ideal bank slope of wetland ponds and pools for breeding amphibians is no greater than 3H:1V. This bank slope will provide shallower, warmer water, which is ideal for rearing and foraging of amphibian larvae. In addition, the shallower water will encourage growth of native emergent wetland vegetation, provide protective cover from predators, and also provide sturdy vegetation stems and root stringers to serve as attachment sites for amphibian egg masses.

The open bank slope of the shallow dendritic channels is 4H:1V and the bank slopes of the open water dendritic channels and open water ponds vary between 3H:1V and 4H:1V to provide amphibian and aquatic habitat. The open water ponds and open water dendritic channels are designed to provide sections of open water that maintain a minimum of approximately 2.5 feet of water depth during the low groundwater period while the shallow 3H:1 and 4H:1V bank slopes will provide locations with varying water depth. Large woody debris will be placed along the banks of the constructed channels so that approximately one-third of the stem is below the minimum water level as shown on Sheet 11. The woody debris will be placed throughout the site at varying orientations and depths to provide a variety of habitat. Some of the large woody debris will incorporate full root wads that will provide interstitial space for species to escape predation. The woody material will also serve as a food source as macroinvertebrates grow on the wood.

Brush piles and large wood structures are an important component of habitat for amphibians, among other species. Brush piles can provide habitat for nesting, feeding, rearing, resting, and protection from predators. Brush piles should be located near amphibian breeding habitats but primarily in upland habitat. Providing numerous brush piles of varying sizes is recommended by ODFW, with consideration given to size of wood used, tree species, and decay class. In addition to strategic placement of brush piles with regard to breeding habitat, as well as upland habitat, random placement of brush piles is also recommended, with consideration given to locating structures near one another to encourage wildlife movement between structures.

ODFW recommends that brush pile size generally be 5 feet high and 8 feet in diameter, with each component of a brush pile being a minimum of 6 feet long and 6 inches in diameter at the small end, with a total volume of at least 10 cubic feet. When constructing the structures, the largest size components will be placed at the bottom of the brush pile to prevent accelerated decay of the materials, and 2 to 4 feet of smaller size components, such as leafy boughs, will be placed on top of this foundation. The species selected for brush pile construction will be a minimum of 50 percent conifer. Specific species included will likely consist of Douglas fir, Western redcedar, bigleaf maple, and black cottonwood. When selecting brush pile components, logs will have at least 75 percent of the bark tightly adhered. Additionally, brush pile components will be selected from areas as close as possible to the CWM site and inspected to minimize the introduction of fungal diseases and insects. From improved food source opportunities to improved protective cover and microclimate conditions, the use of brush piles and large wood structures have the potential to provide numerous benefits to small wildlife and amphibian communities. Additional details on the brush piles are included on Sheet 19.

3.2.4 Raptor Habitat

Enhancement of the proposed CWM site will also allow for the opportunity to improve habitat for raptor species. Raptor habitat improvements will include the installation of nesting platforms as well as perch poles. Nesting platforms differ from perch poles in that nesting platforms are used by raptors primarily for feeding, resting, and rearing juveniles, and perch poles are used primarily for hunting activity. ODFW recommends nesting platforms be placed a minimum distance of 0.5 mile from one another. The size of the proposed CWM site will allow for approximately three to four raptor nesting platforms.

Perch poles facilitate hunting activity for raptor species, particularly when located adjacent to appropriate food source habitats. Perch poles used by osprey and bald eagles are best located adjacent to waterbodies and riparian areas; perch poles used by red-tailed hawks, kestrels, and northern harriers are best located adjacent to wetlands, grasslands, and scrublands; perch poles used by owls are best located adjacent to an interlocking forest canopy. ODFW recommends perch poles be placed a minimum of 50 yards from one another. Additional details of raptor nesting platforms and perch poles are included on Sheet 18. Natural nesting boxes and perch poles are preferred; therefore, the constructed artificial structures are considered temporary. Artificially constructed structures will be necessary during the initial establishment of the proposed CWM site, as they will provide habitat while the native vegetation continues to mature. Due to the benefits to habitat, native vegetation such as black cottonwood trees are included in the planting plan.

3.2.5 Songbird Habitat

Songbirds are an additional element of the wildlife community that stand to benefit from the availability of wetland habitat, as well as contribute to the health and successful functioning of the proposed CWM site. Wetland ecosystems provide a steady food source in the form of insects for songbirds and their offspring. The availability of this food source, in addition to the brush piles and large wood structures that will be installed at the proposed CWM site, will promote and support songbird populations in the vicinity of the site. Moreover, the variety of native vegetation that will be strategically planted throughout the proposed CWM site will also

be beneficial to songbirds. A diverse selection of native grasses, trees, and shrubs will provide songbirds with structurally diverse available habitat, as well as provide seasonal variation in the seeds and fruits available for food. Similarly, the proposed CWM site is being designed with emergent, scrub-shrub, and forested wetland species, and the transitioning habitat among these three planting regimes will create a substantial amount of ideal songbird habitat in the form of habitat edges, which are preferred by many species of songbirds. Having a robust population of songbirds will, in turn, enhance the local ecosystem not only through the benefit of pest and insect control, but also through the beneficial role that birds play regarding seed dispersal and pollination.

3.2.6 Bat Habitat

Providing suitable habitat for bats is an important component of maintaining a diverse and healthy wildlife community. Wetlands and similar aquatic habitat provide ideal food source opportunities for bats and, therefore, allow bats to have a highly compatible coexistence with wetland ecosystems. In addition to the important role that bats play regarding insect control, bats also provide ecological benefit through their role as pollinators.

The installation of multiple bat boxes at strategic locations within the proposed CWM site will assist in establishing a healthy bat population to benefit the local ecosystem. Bat boxes larger in size and designed with multiple chambers have been shown to result in greater use than smaller size bat boxes. Boxes will be installed a minimum of 12 feet above the ground in an area that receives a minimum of four hours of direct sunlight on days with sunshine, ideally facing south or southeast. Boxes will also be installed in areas adjacent to open water, and at least 30 feet from any raptor perches or nesting structures. Additional predator control measures will include installing boxes on a smooth metal pole or installing smooth metal sheeting below the boxes to prevent access by predators. Additional details of the bat boxes are included on Sheet 18.

Section 4.0 - Compensatory Wetland Mitigation Existing Site Conditions

4.1 Wetland Delineation or Determination Results

A Wetland Delineation Report (WDR) for the proposed renewable fuels facility study area was submitted to the Oregon Department of State Lands (DSL) in November 2020 (WD2020-0663). A revised version of the report was submitted in July 2021. The WDR described six wetlands totaling 141.04 acres within the proposed renewable fuels facility site, and several unnamed drainage ditches. Concurrence was received for this delineation on September 21, 2021.

A WDR for the proposed compensatory wetland mitigation (CWM) site has been prepared and was submitted to the DSL on September 1, 2021. This WDR describes two wetlands covering most of the area within the 580-acre proposed CWM site study area, as well as several waterways (McLean Slough and numerous unnamed drainage ditches). Concurrence was received for this delineation on February 3, 2022.

4.2 Existing Hydrogeomorphic and Cowardin Classes On-Site

The impacted wetlands at the proposed renewable fuels facility site are classified as Palustrine Emergent (PEM) and Palustrine Shrub-Scrub (PSS) habitat using the Cowardin classification system and Flats using the hydrogeomorphic classification system. Currently, the proposed CWM site contains wetlands classified as PEM, PSS, Palustrine Forested, and Flats; however, the existing hybrid poplar plantation will be removed prior to construction of the proposed CWM site.

Photographs of the existing wetland areas are shown on Figures 4A through 4K.

4.3 Description of Existing and Proposed Hydrology

Currently, the impacted wetlands appear to be supported by natural precipitation, groundwater, and/or surface runoff. Following construction, the impacted wetlands will contain structures, culverts, impermeable surfaces, and road fill. Rainfall and runoff will be treated before leaving the impact site, and surface flow will be routed around the site.

The proposed CWM site is located within the Beaver Drainage District (BDD). The BDD is managed by the Beaver Drainage Improvement Company, Inc. (BDIC) to provide drainage during the winter and sub-irrigation during the summer. Throughout the BDD there are a series of private and BDIC ditches that provide drainage. The typical drainage layout consists of private drainage ditches constructed straight across fields that drain to McLean Slough, Dobbins Slough, and Beaver Slough. The sloughs then generally flow from the northeast to the southwest. Ultimately, the flow ends up in Beaver Slough where a pump station pumps the water out of the BDD into the Beaver Dredge Cut, which then flows to the Columbia River. The pump station is operated to maintain a water surface elevation of approximately -6.1 to -7.1 feet during the winter.

The pump station operating elevations were determined based on a description of the pump operation provided by the BDIC. The elevations provided by the BDIC were adjusted to the project vertical datum

of North American Vertical Datum of 1988 based on a GPS survey of the staff gauge located at the pump station.

During the summer, water from the Columbia River flows through John Slough to an irrigation intake on Kallunki Road. From the intake, the irrigation water is distributed via a series of sloughs and ditches in the northeastern portion of the BDD. Wooden checkboards are installed across McLean Slough at the intersection with Collins Road. The checkboards are placed to maintain a water surface elevation of 0.4 foot upstream of Collins Road. During this time, the water surface elevation at the pump station is set to an elevation of -4.6 feet. The BDIC prefers to regulate inflow at Kallunki Road to control the water surface elevation within the BDD rather than incurring the cost associated with pumping.

The CWM site is almost entirely surrounded by sloughs or drainage ditches that serve various functions for the BDIC. The hydraulic capacity of these drainage features will be maintained, and the ditches and sloughs will be improved to create a perimeter ditch system. Perimeter ditches will help maintain operation of the BDIC and limit potential groundwater impacts to neighboring properties. The perimeter ditches are further described in Section 6.2.

The proposed CWM site will have increased hydrologic connectivity with McLean Slough as a result of lowering the ground surface elevation and constructing a network of dendritic channels throughout the site, excluding the low impact zone near the Beaver Cut Levee (see Section 6.2.4). Approximately 6 to 12 inches of topsoil is anticipated to be removed from the CWM site, and channels will be excavated 2.5 to 4 feet deep on average with limited areas being excavated approximately 6 feet deep to construct open water channels and ponds. The net elevation reduction across the site will be approximately 1.5 feet. Lowering the ground surface elevation of the site is anticipated to provide a period of surface saturation for part of the year and promote the growth of species adapted to wetter conditions. The dendritic channels will allow for hydraulic connectivity as well as reduce potential for inundation of the site. The dendritic channels and site grading will also be designed to work with the summer and winter operating levels of the BDD.

4.4 Existing Plant Communities

The impacted wetland areas contain tule (*Schoenoplectus acutus*), sedges (*Carex nebrascensis*), cattails (*Typha latifolia*), rushes (*Juncus balticus*), reed canarygrass (*Phalaris arundinacea*), common spikerush (*Eleocharis palustris*), and Himalayan blackberry (*Rubus armeniacus*). Additional plant species include hybrid poplar (*Populus balsamifera*), Kentucky bluegrass (*Poa pratensis*), perennial ryegrass (*Lolium perenne*), creeping thistle (*Cirsium arvense*), peppermint (*Mentha x piperita*), common bent (*Agrostis capillaris*), meadow foxtail (*Alopecurus pratensis*), panicle bullrush (*Scirpus microcarpus*), velvetgrass (*Holcus lanatus*), spike bentgrass (*Agrostis exarata*), horsetail (*Equisetum arvense*), curly dock (*Rumex crispus*), creeping buttercup (*Ranunculus repens*), white clover (*Trifolium repens*), ladythumb (*Polygonum persicaria*), and Douglas hawthorn (*Crataegus douglasii*).

The proposed CWM site is currently dominated by hybrid poplar plantations. Herbaceous vegetation observed in these wetlands included reed canarygrass, creeping buttercup, horsetail, sedges, rushes, various native and introduced grasses, and smaller amounts of forbs. There are extensive Himalayan blackberry thickets in some areas, smaller patches of elderberry, and hybrid poplars of varying ages throughout the proposed CWM site.

4.5 Existing Soil Conditions

Soils within and adjacent to the proposed CWM site have been influenced by the Columbia River and impacted by agriculture/grazing, construction and maintenance of roads, the railroad, and the construction and maintenance of the energy infrastructure at Port of Columbia County.

Soils mapped in the mitigation site by the Natural Resources Conservation Service (NRCS) are Lacoda silt loam, protected; Wauna silt-loam, protected; Wauna-Lacoda silt loams, protected; and Crims silt loam, protected. These soils formed in depressions on the Columbia River floodplain, and all soils are all listed as hydric (NRCS, 2021).

The soil types present at the CWM site are classified as either poorly drained or very poorly drained, with moderately high to high Ksat values (saturated hydraulic conductivity or the capacity of the most limiting layer to transmit water) ranging from 0.20 inch per hour to 1.98 inches per hour. The parent material of the Locoda silt loam, Wauna silt loam, and Wauna-Locoda silt loam is silty alluvium derived from mixed sources, and the parent material of Crims silt loam originates from partially decomposed herbaceous material over silty alluvium (NRCS, 2021). These soil types are ideal for adequate functioning of wetland hydrology.

Due to the history of both agricultural development and flood control development at the CWM site, it could be anticipated that soil health may have degraded over time. Therefore, the soil may be augmented with nutrients or fertilizer prior to planting and/or during site maintenance. This will aid in establishment of native plant communities and contribute to the overall success of the CWM site.

4.6 Site Constraints or Limitations

Constraints at the proposed CWM site include the presence of Hermo Road, which bisects the site, and agricultural fields to the west, north, east, and south. McLean Slough is present in the northwest section of the proposed mitigation area. Two known cultural resource sites are located within or near the CWM site. The general area of the cultural resource sites is near the intersection of Collins Road and McLean Slough, and east of Hermo Road between Collins Road and Collins Road 1. The mitigation site has been designed with a 50-foot setback to avoid ground disturbance in these areas.

Once constructed, the proposed renewable fuels facility and access road will present site constraints to the north. The Beaver Cut Levee is located on the southeast side of the mitigation site. The CWM site is also in the BDD, which is operated by the BDIC. The CWM site will be designed to maintain the operational capability of the BDIC to provide irrigation and drainage to neighboring properties. A detailed discussion of how this will be accomplished is included in Section 6.2.

Other constraints are related to habitat, such as the persistent and regional threat of invasive species such as reed canarygrass and Himalayan blackberry.

Section 5.0 - Functions and Values Assessment

5.1 Rationale for Method Used

Since the proposed project area is not tidally influenced or located in the Willamette Valley, Oregon Rapid Wetland Assessment Protocol (ORWAP) was used, as required by the Oregon Department of State Lands. The data sheets from these evaluations are included in Appendix B.

5.2 Summary of Expected Gains and Losses

The functions and values of the impacted wetlands and the proposed compensatory wetland mitigation (CWM) site (pre- and post-construction) were evaluated using ORWAP. Construction of the renewable fuels facility will remove all functions of the impacted wetlands. These losses will be offset by the creation of the proposed CWM site, which is anticipated to have functions and values similar to or better than the majority of the impacted wetlands.

Since the proposed CWM site includes existing wetlands, Table 5-1 presents a comparison of the pre- and post-construction function and value ratings of this area. The pre-construction evaluation is the projected condition of the site after the existing poplar plantations have been harvested. Table 5-2 includes a summary of the existing and predicted ratings for the impact and mitigation sites, respectively.

TABLE 5-1
SUMMARY OF COMPENSATORY WETLAND MITIGATION SITE WETLAND FUNCTIONS AND VALUES

Functions and Values			Pre-Construction		Post-Construction	
			Existing Rating	Rating Break Proximity	Predicted Rating	Rating Break Proximity
GROUPS	Hydrologic Function	Function	Lower		Lower	
		Value	Lower		Lower	
	Water Quality Support	Function	Moderate		Moderate	
		Value	Higher		Higher	
	Fish Habitat	Function	Lower		Lower	
		Value	Lower		Lower	
	Aquatic Habitat	Function	Higher	MH	Higher	
		Value	Higher		Higher	
	Ecosystem Support	Function	Moderate		Higher	MH
		Value	Higher		Higher	
SPECIFIC FUNCTIONS AND VALUES	Water Storage and Delay	Function	Lower		Lower	
		Value	Lower		Lower	
	Sediment Retention and Stabilization	Function	Lower	LM	Moderate	
		Value	Higher		Higher	
	Phosphorus Retention	Function	Moderate		Moderate	
		Value	Higher		Higher	
	Nitrate Removal and Retention	Function	Lower	LM	Moderate	
		Value	Higher		Higher	
	Anadromous Fish Habitat	Function	Lower		Lower	
		Value	Lower		Lower	
	Resident Fish Habitat	Function	Lower		Lower	
		Value	Lower		Lower	
	Amphibian and Reptile Habitat	Function	Higher		Higher	
		Value	Lower		Lower	
	Waterbird Nesting Habitat	Function	Higher	MH	Higher	
		Value	Higher		Higher	
	Waterbird Feeding Habitat	Function	Higher		Higher	
		Value	Higher		Higher	
	Aquatic Invertebrate Habitat	Function	Lower		Moderate	LM
		Value	Lower		Lower	
	Songbird, Raptor, Mammal Habitat	Function	Moderate		Moderate	MH
		Value	Higher		Higher	
	Water Cooling	Function	Moderate		Moderate	
		Value	Higher		Higher	
	Native Plant Diversity	Function	Moderate	MH	Higher	
		Value	Lower		Lower	
	Pollinator Habitat	Function	Moderate	MH	Higher	MH
		Value	Moderate	MH	Moderate	
	Organic Nutrient Export	Function	Moderate		Moderate	
		Value	N/A		N/A	
	Carbon Sequestration	Function	Moderate	MH	Moderate	
		Value	N/A		N/A	
	Public Use and Recognition	Function	N/A		N/A	
		Value	Lower	LM	Moderate	

LM = low-moderate, MH = moderate-high

**TABLE 5-2
SUMMARY OF WETLAND FUNCTIONS AND VALUES**

Functions and Values			Impact Site		CWM Site		Attribute Replaced?	Mitigation Exceeds Impact Function Rating?
			Existing Rating	Rating Break Proximity	Predicted Rating	Rating Break Proximity		
GROUPS	Hydrologic Function	Function	Lower		Lower		Yes	
		Value	Lower		Lower		Yes	
	Water Quality Support	Function	Moderate		Moderate		Yes	
		Value	Higher		Higher		Yes	
	Fish Habitat	Function	Lower		Lower		Yes	
		Value	Lower		Lower		Yes	
	Aquatic Habitat	Function	Higher	MH	Higher		Yes	
		Value	Higher		Higher		Yes	
SPECIFIC FUNCTIONS AND VALUES	Ecosystem Support	Function	Higher	MH	Higher	MH	Yes	
		Value	Moderate		Higher		Yes	
	Water Storage and Delay	Function	Lower		Lower		Yes	
		Value	Lower		Lower		Yes	
	Sediment Retention and Stabilization	Function	Lower	LM	Moderate		Yes	
		Value	Higher		Higher		Yes	
	Phosphorus Retention	Function	Moderate		Moderate		Yes	
		Value	Higher		Higher		Yes	
	Nitrate Removal and Retention	Function	Lower		Moderate		Yes	Yes
		Value	Higher		Higher		Yes	
	Anadromous Fish Habitat	Function	Lower		Lower		Yes	
		Value	Lower		Lower		Yes	
	Resident Fish Habitat	Function	Lower		Lower		Yes	
		Value	Lower		Lower		Yes	
	Amphibian and Reptile Habitat	Function	Higher		Higher		Yes	
		Value	Lower		Lower		Yes	
	Waterbird Nesting Habitat	Function	Higher	MH	Higher		Yes	
		Value	Higher		Higher		Yes	
	Waterbird Feeding Habitat	Function	Higher		Higher		Yes	
		Value	Higher		Higher		Yes	
	Aquatic Invertebrate Habitat	Function	Lower		Moderate	LM	Yes	
		Value	Lower		Lower		Yes	
	Songbird, Raptor, Mammal Habitat	Function	Moderate		Moderate	MH	Yes	
		Value	Higher		Higher		Yes	
	Water Cooling	Function	Lower	LM	Moderate		Yes	
		Value	Higher		Higher		Yes	
	Native Plant Diversity	Function	Moderate	MH	Higher		Yes	
		Value	Lower		Lower		Yes	
	Pollinator Habitat	Function	Higher	MH	Higher	MH	Yes	
		Value	Moderate		Moderate		Yes	
	Organic Nutrient Export	Function	Moderate		Moderate		Yes	
		Value	N/A		N/A		N/A	
	Carbon Sequestration	Function	Moderate		Moderate		Yes	
		Value	N/A		N/A		N/A	
	Public Use and Recognition	Function	N/A		N/A		N/A	
		Value	Lower	LM	Moderate		Yes	

5.3 Considerations to Address Expected Losses

Losses to the functions and values of the impacted wetlands will be addressed through enhancement of a similar wetland area southwest of the impacted wetland area.

Section 6.0 - Compensatory Wetland Mitigation Plan, Construction Maps, and Drawings

6.1 Basic Mitigation Plan

The objective of this Compensatory Wetland Mitigation Plan (CWMP) is to enhance the hydrology and vegetation of the proposed compensatory wetland mitigation (CWM) site, which will improve wetland functions and values, as well as provide valuable wildlife habitat. This will be accomplished by the following activities:

1. Strategically fill approximately 26,800 linear feet of the site's existing interior private drainage ditches. No perimeter ditches will have their hydraulic capacity reduced.
2. Utilize one growing season of mechanical (plowing/discing/grading) and chemical (herbicide) controls to reduce the presence and potential re-establishment of invasive plant species prior to re-establishing native vegetation.
3. Create small, dendritic channels patterned after those typically found in lower Columbia River backwater sloughs.
4. Create shallow pools. This will provide an opportunity to diversify emergent vegetation and provide potential reproductive habitat for amphibians and other aquatic wildlife.
5. Create overall surface roughness (enhanced microtopography). Surface microtopography will be incorporated throughout the site to diversify surface hydrology and resultant vegetation. Microtopography will consist of machinery-induced undulations from site preparation tillage and will result in generally 6-inch height/depth variations.
6. Revegetate with native species of appropriate genetic stock to establish a mix of native forbs, grasses, sedges, rushes, and woody species compatible with lower Columbia River bottomland emergent, forested, and shrub habitat.
7. Utilize adaptive management throughout the project to react quickly and effectively to unforeseen events.
8. Incorporate five years of annual vegetation monitoring (see Section 7.0).

6.2 Grading Plan Objectives

Currently, the proposed CWM site is flat, with relatively little surface topography except for numerous drainage ditches. Depending on results from groundwater monitoring data, the site will be constructed by removing approximately 6 to 12 inches of the topsoil layer, if needed, to lower the elevation and remove the non-native seed bed. Ongoing results from groundwater monitoring may warrant adjustments to the grading plan. Any adjustments or refinements to the grading plan are anticipated to

be minor and will be used with the goal of better meeting design criteria and project objectives. Tree removal will be required to clear the site of the existing commercial hybrid poplar plantation to allow excavation of the channels and re-establishment of native wetland species. Dendritic channels will be constructed throughout the site to create wildlife habitat diversity and reconnect hydrology. One objective of this CWMP is to grade the proposed CWM site to an elevation sufficient to enhance wetland hydrology, support wetland vegetation, and allow hydric soils to develop. Because NEXT Renewable Fuels Oregon, LLC, has entered into a long-term lease of the property, the proposed CWM site will be protected from haying, grazing, and other agricultural activities.

6.2.1 Hydrology Enhancement

The wetland hydrology at the CWM site will be enhanced through two primary grading activities. First, the entire site, excluding the low impact zone, as described in Section 6.2.4.2, is anticipated to be lowered approximately 6 to 12 inches to help the roots of wetland plants reach the saturation zone of current groundwater conditions. The depth of 6 to 12 inches was determined based on site investigations and GPS survey points that were collected. The survey points collected water surface elevations throughout and adjacent to the site to help understand groundwater and surface water conditions.

Areas within the CWM site that had better functioning wetland and hydrologic characteristic were also noted during site investigations. GPS survey points were taken in these locations and compared to the available light detection and ranging (LiDAR) data. These locations were used as references when developing the preliminary grading plan for the rest of the CWM site. Monitoring wells will be installed throughout the site as discussed in the description of hydrology monitoring; the monitoring wells will more accurately determine the existing groundwater conditions throughout the year at the CWM site. Additionally, following tree removal beginning in summer 2022 and completed in spring 2023, new LiDAR data will be collected for the entire CWM site. Updated LiDAR data in conjunction with monitoring well data will help determine the final adjustments to the grading of the CWM site with the goal of improving hydrologic function by lowering the CWM site to function with the existing hydrologic conditions.

The second grading activity that will enhance the hydrologic function of the CWM site is the replacement of the straight interior drainage ditches with dendritic channels. The drainage ditches currently function to efficiently drain the site to McLean Slough during the wet season. Since the dendritic channels are designed to retain water on site longer, this will allow precipitation to better infiltrate into the ground and help increase groundwater elevation on site. This is due to the dendritic channels having more sinuosity, a higher invert elevation than the drainage ditches, and a greater wetted surface area. The dendritic channels are also designed to distribute water more evenly throughout the site and increase groundwater elevation in localized areas on the CWM site that are currently experiencing lower groundwater. During the summer, the site receives sub-irrigation from the intake on Kallunki Road, and the dendritic channels will distribute the sub-irrigation water more evenly throughout the CWM site. Although water may temporarily inundate the proposed CWM site during the spring, especially during very wet years, the design is based on saturation by groundwater, which was observed while conducting the wetland delineation.

6.2.2 Controlling Groundwater Rise

Construction of the proposed CWM site is not anticipated to cause adjacent properties to flood or change the water table in surrounding properties from its existing conditions. This will be accomplished by maintaining and installing perimeter ditches around the proposed CWM site. The perimeter ditches will intercept any potential increase in groundwater elevation that occurs on the CWM site and allow it to drain to McLean Slough before impacting an adjacent property. The perimeter ditches are not anticipated to drain the CWM site since they are existing ditches, and the water surface elevations are controlled based on McLean Slough and local groundwater elevations. Drainage discharges to McLean Slough are not being altered as part of the design, and the CWM site was designed to function within the current water surface elevations of the ditches and McLean Slough. Additionally, the wetland delineation confirmed that the existing ditches do not and will not cause a groundwater drawdown that significantly dewater the wetlands since wetlands were delineated right up to the edge of the existing perimeter ditches.

An increase in the Beaver Drainage Improvement Company, Inc. (BDIC) pumping cost associated with the CWM site is not anticipated since the proposed enhancements are not adding or subtracting water to the Beaver Drainage District (BDD) system. The enhancements are designed to work with the volume of water already present at the site. The CWM site may act as a buffer within the BDD by slowing the release of water from the site during the wet season, but it is not anticipated to increase the volume of water within the BDD.

6.2.3 Maintaining Beaver Drainage Improvement Company, Inc., Operation and Capacity

The CWM site is located within the BDD, and the BDIC needs to maintain the ability to provide drainage and irrigation to the surrounding properties. McLean Slough and Dobbins Slough are the two primary conveyance features within the CWM site. The CWM improvements will consist of minimal alteration to these conveyance features and would not reduce their hydraulic capacity. Alterations may include minor grading adjacent to the sloughs and minor grading along the bank where the existing drainage ditches and proposed dendritic channels connect to the sloughs.

Improvements may also consist of replacement or construction of control structures. Currently, the BDIC utilizes a control structure on McLean Slough at the intersection of Collins Road to control sub-irrigation during the summer. Improvements may be needed at this control structure. The improvements will be designed to maintain the capacity and operational function of the existing structure. The improvements are anticipated to improve the function and reduce the operation and maintenance for the BDIC through installation of a newer and more efficient structure.

6.2.3.1 Beaver Drainage Improvement Company, Inc., Maintenance Areas

NEXT Renewable Fuels Oregon, LLC, worked with the BDIC regarding access and maintenance for sloughs through the CWM site. These maintenance areas will be

outside the mitigation site and are not counted toward the required mitigation acreage. These maintenance areas include the following:

- 1) The safety strip, extending 100 feet from the toe of Beaver Cut Levee along the full extent of the levee along the edge of the mitigation site
- 2) A 30-foot maintenance strip along Hermo Road and Collins Road and between Hermo Road and Dobbins Slough for the relocated internal drainage ditch discussed in Section 6.2.3.2
- 3) A 30-foot maintenance strip along Dobbins Slough to provide adequate width for access and maintenance

NEXT will complete grading activities to reduce the presence of invasive plant species directly in the easement areas, excluding the safety strip, adjacent to the mitigation site. NEXT is not responsible for any additional improvements BDIC completes within the provided easements. All easement areas will be left as unimproved dirt surfaces planted with the native palustrine emergent wetland seed mix used within the mitigation site. The additional easement areas provide BDIC with area to maintain their responsibilities within the BDD. This reduces the potential of BDIC impacting the mitigation site while completing maintenance of the BDD.

6.2.3.2 Drainage Patterns

In addition to the sloughs, there are a series of drainage ditches throughout the CWM site. The sole purpose of many of these ditches is for the benefit of drainage on the CWM site and not for drainage within the BDD. These ditches are considered private drainage ditches and will be eliminated as part of the CWM site and will not impact the BDIC's ability to provide drainage to adjacent property within the BDD.

Besides McLean Slough and Dobbins Slough, the only area the BDIC serves via ditches through the CWM site is an area adjacent to the southeast edge of the CWM site between Beaver Dike Road and Hermo Road. The BDIC currently drains this area via a ditch that runs through the southern portion of the CWM site. NEXT Renewable Fuels Oregon, LLC, is working with the BDIC to relocate this drainage path from the middle of the CWM site to a ditch along the southern edge of Hermo Road and Collins Road as shown on Sheets 14 and 15. A one dimensional hydraulic analysis will be completed using U.S. Army Corps of Engineers' Hydrologic Engineering Center's River Analysis System (HEC-RAS). The HEC-RAS analysis will be used to help ensure the relocated internal drainage ditch substantially provides the same drainage capacity provided by the existing internal drainage ditches. Relocation of the drainage path would include improvements to the ditch along the southern edge of Hermo Road and Collins Road as part of the construction of the CWM site. The improvements would include cleaning, deepening, and widening of the ditch along the new drainage path as needed to provide the capacity to continue to drain the areas outside of the CWM site. Similar to McLean Slough and Dobbins Slough, the BDIC would be able to access and maintain the ditch, and this area is not included in the CWM site. Routing this drainage around the

southeast corner of the CWM site and along the southern edge of Hermo Road and Collins Road will provide conveyance that is easy for the BDIC to access and maintain since it will be adjacent to farm fields and Hermo Road and Collins Road instead of through the middle of the CWM site. Routing the drainage around the site is anticipated to also reduce ditch maintenance associated with beaver activity.

Based on observations at other wetland mitigation sites, concerns have been raised regarding the negative drainage effects the widening or deepening of the ditch could have on the surrounding mitigation area. One concern is the wetlands would become dewatered adjacent to the ditch, therefore, effecting functionality of the wetlands in these locations. This proposed CWM site is unique, however, in that the wetland delineation demonstrated that the large ditches do not appear to effectively lower the groundwater table adjacent to the bank, and the existing wetland delineated boundary extends all the way up to the edge of the existing ditches.

The widening and deepening of the ditch along Hermo Road and Collins Road will be completed to replace the BDIC conveyance capacity that will be cut off within the mitigation site. Widening the large perimeter ditches will essentially realign the conveyance capacity of the interior ditches to the edge of the CWM site along Hermo Road and Collins Road. These modifications will not have a negative drainage effect on the mitigation area and will maintain the regional hydrology of neighboring properties.

These modifications are not anticipated to affect the water surface elevations in the perimeter drainage ditch being modified. The water surface in the ditch is controlled based on the water surface elevation in McLean Slough and not on the geometry or slope of the ditch. The increased area of the ditch is designed to provide the same capacity of the realigned interior BDIC ditch being filled in.

A shallow dendritic channel will be constructed on the northeast block of the mitigation area. The channel will be along the southern property boundary of the block and will serve a dual purpose. First, it will function as a dendritic channel similar to the rest of the CWM site. Secondly, it will help to minimize potential surface water impacts to the neighboring property from the CWM site.

6.2.3.3 Artesian Flows

In this context, artesian flows are defined as “water from a confined aquifer that rises above the confining layer elevation.” The concern with artesian flows is that they will increase the volume of water entering the BDD drainage system. Artesian flows may be encountered throughout the site due to the high groundwater elevations coupled with the possibility of sand lenses overlain with a confining silt layer. A review of the well logs from adjacent parcels described a sandy layer of soil that held water was encountered from a depth of 5 to 17 feet below existing ground surface. This layer produced artesian-like flows, but those flows did not rise above the existing ground surface. BDIC believes it is possible for the areas with deeper excavation of the mitigation site to encounter a similar situation.

NEXT will cap artesian flows (as defined above) encountered during construction of the mitigation site with native material when the flows rise above the elevation of the outlet control structures on the mitigation site. Additionally, dendritic channels may be rerouted as described in Section 6.2.5, Adaptive Management During Construction. Limiting when artesian flows would be capped allows the mitigation site to become more hydrologically connected to the groundwater and allow the dendritic channels to spread this water throughout the mitigation site. Comparing the still water elevation of artesian flows to the outlet control structures will allow NEXT to demonstrate that the confined aquifer will remain under the same head pressure and is not anticipated to increase the volume of water entering the BDD. If an artesian flow is encountered that does raise above the outlet control structure elevation, the flow will be capped so the overall flow into the BDD will not be increased.

6.2.3.4 Summary

As outlined above, the proposed CWM site will not affect the BDIC's ability to control water levels on surrounding properties due to the CWM design, which includes perimeter ditches, no reduction in capacity of McLean Slough or Dobbins Slough, the design of a conveyance path that will provide drainage to the properties at the southeast corner of the CWM site, and management of artesian flows that may be encountered during construction that could impact flows into the BDD.

6.2.4 Protection of the Beaver Cut Levee

During coordination with the BDIC, several items were identified relating to the Beaver Cut Levee, located on the southeast side of the mitigation site. These include future levee maintenance and improvement needs and prevention of the formation of new sand boils that may compromise the integrity of the levee toe and increase the volume of water entering the BDD drainage system.

6.2.4.1 Safety Strip

To allow repairs or potential future improvements to the Beaver Cut Levee, a 100-foot offset between the toe of the levee and the mitigation site was incorporated in the design. Within this safety strip, no grading, complete removal of trees or other deeply rooted vegetation, or soil removal is allowed, although NEXT will cut the existing poplar trees but not remove their roots.

No part of the safety strip will be used for the mitigation site or counted toward the required acreage, and NEXT will not complete any grading within this area. Not including the safety strip in the mitigation site allows the BDIC to carry out necessary activities to maintain the integrity of the Beaver Cut Levee. BDIC is solely responsible for obtaining permits for any future work completed within the safety strip. NEXT will cut down the existing trees within the safety strip and will carry out initial weed control to help prevent future propagation of weeds into the mitigation site. Future weed control will be the BDIC's responsibility.

6.2.4.2 Low Impact Zone

In addition to the safety strip, a low impact zone adjacent to the safety strip was incorporated into the mitigation design. Within this area, NEXT will not create new dendritic channels and will minimize permanent soil excavation (i.e., grading). NEXT may, at its discretion, scrape the top 6 to 8 inches of soil material to remove invasive plants and the associated seed bank from the mitigation site.

Within the low impact zone, NEXT proposes to keep excavation to a minimum while still improving the hydrology of the low impact zone for inclusion within the mitigation site. The low impact zone will be within the temporary perimeter fence for the mitigation site and will have the same deed restriction as the rest of the mitigation site. No future improvements or construction activities related to the Beaver Cut Levee will be allowed to occur within the low impact zone.

Although grading will be kept to a minimum in the low impact zone, hydrologic conditions of this area will still be improved by filling the existing drainage ditches and placing open-water dendritic channels directly outside the low impact zone. Additionally, an open-water dendritic channel will connect to the existing oxbow partially within the low impact zone. The open-water dendritic channel will hydrologically connect the oxbow to the rest of the mitigation site and will help enhance the hydrology of the low impact zone. Currently, the oxbow is connected to a perimeter drainage ditch. This connection will be plugged to prevent draining of the oxbow and the mitigation site into the perimeter ditch at this location. These activities will help equalize groundwater throughout the low impact zone and the mitigation site.

One of the primary uses of the dendritic channels within the mitigation site is to better connect the hydrology of the entire mitigation site. Placement of water control structures at the connection of the open-water dendritic channels, the bordering perimeter ditches, and McLean Slough will help retain and raise the groundwater within the entire mitigation site. Thus, even though grading will be minimized within the low impact zone, the hydrologic conditions of the area will be improved by filling in the existing drainage ditches and placing open-water dendritic channels that connect the existing oxbow and the low impact zone to the larger mitigation site.

6.2.4.3 Sand Boils

In this context, a sand boil is defined as “the rupture of the top foundation stratum landward of the Beaver Cut Levee caused by excess hydrostatic head in the substratum,” which could negatively impact the structural integrity of the levee and potentially increase the volume of water entering the BDD drainage system. NEXT will address sand boils that develop within the immediate vicinity of the Beaver Cut Levee, and per USACE general guidance are of the greatest risk to the levee, during construction of the mitigation site. The safety strip (0 to 100 feet from the toe of the levee) protects the area of greatest concern for the formation of sand boils, will be the BDIC’s responsibility to maintain and monitor, and is outside the mitigation site.

The low impact zone protects the area where sand boils are most likely to form within the mitigation site, since excavation will be minimized in this area. More significant permanent excavation will occur beyond the low impact zone from the Beaver Cut Levee, and it is anticipated that groundwater will be encountered during these activities. If groundwater is encountered within the vicinity of the Beaver Cut Levee and meets the definition of a sand boil, the sand boil will be addressed by initially using sandbags to surround the sand boil and raise the head pressure. The head pressure will be increased until flow stops. A permanent solution will be to replace the soil covering the sand boil to return the head pressure to its preexisting levels. Addressing sand boils within the immediate vicinity of the Beaver Cut Levee will help reduce risk of negative impacts to the foundation of the levee from seepage and increased water input to the BDD drainage system.

6.2.5 Adaptive Management During Construction

The CWM site will be designed to enhance wetland hydrology at the CWM site by working with and maintaining current groundwater conditions and operation of the BDD. A concern has been expressed by the BDIC that during construction of the CWM site, a sand lens could be exposed and create artesian flows or sand boils that potentially increase the flow volume into the BDD. The increased flow volume could result in increased pumping costs to the BDIC. If the sand lens meets the definitions of an artesian flow, the actions described above will be taken. As previously stated, sand boils will only be addressed if encountered within the immediate vicinity of the Beaver Cut Levee.

The likelihood of uncovering new substantial sand lenses during construction is considered to be low due to the presence of the existing drainage ditches that systematically transect the CWM site. These drainage ditches likely would have already transected a sand lens that the CWM site excavation would encounter. If a sand lens is encountered during construction, meets the definitions of an artesian flow, and the still water elevation rises above the elevation of the outlet control structure, the site grading could be adjusted to avoid the area to help reduce the possibility of increased inflow into the BDD. Additionally, it is anticipated that excavation would not occur below current drainage ditch invert elevations, which will help reduce the risk of encountering a sand lens that has not already been disturbed.

As described above, if a sand boil or artesian flow is encountered during construction, measures will be taken to restore the hydrostatic head of sand boils or cap artesian flows under the situations described in Sections 6.2.4 and 6.2.5, to reduce the possibility of increasing the inflow volume into the BDD.

6.3 Planting List and Rationale

Seeding with native species will prevent erosion and stabilize the soil as the natural seed bank in the reserved topsoil establishes. To help with establishing the proposed CWM site, the seed mix shown on Table 6-1 will be applied.

**TABLE 6-1
 SUGGESTED SEED MIX**

Species	Wetland Indicator Status	Percent Mix Desired
Meadow barley (<i>Hordeum brachyantherum</i>)	FACW	10
Western mannagrass (<i>Glyceria occidentalis</i>)	OBL	15
Tufted hairgrass (<i>Deschampsia cespitosa</i>)	FACW	15
American sloughgrass (<i>Beckmannia syzigachne</i>)	OBL	15
Spike bentgrass (<i>Agrostis exarata</i>)	FACW	15
Annual hairgrass (<i>Deschampsia danthonioides</i>)	FACW	15
Baltic rush (<i>Juncus balticus</i>)	FACW	15

FACW = Facultative wetland species

OBL = Obligate wetland species

Tree and shrub replanting will focus on selected areas of the proposed CWM site to better represent the natural habitat and function of emergent wetlands. The proposed CWM site is anticipated to re-establish native Columbia River bottomland emergent wetland with a forested component, a shrub component, and native dominated groundcover. Woody vegetation species to be planted may include, but are not limited to, Oregon ash (*Fraxinus latifolia*), black cottonwood (*Populus balsamifera*), locally adapted willows (*Salix spp.*), redosier dogwood (*Cornus sericea*), Pacific ninebark (*Physocarpus capitatus*), and salmonberry (*Rubus spectabilis*). The forested wetland species, such as cottonwood and ash, will be strategically located in areas of the proposed CWM site that are higher and drier than the surrounding areas to provide for the optimal growing conditions particular to these species. Although these areas are higher and drier, they are currently and will remain wetlands.

The inclusion of black cottonwood on the planting list raises concern regarding the potential for cotton to affect nearby industrial operations (particularly intake fans, etc.). Therefore, strategically locating this particular tree species at the most interior locations possible within the proposed CWM site is anticipated to help minimize this concern. The presence of hybrid poplar plantations in the vicinity provides a good indication that this species will successfully establish and mature. Including this species will provide wildlife and raptor habitat and diversity.

In addition, native herbaceous wetland species plugs will be planted along the perimeter of the constructed pools to aid in the rapid establishment of desirable native species. These plugs may be sourced from the impact sites or another approved location. Species may include, but are not limited to, Columbia sedge (*Carex aperta*), slough sedge (*Carex obnupta*), bur-reed (*Sparganium emersum*), and water plantain (*Alisma sp.*).

6.4 Wetland Buffers

Buffers are an integral component of wetland ecosystems that serve multiple purposes. Buffers serve the benefit of providing a layer of protection for plant and animal communities in a wetland, while reducing impacts from adjacent properties and roads. Ecological benefits of buffers to wetlands include moderating stormwater runoff, stabilizing soil, filtering pollutants and excessive nutrients, and reducing human disturbance. Existing ditches are located within the buffer along Hermo Road. These ditches may

significantly contribute to a well-functioning buffer by deterring human disturbance and capturing stormwater runoff, pollutants, and excessive nutrients.

Planting of woody vegetation adjacent to the buffer was considered; however, it would potentially invite unwanted beaver activity, which is likely to create the need for increased ongoing maintenance and ditch cleaning. For this reason, the planting plan was designed with a 165-foot swath between the perimeter ditch and significant woody vegetative plantings, as it has been observed that beaver activity often extends no greater than 165 feet from any habitat material source (Washington Department of Fish and Wildlife, 2022).

6.5 Construction Schedule

The proposed CWM site will be constructed concurrently with the construction of the NEXT Renewable Fuels Oregon, LLC, renewable fuels facility, approximately from summer 2024 through fall 2025. Excavation of the proposed CWM site will be completed with track excavators and dump trucks. When the desired finished grade elevation is achieved, the site will be seeded and planted.

Section 7.0 - Monitoring Plan

7.1 Proposed Performance Standards

The following criteria will be used to evaluate the success of the proposed compensatory wetland mitigation (CWM) site:

1. The cover of native herbaceous species is at least 60 percent.
2. The cover of invasive species is no more than 10 percent.
3. Bare substrate represents no more than 20 percent cover.
4. By Year 3 and thereafter, at least six different native species are occupying at least 5 percent average cover and occurring in at least 10 percent of the plots sampled.
5. Prevalence Index is less than 3.0.
6. In the Palustrine Scrub-Shrub (PSS) and Palustrine Forested (PFO) planting areas, the density of woody vegetation is at least 1,600 native plants (shrubs) and/or stems (trees) per acre, or the cover of native woody vegetation is at least 50 percent. Native species volunteering on the site may be included, dead plants do not count, and the standard must be achieved for two years without irrigation.
7. The site is a minimum of 458.80 acres of Palustrine Emergent, PSS, and PFO wetland, as determined using the criteria stated in the *1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual* and *2010 Western Mountains, Valleys, and Coast Regional Supplement*, by the end of the fifth year following construction.

7.2 Hydrology Monitoring

Hydrology monitoring will be conducted at the proposed CWM site after removal of the poplar tree plantation, throughout the duration of the final design process to assist in project design, and during the post-construction monitoring period to assess performance standards. A minimum of eight shallow groundwater monitoring wells will be strategically located and installed within the mitigation area. Slotted polyvinyl chloride observation tubes will be installed to a depth of approximately 10 feet below ground surface and will be equipped with electronic data loggers to provide twice-daily groundwater elevation readings.

Nine stilling wells will also be installed at strategic locations in adjacent sloughs and perimeter ditches to measure surface water elevations. These observation locations will help confirm how the seasonal operation of the Beaver Drainage District (BDD) impacts the surface and groundwater elevations at the CWM site. These observation locations will also help determine the relationship of the groundwater within the site to the surface water in the sloughs. As the proposed CWM site is being developed, an adaptive management approach will inform monitoring methods through a process of ongoing evaluation and potential adjustment of monitoring methods, and adaptive management principles will

be applied as necessary throughout the monitoring timeline. Once project design has been finalized, a long-term management and maintenance plan will be developed to aid in successful establishment and maturity of the proposed CWM site.

Hydrology monitoring will continue once construction of the proposed CWM site is complete. Ongoing monitoring will allow site managers to observe site conditions to help determine the success of the proposed CWM site. The groundwater monitoring wells will provide data to help evaluate whether objectives of the proposed CWM site (such as increased detention of surface water) are being met. It is anticipated that as precipitation accumulates, the dendritic channels that are incorporated into the site design will slow the release of water from the proposed CWM site to the surrounding drainage ditches and promote infiltration into soils within the proposed CWM site.

The groundwater monitoring will also be used as a tool during plant establishment. If the wetland plantings struggle to establish, the groundwater monitoring data can help inform adaptive management techniques such as adjusting the control structures to help manage groundwater elevations and improve plant establishment.

Hydrology monitoring will also allow stakeholders to observe interactions between the rainfall, groundwater, and surrounding BDD ditches. This ongoing monitoring will help confirm that the proposed CWM site is not negatively impacting the BDD or surrounding properties through increased flow into the BDD or increased groundwater elevations.

7.3 Monitoring Methods

The following methods will be used yearly to assess the condition of the proposed CWM site:

1. Permanent photo points will be established to provide an overall assessment of the created wetland.
2. Establishment of herbaceous plant species will be determined by sampling the proposed CWM site with plots. Ten transects with 1-square meter plots spaced at 20-meter intervals will be laid out within the proposed CWM site (locations to be determined following site construction). Percent cover of all species present will be recorded.
3. Establishment of PSS and PFO planting areas will be evaluated by establishing ten large sample plots with 10-meter diameters (locations to be determined following site construction). Stem counts and percent cover of woody species present in the sample plots will be recorded.

In addition to the above steps, the proposed CWM site will be delineated, and a functions and values assessment (Oregon Rapid Wetland Assessment Protocol) will be conducted, by the end of the fifth growing season following construction to evaluate the size of the wetland and its characteristics. This delineation will be conducted in accordance with the *1987 USACE Wetland Delineation Manual and the 2010 Western Mountains, Valleys, and Coast Regional Supplement*.

7.4 Monitoring Schedule

A post-construction report will be provided documenting the as-built condition of the site. A five-year monitoring program is proposed beginning the year following construction completion. Once annually, the proposed CWM site will be evaluated, and results will be compared to the success criteria. Notable conditions of the vegetation and site will be recorded, and a report will be submitted to the Oregon Department of State Lands by December 31 of each year.

To determine whether the required acreage of enhanced wetland is present, the proposed CWM site will be delineated no later than the fifth growing season following construction.

7.5 Rationale for Plot and Photo-Documentation Locations

The sampling transects will be located to provide a representative sampling of the vegetation in the proposed CWM site, and the photo point locations will be placed to provide good views of the site as a whole, with closer details as needed.

Section 8.0 - Long-Term Protection and Financial Security Instruments

8.1 Description of Proposed Protection Instrument

A portion of the NEXT Renewable Fuels Oregon, LLC, facility site will be owned by NEXT Renewable Fuels Oregon, LLC, and the remaining section of the project site will be leased from the Port of Columbia County. NEXT Renewable Fuels Oregon, LLC, has entered into a long-term lease agreement with Oregon Port AG Investors, LLC, for the mitigation site. Oregon Port AG Investors, LLC, will record a deed restriction on the property confirming the exclusive and sole use of the property for the approved CWM and require protections for the proposed CWM site, including requirements for maintaining the fences for the duration of the monitoring period, excluding livestock, controlling weeds, and ensuring viable wetland vegetation. Such deed restriction will prohibit activity that would alter hydrology of the site, remove vegetation other than that required for maintenance (e.g., weed treatments or tree thinning for habitat improvements), or remove or place material into the wetland that adversely impacts the mitigation site, as well as exclude livestock, controlling weeds, and ensuring viable wetland vegetation. NEXT Renewable Fuels Oregon, LLC, will adopt a management plan, which may ultimately include having a third-party conservation organization with experience with wetland management take operational responsibility for the proposed CWM site.

8.2 Description of Proposed Financial Security Instruments

Long-term maintenance of the proposed CWM site will be the responsibility of NEXT Renewable Fuels Oregon, LLC, and will be funded by NEXT Renewable Fuels Oregon, LLC. NEXT Renewable Fuels Oregon, LLC, will obtain a bond guaranteeing the proposed CWM site performance from a corporate surety licensed to do business in Oregon. NEXT Renewable Fuels Oregon, LLC, will use the surety bond template provided by the Oregon Department of State Lands.

NEXT Renewable Fuels Oregon, LLC, is an Oregon limited liability company. NEXT Renewable Fuels Oregon, LLC, has one member, which is NEXT Renewable Fuels, Inc.; NEXT Renewable Fuels, Inc., is not a closely held corporation. NEXT Renewable Fuels, Inc., will provide a guarantee securing compliance with mitigation obligations pursuant to Oregon Administrative Rules 141-085-0705(1)(I).

8.3 Long-Term Maintenance Plan

The proposed CWM site will be maintained by NEXT Renewable Fuels Oregon, LLC, and they will be responsible for weed control or other remedial measures required at the site. NEXT Renewable Fuels Oregon will adopt a management plan for long-term maintenance. Management and care of the proposed CWM site may ultimately be turned over to a third-party conservation organization with wetland management experience, but NEXT Renewable Fuels Oregon, LLC, or the owner of the proposed facility will maintain long-term financial responsibility for the proposed CWM site.

Long-term maintenance will be necessary to ensure that the CWM site continues to function as designed. A long-term maintenance plan may entail weed and invasive species management, or augmenting soil health through the use of fertilizers or other nutrients as necessary. Additionally, maintenance of perimeter fencing may be necessary to prevent wildlife damage during establishment of

the CWM site, and, once the site is established, removal of perimeter fencing following the monitoring period will be necessary to allow for natural patterns of wildlife migration. The installation of signs at strategic locations along the perimeter of the CWM site will help alert the public to the ongoing enhancement activities, as well as advise about sensitive areas existing within the site. Adaptive management principles will also benefit the long-term maintenance plan by incorporating data collected from monitoring efforts and applying the data to the ongoing management and maintenance of the CWM site.

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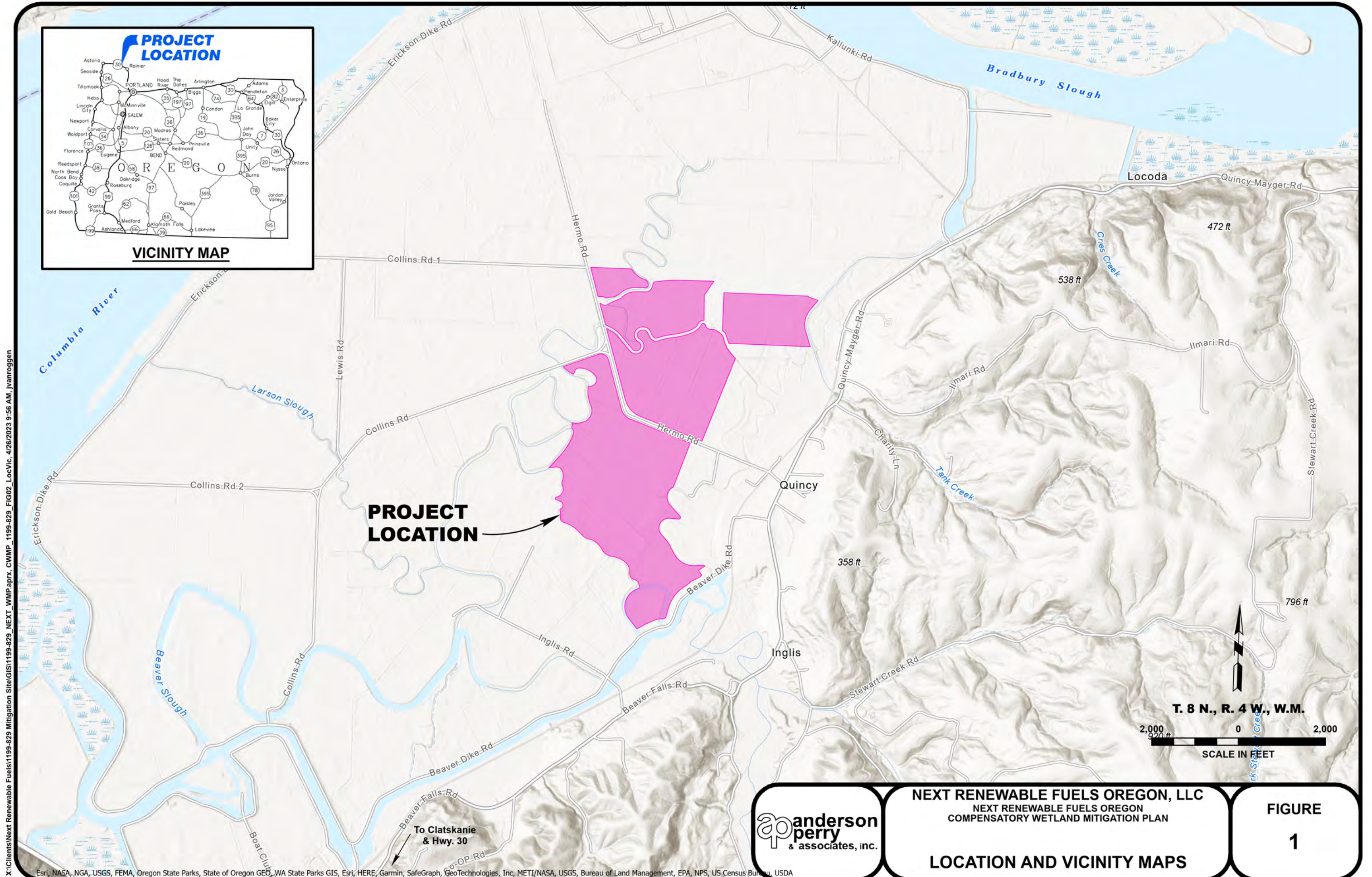
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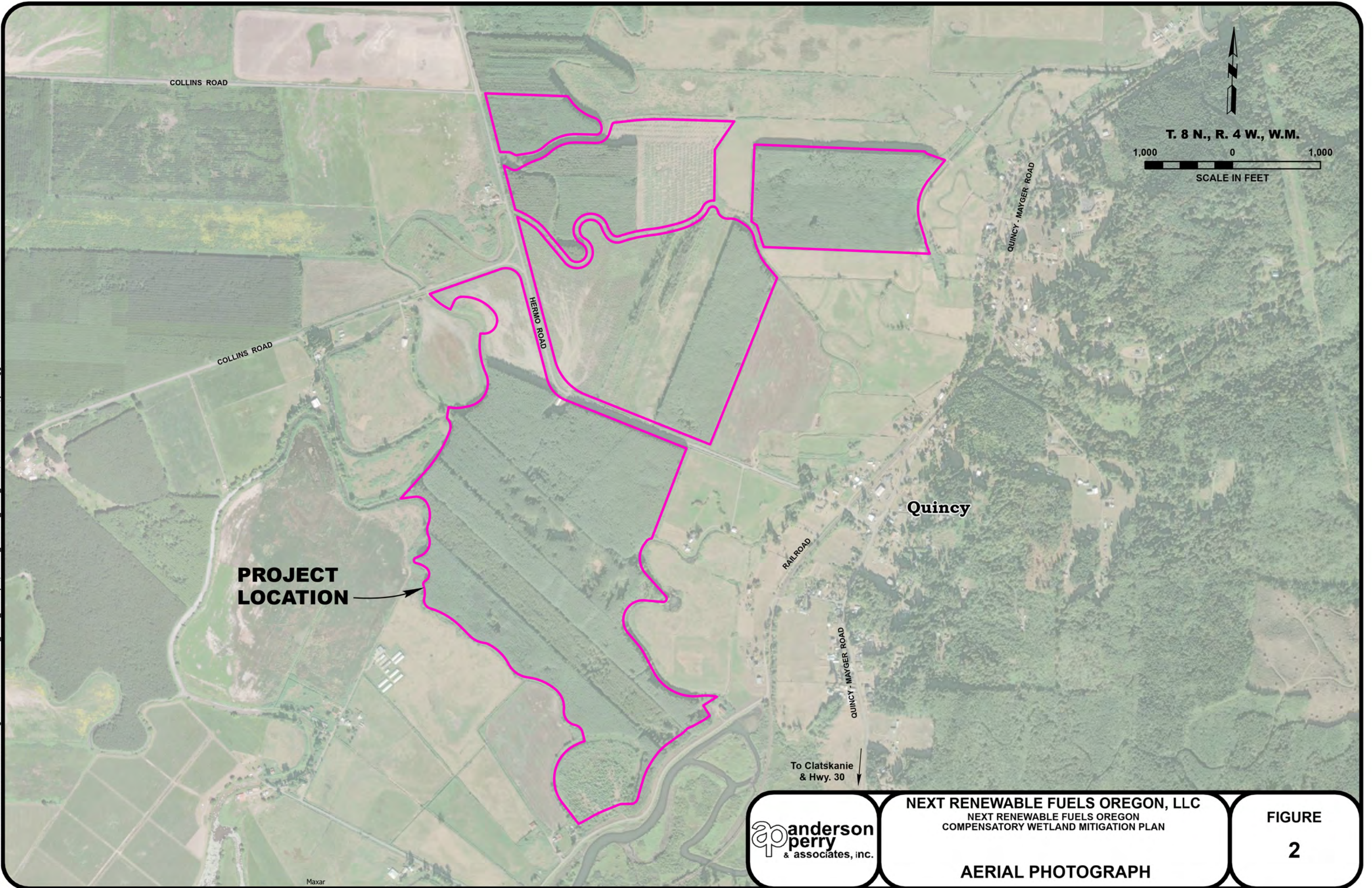
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FIGURES



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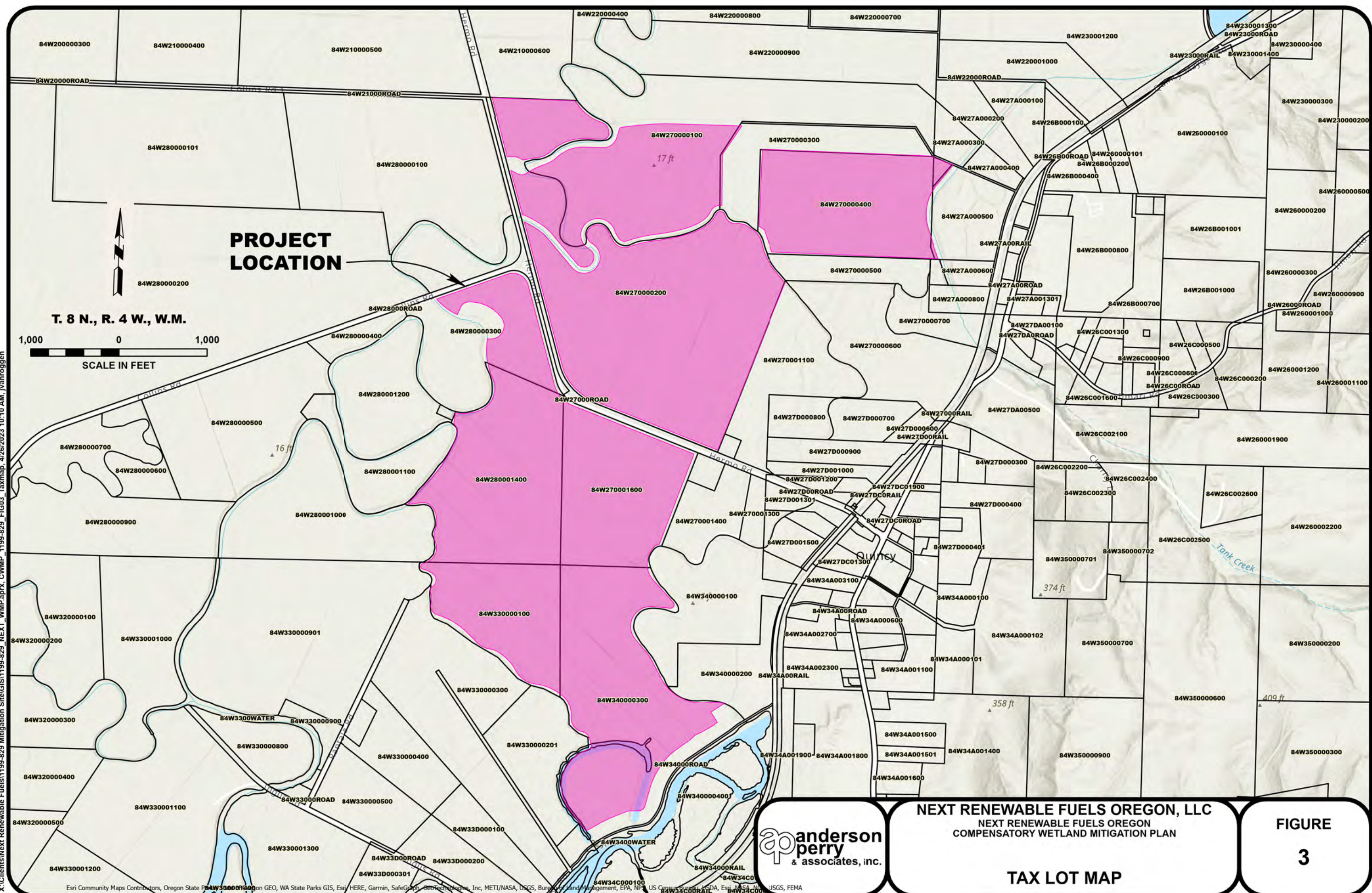
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COMPENSATORY WETLAND MITIGATION PLAN

AERIAL PHOTOGRAPH

FIGURE
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NEXT RENEWABLE FUELS OREGON, LLC
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COMPENSATORY WETLAND MITIGATION PLAN

TAX LOT MAP

FIGURE
3



**PHOTOGRAPH 1 - Wetland 1, looking west at Plots 5 and 5a.
Photograph taken by Sue Brady on October 23, 2018.**



**PHOTOGRAPH 2 - Wetland 1, looking west at Plots 8 and 8a.
Photograph taken by Sue Brady on November 28, 2018.**

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PHOTOGRAPH 3 - Wetland 1, looking west at Plot 16. Photograph taken by Sue Brady on November 29, 2018.



PHOTOGRAPH 4 - Wetland 1, looking east at Plot 28. Photograph taken by Sue Brady on November 29, 2018.

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PHOTOGRAPH 5 - Wetland 1, looking southeast at Plot 33. Photograph taken by Sue Brady on November 14, 2019.



PHOTOGRAPH 6 - Wetland 1, looking southeast at Plot 35. Photograph taken by Sue Brady on November 14, 2019.

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PHOTOGRAPH 7 - Wetland 2, looking northwest at Plots 40 and 40a.
Photograph taken by Sue Brady on November 29, 2018.



PHOTOGRAPH 8 - Wetland 3, looking northwest at Plots 42 and 42a.
Photograph taken by Sue Brady on September 30, 2020.

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**PHOTOGRAPH 9 - Mitigation site, looking north.
Photograph taken by Sue Brady on May 4, 2021.**



**PHOTOGRAPH 10 - Mitigation site ponded area, looking
east. Photograph taken by Sue Brady on May 4, 2021.**



PHOTOGRAPH 11 - Mitigation site, looking southwest along McLean Slough. Photograph taken by Sue Brady on May 4, 2021.



PHOTOGRAPH 12 - Mitigation site, looking south. Photograph taken by Sue Brady on May 6, 2021.

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PHOTOGRAPH 13 - Mitigation site, looking east.
Photograph taken by Sue Brady on May 6, 2021.



PHOTOGRAPH 14 - Mitigation site, looking west.
Photograph taken by Sue Brady on May 6, 2021.



PHOTOGRAPH 15 - Mitigation site, looking northeast along drainage ditch. Photograph taken by Sue Brady on May 6, 2021.



PHOTOGRAPH 16 - Mitigation site, looking southeast. Photograph taken by Shiloh Simrell on May 4, 2021.



PHOTOGRAPH 17 - Mitigation site, looking northeast along drainage swale. Photograph taken by Shiloh Simrell on May 4, 2021.



PHOTOGRAPH 18 - Mitigation site, looking northeast. Photograph taken by Shiloh Simrell on May 5, 2021.

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PHOTOGRAPH 19 - Mitigation site, looking northwest along McLean Slough. Photograph taken by Shiloh Simrell on May 5, 2021.



PHOTOGRAPH 20 - Mitigation site, looking north. Photograph taken by Shiloh Simrell on May 6, 2021.

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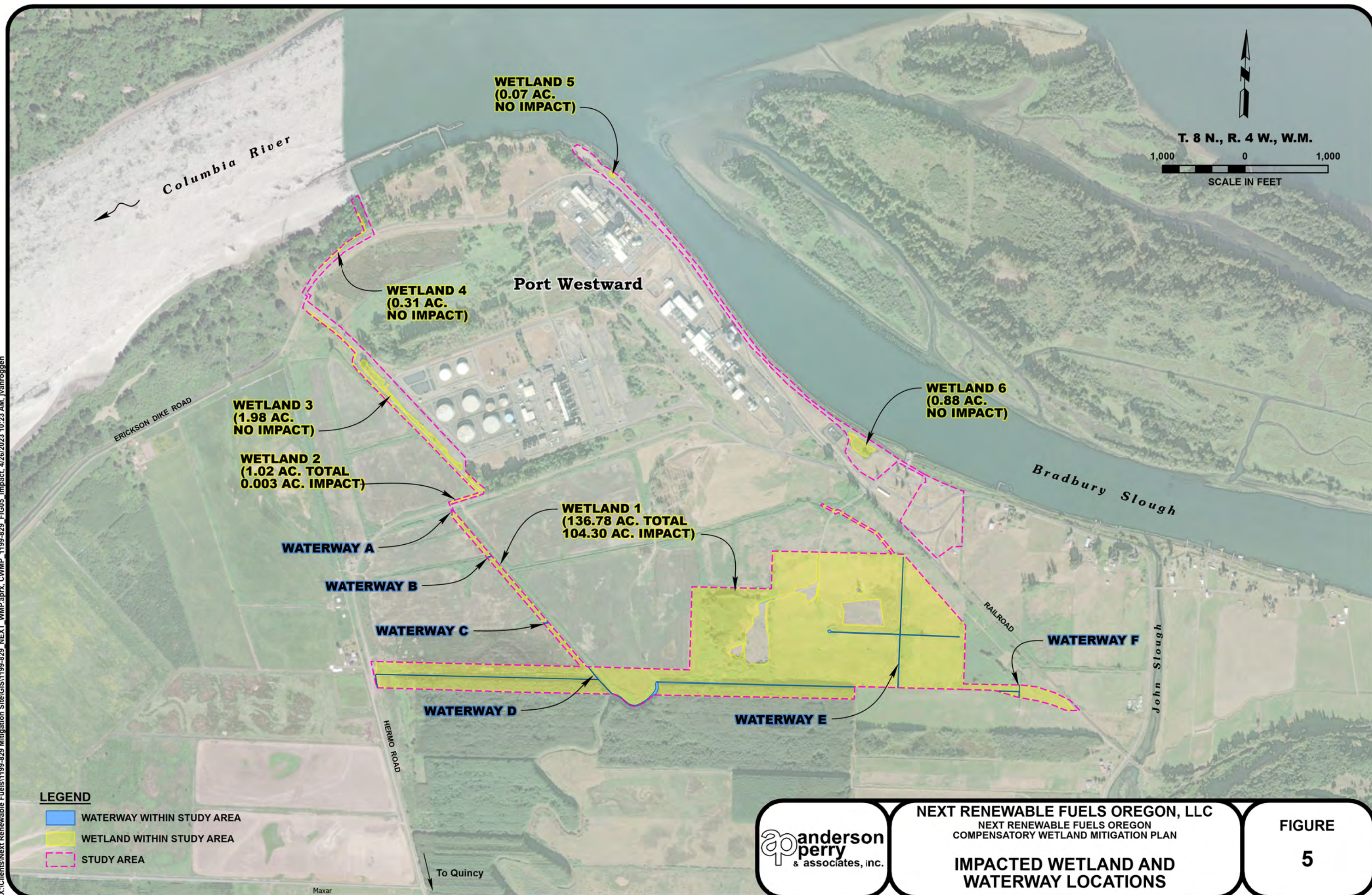
PHOTOGRAPH 21 - Mitigation site, looking northwest along Beaver Slough oxbow. Photograph taken by Shiloh Simrell on May 6, 2021.



PHOTOGRAPH 22 - Mitigation site, looking northwest along drainage ditch. Photograph taken by Shiloh Simrell on May 6, 2021.

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Appendices Table of Contents

Appendix A	Wetland Impact Areas and Wetland Mitigation Plan Drawings
Appendix B	Oregon Rapid Wetland Assessment Protocol Data Sheets
Appendix C	Adjacent Property Owners

APPENDIX A
Wetland Impact Areas and
Wetland Mitigation Plan Drawings

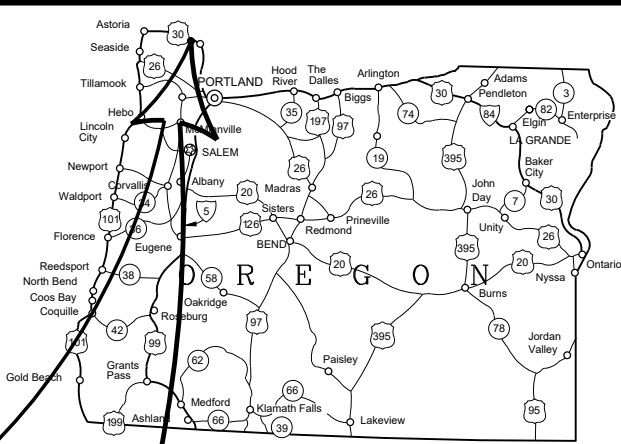
NEXT RENEWABLE FUELS OREGON, LLC

WETLAND MITIGATION PLAN

COLUMBIA COUNTY, OREGON

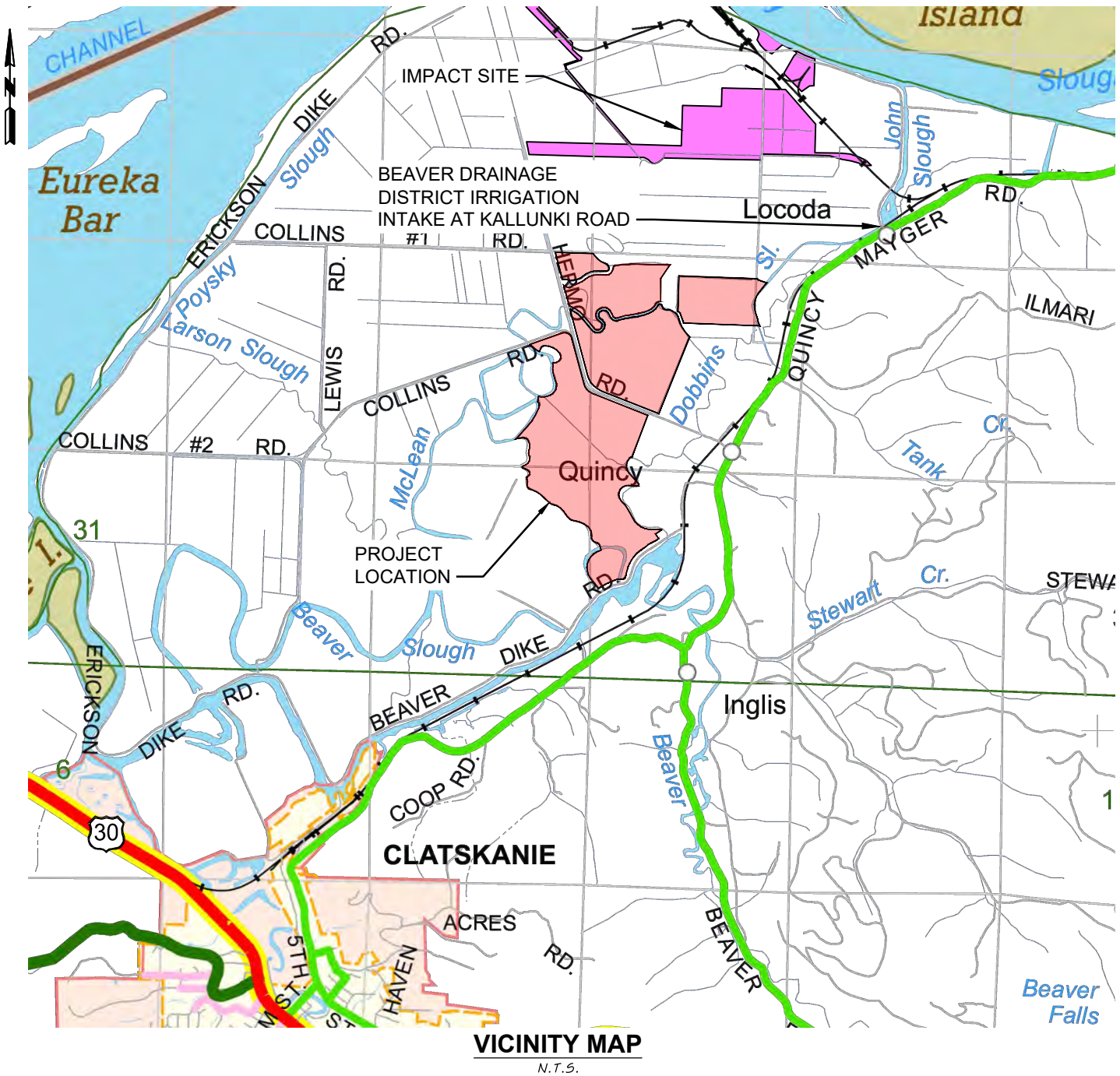
T8N, R4W, SECTIONS 27, 28, 33, AND 34

2023



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-	COVER
1	LEGEND AND EXISTING SITE PLAN
2	DEMOLITION PLAN
3	SITE PLAN SHEET INDEX
4	PROPOSED SITE PLAN I
5	PROPOSED SITE PLAN II AND DETAIL
6	PROPOSED SITE PLAN III
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9	GRADING PLAN III
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13	MITIGATION AREA CONCEPTUAL CROSS-SECTION
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19	BRUSH PILE DETAIL
20	CONTROL STRUCTURE PLAN AND ELEVATION



CONTACT INFORMATION

CHRISTOPHER EFIRD, EXECUTIVE CHAIRMAN
NEXT RENEWABLE FUELS OREGON, LLC
11767 KATY FREEWAY, SUITE 705
HOUSTON, TX 77079

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1901 N. Fir Street - La Grande, OR 97850 Ph: (541)963-8309 Fax: (541)963-5456
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DATUM STATEMENT

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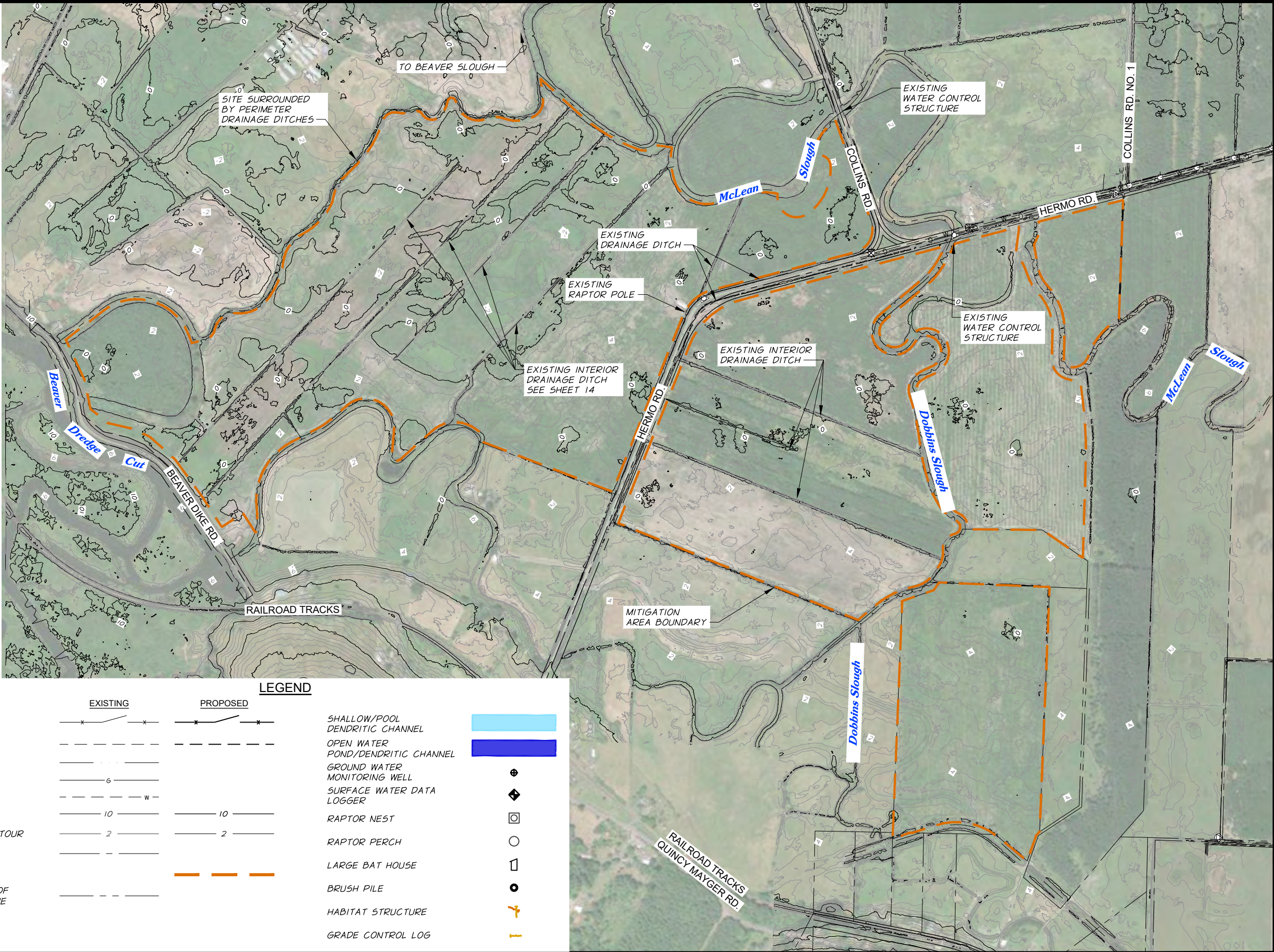
HORIZONTAL DATUM: OREGON COORDINATE SYSTEM
- NORTH ZONE NAD 83,
INTERNATIONAL FEET

SURVEY NOTE

PROPERTY BOUNDARIES AND EASEMENT LOCATIONS SHOWN ARE APPROXIMATE.

GENERAL NOTE

SEE SHEET 14 FOR FLOW DIRECTION AND DRAINAGE PATHS.



LEGEND		
EXISTING	PROPOSED	
FENCE LINE/GATE		SHALLOW/POOL DENDRITIC CHANNEL
EDGE OF GRAVEL		OPEN WATER
DRAINAGE DITCH		POND/DENDRITIC CHANNEL
GAS LINE		GROUND WATER MONITORING WELL
WATER LINE		SURFACE WATER DATA LOGGER
INDEX CONTOUR		RAPTOR NEST
INTERMEDIATE CONTOUR		RAPTOR PERCH
CENTERLINE		LARGE BAT HOUSE
MITIGATION AREA BOUNDARY		BRUSH PILE
PROPERTY/RIGHT OF WAY/EASEMENT LINE		HABITAT STRUCTURE
		GRADE CONTROL LOG

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DRAWN BY	G. SAURBIER	
REVIEWED BY	C. HUTCHINS	

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WETLAND MITIGATION PLAN COLUMBIA COUNTY, OREGON	
LEGEND AND EXISTING SITE PLAN	

SHEET
1

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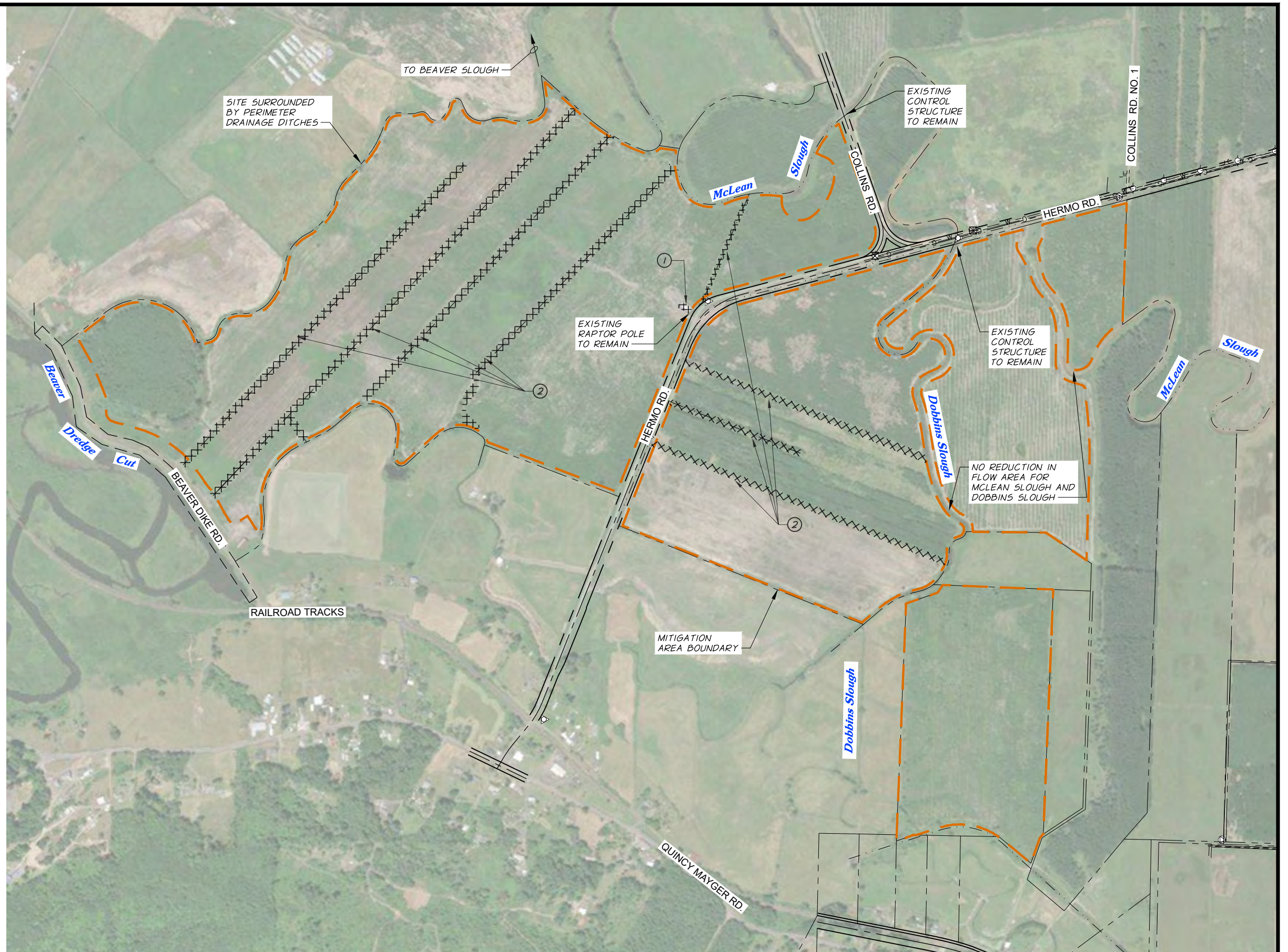


DEMOLITION SCHEDULE

- ① REMOVE/DEMOLISH EXISTING BUILDING AND ASSOCIATED FOUNDATIONS, UTILITIES AND RELATED FEATURES.
- ② INTERIOR DITCHES TO BE FILLED IN PER PROPOSED SITE PLAN, SHEET 3

LEGEND

REMOVE/DEMOLISH OR FILL AS REQUIRED



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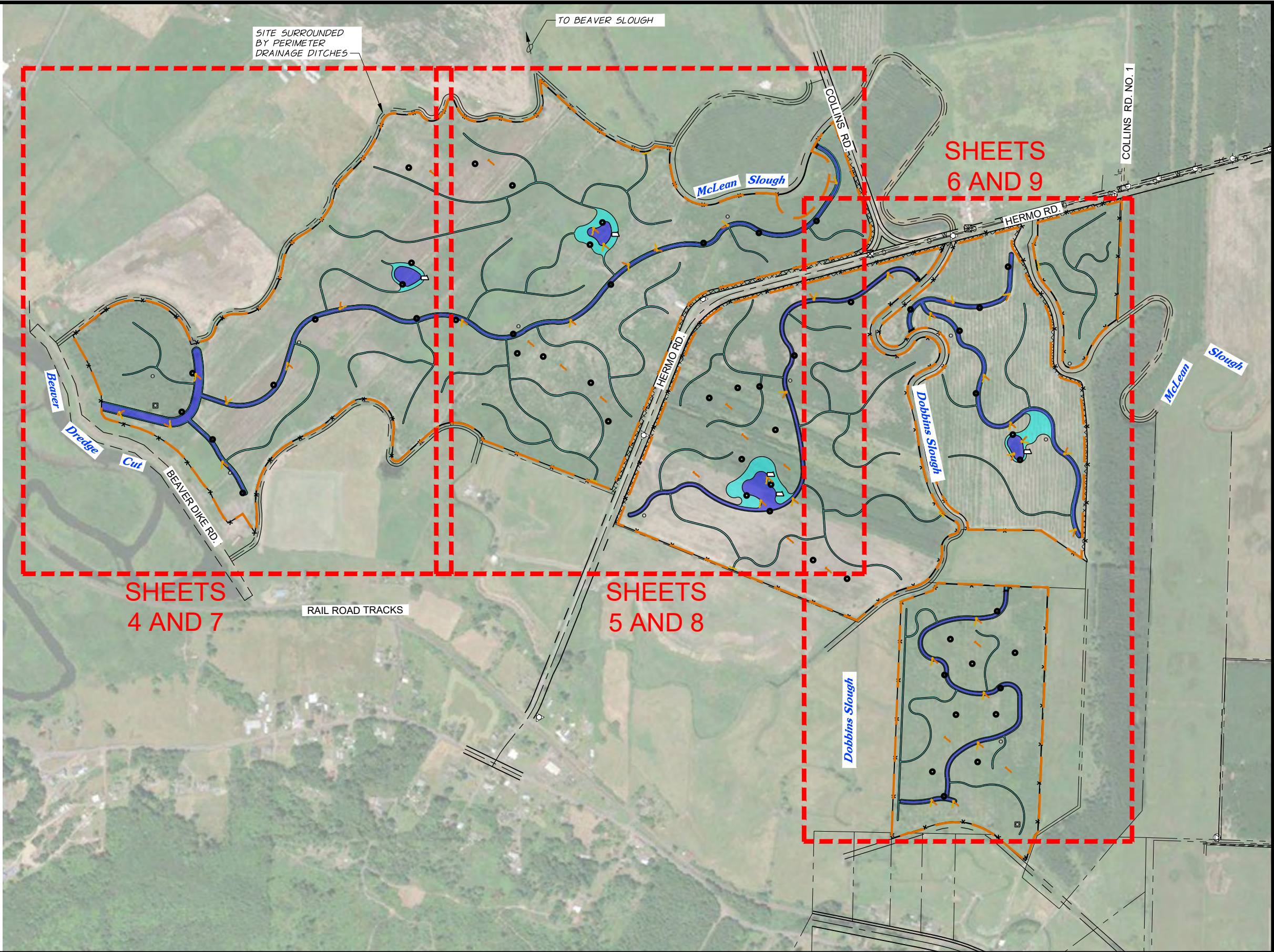
NEXT RENEWABLE FUELS OREGON, LLC
WETLAND MITIGATION PLAN
COLUMBIA COUNTY, OREGON
DEMOLITION PLAN

SHEET
2



CONSTRUCTION SEQUENCE NOTES

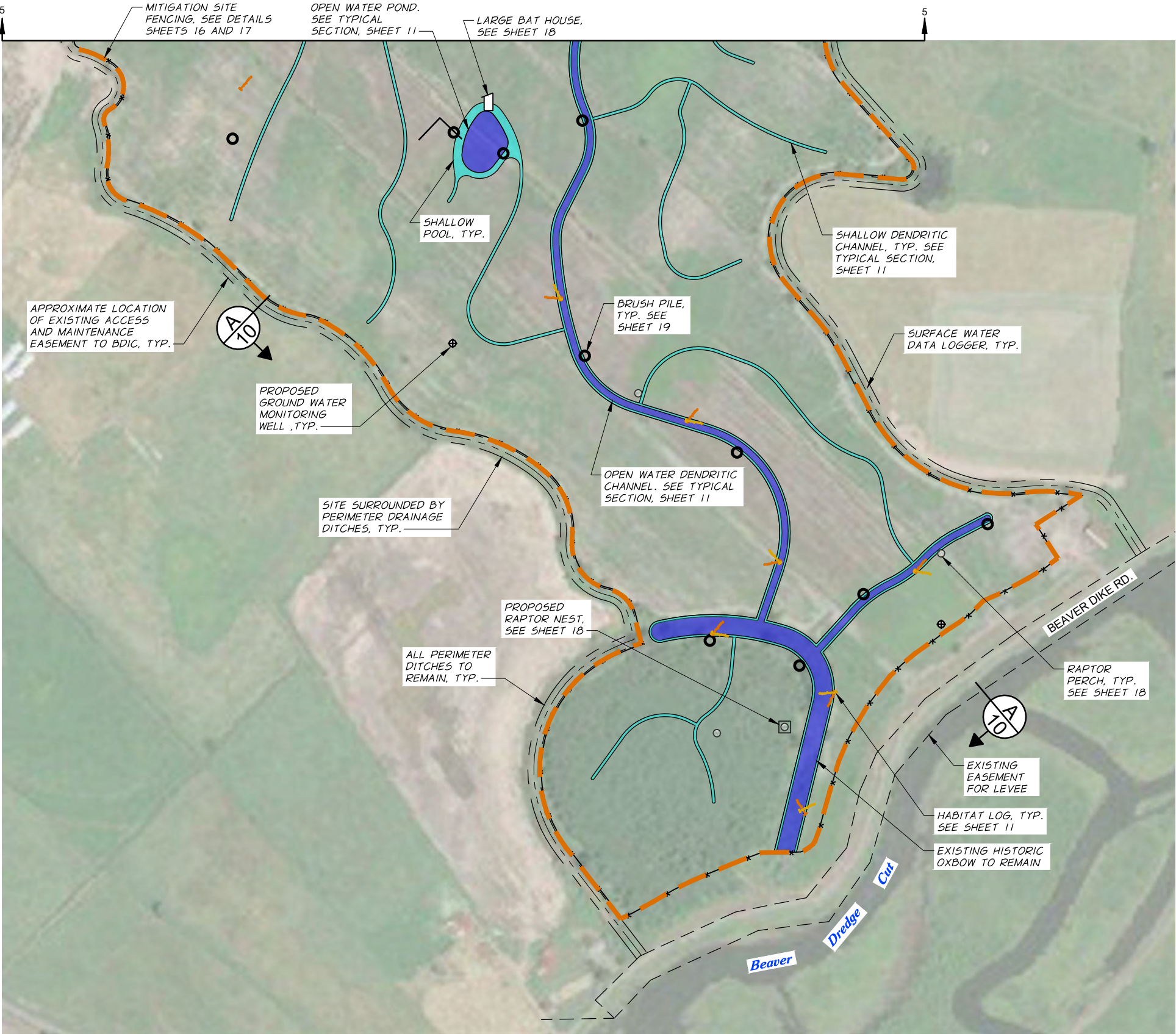
1. APPLY GLYPHOSATE HERBICIDE (TO MANUFACTURER'S SPECIFICATIONS) TO THE SITE A MONTH PRIOR TO REMOVAL OF TOPSOIL (BY OTHERS).
2. REMOVE 6" OF TOPSOIL AND EXPORT OFF-SITE TO AN APPROVED UPLAND AREA. THIS PROCESS WILL BE PERFORMED DURING SUMMER MONTHS WHEN THE SOIL CONDITIONS ARE OPTIMAL.
3. GRADE TO FINISHED SURFACE ELEVATIONS.
4. INSTALL CONCRETE WEIR STRUCTURE, SEE DETAILS, SHEET 20.
5. INSTALL DEER FENCE, SEE DETAILS SHEETS 16 AND 17.
6. APPLY GLYPHOSATE HERBICIDE ONE MONTH PRIOR TO SEEDING.
7. APPLY SEEDING TO MITIGATION SITE.
8. WEED CONTROL AS REQUIRED, SEE TECHNICAL SPECIFICATIONS.
9. INSTALL FINAL PLANTINGS TO MITIGATION SITE ONE YEAR FROM SEEDING.
10. CONDUCT SITE CLEANUP AND SURFACE RESTORATION.
11. SEE GENERAL REQUIREMENTS FOR CONSTRUCTION SEQUENCING TIMING.



REVISION		BY	DATE	400 0 400 800 1200 SCALE IN FEET		FOR REVIEW ONLY NOT FOR CONSTRUCTION	 anderson perry & associates, inc. engineering • surveying • natural resources	NEXT RENEWABLE FUELS OREGON, LLC WETLAND MITIGATION PLAN COLUMBIA COUNTY, OREGON		SHEET
DESIGNED BY A. HAMILTON				JOB NUMBER 1199-829 DATE 2023				SITE PLAN SHEET INDEX	3	
DRAWN BY G. SAURBIER				ACAD FILE: 1199-829-060C-101PROP.dwg						
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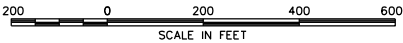
CONSTRUCTION NOTES

1. IF DREDGED SANDS OR ENGINEERED FILL ARE ENCOUNTERED AFTER THE INITIAL GRADING THEN THEY MUST BE REMOVED DOWN TO DEPTH WHERE THE NATIVE SILT LOAM IS ENCOUNTERED OR 12" BELOW FINISH GRADE. THEN FILL WITH NATIVE SILT LOAM TO FINISH GRADE.
2. ALL WETLANDS MUST BE CONSTRUCTED WITH THE NATIVE SILT LOAM.
3. THE CONTRACTOR SHALL GIVE 48-HOUR NOTIFICATION IN ACCORDANCE WITH ORS 757-541. THE "CALL BEFORE YOU DIG" NUMBER IS 811 OR 1-800-332-2344. THE CONTRACTOR SHALL PERFORM ALL NECESSARY COORDINATION WORK WITH THE UTILITY COMPANIES IN PERFORMING THE WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES CAUSED BY THE CONTRACTOR'S OPERATIONS.
4. CONTRACTOR SHALL COORDINATE ALL PLANTINGS AND SEEDING WITH WEED CONTROL CONTRACTOR. NO PLANTINGS AND SEEDING SHALL BE INSTALLED WITHIN 30 DAYS OF HERBICIDE APPLICATION.
5. GROUND CONTOURS NOT SHOWN FOR CLARITY, SEE GRADING PLAN SHEETS 7-9.



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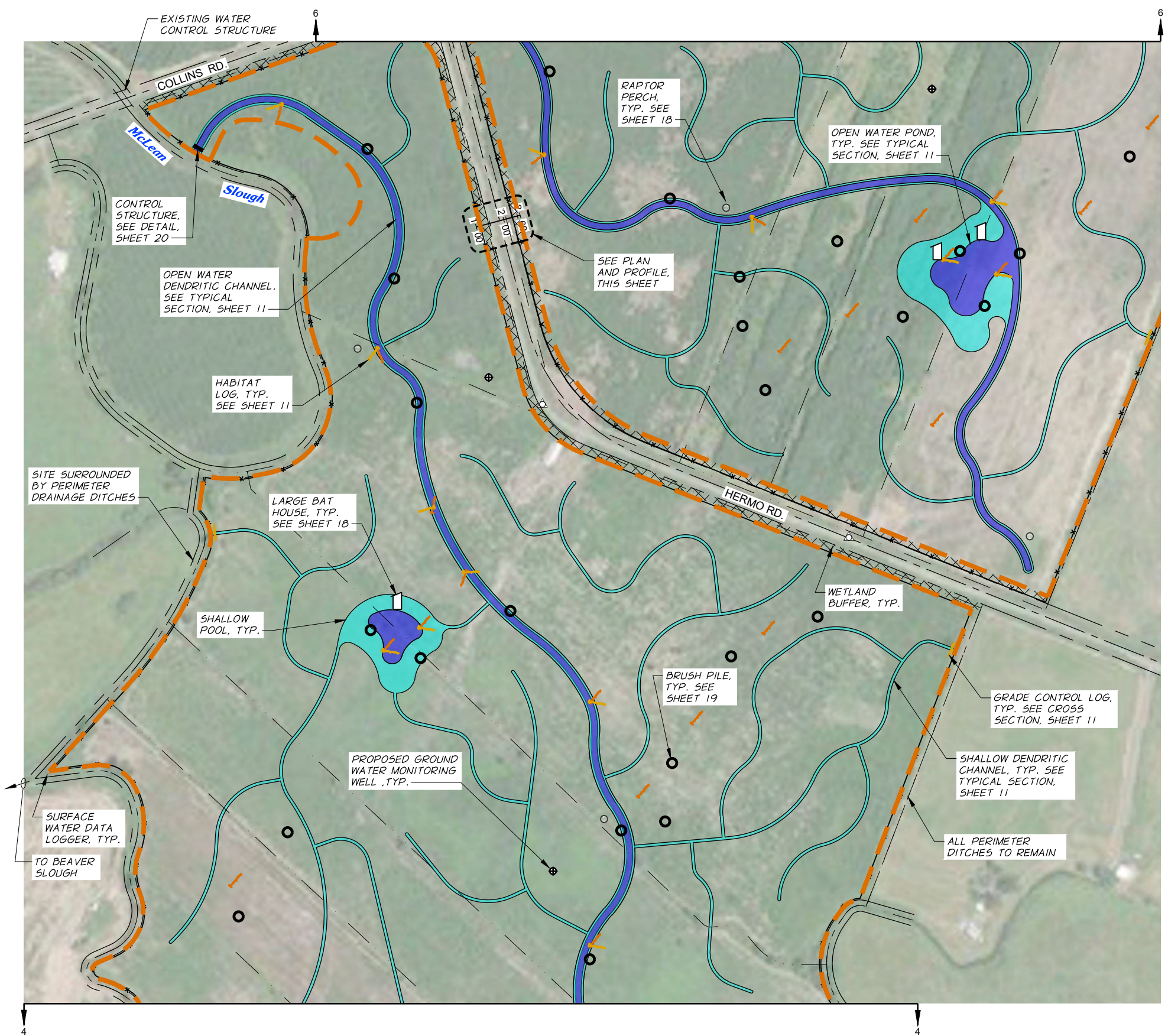
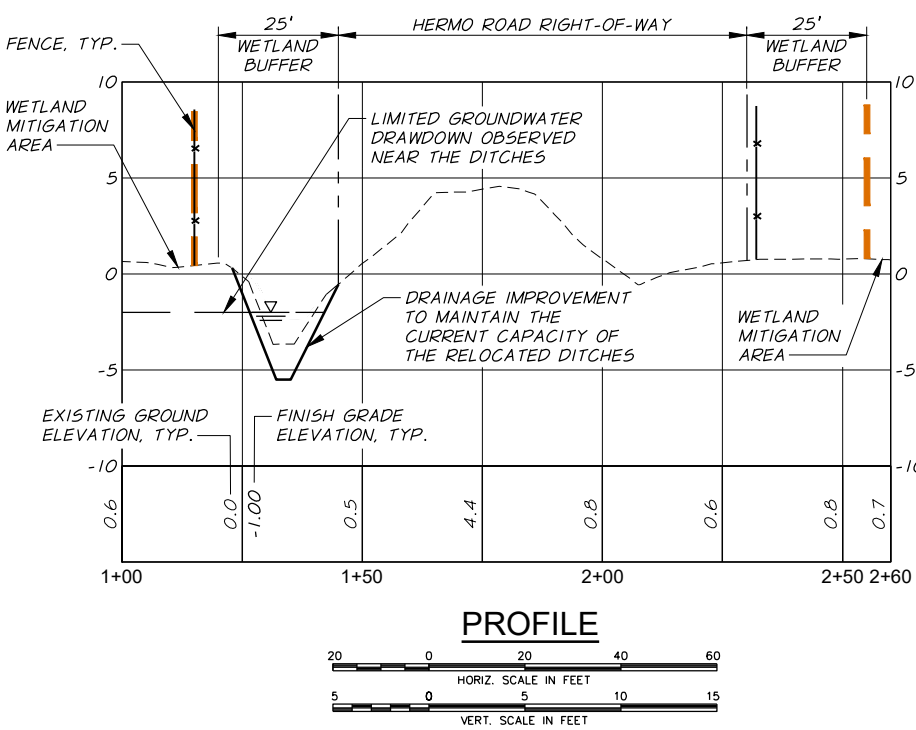
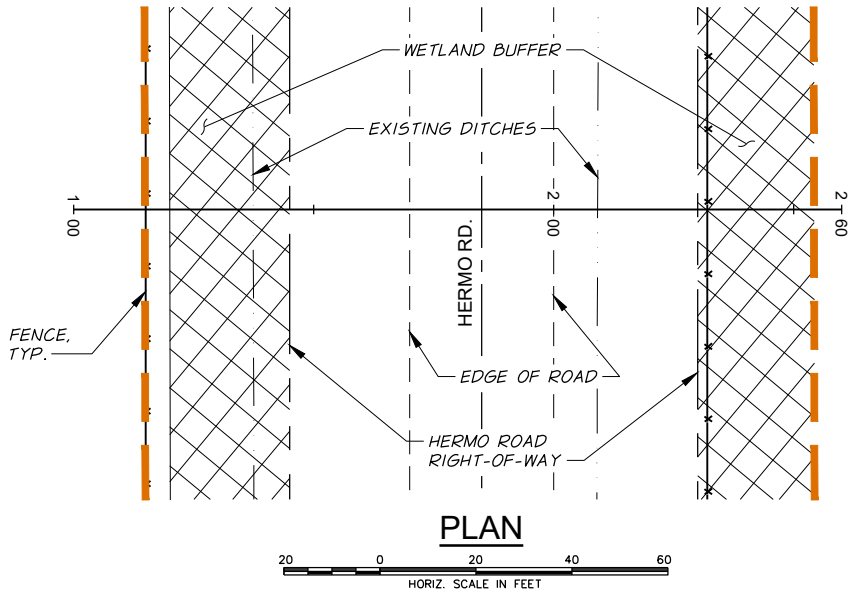
PROPOSED SITE PLAN I

SHEET

4

CONSTRUCTION NOTES

- 1. IF DREDGED SANDS OR ENGINEERED FILL ARE ENCOUNTERED AFTER THE INITIAL GRADING THEN THEY MUST BE REMOVED DOWN TO DEPTH WHERE THE NATIVE SILT LOAM IS ENCOUNTERED OR 12" BELOW FINISH GRADE. THEN FILL WITH NATIVE SILT LOAM TO FINISH GRADE.
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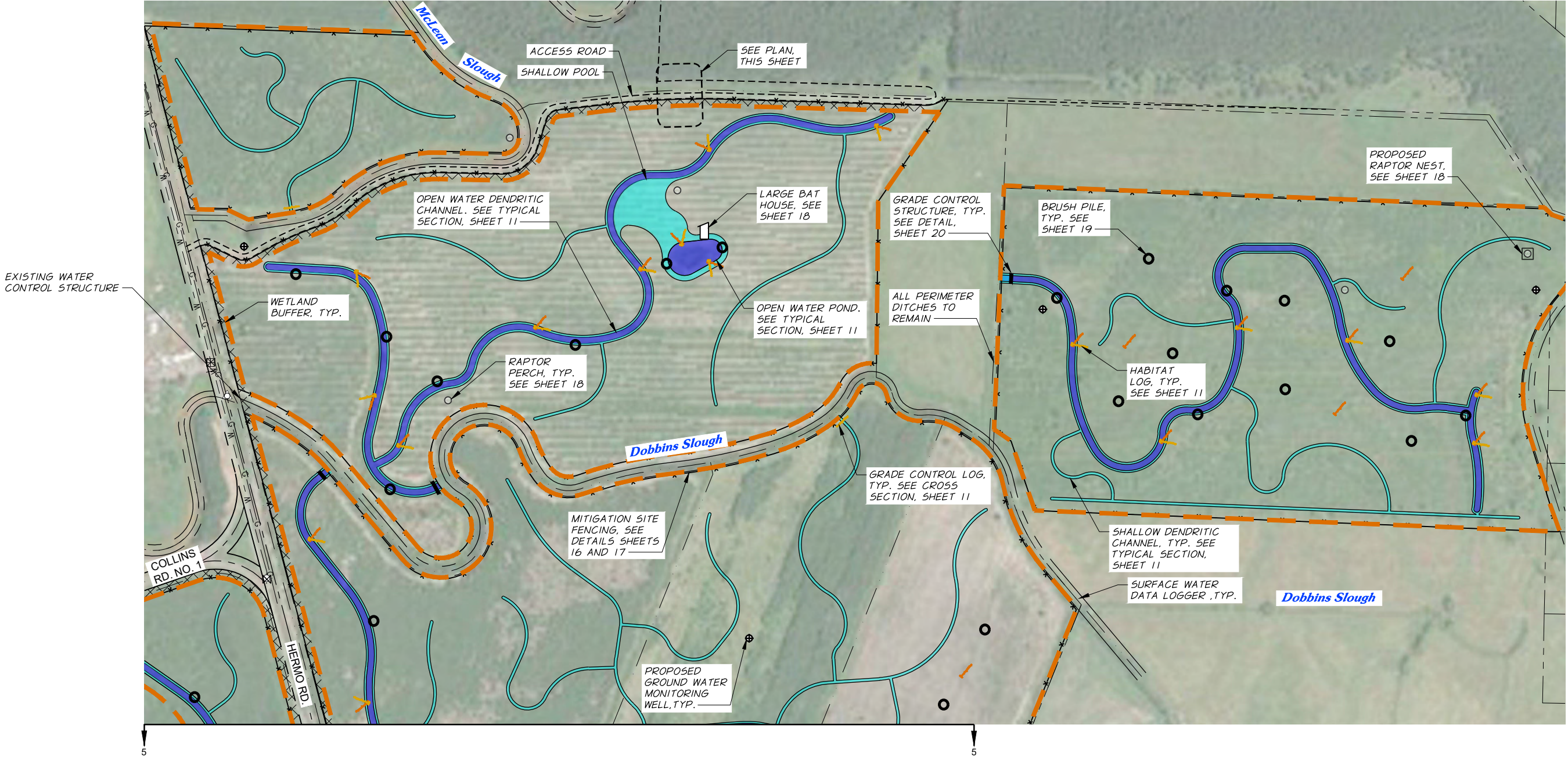
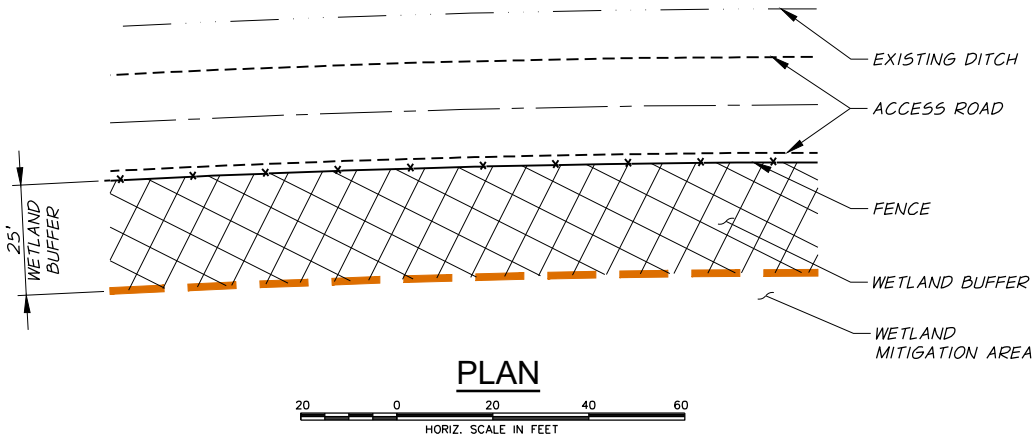
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NEXT RENEWABLE FUELS OREGON, LLC
WETLAND MITIGATION PLAN
COLUMBIA COUNTY, OREGON
PROPOSED SITE PLAN II AND DETAIL

CONSTRUCTION NOTES

- 1. IF DREDGED SANDS OR ENGINEERED FILL ARE ENCOUNTERED AFTER THE INITIAL GRADING THEN THEY MUST BE REMOVED DOWN TO DEPTH WHERE THE NATIVE SILT LOAM IS ENCOUNTERED OR 12" BELOW FINISH GRADE. THEN FILL WITH NATIVE SILT LOAM TO FINISH GRADE.
- 2. ALL WETLANDS MUST BE CONSTRUCTED WITH THE NATIVE SILT LOAM.
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- 4. CONTRACTOR SHALL COORDINATE ALL PLANTINGS AND SEEDING WITH WEED CONTROL CONTRACTOR. NO PLANTINGS AND SEEDING SHALL BE INSTALLED WITHIN 30 DAYS OF HERBICIDE APPLICATION.
- 5. GROUND CONTOURS NOT SHOWN FOR CLARITY, SEE GRADING PLAN SHEETS 7-9.

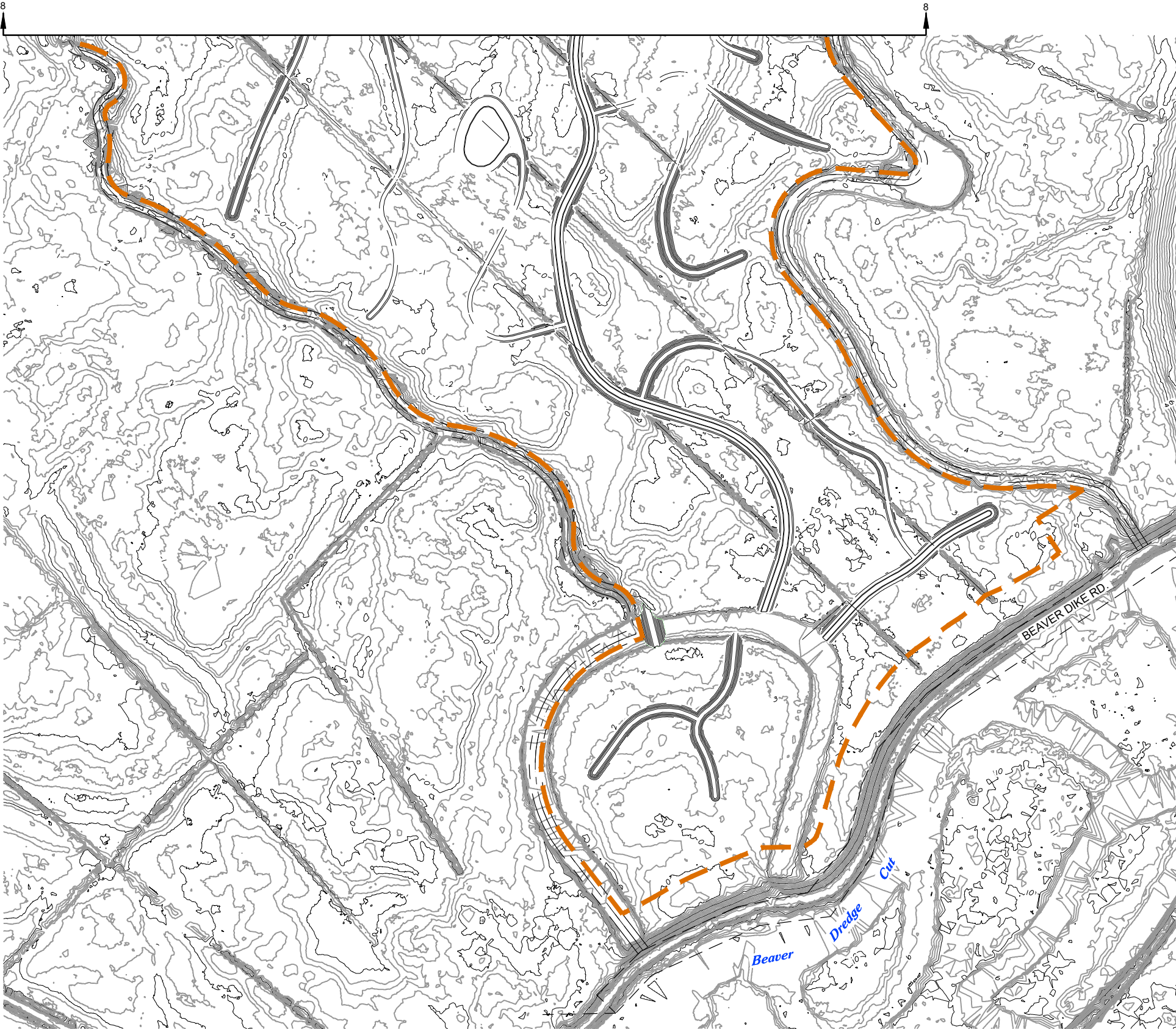


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GRADING NOTES

- 1. EXISTING SITE TO BE STRIPPED 6 INCHES.
- 2. FINISHED GRADES TO BE GRADED TO 6"± TO CREATE MICROTOPOGRAPHY THROUGHOUT THE WETLAND MITIGATION SITE AS DIRECTED BY A WETLAND SPECIALIST DURING CONSTRUCTION.



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WETLAND MITIGATION PLAN
COLUMBIA COUNTY, OREGON

GRADING PLAN I

SHEET

7

GRADING NOTES

- 1. EXISTING SITE TO BE STRIPPED 6 INCHES.
- 2. FINISHED GRADES TO BE GRADED TO 6'± TO CREATE MICROTOPOGRAPHY THROUGHOUT THE WETLAND MITIGATION SITE AS DIRECTED BY A WETLAND SPECIALIST DURING CONSTRUCTION.

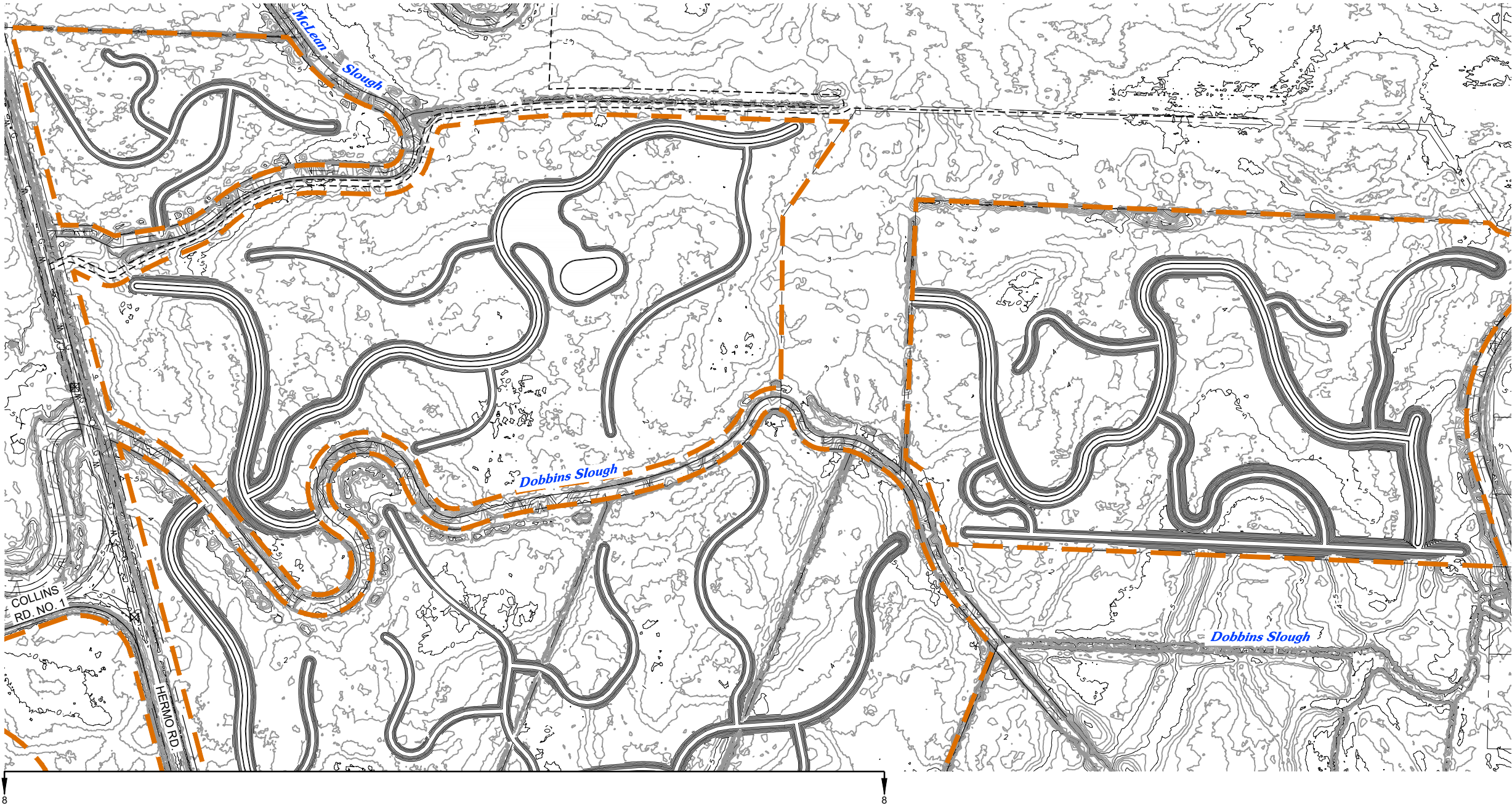


				200 0 200 400 600 SCALE IN FEET		FOR REVIEW ONLY NOT FOR CONSTRUCTION	 engineering • surveying • natural resources	NEXT RENEWABLE FUELS OREGON, LLC		SHEET	
								WETLAND MITIGATION PLAN		8	
								COLUMBIA COUNTY, OREGON			
REVISION		BY		DATE				GRADING PLAN II			
DESIGNED BY A. HAMILTON				JOB NUMBER 1199-829		DATE 2023					
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GRADING NOTES

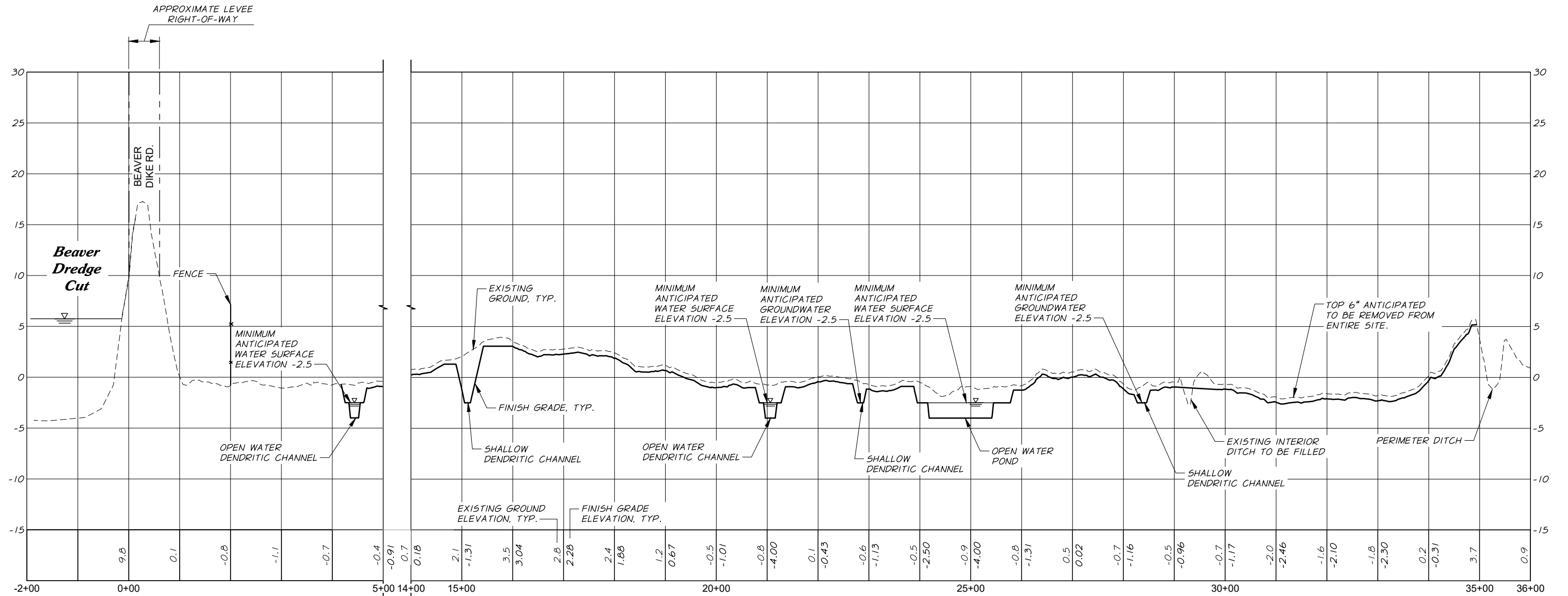
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- 2. FINISHED GRADES TO BE GRADED TO 6"± TO CREATE MICROTOPOGRAPHY THROUGHOUT THE WETLAND MITIGATION SITE AS DIRECTED BY A WETLAND SPECIALIST DURING CONSTRUCTION.



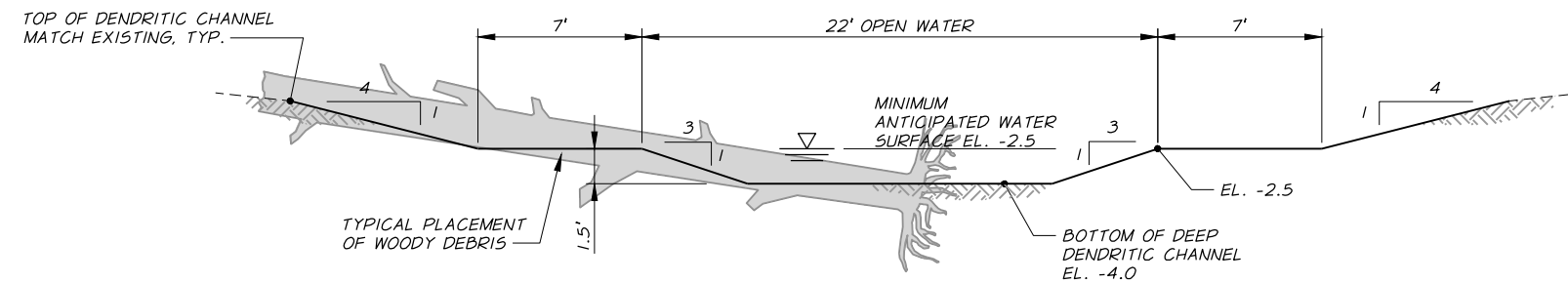
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								GRADING PLAN III	

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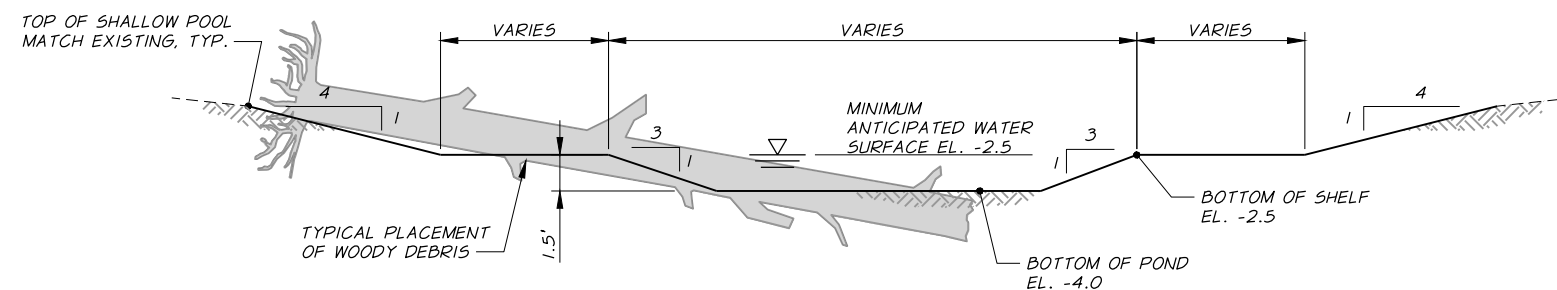


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DESIGNED BY <i>A. HAMILTON</i>				5 0 5 10 15 VERTICAL SCALE IN FEET					
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TYPICAL OPEN WATER DENDRITIC CHANNEL SECTION

N.T.S.

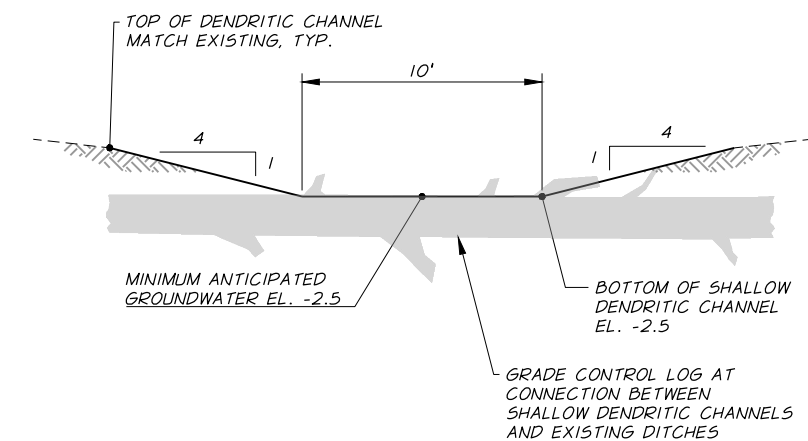


TYPICAL OPEN WATER POND SECTION

N.T.S.

NOTE

FINISH GRADES TO BE GRADED TO 6"± TO CREATE
MICROTOPOLOGY THROUGHOUT THE WETLAND SITE AS
DIRECTED BY A WETLAND SPECIALIST DURING CONSTRUCTION.



TYPICAL SHALLOW DENDRITIC CHANNEL SECTION

N.T.S.

ESTIMATED PRELIMINARY QUANTITIES

THE QUANTITIES SHOWN ARE NEAT LINE ESTIMATES PREPARED BY THE ENGINEER FOR REMOVAL OF 6" TOPSOIL AND WETLANDS GRADING WORK AND ARE BASED UPON PRELIMINARY DESIGN SHOWN ON THE DRAWINGS. THE ENGINEER'S ESTIMATED QUANTITIES ARE FOR INFORMATION ONLY, AND ARE NOT TO BE USED FOR BIDDING PURPOSES. THE ENGINEER/OWNER SHALL NOT BE HELD RESPONSIBLE FOR THE USE OF THESE ESTIMATED QUANTITIES.

WETLAND GRADING

WETLAND GRADING
ESTIMATED TOTAL CUT: 724,000 C.Y.

ESTIMATED TOTAL FILL: 52,000 C.Y.*

* INCLUDES FILLING OF EXISTING ON-SITE DITCHES.

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								WETLAND MITIGATION PLAN		
								COLUMBIA COUNTY, OREGON		
								TYPICAL SECTIONS II		
REVISION		BY	DATE							
DESIGNED BY	A. HAMILTON			JOB NUMBER	1199-829	DATE	2023			
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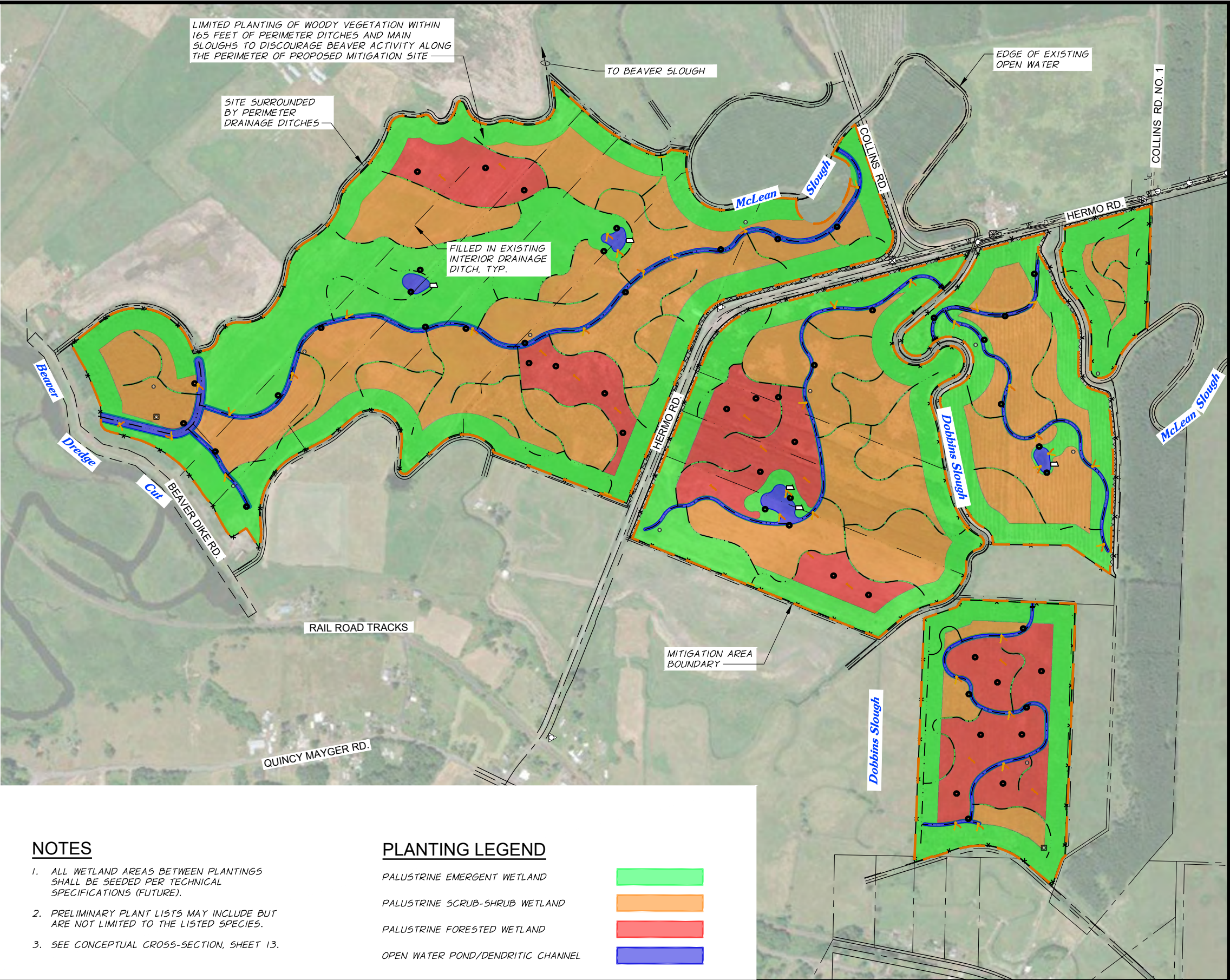


PALUSTRINE EMERGENT WETLAND PLANTINGS	
SPECIES	STOCK TYPE
COLUMBIA SEDGE (CAREX APERTA)	PLUGS
SLOUGH SEDGE (CAREX OBNUPTA)	PLUGS
BUR-REED (SPARGANIUM EMERSUM)	PLUGS
WATER PLANTAIN (ALISMA SP.)	PLUGS
MEADOW BARLEY (HORDEUM BRACHYANTHERUM)	DRILL OR BROADCAST
SPIKE BENTGRASS (AGROSTIS EXARATA)	DRILL OR BROADCAST
TUFTED HAIRGRASS (DESCHAMPSIA CESPITOSA)	DRILL OR BROADCAST
ANNUAL HAIRGRASS (DESCHAMPSIA DANTHONIOIDES)	DRILL OR BROADCAST
WESTERN MANNAGRASS (GLYCERIA XOCCIDENTALIS)	DRILL OR BROADCAST
AMERICAN SLOUGHGRASS (BECKMANNIA SYZIGACHNE)	DRILL OR BROADCAST
BALTIC RUSH (JUNCUS ARCTICUS)	DRILL OR BROADCAST

PALUSTRINE SCRUB SHRUB WETLAND PLANTINGS	
SPECIES	STOCK TYPE
OREGON ASH (FRAXINUS LATIFOLIA)	CONTAINER
REDOSIER DOGWOOD (CORNUS SERICA)	CUTTINGS
PACIFIC NINEBARK (PHYSOCARPUS CAPITATUS)	CONTAINER
LOCALLY ADAPTED WILLOW (SALIX SPP.)	CUTTINGS
SALMONBERRY (RUBUS SPECTABILIS)	CONTAINER

PALUSTRINE FORESTED WETLAND PLANTINGS	
SPECIES	STOCK TYPE
OREGON ASH (FRAXINUS LATIFOLIA)	CONTAINER
REDOSIER DOGWOOD (CORNUS SERICA)	CONTAINER
PACIFIC NINEBARK (PHYSOCARPUS CAPITATUS)	CONTAINER
LOCALLY ADAPTED WILLOW (SALIX SPP.)	CONTAINER
SALMONBERRY (RUBUS SPECTABILIS)	CONTAINER
BLACK COTTONWOOD (POPULUS BALSAMIFERA)	CONTAINER

WETLAND MITIGATION AREAS	
WETLAND TYPE	AREA (ACRES)
PALUSTRINE EMERGENT	226.20
PALUSTRINE SCRUB SHRUB	177.43
PALUSTRINE FORESTED	62.47
TOTAL	466.10



NOTES

- ALL WETLAND AREAS BETWEEN PLANTINGS SHALL BE SEEDED PER TECHNICAL SPECIFICATIONS (FUTURE).
- PRELIMINARY PLANT LISTS MAY INCLUDE BUT ARE NOT LIMITED TO THE LISTED SPECIES.
- SEE CONCEPTUAL CROSS-SECTION, SHEET 13.

PLANTING LEGEND

- PALUSTRINE EMERGENT WETLAND
- PALUSTRINE SCRUB-SHRUB WETLAND
- PALUSTRINE FORESTED WETLAND
- OPEN WATER POND/DENDRITIC CHANNEL

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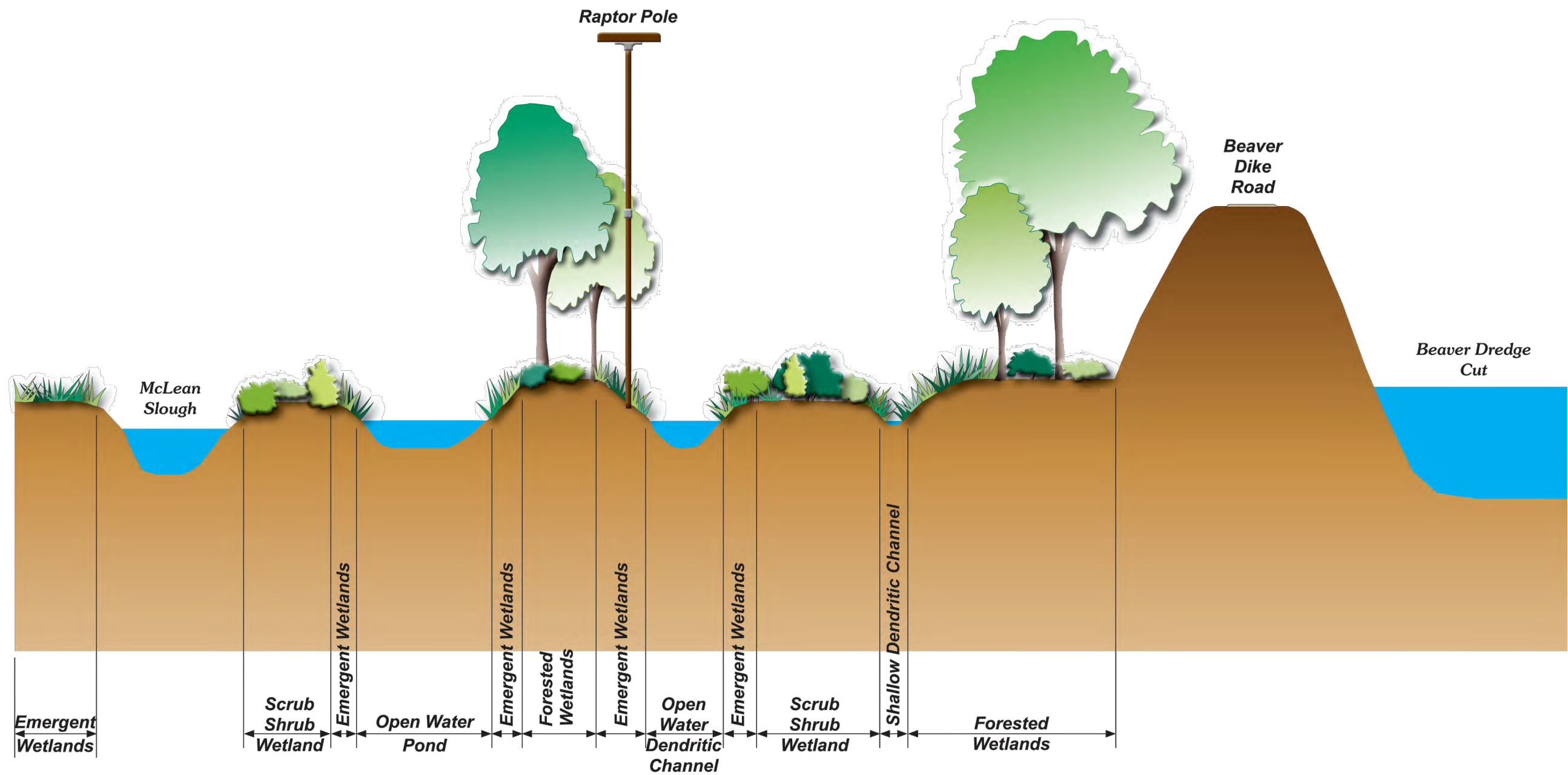
NEXT RENEWABLE FUELS OREGON, LLC
WETLAND MITIGATION PLAN
COLUMBIA COUNTY, OREGON

PLANTING PLAN

SHEET

12

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							WETLAND MITIGATION PLAN COLUMBIA COUNTY, OREGON		
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DESIGNED BY A. HAMILTON							JOB NUMBER 1199-829	DATE 2023	
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REVIEWED BY C. HUTCHINS							COPYRIGHT 2023 BY ANDERSON PERRY & ASSOC., INC.		
					MITIGATION AREA CONCEPTUAL CROSS-SECTION				

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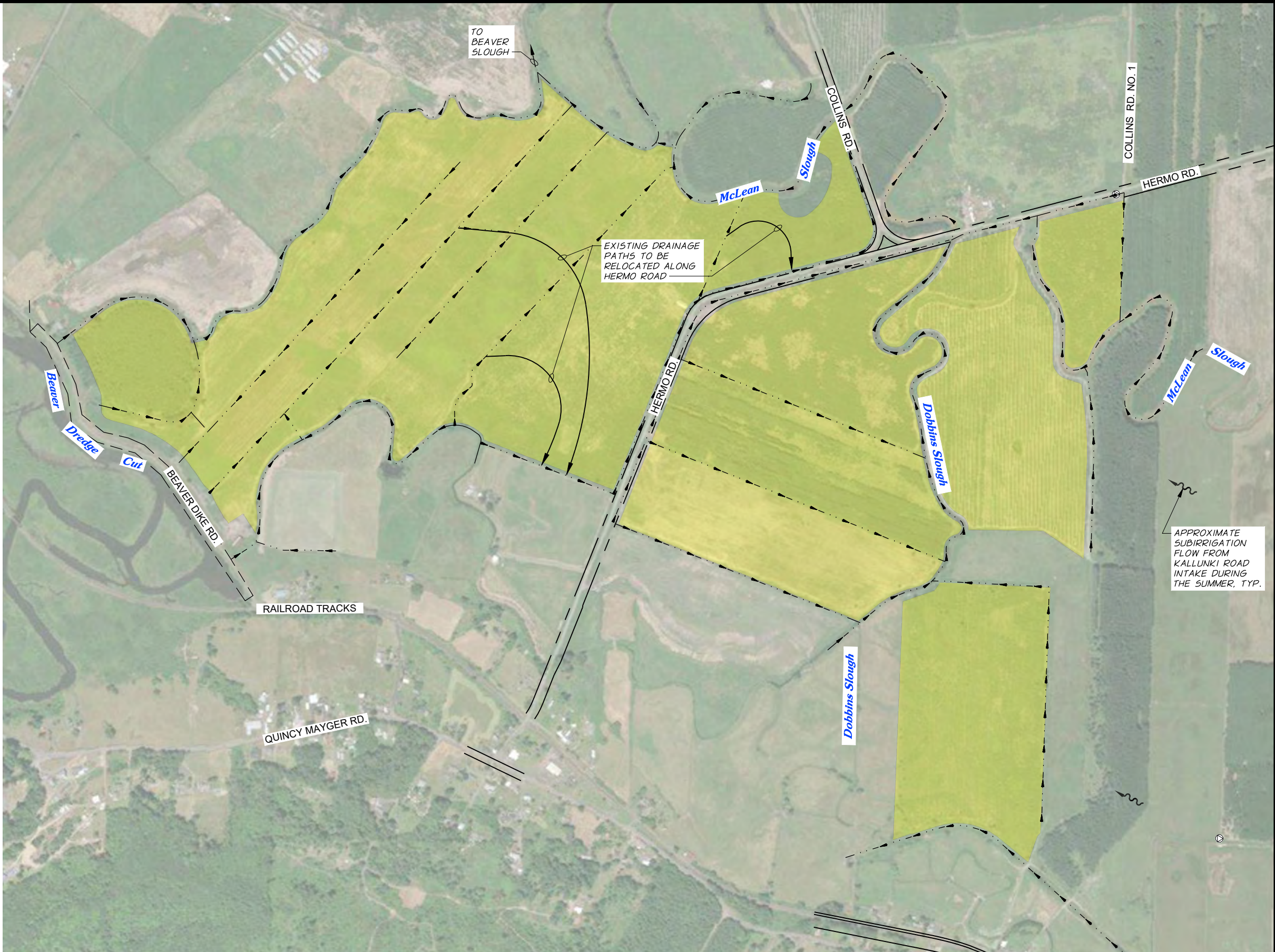


NOTES


1. DRAWING SHOWS THE ESTIMATED FLOW PATTERNS OF SITE BASED ON DESKTOP REVIEW, PRELIMINARY SITE INVESTIGATIONS, AND DISCUSSIONS WITH ADJACENT LANDOWNERS AND BOARD OF DIRECTORS FOR THE BDIC.
2. FLOW PATTERN FOR THE SITE WILL BE REFINED WITH FINDINGS FROM THE FUTURE DETAILED GROUNDWATER STUDY FOR THE PROPOSED MITIGATION SITE.

LEGEND

PROPOSED MITIGATION SITE



REVISION		BY	DATE
DESIGNED BY		A. HAMILTON	
DRAWN BY		G. SAURBIER	
REVIEWED BY		C. HUTCHINS	

			
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WETLAND MITIGATION PLAN
COLUMBIA COUNTY, OREGON

EXISTING DRAINAGE PATHS

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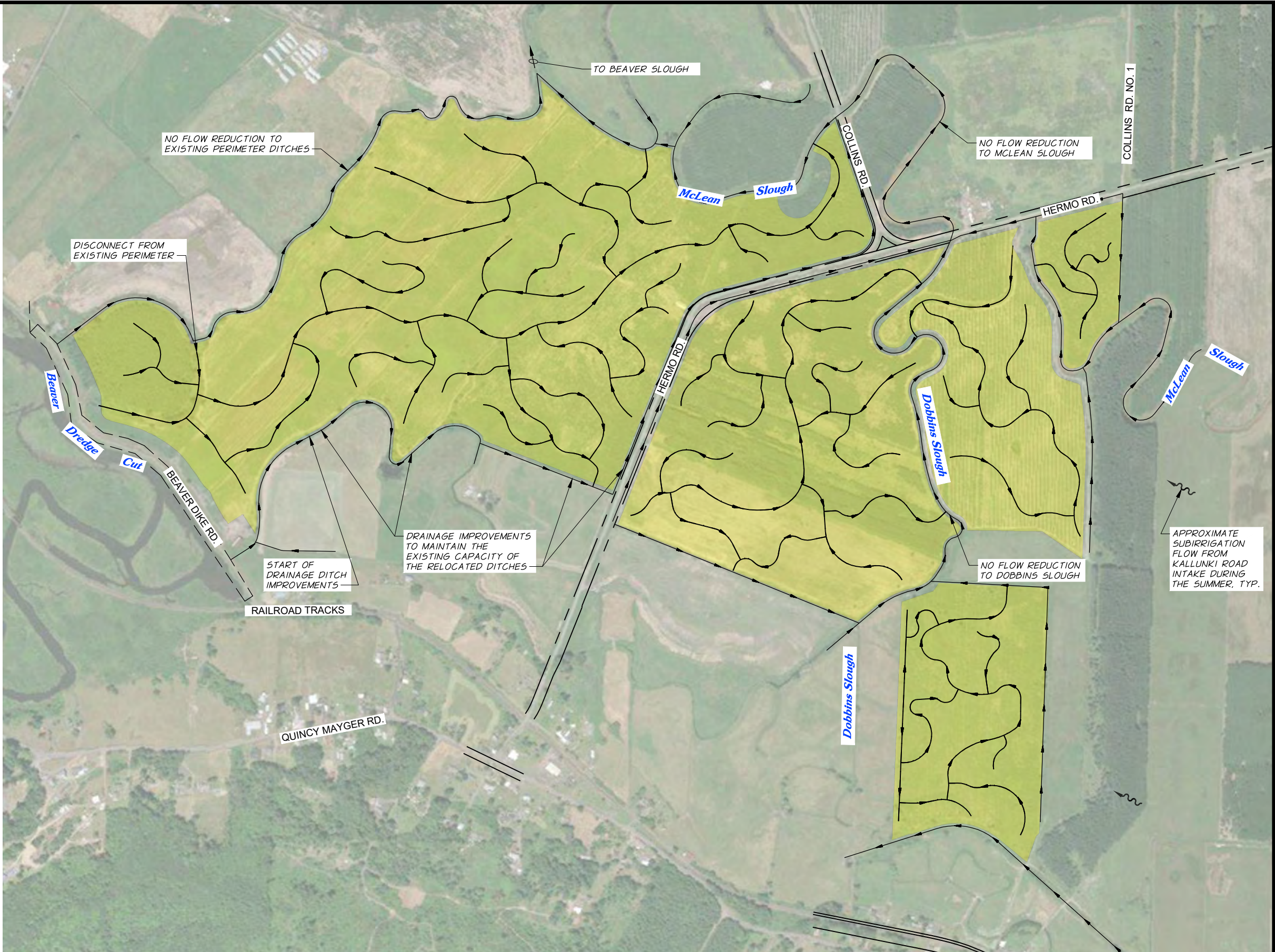


NOTES

- 1. DRAWING SHOWS THE ESTIMATED FLOW PATTERNS OF PROPOSED SITE BASED PRELIMINARY INVESTIGATIONS AND PROPOSED WORK WITHIN THE MITIGATION SITE.
- 2. FLOW PATTERN FOR THE PROPOSED SITE WILL BE REFINED WITH FINDINGS FROM FUTURE DETAILED GROUNDWATER STUDY FOR THE PROPOSED MITIGATION SITE AND CONTINUED COORDINATION WITH ADJACENT LANDOWNERS.

LEGEND

PROPOSED MITIGATION SITE



REVISION	BY	DATE
DESIGNED BY	A. HAMILTON	
DRAWN BY	G. SAURBIER	
REVIEWED BY	C. HUTCHINS	

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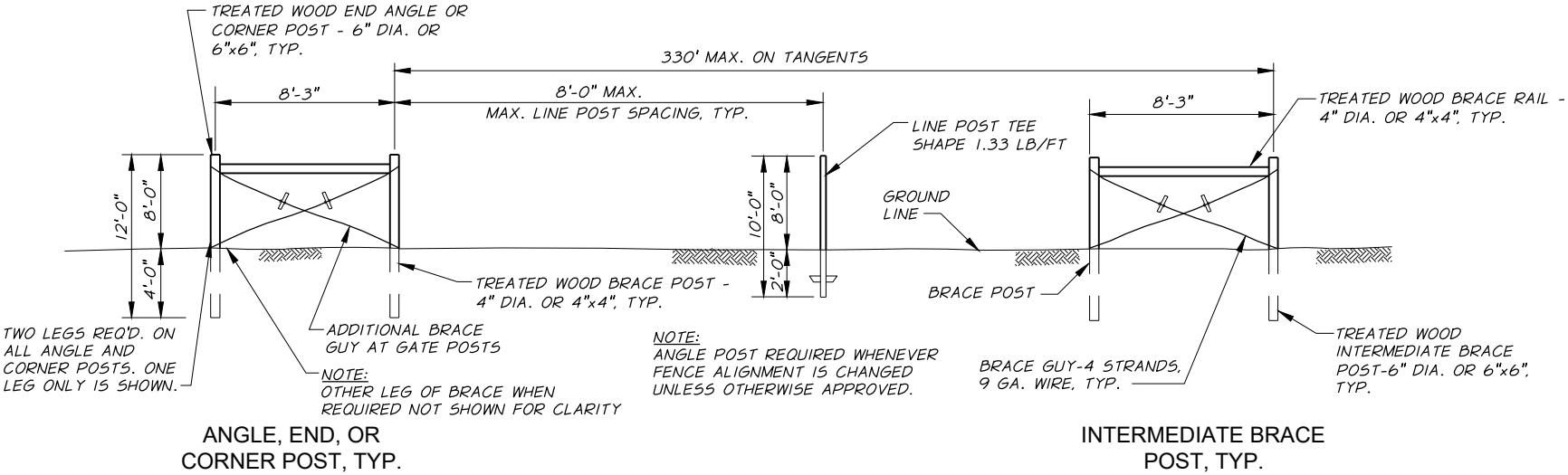
PROPOSED DRAINAGE PATHS

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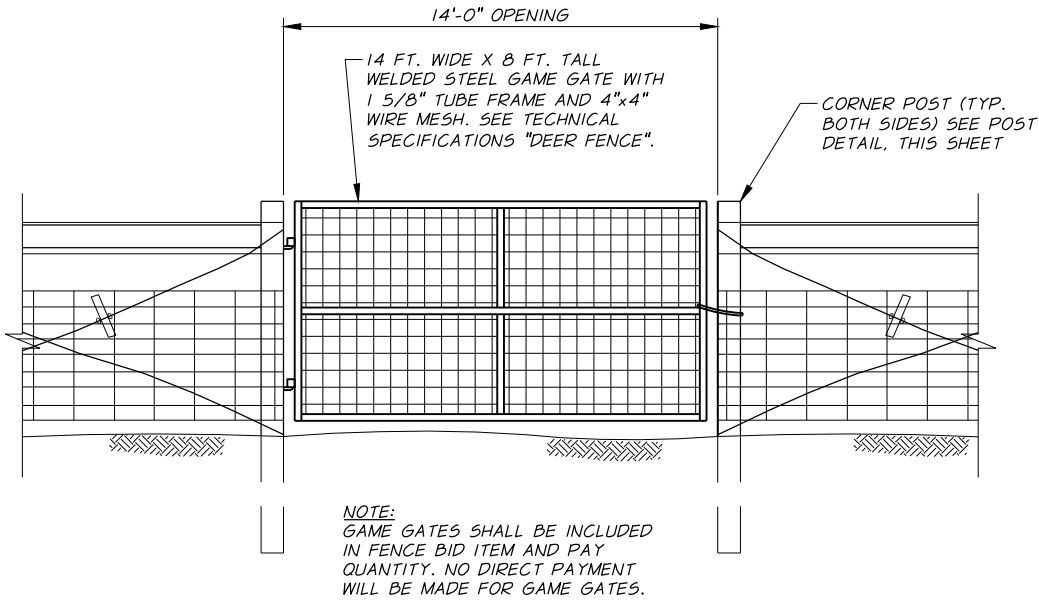
NOTES

1. DO NOT USE POSTS TREATED WITH COPPER-TYPE WOOD PRESERVATIVES.



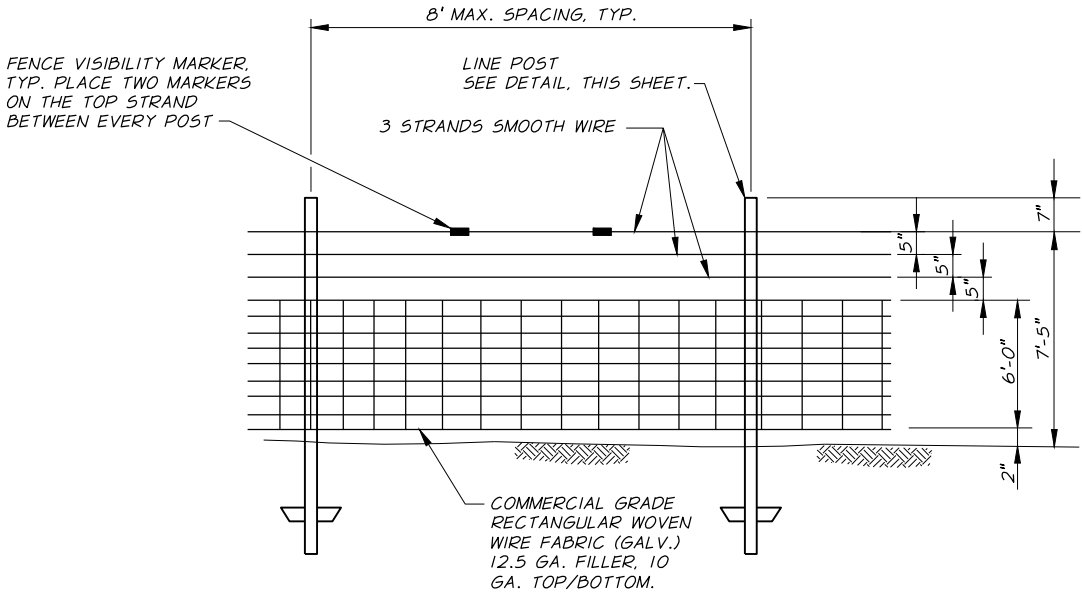
TREATED WOOD AND STEEL FENCE POSTS DETAIL

N.T.S.



GAME GATE DETAIL

N.T.S.



WOVEN WIRE FENCE DETAIL

N.T.S.

REVISION	BY	DATE	JOB NUMBER	1199-829	DATE	2023
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DRAWN BY	P. RICHARDSON					
REVIEWED BY	C. HUTCHINS					

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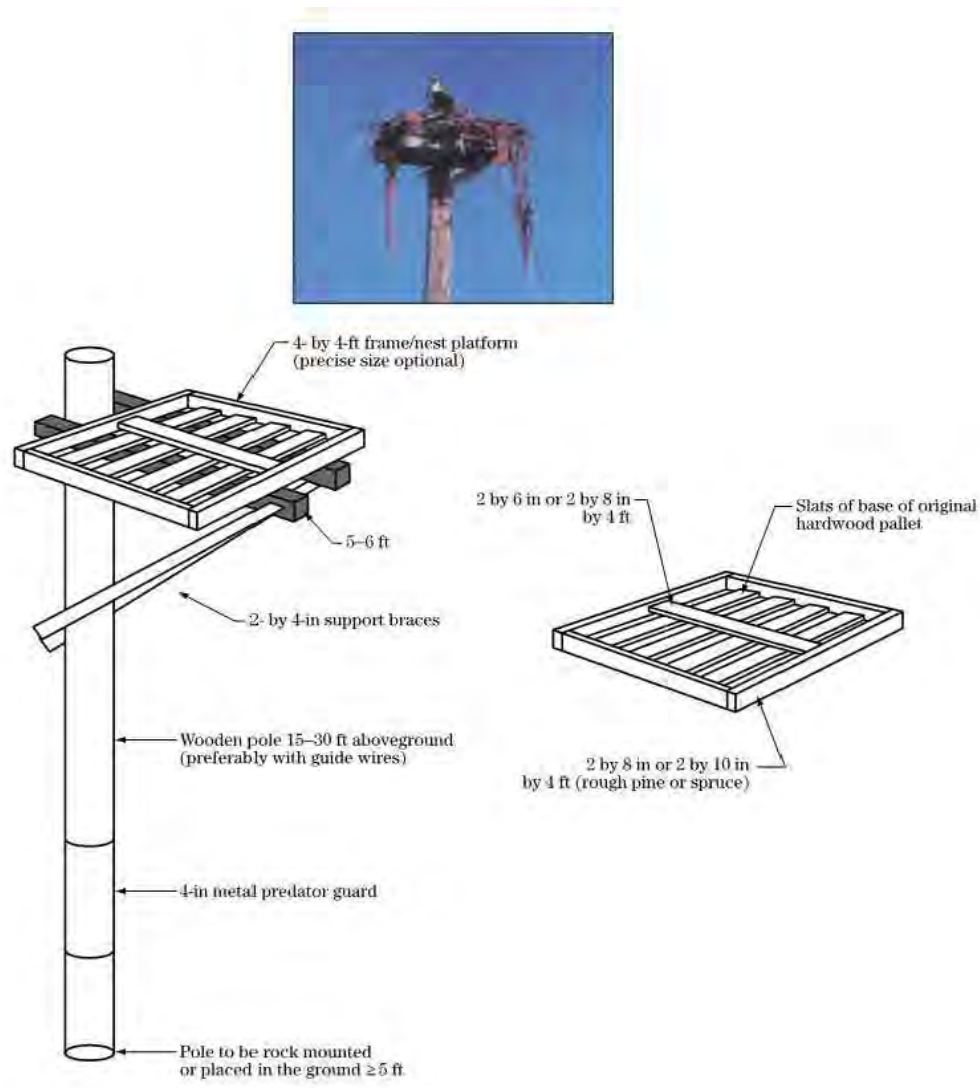
NEXT RENEWABLE FUELS OREGON, LLC
WETLAND MITIGATION PLAN
COLUMBIA COUNTY, OREGON

FENCE DETAILS I

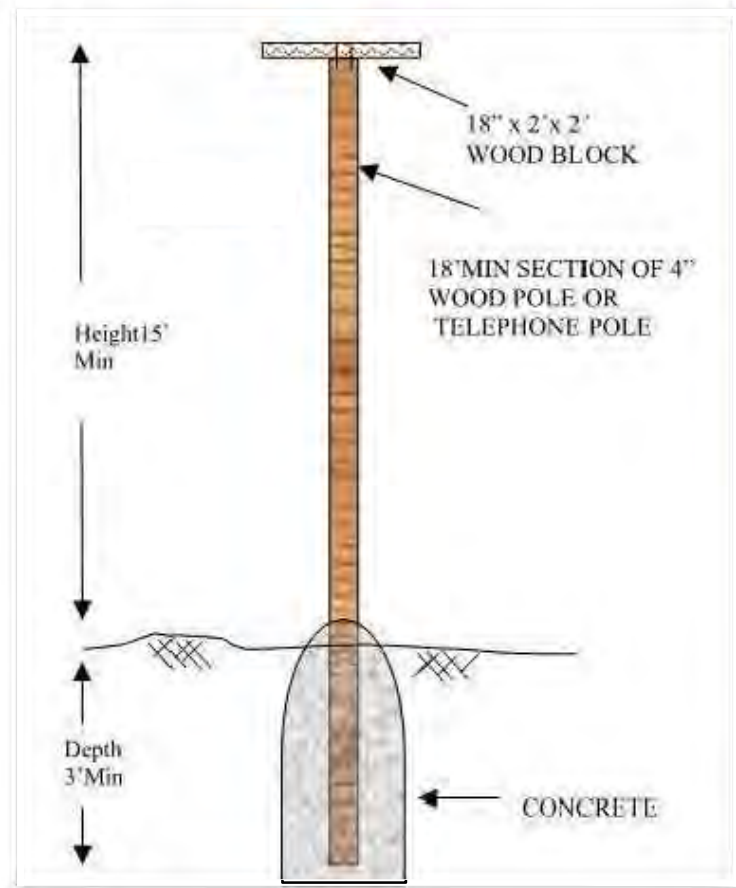
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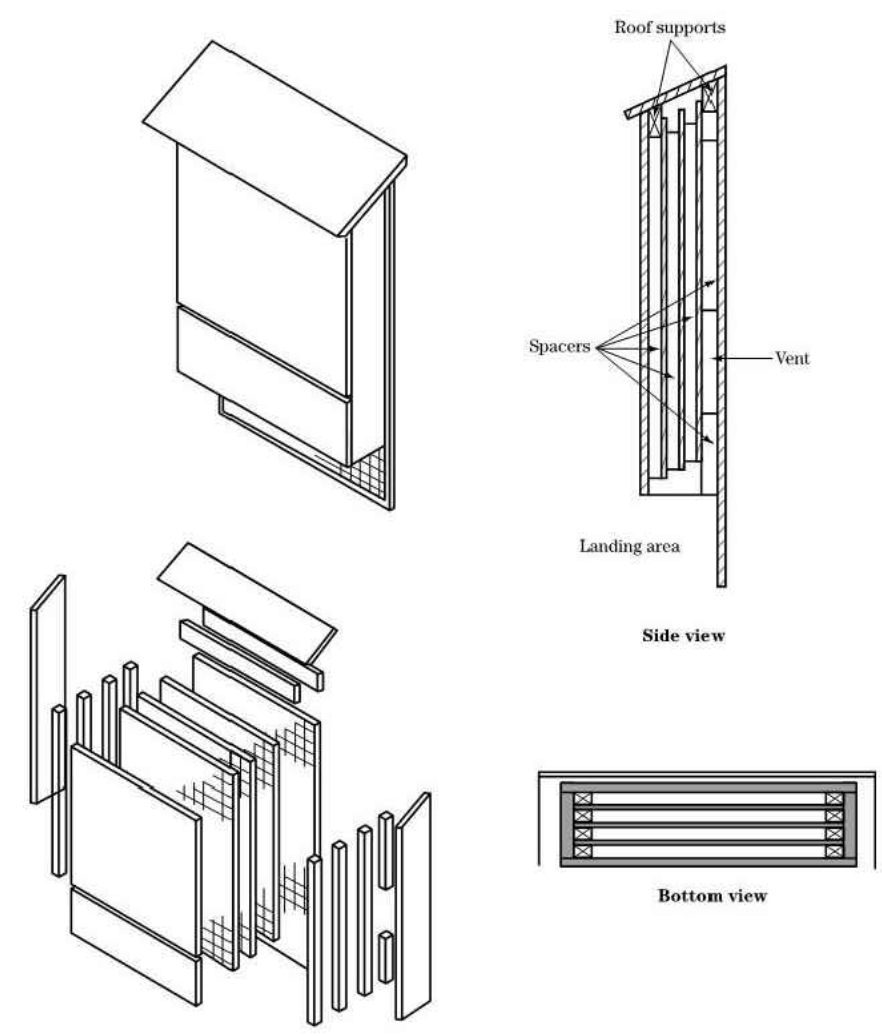
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RAPTOR NEST DETAIL
N.T.S.



RAPTOR PERCH DETAIL
N.T.S.



LARGE BAT HOUSE DETAIL
N.T.S.

REVISION		BY	DATE
DESIGNED BY	A. HAMILTON		
DRAWN BY	P. RICHARDSON		
REVIEWED BY	C. HUTCHINS		

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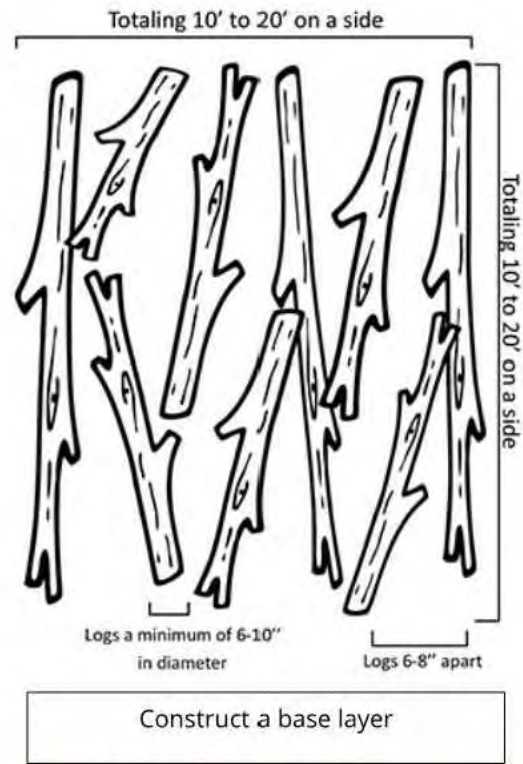
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NEXT RENEWABLE FUELS OREGON, LLC
WETLAND MITIGATION PLAN
COLUMBIA COUNTY, OREGON

RAPTOR NEST, RAPTOR PERCH, AND BAT HOUSE DETAILS

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The foundation should be covered with brush, using increasingly smaller branches on top.



A second layer is laid on top of and roughly perpendicular to the first layer.

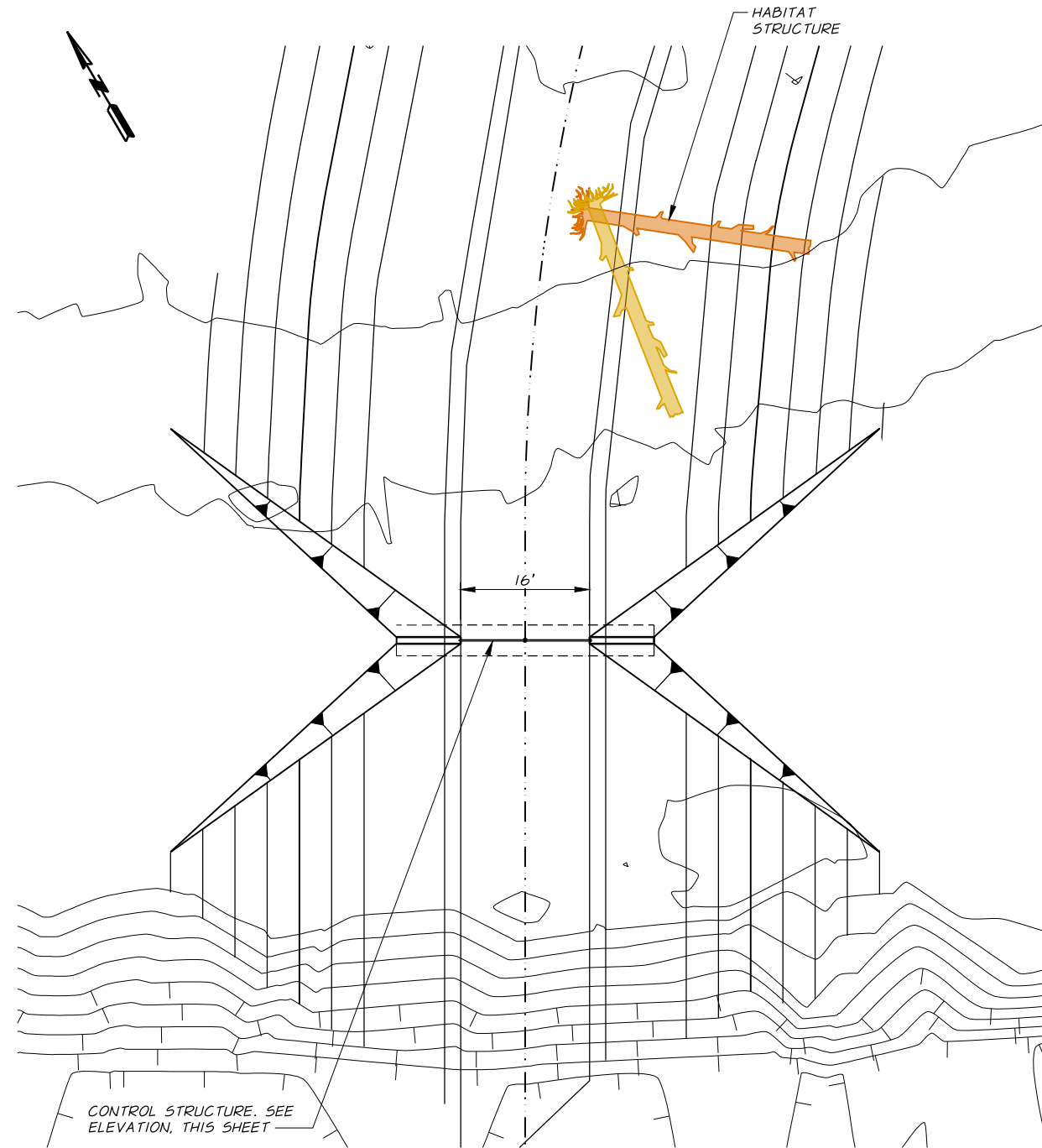


Add leafy crowns or boughs to the top of the pile.

BRUSH PILE DETAIL
N.T.S.

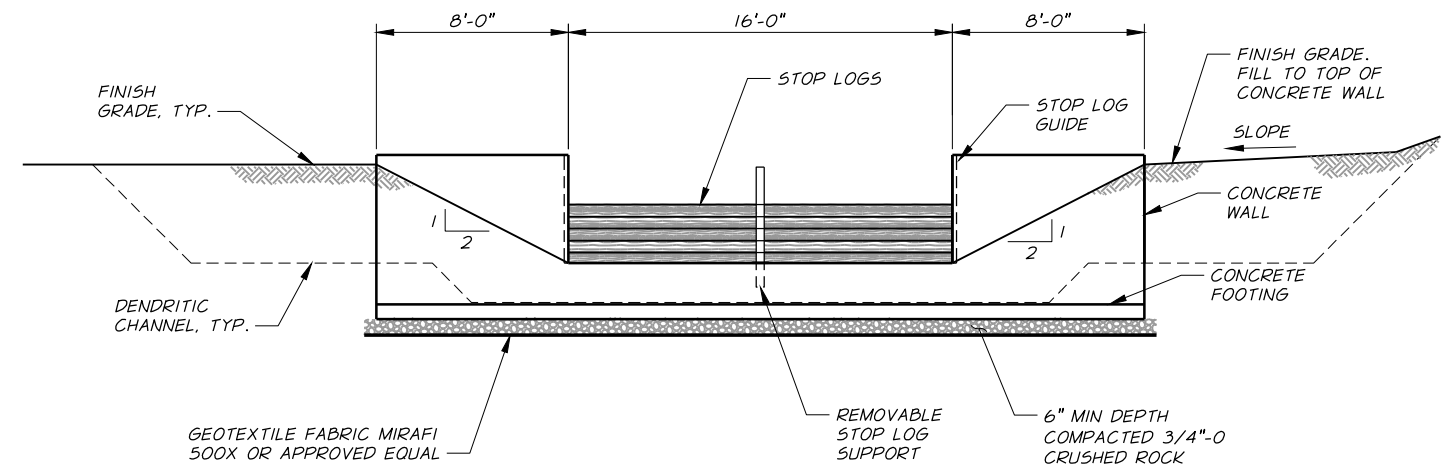
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REVISION		BY	DATE	JOB NUMBER 1199-829									
DESIGNED BY		A. HAMILTON		DATE 2023									
DRAWN BY		P. RICHARDSON		ACAD FILE: 1199-829-060C-504DTL.dwg									
REVIEWED BY		C. HUTCHINS		COPYRIGHT 2023 BY ANDERSON PERRY & ASSOC., INC.				BRUSH PILE DETAIL					

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McLean Slough

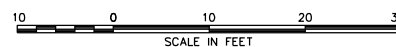
CONTROL STRUCTURE PLAN



CONTROL STRUCTURE TYPICAL ELEVATION

N.T.S.

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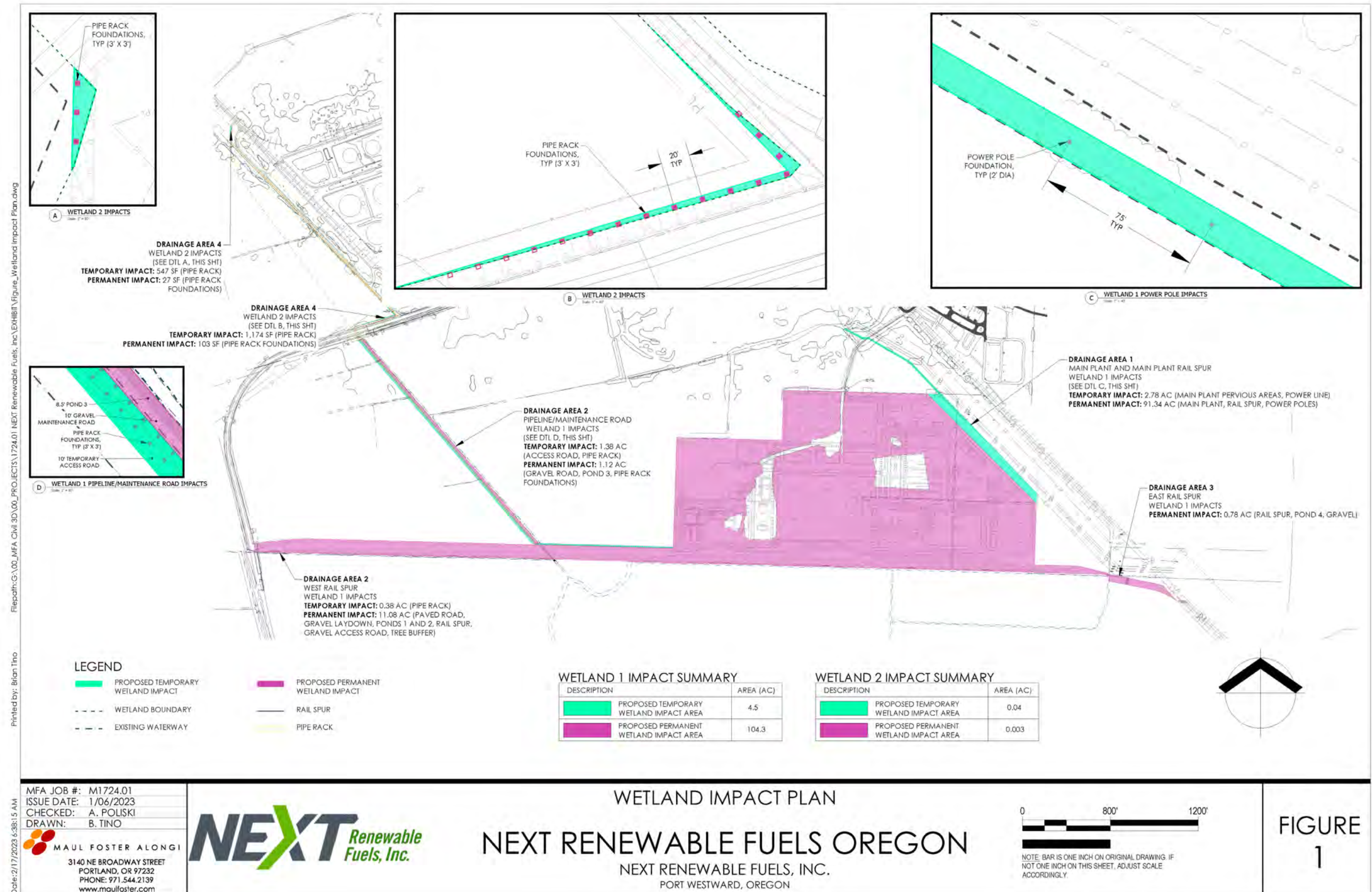
NEXT RENEWABLE FUELS OREGON, LLC

WETLAND MITIGATION PLAN
COLUMBIA COUNTY, OREGON

CONTROL STRUCTURE PLAN AND ELEVATION

SHEET

20



NOTE:
DRAWING PROVIDED MAUL FOSTER ALONGI

APPENDIX B
Oregon Rapid Wetland Assessment
Protocol Data Sheets

Oregon Rapid Wetland Assessment (ORWAP) V.3.2.*	Cover Page: Basic Description of Assessment
Site Name:	NEXT Renewable Fuels Oregon (Wetlands 1-3)
Investigator Name:	Sue Brady
Date of Field Assessment:	9/30/2020
County:	Columbia
Nearest Town:	Clatskanie
Latitude (decimal degrees):	46.165392°
Longitude (decimal degrees):	-123.161365°
TRS, quarter/quarter section and tax lot(s):	T8N R4W Sections 16, 21, 22, 38
Approximate size of the Assessment Area (AA, in acres):	110.7
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	50%
If delineated, DSL file number (WD #) if known:	delineation number not yet assigned
Cowardin Systems & Classes (indicate all present, based on field visit and/or aerial imagery): <u>Systems</u> : Palustrine =P, Riverine =R, Lacustrine =L, Estuarine =E <u>Classes</u> : Emergent =EM, Scrub-Shrub =SS, Forested =FO, Aquatic Bed (incl. SAV) =AB, Open Water =OW, Unconsolidated Bottom =UB, Unconsolidated Shore =US	PEM, PSS
Predominant HGM Class : Estuarine=E, Lacustrine=L, Riverine=R, S= Slope, F= Flats, D= Depressional	Flats
Soil Unit Mapped in Most of the AA:	Udipsamments, nearly level, protected
If tidal, the tidal phase during most of visit:	n/a
What percent (approximate) of the wetland were you able to visit?	50
What percent (approximate) of the AA were you able to visit?	100
Have you attended an ORWAP training session? If so, indicate approximate month & year.	Oct-11
How many wetlands have you assessed previously using ORWAP (approximate)?	20+
Comments about the site or this ORWAP assessment (attach extra page if desired):	

ORWAP V.3.2 Site Name:	NEXT Renewable Fuels Oregon (Wetlands 1-3)
Investigator Name:	Sue Brady
Date of Field Assessment:	9/30/2020
<i>Scores will appear below after data are entered in worksheets OF, F, T, and S. See Manual for definitions and descriptions of how scores were computed and ratings assigned.</i>	

Normalized Scores & Ratings for this Assessment Area (AA):								
Specific Functions or Values:	Function Score	Function Rating	Rating Break Proximity	Values Score	Values Rating	Rating Break Proximity	Function Score (raw)	Values Score (raw)
Water Storage & Delay (WS)	3.18	Lower		0.00	Lower		3.18	0.00
Sediment Retention & Stabilization (SR)	3.37	Lower	LM	9.05	Higher		3.67	6.90
Phosphorus Retention (PR)	5.30	Moderate		8.17	Higher		5.48	6.79
Nitrate Removal & Retention (NR)	3.10	Lower		10.00	Higher		4.43	10.00
Anadromous Fish Habitat (FA)	0.00	Lower		0.00	Lower		0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower		0.00	Lower		0.00	0.00
Amphibian & Reptile Habitat (AM)	7.76	Higher		3.61	Lower		7.03	3.61
Waterbird Nesting Habitat (WBN)	7.13	Higher	MH	10.00	Higher		5.92	10.00
Waterbird Feeding Habitat (WBF)	9.23	Higher		10.00	Higher		8.33	10.00
Aquatic Invertebrate Habitat (INV)	1.79	Lower		2.60	Lower		4.01	3.09
Songbird, Raptor, Mammal Habitat (SBM)	5.18	Moderate		10.00	Higher		6.45	10.00
Water Cooling (WC)	2.31	Lower	LM	10.00	Higher		2.02	9.58
Native Plant Diversity (PD)	6.37	Moderate	MH	2.18	Lower		5.71	2.18
Pollinator Habitat (POL)	7.60	Higher	MH	3.92	Moderate		6.63	3.17
Organic Nutrient Export (OE)	5.90	Moderate					5.22	
Carbon Sequestration (CS)	5.16	Moderate					4.71	
Public Use & Recognition (PU)				3.48	Lower	LM		4.08

Other Attributes:	Score	Rating	Rating Break Proximity		
Wetland Sensitivity (SEN)	2.84	Moderate			4.83
Wetland Ecological Condition (EC)	5.02	Moderate			6.05
Wetland Stressors (STR)	6.34	Higher	MH		5.83

GROUPS	Selected Function	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity
Hydrologic Function (WS)	Water Storage & Delay (WS)	Lower		Lower	
Water Quality Support (SR, PR, or NR)	Phosphorus Retention (PR)	Moderate		Higher	
Fish Habitat (FA or FR)	Anadromous Fish Habitat (FA)	Lower		Lower	
Aquatic Habitat (AM, WBF, or WBN)	Waterbird Nesting Habitat (WBN)	Higher	MH	Higher	
Ecosystem Support (WC, INV, PD, POL, SBM, or OE)	Pollinator Habitat (POL)	Higher	MH	Moderate	

NOTE: A score of 0 does not always mean the function or value is absent from the wetland. It usually means that this wetland has equal or less capacity than the lowest-scoring one, for that function or value, from among the 200 calibration wetlands that were assessed previously by Oregon Department of State Lands.

Date: 10/1/20		Name: Sue Brady		Site: NEXT Renewable Fuels Oregon (Wetlands 1-3)		
Form OF Office Data ORWAP V. 3.2		Conduct an assessment <u>only after reading the accompanying Manual and explanations in column E below</u> . Answering many of the following questions requires viewing aerial imagery and maps, covering an area up to within 2 miles of the AA. For each affirmative answer, change the 0 in the "Data" column to a "1". Answer all items except where directed to skip to others. Questions whose cells in "Data" column have a "W" MUST be answered for the ENTIRE wetland and bordering waters.		For a list of functions to which each question pertains, see bracketed codes in column E. Codes for functions and their benefits are: WS= Water Storage, WC= Water Cooling, SR= Sediment Retention, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Aqualic Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibians & Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, & Mammal Habitat, POL= Pollinator Habitat, PD= Native Plant Diversity, PU= Public Use & Recognition, EC= Ecological Condition, Sens= Sensitivity, STR= Stressors.		For guidance and detailed descriptions of how Excel calculates the numbers in the Scores worksheet, see the Technical Supplement and Appendix C of the Manual. For a documented rationale for each indicator, open each of the worksheet tabs at the bottom (one for each function or value) and see column H.
#	Indicators	Condition Choices	Data	Explanations, Definitions (Column E)	Cell Name	Comments
OF1	Distance to Extensive Perennial Cover (DistPerCov)	The distance from the <u>AA edge</u> to the edge of the closest patch or corridor of perennial cover (see definition in column E) larger than 100 acres is:		Corridor - is simply an elongated patch of perennial cover that is not narrower than 150 ft at any point.		
		<100 ft.	1	Perennial cover - is vegetation that includes wooded areas, native prairies, sagebrush, vegetated wetlands, as well as relatively unmanaged commercial lands in which the ground is disturbed less than annually, such as hayfields, lightly grazed pastures, timber harvest areas, and rangeland. <u>It does not</u> include water, row crops (e.g., vegetable, orchards, Christmas tree farms), lawns, residential areas, golf courses, recreational fields, pavement, bare soil, rock, bare sand, or gravel or dirt roads. [AM, WBN, PD, PDV, POL, SBM, Sens, STR]		
		100 to <300 ft.	0			
		300 to <1000 ft.	0			
		1000 ft. to <0.5 mile.	0			
		0.5 mile to 2 miles.	0			
> 2 miles.	0					
OF2	Distance to Tidal Waters (DistTidal)	The distance from the <u>AA edge</u> to the closest body of tidal water is:		Tidal water - If unclear whether a water body is tidal, check the ORWAP Map Viewer's Headtide layer (expand Hydrology), or check with local sources.		
		<1 mile.	1	Assume <u>Columbia River</u> is tidal east to Bonneville Dam and the Willamette River south to the Oregon City Falls. [WBF]		
		1-5 miles.	0			
		>5 miles.	0			
OF3	Distance to Ponded Water (DistPond)	The distance from the <u>AA edge</u> to the closest (but separate) body of nontidal fresh water (wetland, pond, or lake) that is ponded all or most of the year is:		Use field observations, aerial imagery, and/or the ORWAP Map Viewer's Persistent Nontidal layer (expand Wetlands/National Wetlands Inventory).		
		<100 ft.	0	[AM, WBF, WBN, SBM, PD, Sens]		
		100 to <300 ft.	0			
		300 to <1000 ft.	0			
		1000 ft. to <0.5 mile.	0			
		0.5 mile to 2 miles.	0			
>2 miles.	1					
OF4	Distance to Lake (DistLake)	The distance from the <u>AA edge</u> to the closest (but separate) body of nontidal fresh water (wetland, pond, or lake) that is ponded during most of the year and is larger than 20 acres (about 1000 ft on a side) is:		Use field observations, aerial imagery, and/or the ORWAP Map Viewer's Persistent Nontidal layer (expand Wetlands/National Wetlands Inventory).		
		<1 mile.	0	[WBF, WBN]		
		1-5 miles.	0			
		>5 miles.	1			
OF5	Distance to Herbaceous Open Land (DistOpenL)	The distance from the <u>AA edge</u> to the closest patch of herbaceous openland larger than 10 acres and in flat terrain is:		Herbaceous openland - includes both perennial and non-perennial cover. For example, it can include pasture, herbaceous wetland, meadow, prairie, ryegrass fields, row crops, herbaceous rangeland, golf courses, grassed airports, and hayfields.		
		<100 ft.	1	Do not include open water of lakes, ponds, or rivers; or unvegetated surfaces; or areas with woody vegetation. In dry parts of the state, croplands in flat areas are often irrigated and are distinctly greener in aerial images. Flat terrain - means slope of less than 5%. [WBF, WBN, POL]		
		100 to <300 ft.	0			
		300 to <1000 ft.	0			
		1000 ft. to <0.5 mile.	0			
		0.5 mile to 2 miles.	0			
>2 miles.	0					

OF5	Distance to Nearest Busy Road (DistRd)	The distance from the AA center to the nearest road with an average daytime traffic rate of at least 1 vehicle/minute is:		Estimate this traffic rate threshold using your judgment and considering the road width, local population, distance to densely settled areas, alternate routes, and other factors.		
		<100 ft.	0			
		100 to <300 ft.	0	[AM,SBM,PD,PUV,STR]		
		300 to <0.5 mile.	0			
		0.5 to <1 miles.	1			
		1 to 2 miles.	0			
		>2 miles.	0			
OF7	Size of Largest Nearby Patch of Perennial Cover (SizePerenn)	Including the AA's vegetated area, the largest patch or corridor that is perennial cover and is contiguous with vegetation in the AA (i.e., not separated by roads or channels that create gaps wider than 150 ft), occupies:		Contiguous - Abutting, with no major physical separation that prohibits free exchange or flow of surface water (i.e., not separated by roads or channels that create gaps wider than 150 ft)		
		<.01 acre.	0	Perennial cover - See OF1.		
		.01 to <1 acre.	0			
		1 to <10 acres.	0	Disqualify any patch or corridor of perennial cover where it becomes separated from the AA by a gap of >150 ft, if the gap is comprised of unvegetated land or if the corridor narrows to less than 150 ft.		
		10 to <100 acres.	0			
		100 to <1000 acres.	1			
		1000 to 10,000 acres.	0	[AM,SBM,PD,POL,Sens,STR]		
		>10,000 acres.	0			
OF8	Wetland Type Local Uniqueness (UniqPatch)	Select EACH of the vegetation types below that comprise more than 10% of the AA AND less than 10% of a 0.5 mile radius around the AA. (See Column E).		This is a 2-part question: (1) If no vegetation class comprises more than 10% of the AA, answer "none of the above." (2) If a vegetation class does comprise more than 10%, determine if that vegetation class also comprises less than 10% of a 0.5 mile circle (~50 acres). [INVv,AMv,WBFv,WBNv,SBMv,PDv,POLv,Sens]		
		Herbaceous vegetation (perennial grasses, sedges, forbs; not under a woody canopy; not crops).	0			
		Unshaded shrubland (woody plants shorter than 20 ft).	0			
		Trees (woody plants taller than 20 ft).	0			
		None of above.	1			
OF9	Perennial Cover Percentage (PerCovPct)	Within a 2-mile radius of the AA center, the percentage of land that has perennial cover is:		Perennial cover - is vegetation that includes wooded areas, native prairies, sagebrush, vegetated wetlands, as well as relatively unmanaged commercial lands in which the ground is disturbed less than annually, such as hayfields, lightly grazed pastures, timber harvest areas, and rangeland. It does not include water, row crops (e.g., vegetable, orchards, Christmas tree farms), lawns, residential areas, golf courses, recreational fields, pavement, bare soil, rock, bare sand, or gravel or dirt roads. [FA,AM,SBM,POL,Sens,STR]		
		<5% of the land.	0			
		5 to <20% of the land.	0			
		20 to <60% of the land.	1			
		60 to 90% of the land.	0			
		>90% of the land.	0		PerennAll	
OF10	Forest Percentage (ForestPct)	Within a 2-mile radius of the AA center, the cumulative amount of forest (regardless of forest patch sizes, and including any in the AA) is:		Forested patch - is a land cover patch that currently has >70% cover of woody plants taller than 20 ft. May be in a plantation.		
		<5% of the circle.	0			
		5 to <20%.	0	[FA,SBM,STR]		
		20 to <50%.	1			
		50 to 80%.	0			
		>80%.	0			
OF11	Herbaceous Open Land Percentage (OpenLpct)	Within a 2-mile radius of the AA center, the amount of herbaceous openland in flat terrain is:		Herbaceous openland - can include both perennial and non-perennial cover. For example, it can include pasture, herbaceous wetland, meadow, prairie, ryegrass fields, row crops, herbaceous rangeland, golf courses, grassed airports, and hayfields. Do not include open water of lakes, ponds, or rivers; or unvegetated surfaces; or areas with woody vegetation.		
		<5% of the land.	0			
		5 to <20%.	0			
		20 to <50%.	1			
		50 to 80%.	0			
		>80%.	0	Flat terrain - means slope of less than 5%. [WBF,WBN,POL]		

OF12	Landscape Wetland Connectivity (ConnScapeW)	Within a 2-mile radius of the AA center:		Corridor - is simply an elongated patch of perennial cover that is not narrower than 150 ft at any point.		
		There are NO other wetlands.	0			
		There are other wetlands (or a wetland), but NONE are connected to the AA by a corridor of perennial vegetation. The corridor must be at least 150 ft wide along its entire length and not interrupted by roads with regular traffic.	0	Regular traffic - is at least 1 vehicle per hour during the daytime throughout most of the growing season. Assess this based on local knowledge, type of road, and proximity to developed areas.		
		There are other wetlands (or a wetland), and ALL are connected to the AA by the type of corridor described.	0	Perennial - see OF9 for definition.		
OF13	Local Wetland Connectivity (ConnLocalW)	Within a 0.5 mile radius of the AA center:				
		There are NO other wetlands.	0	Regular traffic - is at least 1 vehicle per hour during the daytime throughout most of the growing season. Assess this based on local knowledge, type of road, and proximity to developed areas.		
		There are other wetlands (or a wetland), but NONE are connected to the AA by a corridor of perennial vegetation. The corridor must be at least 150 ft wide along its entire length and not interrupted by roads with regular traffic.	0	Perennial - see OF9 for definition.		
		There are other wetlands (or a wetland), and ALL are connected to the AA by the type of corridor described.	0	IF possible, field verify		
OF14	Wetland Number & Diversity Uniqueness (HUCBest)	There are other wetlands (or a wetland), and ONE or MORE (but not all) are connected to the AA by the type of corridor described.	1	[AM,WBN,SBM,PD,Sens,STR]		
		According to the ORWAP Report, this AA is located in one of the HUCs that are listed as having a large diversity, area, or number of wetlands relative to the area of the HUC. Select ALL of the following that are true:		In the ORWAP Report, under the Watershed Information section and the HUC Best table, look at the columns: "Is HUC Best?" and "Greatest Criteria Met."		
		Yes, for the HUC8 watershed	1	[AM,WBF,WBN,SBM,Sens]		
		Yes, for the HUC10 watershed	0			
OF15	Landscape Functional Deficit (GIScore)	Yes, for the HUC12 watershed	0			
		None of above.	0			
		Data are inadequate (NW) mapping not completed in HUC.	0			
		In the ORWAP Report, find the HUC 12 Functional Deficit table. Select ALL functions below that have a notation for that HUC.		In the ORWAP Report, under the Watershed Information section, look at the Functional Deficit table. Enter 1 for each of the listed functions that are noted.		
		Water storage (WS)	0			
		Sediment retention (SR)	0	These are HUCs in which a relatively small number, or proportional area, of the wetlands are likely to be performing the named function, thus adding value to those that are.		
		Nutrient transformation (NT)	0			
		Thermoregulation (WC)	0	See ORWAP's Technical Supplement for explanation of how the FuncDeficit was calculated.		
		Aquatic invertebrate habitat (INV)	0			
		Amphibian habitat (AM)	0	[WSv,WCv,SRv,PRv,INVv,FAv,AMv,WBNv]		
OF16	Conservation Designations of the AA or Local Area (ConDesign)	Fish habitat (FH)	0			
		Waterbird habitat (WB)	0			
		None of above.	1			
		No data.	0			
		On the ORWAP Map Viewer, use the layers indicated below to answer. Select ALL of the following that are true:		In the ORWAP Map Viewer, use the applicable layers.		
		(a) The AA is within or connected to a stream or other water body and this stream or water body has been designated as ESH within 0.5 miles of the AA, according to the Essential Salmonid Habitat (ESH) layer.	0	Include areas not shown as ESH, if ODFW has confirmed they qualify as ESH. [WCV,FA,FAv]		
		(b) The AA is within or contiguous to a designated Oregon's Greatest Wetlands, according to the map layer of that name.	0	Oregon's Greatest Wetlands identifies the most biologically and ecologically significant wetlands in the State of Oregon. [PU]		
		(c) The AA is within an Important Bird Area (IBA), as officially designated, according to the map layer of that name.	1	[WBFv,WBNv]		
		None of above.	0			

OF17	Non-anadromous Fish Species of Conservation Concern (RareFR)	According to the ORWAP Report, the score for occurrences of rare non-anadromous fish species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp_Info file for a list of species.		
		High (≥ 0.75 for maximum score, or ≥ 0.90 for this group's sum score), or there is a recent (within 5 years) onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	Species include Miller Lake lamprey, Goose Lake lamprey, Pit sculpin, Lahontan cutthroat trout, Inland Columbia Basin redband trout, Steelhead (Snake River Basin ESU), Alvord chub, Goose Lake tui chub, Borax Lake chub, Lahontan redband, Oregon chub, Goose Lake sucker, Tahoe sucker, Warner sucker, Shortnose sucker, Lost River sucker. Note that for some of these species, only specific geographic populations are designated. [FRv]		
		Intermediate (i.e., not as described above or below).	0			
		Low (≤ 0.33 for both the maximum score and this group's sum score, but not 0 for both).	0			
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1	This question may need to be revised after the field visit.		
OF18	Amphibian or Reptile of Conservation Concern (AmphRare)	According to the ORWAP Report, the score for occurrences of rare amphibian or reptile species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp_Info file for a list of species.		
		High (≥ 0.60 for maximum score, or >0.90 for sum score), or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	Species include: Black salamander, California slender salamander, Cope's giant salamander, Rocky Mountain tailed frog, Woodhouse's toad, Foothill yellow-legged frog, Northern leopard frog, Oregon spotted frog, Columbia spotted frog.		
		Intermediate (i.e., not as described above or below).	0			
		Low (≤ 0.21 for maximum score AND <0.15 for sum score, but not 0 for both).	0			
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1	[AMv] This question may need to be revised after the field visit.		
OF19	Feeding (Non-breeding) Waterbird Species of Conservation Concern (RareWBF)	According to the ORWAP Report, the score for occurrences of rare non-breeding (feeding) waterbird species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp_Info file for a list of species.		
		High (≥ 0.33 for maximum score, or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	Non-breeding - mainly refers to waterbird feeding during migration and winter, California brown pelican, Aleutian cackling goose, Dusky Canada goose		
		Low (< 0.33 for maximum score and for sum score, but not 0 for both).	0	[WBFv]		
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1	This question may need to be revised after the field visit.		
OF20	Nesting Waterbird Species of Conservation Concern (RareWBN)	According to the ORWAP Report, the score for occurrences of rare nesting waterbird species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp_Info file for a list of species.		
		High (≥ 0.60 for maximum score, or ≥ 1.00 for this group's sum score), or there is a recent breeding-season observation of any of these species onsite by a qualified observer under conditions similar to what now occur.	0	Species include: Horned grebe, Red-necked grebe, Western grebe, Clark's grebe, American white pelican, Least bittern, Snowy egret, Trumpeter swan, White-faced ibis, Harlequin duck, Bufflehead, Yellow rail, Western snowy plover, Upland sandpiper, Franklin's gull, Marbled murrelet.		
		Intermediate (i.e., not as described above or below).	0			
		Low (≤ 0.09 for maximum score and for sum score, but not 0 for both).	0	[WBNv]		
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species during breeding season by a qualified observer under conditions similar to what now occur.	1	This question may need to be revised after the field visit.		
OF21	Songbird, Raptor, Mammal Species of Conservation Concern (RareSBM)	According to the ORWAP Report, the score for occurrences of rare songbird, raptor, or mammal species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp_Info file for a list of species.		
		High (≥ 0.60 for maximum score, or >1.13 for sum score), or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	1	Species include: Bald eagle, American peregrine falcon, Arctic peregrine falcon, Greater sage-grouse, Columbian sharp-tailed grouse, Yellow-billed cuckoo, Northern spotted owl, Short-eared owl, Black swift, Lewis's woodpecker, Purple martin, Northern waterthrush, Bobolink, Tricolored blackbird, Fringed myotis, Spotted bat, Townsend's big-eared bat, Pallid bat, Northern sea lion, Fisher, Sea otter, Canada lynx, Columbian white-tailed deer. [SBMv]		
		Intermediate (i.e., not as described above or below).	0			
		Low (≤ 0.09 for maximum score AND <0.13 for sum score, but not 0 for both).	0			
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	0	This question may need to be revised after the field visit.		
OF22	Invertebrate Species of Conservation Concern (RareInvert)	According to the ORWAP Report, the score for occurrences of rare invertebrate species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp_Info file for a list of species.		
		High (≥ 0.75 for maximum score, or for this group's sum score), or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	See the Supp_Info file's RareAnimals worksheet for list of species addressed by this question.		
		Low (< 0.75 for maximum score AND for this group's sum score, but not 0 for both).	0	[INWv]		
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1	This question may need to be revised after the field visit.		

OF23	Plant Species of Conservation Concern (RarePscpp)	According to the ORWAP Report, the score for occurrences of rare <u>wetland-indicator plant</u> species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores.		
		High (≥ 0.75 for maximum score, or > 4.00 for sum score), or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	See the Supp. Info's RareWetPlants worksheet for list of species addressed by this question.		
		Intermediate (i.e., not as described above or below).	0	[PDv,POLv]		
		Low (≤ 0.12 for maximum score AND < 0.20 for sum score, but not 0 for both).	0	This question may need to be revised after the field visit.		
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1			
OF24	River Proximity (RiverProx)	There is a nontidal river within 1 mile and it is adjacent to, OR downslope from, the AA (connected or not). Enter 1, if true. If not, SKIP to OF27.	0	River - as used here is a channel wider than 50 ft between its banks. In the ORWAP Map Viewer, use the National Hydrography Dataset - Flowline layer (expand Hydrology) [WSv]	NearRiver	
OF25	Floodable Property (FloodProp)	Select ONE of the below:		Row crops - do not include pasture or other perennial cover.		
		Floodplain boundaries within 1 mile downslope or downriver from the AA have not been mapped. Enter 1 and SKIP TO OF27.	0	In the ORWAP Map Viewer, use the Floodplain layers. Also, the Seasonal Nontidal Wetland layer (expand Wetlands/National Wetlands Inventory) may indicate some floodplain areas.		
		Floodplain boundaries within 1 mile downslope from the AA have been mapped BUT there is neither infrastructure nor row crops vulnerable to river flooding located within the floodplain and within that distance. Enter 1 and SKIP TO OF27.	0	[WSv]		
		Floodplain boundaries have been mapped AND infrastructure or row crops are present within 1 mile downslope or downriver and those are not protected from 100-year floods, but actual damage has not been documented.	0	Supplement with field observations at multiple seasons, if possible.		
		Damage to infrastructure or row crops from river flooding has been documented within that distance.	0			
OF26	Type of Flood Damage (DamageType)	The greatest financial damage in the floodplain is (or would be) to:		Row crops - do not include pasture or other perennial cover. On the ORWAP Map Viewer, use the Floodplain layers [WSv]		
		Buildings, roads, bridges.	0			
		Row crops (during some years).	0			
OF27	Hydrologic Landscape (Arid)	According to the ORWAP Report, the wetland is in a hydrologic landscape unit classified as:		In the ORWAP Report, under the Location Information table, find the Hydrologic Landscape Class.		
		Arid.	0	[AM, AMv, WBNv, SBMv, OE, Sens]		
		Semi-arid.	0			
		Dry.	0			
		Moist.	0			
		Wet.	1			
		Very Wet.	0			
OF28	Input Water - Recognized Quality Issues (WQin)	According to ORWAP Map Viewer's Water Quality Streams layer and Water Quality Lakes layers, ALL of the following are true: (a) within 1 mile upstream from the AA edge, a water body or stream reach is labeled as being 303d, Water Quality Limited (categories 3B-5); Potential Concern; or TMDL Approved AND (b) the problem concerns one or more of the parameters listed below. Select ALL that apply.		Use the ORWAP Map Viewer's Water Quality Streams layer and the Water Quality Lakes layer (expand Water Quality and Quantity) and the Distance tool. Use the Identify tool to determine the reason for the listings.		
		Total suspended solids (TSS), sedimentation, or turbidity.	0			
		Phosphorus, chlorophyll-a, or algae.	1	If the AA receives both inflow and outflow from river flooding, consider the polluted water to be both "upstream" and "downstream".		
		Nitrates, ammonia, chlorophyll-a, or algae.	0			
		Petrochemicals, heavy metals (iron, manganese, lead, zinc, etc.), other toxins.	1	[SRv,PRv,INV,FA,FR,AM,WBF,WBN,STR]		
		Temperature or dissolved oxygen.	1	This may need to be verified in the field.		
		None of above, or no data. If true, enter 1 and SKIP to OF30.	0		NoDataWQup	
OF29	Duration of Connection Between Problem Area & the AA (ConnectUp)	The upstream problem area mentioned above (OF28) has a surface water connection to the AA:		In the ORWAP Map Viewer, use the National Hydrography Dataset (expand Hydrology) and the Persistent, Seasonal, or Saturated nontidal layers (expand Wetlands/National Wetlands Inventory) to determine duration of surface water connection.		
		For 9 or more continuous months annually.	0	[SRv,PRv,INV,FA,FR,AM,WBF,WBN,STR]		
		Intermittently (at least once annually, but for less than 9 months continually).	0	This may need to be determined or verified in the field.		
		Never (or less than annually).	1			
OF30	Downslope Water Quality Issues (ContamDown)	According to ORWAP Map Viewer's Water Quality Streams layer and Water Quality Lakes layer, ALL of the following are true: (a) within 1 mile downhill or downstream from the AA's edge, a water body is labeled as being 303d, Water Quality Limited (categories 3B-5); Potential Concern; or TMDL Approved AND (b) the problem concerns one or more of the parameters listed below. Select ALL that apply.		Use the ORWAP Map Viewer's Water Quality Streams layer and the Water Quality Lakes layer (expand Water Quality and Quantity) and the Distance tool. Use the Identify tool to determine the reason for the listings.		
		Total suspended solids (TSS), sedimentation, or turbidity.	0	[WCv,SRv,PRv,FA]		
		Phosphorus, chlorophyll-a, or algae.	1			
		Nitrates, ammonia, chlorophyll-a, or algae.	0			
		Petrochemicals, heavy metals (iron, manganese, lead, zinc, etc.), other toxins.	1			
		Temperature or dissolved oxygen.	1			
		None of above, or no data. Enter 1 and SKIP to OF32.	0		NoDataWQdo	
OF31	Duration of Connection Between AA & Water Quality Problem Area (ConnDown)	The connection between the downstream problem area mentioned above (OF30) and the AA:		In the ORWAP Map Viewer, use the National Hydrography Dataset (expand Hydrology) and the Persistent, Seasonal, or Saturated nontidal layers (expand Wetlands/National Wetlands Inventory) to determine duration of surface water connection.		
		Is a stream or water body that connects these areas for 9 or more continuous months annually.	1			
		Is a stream or water body that connects these areas intermittently (at least once annually, but for less than 9 months continually).	0	[WCv,SRv,PRv,FA]		

		Is a probable groundwater connection, or connection via direct runoff only (no channel connection).	0	This may need to be determined or verified in the field.		
		Never exists (a topographic ridge probably prevents all the AA's runoff and groundwater from reaching the problem area).	0			
OF32	Drinking Water Source (DEQ) (DWSource)	According to ORWAP Map Viewer's Surface Water Drinking Water Source Areas layer and the Ground Water Drinking Water Source Areas layer, the AA is within:		In the ORWAP Map Viewer, use the water source layers (expand Water Quality and Quantity).		
		The source area for a surface-water drinking water (DW) source.	0	[NRV]		
		The source area for a groundwater drinking water source.	0			
		Neither of above.	0			
OF33	Groundwater Risk Designations (GWrisk)	According to ORWAP Map Viewer's Groundwater Management Areas layer and the Sole Source Aquifer layer, the AA is:		In the ORWAP Map Viewer, use the DEQ Groundwater Management Areas layer and the Sole source Aquifer layer (expand Water Quality and Quantity).		
		Select All that apply				
		Within a designated Groundwater Management Area (ODEQ).	0	[NRV]		
		Within a designated Sole Source Aquifer area (EPA); the North Florence Dunal Aquifer.	0			
		Neither of above.	0			
OF34	Relative Elevation in Watershed (Elev)	In the ORWAP Map Viewer, based on the Hydrologic Boundaries 4th Level (HUC 8) layer (expand Hydrology), determine if the AA is: (See Column E)		1) Consider which end of the HUC is the bottom. Where streams join, the "V" that they form on the map points towards the bottom of the HUC.		
		In the upper one-third of its watershed.	0	2) If the AA is closer to the HUC's outlet than to its upper end, and is closer to the river or large stream that exits at the bottom of the HUC than it is to the boundary (margin) of the HUC, then check "lower 1/3". If not near that river, check "middle 1/3".		
		In the middle one-third of its watershed.	0	3) If the AA is not in a 100-yr floodplain, is closer to the HUC upper end than to its outlet, and is closer to the boundary (margin) of the HUC than to the river or large stream that exits at the bottom of the HUC, then check "upper 1/3".		
		In the lower one-third of its watershed.	0	4) For all other conditions, check "middle 1/3".	Lower/Shed	
				[WSv, PRv, FA, FR, WCv, OE, Sens, SRv]		
OF35	Runoff Contributing Area (RCA) - Wetland as % of (WetPotRCA)	Delimit the wetland's Runoff Contributing Area (RCA) using a topographic base map. The area of the AA's wetland is:		See the ORWAP Manual for specific protocol for delimiting the RCA (Section 4.1 Step 5). The RCA includes only the areas that potentially drain directly to the AA's wetland rather than to channels that flow or flood into that wetland. Exact precision in drawing the boundary is not required.		
		<1% of its RCA.	0			
		1 to <10% of its RCA.	0			
		10 to 100% of its RCA.	0	[WS, WSv, SR, SRv, PR, PRv, WCv]		
		Larger than the area of its RCA. Enter 1 and SKIP TO OF39.	0		NoRCA	

OF36	Unvegetated % in the RCA (ImpervRCA)	The proportion of the RCA comprised of buildings, roads, parking lots, exposed bedrock, and other surface that is usually unvegetated at the time of peak annual runoff is about:	W	In the ORWAP Map Viewer, use an Aerial layer to determine the proportion of the RCA comprised of buildings, roads, parking lots, exposed bedrock, and other surfaces that are usually unvegetated at the time of peak annual runoff. [WSv,WCv,SRv,PRv,INV,FA,Sens,STR]		
		<10%.	0			
		10 to 25%.	1			
		>25%.	0			
OF37	Transport From Upslope (TransRCA)	A relatively large proportion of the precipitation that falls farther upslope in the RCA reaches this wetland quickly as indicated by the following: (a) RCA slopes are steep, <u>and/or</u> (b) upslope wetlands historically present have been filled or drained extensively, <u>and/or</u> (c) land cover is mostly non-forest, <u>and/or</u> (d) most RCA soils are shallow. This statement is:	W	Refer to aerial imagery <u>and/or</u> consult local sources. See the <u>ORWAP Manual</u> for instructions. [WSv,SRv,PRv,STR]		
		Mostly true.	0			
		Somewhat true.	1			
		Mostly untrue.	0			
OF39	Upslope Soil Erodibility Risk (ErodeUp)	Use the ORWAP Report or the Map Viewer to determine if the erosion hazard rating of the soil within 200 ft away and upslope of the AA is:		If the soil unit is the same as the AA, the Erosion Hazard can be obtained from the ORWAP Report's Soil Information section. If the soil unit is different than the AA, use ORWAP Map Viewer's Oregon Soil layer and see the ORWAP Manual for instructions on how to determine the erosion hazard rating. [SRv,PRv,STR]		
		Slight.	1			
		Moderate.	0			
		Severe.	0			
		Vary severe.	0			
		Could not determine.	0			
OF39	Streamflow Contributing Area (SCA) - Wetland as % of (WetPotSCA)	Delimit (or visualize, for large river basins) the wetland's Streamflow Contributing Area (SCA) using a topographic base map. The area of the AA's wetland is:	W	See the <u>ORWP Manual</u> for specific protocol for delimiting the SCA (section 4.1, Step 6). The SCA is all upland areas that drain into streams, rivers, and lakes that feed the AA's wetland either directly or during semi-annual floods. In addition, for wetlands intercepted by a mapped stream, the SCA can be delineated automatically and its area reported at this USGS web site: https://streamstats.usgs.gov/ss/ . Enter the coordinates, select Oregon, select Delineate, zoom to level 15 or finer, and click on a stream. [WS, SR, SRv, PR, PRv, WCv]		
		<1% of its SCA, or wetland is in the floodplain of a major river.	0			
		1 to <10% of its SCA.	0			
		10 to 100% of its SCA.	1		NoSCA1	
		Larger than the area of its SCA. Enter 1 and SKIP TO OF41.	0		NoSCA	
		Wetland lacks tributaries and receives no overbank water. Enter 1 and SKIP to OF41.	0			
OF40	Unvegetated % in the SCA (ImpervSCA)	The proportion of the SCA comprised of buildings, roads, parking lots, exposed bedrock, and other surface that is usually unvegetated at the time of peak annual runoff is about:	W	See the <u>ORWAP Manual</u> for instructions. [WCv,SRv,PRv,FA,STR]		
		<10%.	0			
		10 to 25%.	0			
		>25%.	1			
OF41	Upland Edge Shape Complexity (EdgeShape)	Most of the edge between the AA's wetland and upland is (select one):	W	See <u>ORWAP Manual</u> for instructions and illustrations. [NR, SBM, Sens]		
		Linear: a significant proportion of the wetland's upland edge is straight, as in wetlands bounded partly or wholly by dikes or roads, or the AA is entirely surrounded by water or other wetlands.	1			
		Intermediate: Wetland's shape is (a) ovoid, or (b) mildly ragged edge, and/or (c) contains a lesser amount of artificially straight edge.	0			
		Convolute: Wetland perimeter is many times longer than maximum width of the wetland, with many alcoves and indentations ("fingers").	0			
OF42	Zoning (Zoning)	According to ORWAP Map Viewer's Zoning layer, the dominant zoned land use designation for currently undeveloped parcels upslope from the AA and within 300 ft. of its upland edge is:		See the <u>ORWAP Manual</u> for instructions on how to determine the zoning designation. If information is not provided, check local zoning maps. [WSv,WCv,SRv,PRv,INV,FAv,FRv,AMv,WBFv,WBNv,SBMv,PDv,POLv,PUv]		
		Development (Commercial, Industrial, Urban Residential, etc.), or no undeveloped parcels exist upslope from the AA.	1			
		Agriculture or Rural Residential.	0			
		Forest or Open Space, or entirely public lands.	0			
		Not zoned, or no information.	0			

OF43	Growing Degree Days (GDD)	According to ORWAP Map Viewer's Growing Degree Days layer, the long term normal Growing Degree Days category at the approximate location of the AA is:		See the ORWAP Manual for instructions on how to determine the growing degree days category.		
		<256.	0	[NR, FR, AM, WBN, SBM, WCv, OE, CS, Sens]		
		256 - 1020.	0			
		1021-1785.	0			
		1786 - 2550.	1			
		2551 - 3315.	0			
		3316 - 4079.	0			
		> 4079.	0			

Date: 10/1/20		Name: Sue Brady		Site: NEXT Renewable Fuels Oregon (Wetlands 1-3)		
Form F Field Data (nontidal Wetlands) ORWAP V 3.2		Conduct an assessment <u>only after reading the accompanying Manual and explanations in column E below.</u> For each affirmative answer, change the 0 in the "Data" column to a "1". Answer all items except where directed to skip to others. Questions whose cells in "Data" column have a "W" MUST be answered for the ENTIRE wetland and bordering waters.		For a list of functions to which each question pertains, see bracketed codes in column E. Codes for functions and their benefits are: WS= Water Storage, WC= Water Cooling, SR= Sediment Retention, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Export, INV= Invertebrates, FA= Anadromous Fish, FR= Resident Fish, AM= Amphibians, WBF= Feeding Waterbirds, WBN= Nesting Waterbirds, SBM= Songbirds, Mammals, & Raptors, POL= Pollinators, PH= Plant Habitat, PU= Public Use & Recognition, EC= Ecological Condition, Sens= Sensitivity, STR= Stressors.		For guidance and detailed descriptions of how Excel calculates the numbers in the Scores worksheet, see the Technical Supplement and Appendix C of the accompanying Manual. For a documented rationale for each indicator, open each of the worksheet tabs at the bottom (one for each function or value) and see column H.
#	Indicators	Condition Choices	Data	Explanations, Definitions (Column E)	Cell Name	Comments
F1	Tidal Wetland (Tidal)	This is a tidal wetland (either freshwater or saltwater). If yes, GO TO worksheet " T ". Do not enter any data here. If nontidal, continue with F2.		Tidal wetland - a wetland that receives tidal water at least once during a normal year, regardless of salinity, and dominated by emergent or woody vegetation. Tidal flooding occurs on a 6-hour cycle DURING THE TIME it is flooded by tide, which may be as infrequent as once per year. If NWI map shows the wetland with a code beginning with E (for estuarine), assume the wetland to be tidal. However, some wetlands lacking that code are also tidal.		
F2	Ponded Condition (Lentic)	At least once every 2 years, some part of the AA contains a cumulative total of >900 sq.ft. of surface water that is ponded. The water persists for >6 days and may be hidden beneath emergent vegetation or scattered in small pools. Enter 1, if true.	1	Ponded - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle). [AM,WBF,WBN]	Lentic	
Reminder: For all questions, the AA should include all persistent waters in ponds smaller than 20 acres that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes or rivers larger than 20 acres -- specifically, the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone.				Adjacent - is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.		
F3	Water Regime (Hydropd)	The water regime (hydropereid) of the most permanent (usually deepest) part of the AA is: Select only ONE. [To meet any of the definitions other than <u>Ephemeral</u> , there must be >100 sq ft of surface water for the duration described, otherwise mark the type listed above it.] <u>Ephemeral</u> . Surface water in the wettest part of the AA is present for fewer than 7 consecutive days during an average growing season. Includes some of the areas mapped as <u>Saturated</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and SKIP to F25. <u>Temporary</u> . Surface water present for 1-4 weeks consecutively during an average growing season, OR if persists for longer, it is almost entirely in scattered pools, each smaller than 1 sq.m. Dries up completely during part of most average years. Includes some of the areas mapped as <u>Saturated</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and SKIP to F25. <u>Seasonal</u> . Surface water present for 5-17 weeks (1-4 months) consecutively during an average growing season, but dries up completely during part of most average years. Includes some of the areas mapped as <u>Seasonal</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and SKIP to F5. <u>Semi-Persistent</u> . Surface water present for more than 17 weeks (4 months) consecutively during an average growing season, but dries up completely during part of most average years. Includes some of the areas mapped as <u>Seasonal</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and SKIP to F5. <u>Permanent</u> . Does not dry up completely during most average years. Includes some of the areas mapped as <u>Persistent</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and continue.	0 0 0 1	In the NRCS county soil survey, the Water Features table provides information about periods of flooding, ponding, and highwater table depths. Descriptions of the soil units may include information on saturation persistence. Also consider the hydropereid label on NWI wetland polygons. [WS, FA, FR, WBN, WBF, WC]	NeverWater TempWet ShallowType DeepType PermType	

F4	Flooded Persistently - % of AA (PermW)	Identify the parts of the AA that still contain surface water even during the driest times of a normal year . At that time, the percentage of the AA that still contains surface water is:		driest times of a normal year - i.e., when the AA's surface water is at its lowest annual level.	
		1 to <25% of the AA.	1	Sites fed by unregulated streams that descend on north-facing slopes, tend to remain wet longer into the summer. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat.	
		25 to <50% of the AA.	0	[WS,PR,NR,CS,INV,FR,AM,WBF,WBN]	
		50 to 95% of the AA.	0		
		>95% of the AA.	0		AllPermWater
F5	Depth Class (Predominant) (DepthDom)	When water is present in the AA, the depth most of the time in most of inundated area is: [Note: NOT necessarily the maximum spatial or annual depth]		This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the AA is brief, the answer will be based on the depth of the most persistently inundated part of the AA. Include surface water in channels and ditches as well as ponded areas.	
		>0 to <0.5 ft.	0		
		0.5 to < 1 ft deep.	0		
		1 to <3 ft deep.	1	In the <i>QRWAP Manual</i> , see the diagram in Appendix B.	
		3 to 6 ft deep.	0		
		>6 ft deep.	0	[WC,SR,PR,CS,OE,INV,FA,FR,WBF,WBN,PD,Sens]	
F6	Depth Class Distribution (DepthEven)	Within the area described above, and during most of the time when surface water is present, the water area has: Select only one.		Estimate these proportions by considering the gradient and microtopography of the site.	
		One depth class covering >90% of the AA's inundated area (use the classes in the question above).	1	In the <i>QRWAP Manual</i> , see the diagram in Appendix B.	
		One depth class covering 51-90% of the AA's inundated area (use the classes in the question above).	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0	[INV,FR,WBF,WBN,PD]	
F7	Emergent Plants -- Area (EmArea)	Consider just the area that has surface water for >1 week during the growing season. Herbaceous plants (not moss, not woody) whose foliage extends above a water surface in this area (i.e., emergents) cumulatively occupy an annual maximum of:	W	If multiple small patches are separated by less than 150 ft, they may be combined when evaluating this question.	
		<0.01 acre (< 400 sq.ft). Enter 1 and SKIP TO F10, unless only part of a wetland is being assessed.	0	[SR,PR,OE,INV,FR,WBF,WBN,SBM,PD]	NoEm
		0.01 to < 0.10 acres (3,920 sq. ft).	0		
		0.10 to <0.50 acres (21,340 sq. ft).	0		
		0.50 to <5 acres.	0		
		5 to 50 acres.	1		
		>50 acres.	0		
F8	% Emergent Plants (EmPct)	Emergent plants occupy an annual maximum of:		[WC,SR,PR,NR,CS,OE,INV,PD,FA,FR,AM,WBF,WBN,SBM]	
		<5% of the parts of the AA that are inundated for >7 days at some time of the year.	0		
		5 to <30% of the parts of the AA that are inundated for >7 days at some time of the year.	0		
		30 to <60% of the parts of the AA that are inundated for >7 days at some time of the year.	0		
		60 to 95% of the parts of the AA that are inundated for >7 days at some time of the year.	1		
		>95% of the parts of the AA that are inundated for >7 days at some time of the year.	0		
F9	Cattail or Tall Bulrush Cover (Cttail)	The percentage of the emergent vegetation cover in the AA that is cattail (<i>Typha</i> spp.) or tall bulrush is:		[WBN, SBM]	
		<1% of the emergent vegetation, or cattail and bulrush are absent.	0		
		1 to <25% of the emergent vegetation.	1		
		25 to 75% of the emergent vegetation.	0		
		>75%, of the emergent vegetation.	0		

F10	Water Shading by AA's Woody Vegetation - Driest (WoodyDryShade)	During an average growing season, when water levels are lowest (but surface water still occupies >400 sq ft or >1% of the AA), the percentage of the remaining surface water within the AA that is shaded by trees and/or shrubs located within the AA is:		[WC,FA,WBN,SBM]		
		<5% of the water, and fewer than 10 woody plants taller than 3 ft shade it, or all surface water is flowing.	0			
		<5% of the water, but more than 10 woody plants taller than 3 ft shade it.	0			
		5 to <25% of the water.	1			
		25 to <50% of the water.	0			
		50 to 95% of the water.	0			
		>95% of the water.	0			
F11	Open Water - Extent	During most of the growing season, the largest patch of open water that is in or adjacent to the AA is >1 acre and mostly deeper than 1 ft. Enter 1, if true.	1	Open Water - is surface water of any depth that contains no emergent herbaceous or woody vegetation (may contain floating-leaved or completely submersed plants). It may be partially shaded by a tree canopy.	OpenW	
F12	All Pooled Water as Percentage - Wettest (PondWpctWet)	When water levels are <u>highest</u> , during a normal year, the surface water that is <u>pooled</u> continually for >6 days occupies:		Pooled - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle).		
		<1% or none of the AA. Surface water is completely or nearly absent then, or is entirely flowing. Enter 1 and SKIP TO F22.	0		NoPond	
		1 to <5% of the AA.	0	[WS,WC,CS,OE,INV,AM,WBF,WBN]		
		5 to <30% of the AA.	1			
		30 to <70% of the AA.	0			
		70 to 95% of the AA.	0			
		>95% of the AA.	0			
F13	Pooled Open Water Area - Wettest (OWareaWet)	When water levels are <u>highest</u> , during a normal year, the AA's <u>pooled open water</u> occupies a cumulative area of:	W	Pooled - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle).		
		<0.10 acre (<4356 sq. ft) of the AA and adjacent ponded waters. Enter 1 and SKIP TO F16.	0		NoPondOW	
		0.10 to <0.50 acres (21,340 sq. ft) of the AA and adjacent ponded waters.	0			
		0.50 to <1 acres of the AA and adjacent ponded waters.	0	Open water - is surface water of any depth that contains no emergent herbaceous or wood vegetation (may contain floating-leaved or completely submersed species). It may be partially shaded by a tree canopy.		
		1 to <5 acres of the AA and adjacent ponded waters.	1			
		5 to <50 acres of the AA and adjacent ponded waters.	0			
		50 to <640 acres (1 sq. mi) of the AA and adjacent ponded waters.	0	[WS,WBF]		
		640 to <1000 acres of the AA and adjacent ponded waters.	0			
		1000 to <2500 acres of the AA and adjacent ponded waters.	0			
F14	Pooled Open Water Distribution - Wettest (WaterMixWet)	When water levels are <u>highest</u> , during a normal year, the distribution (in aerial view) of ponded open water patches larger than 0.01 acre (400 sq. ft) within the AA is (must meet both a and b criteria):		[NR,AM,WBF,WBN,PD,SBM]		
		(a) Vegetation <u>and</u> open water <u>EACH</u> comprise 30-70% of the AA (including its bordering waters if any) <u>AND</u> (b) There are <u>many</u> small patches of open water scattered widely within vegetation or <u>many</u> small vegetation clump "islands" scattered widely within open water. Typical (for example) of some extensive bulrush and cattail marshes.	0			
		(a) Vegetation <u>and</u> open water <u>EACH</u> comprise 30-70% of the AA (including its bordering waters if any) <u>AND</u> (b) There are only a <u>few</u> (or <u>no</u>) small patches of open water scattered widely within vegetation or a <u>few</u> small vegetation clump "islands" scattered widely within open water.	0			
		(a) Vegetation <u>or</u> open water <u>comprise</u> >70% of the AA (and its bordering waters) <u>AND</u> (b) There are <u>several small patches</u> of open water scattered within vegetation or <u>several</u> small vegetation clump "islands" scattered within open water.	1			
		(a) Vegetation <u>or</u> open water <u>comprise</u> >70% of the AA (and its bordering waters) <u>AND</u> (b) Open water is <u>mostly in a single area</u> (e.g., center of the wetland) and vegetation is in the rest (e.g., periphery), with almost no intermixing. (Typical of many ponds excavated for livestock watering, stormwater treatment, mineral extraction as well as many wetlands that are inundated only temporarily each year).	0			
F15	Width of Vegetated Zone - Wettest (WidthWet)	When water levels are <u>highest</u> , during a normal year, the width of the <u>vegetated wetland</u> that separates the largest patch of open water within or bordering the AA from the closest adjacent uplands, is predominantly: [Note: This is not asking for the maximum width.]		Vegetated wetland - in this case does not include underwater or floating-leaved plants, i.e., aquatic bed. In farmed wetlands that have different crops from year to year, consider vegetation condition as it probably existed during most of the past 5 years.		
		<5 ft, or no vegetation between upland and open water.	0	If open water exists as many patches, use the distance between the majority of those patches and uplands.		
		5 to <30 ft.	0			
		30 to <50 ft.	0			
		50 to <100 ft.	0	[WC,SR,PR,NR,CS,OE,AM,WBF,WBN,SBM,PD,Sens,EC]		
		100 to 300 ft.	0			
		> 300 ft.	1			

F16	All Ponded Water as a Percentage (Driest) (PondWpctDry)	When water levels are <u>lowest</u> , during a normal year, but surface water still occupies <u>>1,076 sq feet (100 sq meter) OR >1% of the AA (whichever is more)</u> , the water that is ponded (either visible or concealed by vegetation) in the AA occupies:		Ponded - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle). [WC,FA,FR,AM,WBN,Sens]	NoPond2	
		<1% or none. Surface water is completely or nearly absent then, or is entirely flowing. Enter 1 and SKIP TO F22.	0			
		1 to <5% of the AA.	1			
		5 to <30% of the AA.	0			
		30 to <70% of the AA.	0			
		70 to 95% of the AA.	0			
		>95% of the AA.	0			
F17	Ponded Open Water Area (Driest) (OWAreaDry)	When water levels are <u>lowest</u> , during a normal year, the AA's ponded open water occupies a cumulative area, including adjacent ponded waters, of:	W	Ponded - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle). Open water - is surface water of any depth that contains no emergent herbaceous or wood vegetation (may contain floating-leaved or completely submersed species). It may be partially shaded by a tree canopy. [WBN,PUV]	NoPondOW2	
		<0.10 acre (< 4356 sq. ft). Enter 1 and SKIP TO F24.	1			
		0.10 to <0.50 acres (21,340 sq. ft).	0			
		0.50 to <1 acres.	0			
		1- 4 acres.	0			
		5 to <50 acres.	0			
		50 to <640 acres (1 sq. mi).	0			
		640 to <1000 acres.	0			
		1000 to 2500 acres.	0			
		>2500 acres (>4 sq.mi).	0			
F18	Ponded Open Water Distribution - (Driest) (WaterMixDry)	When water levels are lowest, during a normal year, the distribution of ponded open water patches larger than 0.01 acre (400 sq. ft) within the AA is:		[NR,INV,AM,WBN]		
		(a) Vegetation <u>and open water EACH comprise 30-70%</u> of the AA (including its bordering waters if any) AND (b) There are <u>many small patches</u> of open water scattered widely within vegetation or many small vegetation clump "islands" scattered widely within open water. Typical (for example) of some extensive bulrush and cattail marshes.	0			
		(a) Vegetation <u>and open water EACH comprise 30-70%</u> of the AA (including its bordering waters if any) AND (b) There are <u>only a few (or no) small patches</u> of open water scattered widely within vegetation or a few small vegetation clump "islands" scattered widely within open water.	0			
		(a) Vegetation <u>or open water comprise >70%</u> of the AA (and its bordering waters) AND (b) There are <u>several small patches</u> of open water scattered within vegetation or several small vegetation clump "islands" scattered within open water.	0			
		(a) Vegetation <u>or open water comprise >70%</u> of the AA (and its bordering waters) AND (b) Open water is <u>mostly in a single area</u> (e.g., center of the wetland) and vegetation is in the rest (e.g., periphery), with almost no intermixing. Typical of many ponds excavated for livestock watering, stormwater treatment, mineral extraction as well as many wetlands that are inundated only temporarily each year.	0			
F19	Floating Algae & Duckweed (Algae)	At some time of the year, <u>most</u> of the AA's otherwise-unshaded water surface is covered by floating mats of algae, or small (<1 inch) floating plants such as duckweed, <i>Azolla</i> , <i>Wolffia</i> , or <i>Riccia</i> . Enter 1, if true.	0	This includes most nontidal wetlands labeled as Aquatic Bed (AB) on NWI maps. If wetland can be visited only during winter, it may not be possible to answer this question with much certainty unless local sources are contacted or indicators (e.g., dried remains of algae) are found.		
F20	Floating-leaved & Submerged Aquatic Vegetation (SAV)	SAV (submerged & floating-leaved aquatic vegetation, excluding the species listed above) occupies an annual maximum of:		SAV - are herbaceous plants that characteristically grow at or below the water surface, i.e., whose leaves are primarily and characteristically under or on the water surface during most of the part of the growing season when surface water is present. Some species are rooted in the sediment whereas others are not. If pond lily (<i>Nuphar</i>) is the predominant species, consider its maximum extent only during the period when surface water is present beneath the leaves. [PR,OE,INV,FR,AM,WBF,WBN]	NoSAV	
		none, or <5% of the water area.	0			
		5 to <25% of the water area.	0			
		25 to <50% of the water area.	0			
		50 to 95% of the water area.	0			
		>95% of the water area.	0			
		many SAV plants present, but impossible to select from the above categories.	0			
F21	Width of Vegetated Zone (Driest) (WidthDry)	When water levels are lowest, during a normal year, but surface water still occupies <u>>400 sq feet or >1% of the AA</u> (whichever is more), the width of the vegetated wetland that separates the largest patch of open water within or bordering the AA from the closest adjacent uplands, is predominantly:		Measure the width perpendicular to the open water part. Vegetated wetland - in this case does not include underwater or floating-leaved plants, i.e., aquatic bed. In farmed wetlands that have different crops from year to year, consider vegetation condition as it probably existed during most of the past 5 years. Note: For most sites larger than 1 acre and with persistent water, measure the width using aerial imagery rather than estimating in the field. [WBN]		
		<5 ft, or no vegetation between upland and open water.	0			
		5 to <30 ft.	0			
		30 to <50 ft.	0			
		50 to <100 ft.	0			
		100 to 300 ft.	0			
		> 300 ft.	0			

F22	Beaver (Beaver)	Use of the AA by beaver during the past 5 years is: Select most applicable ONE.		Valley width - is delimited by an abrupt increase in slope on both sides of the channel.		
		Evident from direct observation or presence of gnawed limbs, dams, tracks, dens, or lodges.	0	{AM,WBN,SBM,PD,Sens}		
		Very likely based on known occurrence in this part of the region and proximity to ALL of the following (a) a persistent freshwater wetland, pond, or lake, or a perennial low-gradient (<5%) channel, and (b) average valley width is > 150 ft and (c) >20% cumulative cover of aspen, cottonwood, alder, and willow in vegetated areas within 150 ft of the AA's edge. Or there is evidence of beaver just outside the AA.	0			
		Somewhat likely based on known occurrence in this part of the region and proximity to ALL of the following (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) average valley width is >50 ft, and (c) >20% cumulative cover of hardwood trees and shrubs in vegetated areas within 150 ft of the AA's edge.	0			
		Unlikely because site characteristics above are deficient, and/or this is an area where beaver are routinely removed. But beaver occur within 2 miles.	0			
		None. Beaver are absent from this part of the region.	0			
F23	Isolated Island (Island)	During June, the wetland contains (or is part of) an island that is isolated from the shore by water depths >3 ft. The island may be solid, or it may be a floating vegetation mat suitable for nesting waterbirds. The island must be larger than 400 sq.ft and without inhabited buildings. Enter 1, if true.	0	{WBF,WBN}		
F24	Ice-free (IceDura)	During most years, most of the AA's surface water (if any) does not freeze, or freezes for fewer than 4 continuous weeks. Enter 1, if true.	1	{PR,FR,WBF}		

F25	Water Fluctuation Range - Maximum (Fluctu)	The maximum vertical fluctuation in surface water within the AA, during a normal year is:		maximum vertical fluctuation - is the difference between the highest annual and lowest annual water level during an average year.		
		<0.5 ft or stable.	1	Use field indicators to assess this indicator. [WS,SR,PR,NR,CS,OE,INV,AM,WBN,PD]		
		0.5 to < 1 ft.	0			
		1 to <3 ft.	0			
		3 to 6 ft.	0			
		>6 ft.	0			
F26	% Only Saturated or Seasonally Flooded (SeasPot)	Identify the parts (if any) of the AA that never contain surface water (only saturated soil) or where the water (either ponded or flowing) usually remains on the land surface for <u>less than the entire growing season</u> . The percentage of the AA containing such areas is:		If you can identify plants, use their wetland indicator status to infer the possible extent of seasonal-only inundation within a wetland. Vegetation may be patterned in concentric or parallel zones, as one moves outward & away from the deepest part of the wetland or channel. Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) may be evident when not fully inundated. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualizing where that would intercept the land along the river. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. Although useful only as a general guide, the NRCS county soil survey descriptions of the soil units and water feature table usually includes information on flooding frequency and saturation persistence. [SR,NR,CS,OE,INV,FA,WBF,WBN,POL,SBM,PD,Sens,EC]		
		<5% of the AA, or none (i.e., all water persists for >4 months).	0		NoSeasonal	
		5 to <25% of the AA.	0			
		25 to <50% of the AA.	0			
		50 to 75% of the AA.	0			
		>75% of the AA.	1			
F27	Salinity, Alkalinity, Conductance (Salin)	The AA's surface water is mostly:		Saline or brackish conditions are commonly indicated by a prevalence of particular plant species. Consult the ORWAP_SupplInfo file's P_Salt worksheet for a list of these.		
		Brackish or saline. Plants that indicate saline conditions dominate the vegetation. Salt crust may be obvious around the perimeter and on flats.	0	Brackish or saline - conductance of >5000 µS/cm, or >3200 ppm TDS Slightly brackish - conductance of 500- 5000 µS/cm, or 320 - 3200 ppm TDS Fresh - conductance of < 500 µS/cm, or <320 ppm TDS [PR,CS,AM]		
		Slightly brackish. Plants that indicate saline conditions are common. Salt crust may or may not be present along perimeter.	0			
		Fresh. [Note: Assume this to be the condition unless wetland is known to be a playa or there is other contradicting evidence].	1		FreshW	
		Unknown.	0			
F28	Fish & Waterborne Pests (FishAcc)	Select All that apply:		[INV,FA,FR,AM,WBF]		
		A regularly-used boat dock is present within or contiguous to the AA.	0			
		A regularly-used boat dock is not within the AA, but there is one within 300 ft. of the AA and there is a persistent surface connection between the dock and the AA.	0			
		Fish (native or stocked) are known to be present in the AA, or can access it during at least one day annually.	0			
		None of the above, and could not estimate fish presence/absence.	1			
F29	Non-native Aquatic Animals (PestAnim)	The following are known or likely to have reproducing populations in this AA, its wetland, or in water bodies within 300 ft that connect to the AA at least seasonally. Select All that apply:		Assume non-native fish to be present if wetland is associated with a nearby reservoir, fish pond, or perennial stream flowing through an agricultural or residential area. Assume bullfrog, nutria, and/or carp to be present if (a) the AA contains persistent water or is flooded seasonally by an adjoining body of permanent water, and (b) not a forested wetland, and (c) in western Oregon, elevation is lower than about 3000 ft. In the ORWAP_SupplInfo file, see Inverts_Exo worksheet for more complete list of non-native invertebrates for Oregon, and WetVerts worksheet for more complete list of fish that are not native to Oregon. You may also consult: http://nas.er.usgs.gov/queries/default.aspx http://www.dfw.state.or.us/conservationstrategy/invasive_species.asp [FA,FR,AM,EC]		
		Non-native amphibians (e.g., bullfrog) or reptiles (e.g., red-ear slider).	1			
		Carp.	0			
		Non-native fish that prey on tadpoles or turtles (e.g., bass, walleye, crappie, brook trout).	0			
		Non-native invertebrates (e.g., New Zealand mudsnail, mitten crab, rusty crayfish).	0			
		Nutria.	0			
		None of above.	0			

F30	Shorebird Feeding Habitats (Shorebd)	The extent of <u>mudflats</u> , <u>very shallow waters</u> , or <u>shortgrass meadows</u> , within the AA, that meet the definition of <u>shorebird habitat</u> for at least 3 months during the period of late summer through the following May is:		Shorebird habitat - areas must have (a) grasses shorter than 6", or a mudflat, during any part of this period, AND (b) soils that either are saturated or covered with <2 inches of water during any part of this period, AND (c) no detectable surrounding slope (e.g., not the bottom of an incised dry channel), AND (d) not shaded by shrubs or trees. See photograph in Appendix A of manual. This addresses needs of most migratory sandpipers, plovers, curlews, and godwits. [WBF]	
		None, or <100 sq. ft.	0		
		100 to <1000 sq. ft. within AA.	0		
		1000 to 10,000 sq. ft. within AA.	0		
		>10,000 sq. ft. within AA.	1		
F31	Outflow Duration (OutDura)	The <u>most persistent</u> surface water connection (outlet channel, pipe, ditch, or overbank water exchange) between the AA and the closest stream or lake located downslope is: [Note: if the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of its wetland, OR the surface connection between the AA's wetland and a mapped stream or lake located within 300 ft downslope from this wetland].	W	The emphasis is on the connection to a mapped stream network. A larger difference in elevation between the wetland-upland boundary and the bottom of the wetland outlet (if any) indicates shorter outflow duration.	
		Persistent (>9 months/year).	1	Do not rely only on topographic maps or NWI maps to show this; inspect while in field if possible, and ask landowner. The durations given are only approximate and are for a "normal" year.	
		Seasonal (14 days to 9 months/year, not necessarily consecutive).	0	The connection need not occur during the growing season. Assume that depressions with effective nearby ditches or tile drains will connect for shorter periods.	
		Temporary (<14 days, not necessarily consecutive).	0	[WS,WCv,SR,PR,NR,CS,OE,FA,FR,Sens]	NoOutlet
		None - no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. Enter 1 and SKIP TO F33.	0		
F32	Outflow Confinement (Constric)	During major runoff events , in the places described above where surface water exits the AA, it:	W	Major runoff events - would include biennial high water caused by storms and/or rapid snowmelt.	
		is impeded as it mostly passes through a pipe, culvert, tidegate, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography).	0	Impeded - means causing a delay or reduction in water velocity or volume.	
		Leaves mainly through natural surface exits, not largely through artificial or temporary features which impede or accelerate outflow.	0	[WS,SR,PR,NR,CS,OE,Sens,STR]	
		Is exported more quickly than usual as it mostly passes through ditches or pipes intended to accelerate drainage. They may be within the AA or connected to its outlet or within 30 ft of the AA's edge.	1		
F33	Tributary or Overbank Inflow (Inflow)	At least once annually, surface water from upstream or another water body moves into the AA. It may enter directly, or as unconfined overflow from a contiguous river or lake. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. Enter 1, if true. If false, SKIP TO F36.	0	[SRv,PRv, PD]	Inflow
F34	Input Channel Gradient (SlopeInChan)	The gradient of the tributary with the largest inflow, averaged over the 150 ft. before it enters the AA (but excluding any portion of the distance where water travels through a pipe) is:		[SRv, PRv]	
		<1%.	0		
		1 to <3%.	0		
		3 to 6%.	0		
		>6%.	0		
F35	Throughflow Complexity (ThruFlo)	[Skip this question if the AA lacks both an inlet and outlet.] During peak annual flow, water entering the AA in channels encounters which of the following conditions as it travels through the AA: Select the ONE encountered most.		This mainly refers to surface water that moves between the inlet and outlet. Some judgment is required in assessing straight vs. indirect flow path.	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel within unvegetated (often incised) channels and has minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0	See <u>QRWAP Manual</u> , Appendix B diagram.	
		Bumps into <u>herbaceous vegetation</u> but mostly remains in fairly <u>straight channels</u> .	0	[WS,SR,PR,NR,OE,INV,FA,FR,WBF,WBN,PD]	
		Bumps into <u>herbaceous vegetation</u> and mostly <u>spreads throughout</u> , or follows a fairly <u>indirect path</u> (in widely meandering, multi-branched, or braided channels).	0		
		Bumps into <u>tree trunks and/or shrub stems</u> but mostly remains in fairly <u>straight channels</u> .	0		
		Bumps into <u>tree trunks and/or shrub stems</u> and follows a fairly <u>indirect path</u> (meandering, multi-branched, or braided) from entrance to exit.	0		

F36	Internal Gradient (Gradient)	The gradient from the lowest to highest point of land <u>within the AA</u> (or from outlet to inlet) is:		Wetlands with no outlet, and wetlands where most surface water is impounded on site, should be considered flat (<2%).		
		<2% (internal flow is absent or barely detectable; basically flat).	1	For other wetlands, estimate gradient as the elevation difference between the inlet and outlet (if any) divided by the distance between them, or the difference between the highest and lowest points in the wetland divided by the distance between them.		
		2 to <6%.	0	[WS,SR,PR,NR,CS,OE,AM,WBF,WBN]	TooSteep1	
		6 to 10%.	0		TooSteep2	
		>10%.	0			
F37	Groundwater Strength of Evidence (Groundw)	Select first one that applies:		[WS,WC,NR,CS,OE,INV,FA,FR,PD]		
		In the AA or its wetland: (a) Springs are observed, OR (b) Water is markedly cooler in summer and warmer in winter (e.g., later ice formation) than in other local wetlands, OR (c) Measurements from shallow wells indicate groundwater is discharging to the wetland, OR (d) Water visibly seeps into pits dug within the AA during the driest time of the year and located >30 ft from the closest surface water.	0			
		The AA's wetland: (a) Is very close to the base of a natural slope steeper than 15% and longer than 300 ft or is located at a geologic fault, OR (b) Has no persistently flowing tributary AND one or more is true: (b1) Is on a natural slope of >5%, OR (b2) Has rust deposits ("iron floor"), colored precipitates, or dispersible natural oil sheen, OR (b3) Is in an Arid or Semi-arid hydrologic unit.	0	Arid or Semi-arid hydrologic unit - See the ORWAP Report's Hydrologic Landscape Class (under Location Information).		
		The AA is <u>not</u> in an Arid or Semi-arid hydrologic unit, but has persistent ponded water, no tributary, and is not fed by wastewater, concentrated stormwater, or irrigation water, or by an adjacent river or lake.	0			
		None of above is true, OR AA contains a hot spring. Some groundwater may nonetheless discharge to or flow through the wetland.	1			
F38	Unshaded Herbaceous Vegetation (Extent) (HerbExpos)	The annual maximum areal cover of herbaceous vegetation (excluding SAV, ferns, and mosses, but including forbs & graminoids) that is not beneath a woody canopy reaches:		Do not include submersed and floating-leaved aquatics (SAV) in the category of "herbaceous vegetation", or when defining the "vegetated part" of the site.		
		<5% of the vegetated part of the AA. Enter 1 and SKIP to F42.	0	For sites larger than 10 acres, this should be determined from aerial imagery rather than estimated in the field.	NoHerb	
		5 to <25% of the vegetated part of the AA.	0			
		25 to <50% of the vegetated part of the AA.	0			
		50-95% of the vegetated part of the AA.	1	[WBF,WBN]		
		>95% of the vegetated part of the AA.	0			
F39	Forb Cover (Forb)	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		Forbs - are flowering non-woody vascular plants (excludes grasses, sedges, ferns, mosses).		
		<5% of the herbaceous part of the AA.	0	[POL]		
		5 to <25% of the herbaceous part of the AA.	0			
		25 to <50% of the herbaceous part of the AA.	1			
		50 to 95% of the herbaceous part of the AA.	0			
		>95% of the herbaceous part of the AA.	0			
F40	Species Dominance - Herbaceous (HerbDom)	Determine which <u>two</u> native herbaceous (forb, fern, and graminoid) species comprise the greatest portion of the herbaceous cover that is unshaded by a woody canopy. Then select one:		[INV,WBF,SBM,PD,POL,Sens,EC]		
		Those species together comprise <u>more than half</u> of the areal cover of <u>native</u> herbaceous plants at any time during the year, i.e., one dominant species or two co-dominants. Also mark this if <20% of the vegetated cover is native species.	1			
		Those species together comprise <u>less than half</u> of the areal cover of <u>native</u> herbaceous plants at any time during the year.	0			

F41	Invasive or Non-native - % of Vegetative Cover (Invas)	Vegetative cover (annual maximum) is:		In the ORWAP Suppinfo, see P_Invas worksheet for list of invasives and P_Exo for non-native species list. Examples of woody invasives are Himalayan blackberry, English ivy, scotch broom, and gorse. For known distributions of invasive plants in your area see: http://nr.oregonstate.edu/orbic/invasive-species and http://www.weedmapper.org/maps.html but do not limit your answer based only on that information. Consider most crops to be non-native. [WBF,PD,POL,Sens,EC]		
		Overwhelmingly (>80% cover) non-native species AND ≥10% of the herbaceous cover is <u>invasive species</u> . (See ORWAP Suppinfo file for species designations).	0		InvasDom	
		Overwhelmingly (>80% cover) non-native species AND ≤10% of the herbaceous cover is <u>invasive species</u> : OR 50-80% of cover is non-native species regardless of invasiveness.	0			
		Mostly (50-80%) native species.	1			
		Overwhelmingly (>80%) native species.	0			
F42	Mowing, Grazing, Fire (VegCut)	There is evidence that grazing by domestic or wild animals -- or mowing (multiple times per year), plowing, herbicides, harvesting, or fire -- has repeatedly reduced the AA's vegetation cover (plants that normally grows taller than 4") to <u>less than 4 inches</u> , or has created an obvious browse line, over the following extent:		Repeatedly - means the condition occurred in at least half of the last 10 years. [SR,AM,WBN,SBM,PD,EC]		
		0% (No evidence of such activities).	0		NoMowGraz	
		Trace to 5% of the normally vegetated AA (grazing, mowing, or fire have occurred but vegetation height effects are mostly unnoticeable).	0			
		5 to <50% of the normally vegetated AA.	0			
		50 to 95% of the normally vegetated AA.	1			
		>95% of the normally vegetated AA.	0			
F43	Historically Lacking Trees (HistVeg)	According to the ORWAP Report, the <u>presettlement vegetation class</u> in the vicinity of the AA was prairie, sagebrush, or other open lands not dominated by trees. In addition, the AA is not within the biennial floodplain of a river where trees and shrubs typically dominate when conditions are unaltered. Enter 1, if true.	1	In the ORWAP Report's Location Information table. This question is used as a classification variable mainly to set appropriate expectations for the extent of forest cover.	HistOpenland	
F44	Moss Wetland (Moss)	The AA's ground cover is primarily a deep layer of moss, and/or soils are mainly peat or organic muck. Also, the soil remains water-saturated to within 3 inches of the surface during most of a normal year. Surface water within the AA often is absent or confined to small scattered pools or ditches. Enter 1, if true.	0	Includes most bogs and fens. May be a floating island. [NR,CS,OE,WBF,WBN,Sens]		
F45	Woody Extent (WoodyPct)	Within the vegetated part of the AA, woody vegetation (trees, shrubs, robust vines) taller than 3 ft occupies:		Robust vines - include Himalayan blackberry and others that are generally erect and taller than 1 ft. Vegetated part - should not include floating-leaved or submersed aquatics. For sites larger than 1 acre, this should be determined from aerial imagery rather than estimated only in the field. [NR,WC,CS,SBM,PD,Sens]		
		<5% of the vegetated AA, and fewer than 10 trees are present. Enter 1 and SKIP to F51.	0		NoWoody	
		<5% of the vegetated AA, but more than 10 trees are present.	0			
		5 to <25% of the vegetated AA.	0			
		25 to <50% of the vegetated AA.	1			
		50 to 95% of the vegetated AA.	0			
F46	Woody Diameter Classes (TreeDiams)	>95% of the vegetated part of the AA.	0	Wooded upland edge - includes woody plants located within one tree-height of the wetland-upland boundary. DBH is the diameter of the tree measured at 4.5 ft above the ground. [CS,SBM,POL,Sens]		
		Select All the types that comprise >5% of the woody canopy cover in the AA or >5% of its wooded upland edge if any:				
		Deciduous 1-4" diameter (DBH) and >3 ft tall.	1			
		Evergreen 1-4" diameter and >3 ft tall.	0			
		Deciduous 4-9" diameter.	1			
		Evergreen 4-9" diameter.	0			
		Deciduous 9-21" diameter.	0			
		Evergreen 9-21" diameter.	0			
		Deciduous >21" diameter.	0			
		Evergreen >21" diameter.	0			

F47	Snags (Snags)	The number of large snags (diameter >12 inches) in the AA plus 100 ft uphill of its edge is:		Snags - are standing trees at least 20 ft tall that are mainly without bark or foliage.		
		Few or none.	1	[SBM,POL]		
		Several.	0			
F48	Abovewater Wood (WoodOver)	The number of horizontal wood pieces thicker than 4 inches that are <u>partly submerged</u> during most of the spring or early summer, thus <u>potentially serving as basking sites</u> for turtles, birds, or frogs and cover for fish is:		Only the wood that is <u>at or above the water surface</u> is assessed because of the impracticality of assessing underwater wood accurately when using a rapid assessment method.		
		None.	1	[FA,FR,AM]		
		Few.	0			
		Several (e.g., >3 per 300 ft of channel or shoreline).	0			
F49	Downed Wood (WoodDown)	The number of downed wood pieces longer than 6 ft and with diameter >4 inches that are not submerged during most of the growing season, is:		Exclude temporary "burn piles."		
		Few or none.	1	[INV,AM,SBM,POL]		
		Several.	0			
F50	Exposed Shrub Canopy (ShrExpos)	Within the vegetated part of the AA, shrubs shorter than 20 ft that are not overtopped by trees occupy. Select first statement that is true.		Vegetated part - should not include floating-leaved or submersed aquatics.		
		<5% of the vegetated AA and <0.01 acre (400 sq ft).	0	[SBM,PD]		
		5 to <25% of the vegetated AA or the water edge (whichever is greater in early summer).	1			
		25 to <50% of the vegetated AA or the water edge (whichever is greater in early summer).	0			
		50 to 95% of the vegetated AA or the water edge (whichever is greater in early summer).	0			
		>95% of the vegetated part of the AA or the water edge (whichever is greater in early summer).	0			
F51	N Fixers (Nfix)	The percentage of the vegetated area in the AA <u>or</u> along its water edge (whichever has more) that contains nitrogen-fixing plants (e.g., alder, Baltic rush, scotch broom, lupine, clover, alfalfa, other legumes) is:		For a more complete list, see <u>ORWAP SupplInfo</u> worksheet NFIX (includes native and non-native species). Do not include algae.		
		<1% or none.	0	[OE,INV,Sens]		
		1 to <25%.	1			
		25 to <50%.	0			
		50 to 75%.	0			
		>75%.	0			
Note for the next four questions: If the AA lacks an upland edge, evaluate based on the AA's <u>entire perimeter</u> and outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.						
F52	Upland Perennial Cover % of Perimeter (PerimPctPer)	The percentage of the AA's <u>edge (perimeter)</u> that is comprised of a band of upland perennial cover wider than 10 ft and taller than 6 inches, during most of the growing season is:		Perennial cover - vegetation that includes wooded areas, native prairies, sagebrush, as well as relatively unmanaged commercial lands in which the ground is disturbed less frequently than annually such as perennial ryegrass fields, hayfields, lightly grazed pastures, timber harvest areas, and rangeland.		
		<5%.	0	It <u>does not</u> include water, row crops (vegetable, orchards, Christmas tree farms), residential areas, golf courses, recreational fields, pavement, bare soil, rock, bare sand, or gravel or dirt roads. [WCv,SRv,PRv,INV,FA,AM,WBF,WBN,SBM,PD,POL,POLv,Sens,STR]		
		5 to <25%.	0			
		25 to <50%.	1			
		50 to <75%.	0			
		75 to 95%.	0			
		>95%.	0			

F53	Upland Perennial Cover Width (Buffer) (BufWidth)	Along the greatest extent of the AA's <u>upland edge</u> , the width of <u>perennial cover</u> taller than 6 inches that extends upslope from the AA until mostly shorter or non-perennial cover is reached is: [NOTE: the width is not necessarily the maximum width. Base on vegetation that occurs most of the growing season.]		Upland edge - is the land within 3 ft of the wetland's perimeter that is not wetland. [WCv,SRv,PRv,INV,FA,AM,WBN,SBM,PD,POL,Sens,STR]		
		< 5 ft. or none.	0		NoUpPerCov	
		5 to <30 ft.	1			
		30 to <50 ft.	0			
		50 to <100 ft.	0			
		100 to 300 ft.	0			
		> 300 ft.	0		AllUpPerren	
F54	Upland Trees as % of All Perennial Cover (UpTreePctPer)	Within 100 ft. landward from the AA's <u>edge (perimeter)</u> , the percentage of the upland perennial cover that is woody plants taller than 20 ft is:		Base this on the cumulative canopy width of the trees. [WSv,FA,WBF,WBN,SBM]		
		<5%, or there is no upland perennial cover along the upland edge.	0			
		5 to <25% of perennial cover.	1			
		25 to <50% of perennial cover.	0			
		50 to <75% of perennial cover.	0			
		75 to 95% of perennial cover.	0			
		>95% of perennial cover.	0			
F55	Weeds - % of Upland Edge (UpWeed)	Along the AA's <u>edge (perimeter)</u> , the cover of invasive woody or herbaceous plants occupies: [If vegetation is so senesced that apparently-dominant edge species cannot be identified even to genus, answer "none"].		See <u>QRWAP_SupplInfo file, worksheet P_Invas.</u> Some of the most common invaders along upland edges of Oregon wetlands are Himalayan blackberry, knotweed, sweetbrier rose, Russian olive, English ivy, nightshade, pepperweed, medusahead, white clover, ryegrass, quackgrass, false brome, bentgrass, dandelion, oxeye daisy, pennyroyal, bull and creeping thistles, tansy ragwort, poison hemlock, and teasel. If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an invasive species, assume the unidentified plant to also be invasive.		
		<5%, or none.	0			
		5 to <25%.	0			
		25 to <50%.	1			
		50 to <75%.	0			
		75 to 95%.	0			
		>95%.	0	[PD,STR]		
F56	Bare Ground & Accumulated Plant Litter (Goover)	Consider the parts of the AA that go dry during a normal year. Viewed from <u>6 inches above the soil surface</u> , the condition in most of that area just before the year's longest inundation period begins is:		Bare ground - includes unvegetated soil, rock, sand, or mud between stems if any. Bare ground under a tree or shrub canopy should be counted. Wetlands that are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season.		
		<u>Little or no (<5%) bare ground</u> is visible between erect stems or under canopy and there is little or no dead detached plant tissue (thatch) remaining on top of the ground surface and ground surface is extensively blanketed by moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0			
		<u>Some (5-20%) bare ground</u> or remaining thatch is visible. Herbaceous plants have moderate stem densities and do not closely hug the ground.	1	[WS,WC,SR,PR,NR,CS,OE,INV,AM,SBM,POL,Sens,EC]		
		<u>Much (20-50%) bare ground</u> or thatch is visible. Low stem density and/or tall plants with little living ground cover during early growing season.	0			
		<u>Mostly (>50%) bare ground</u> or thatch.	0			
		Not applicable. All of the AA is inundated throughout most years.	0			
F57	Ground Irregularity (Glrreg)	In parts of the AA that lack persistent water, the number of small pits, raised mounds, hummocks, boulders, upturned trees, animal burrows, islands, natural levees, wide soil cracks, and microdepressions is:		Microtopography - refers mainly to vertical relief of <3 ft and is represented only by inorganic features, except where plants have created depressions or mounds of soil. Consider the microtopography to be " <u>few or none</u> " if one could walk easily through most of the AA once any slash and logs are removed. Consider it to be " <u>several</u> " if one has to constantly look down and check balance.		
		Few or none, or the entire AA is always water-covered. Minimal microtopography ; <1% of the AA, e.g., many flat sites having a single hydroperiod.	0			
		Intermediate.	1			
		Several (extensive micro-topography).	0	[WS,SR,PR,NR,INV,AM,SBM,PD,POL,EC]		
F58	Soil Composition (SoilTex)	Based on digging into the substrate and examining the <u>surface layer</u> of the soil (2 inch depth) that was mapped as being predominant, its composition (excluding duff and living roots) is mostly:		Do not base the texture on soil maps unless the AA is inaccessible. See <u>QRWAP Manual's</u> protocol (Step 2 of section 5.3 and the soil chart in Appendix B). Judge which soil type is predominant <u>only in the part of the AA that is not inundated</u> at the time of your visit.		
		Loamy: includes silt, silt loam, loam, sandy loam.	0			
		Clayey: includes clay, clay loam, silty clay, silty clay loam, sandy clay, sandy clay loam.	1			
		Organic: includes muck, mucky peat, peat, and mucky mineral soils (blackish or grayish). Exclude live roots unless they are moss.	0	Duff - is loose organic surface material, e.g., dead plant leaves and stems). Organic soils are much less common in floodplains.		
		Coarse: includes sand, loamy sand, gravel, cobble, stones, boulders, fluvents, fluvaquents, riverwash.	0	[WS,PR,NR,CS,OE,PD,Sens]		
F59	Cliffs or Banks (Cliff)	Within 300 ft of the AA, there are elevated terrestrial features such as cliffs, bluffs, talus slopes, or unarmored stream banks that extend at least 6 ft nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1, if true.	0	[SBM,POL]		

F60	Restored or Created Wetland (NewWet)	The AA is (or is within, or contains) a "new" wetland resulting from human actions (e.g., excavation, impoundment) or other factors affecting what was upland (non-hydric) soil. Or, some part of the AA was originally a wetland, was artificially drained for many years, and has since had its water regime partly or wholly restored or rehabilitated (e.g., by ditch plugs, berms, tile breakage, non-maintenance).		Include wetlands whose area was likely expanded by road berms which impeded runoff, but do not include wetlands created by beaver dams except for the part where flooding affected uplands (not just existing wetlands and streams). Determine this using historical aerial photography, old maps, soil maps, consultation with landowners, and/or permit files as available.		
		Yes, and constructed or restored mostly within last 3 years.	0			
		Yes, and constructed or restored mostly 3-7 years ago.	0			
		Yes, and constructed or restored mostly >7 years ago.	0			
		Yes, but time of origin or restoration unknown.	0			
		No.	1			
	Unknown if wetland is constructed, restored, or natural.	0	[PR,NR,CS,OE,PD,Sens]	NotNewWet		
F61	Ownership (Ownership)	Most of the AA is:		An initial indication of ownership can be found on the ORWAP Map Viewer under the Land Ownership layer (expand Land Classification). However, it is advisable to ask local sources or use local maps with higher precision. [PUv]		
		Publicly owned (municipal, county, state, federal).	0			
		Owned by non-profit conservation organization or easement holder who allows public access to this AA.	0			
		Other private ownership, including tribal. Enter 1 and SKIP to F63.	1			
F62	Special Protected Area Designation (Desig)	The AA is part of an area designated as a Special Protected Area according to the USGS Protected Areas Database of the U.S. Enter 1, if true.	0	See the ORWAP Map Viewer Report under the Location Information section for "In Special Protected Area?" [PUv]		
F63	Conservation Investment (ConsInvest)	The AA is not a mitigation wetland, but public funds or community volunteer efforts have been applied to preserve, create, restore, or enhance the condition or functions of the wetland. (e.g. CRP or WRP wetlands, community projects). Enter 1, if true. (If unknown, leave 0).	0	Locations of some restoration wetlands can be found in the ORWAP Map Viewer under Restoration. Another potential source is the Conservation Registry : https://oregonexplorer.info/content/conservation-registry?topic&ptopic [PUv]		
F64	Compensation Wetland (MitWet)	The AA is all or part of a compensation site used explicitly to offset impacts elsewhere. Enter 1, if true. (If unknown, leave 0).	0	Answer to the best of your knowledge. Sources for information include the property owner, DSL, and/or the ACOE. [PUv]		
F65	Sustained Scientific Use (SciUse)	Plants, animals, or water in the AA have been monitored for >2 years, <u>unrelated to any regulatory requirements, and data are available to the public</u> . Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Enter 1, if true. (If unknown, leave 0)	0	[PUv]		
F66	Visibility (Visibil)	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 300 ft of the AA is (Select ONE):		[WBFv,WBNv,SBMv,PUv,STR]		
		<25%.	1			
		25 - 50%.	0			
		>50%.	0			

F67	Non-consumptive Uses - Actual or Potential (RecPoten)	Select All statements that are true of this AA as it currently exists:		The question assumes access is allowed.		
		Walking is physically possible in >5% of the AA during most of year (e.g., free of deep water and dense shrub thickets).	1	[PUv]		
		All or part of the AA (or an area within sight of the AA and within 100 ft) would be physically accessible to people in wheelchairs (e.g., paved and flat).	0			
		Maintained roads, parking areas, or foot-trails are within 30 ft of the AA, or the AA can be accessed most of the year by boat.	0			
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0			
F68	Core Area 1 (VisitNo)	The percentage of the AA almost never walked or driven by humans during an average growing season probably comprises: [Note: If more than half the wetland is visible from areas within 100 ft of the AA, include visits by people to those areas that are actually walked or driven (not simply viewed from)].		Judge this based on proximity to population centers, roads, trails, accessibility of the AA to the public, wetland size, usual water depth, and physical evidence of human visitation.		
		<5% and no inhabited building is within 300 ft of the AA.	0	Exclude visits that are not likely to continue and/or that are not an annual occurrence (e.g., by construction, maintenance, or monitoring crews).		
		<5% and inhabited building is within 300 ft of the AA.	1			
		5 to <50% and no inhabited building is within 300 ft of the AA.	0	[AM,WBF,WBN,SBM,PD,PUv,STR]		
		5 to <50% and inhabited building is within 300 ft of the AA.	0			
		50 to 95% with or without inhabited building nearby.	0			
		>95% of the AA with or without inhabited building nearby.	0			
F69	Core Area 2 (VisitOften)	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [The Note in the preceding question applies here as well].		See note above.		
		<5%.	0	[AM,WBF,WBN,SBM,PD,PUv,STR]		
		5 to <50%.	1			
		50 to 95%.	0			
		>95% of the AA.	0			
F70	Consumptive Uses (Provisioning Services) (Hunt)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select All that apply.		Evidence of these consumptive uses may consist of direct observation, or presence of physical evidence (e.g., recently cut stumps, fishing lures, shell cases), or might be obtained from communication with the land owner or manager.		
		Low-impact commercial timber harvest (e.g., selective thinning).	0			
		Commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0			
		Waterfowl hunting.	0	[FRv,WBFv,PUv]		
		Fishing.	0			
		Trapping of furbearers.	0			
		None of the above.	1			
F71	Domestic Wells (Wells)	Wells or water bodies that currently provide drinking water are:		If unknown, assume this is true if there is an inhabited structure within the specified distance and the neighborhood is known to not be connected to a municipal drinking water system (e.g., is outside an urban growth boundary or other densely settled area).		
		<300 ft and downslope from the AA or at same elevation.	0			
		300 to 1500 ft and downslope or at same elevation.	1			
		>1500 ft downslope, or none downslope, or no information.	0	[NRv]		

F72	Wetland Type of Conservation Concern (Rare Type)	Does the AA contain, or is it part of, any of these wetland types? Select All that apply.	W	Consult the <u>ORWAP Report</u> under the Location Information table for "Rare Wetland Types." But be aware that it may not apply to the exact AA you have delimited. IPDv, SensI	
		<u>Mature forested wetland</u> (anywhere): a wetland in which mean diameter of trees (d.b.h., FACW and FAC species only) exceeds 18 inches, and/or the average age of trees exceeds 80 years, or there are >5 trees/acre with diameter >32 inches.	0	To qualify, the diameter of >18 inches must be the mean measured from at least 10 trees.	
		<u>Bog or Fen</u> : contains a sponge-like organic soil layer which covers most of the AA and often has extensive cover of sedges and/or broad-leaved evergreen shrubs (e.g., Ledum). Often lacks tributaries, being fed mainly by groundwater and/or direct precipitation.	0		
		<u>Playa, Salt Flat, or Alkaline Lake</u> : a nontidal ponded water body usually having saline (salinity >1 ppt or conductivity >1000 µS) or alkaline (conductivity >2000 µS and pH >9) conditions and large seasonal water level fluctuations (if inputs-outputs unregulated). If a playa or salt flat, vegetation cover is sparse and plants typical of saline or alkaline conditions (e.g., Distichlis, Atriplex) are common.	0	See <u>ORWAP_SupplInfo</u> file, worksheet P_Salt for species typically occurring in tidal or saline conditions.	Playa
		<u>Hot spring</u> (anywhere): a wetland where discharging groundwater in summer is >10 degrees (F) warmer than the expected water temperature.	0		
		<u>Native wet prairie</u> (west of the Cascade crest): a seasonally inundated wetland, usually without a naturally-occurring inlet or outlet, and dominated primarily by native graminoids often including species in column E.	0	Deschampsia caespitosa, Danthonia californica, Camassia quamash, Triteleia hyacinthina, Carex densa, C. aperta, and/or C. unilateralis	
		<u>Vernal pool (Willamette Valley)</u> : a seasonally inundated wetland, underlain by hardpan or claypan, with hummocky micro-relief, usually without a naturally-occurring inlet or outlet, and with native plant species distinctly different from those in slightly higher areas, and often including species in column E.	0	Downingia elegans, Isoetes nuttallii, Triteleia hyacinthina, Eleocharis spp., Eryngium petiolatum, Plagiobothrys figuratus, Plagiobothrys scouleri, Grindelia nana, Veronica peregrina, Lasthenia glaberrima, Cicendia quadrangularis, Kickxia elatine, Gnaphalium palustre, and/or Callitriche spp.	
		<u>Vernal pool (Medford area)</u> : a seasonally inundated acidic wetland, underlain by hardpan, with hummocky micro-relief, usually without a naturally-occurring inlet or outlet, and having concentric rings of similar native vegetation, often including species in column E.	0	Downingia vana, Isoetes nuttallii, Pilularia americana, Triteleia hyacinthina, Eleocharis spp., Eryngium petiolatum, Plagiobothrys bracteatus, Plagiobothrys scouleri, Grindelia nana, Veronica peregrina, Alopecurus saccatus, Lasthenia californica, Deschampsia danthonioides, and/or Callitriche spp.	
		<u>Vernal pool (Modoc basalt & Columbia Plateau)</u> : a seasonally inundated wetland, usually without a naturally-occurring inlet or outlet, located on shallow basalt bedrock and often having species in column E.	0	Blennosperma nanum, Camassia quamash, Epilobium densiflorum, Callitriche marginata, Cicendia quadrangularis, Eryngium vaseyi, Psilocarphus brevissimus, and/or Sedella pumila.	
		<u>Interdunal wetland (Coastal ecoregion)</u> : a seasonally inundated wetland, usually without a naturally-occurring inlet or outlet, located between sand dunes where wind has scoured the sand down to the water table (deflation plain, blowout pond), and often with significant cover of the native species in column E.	0	Carex obnupta, Argentina egedii, Juncus tesuueuii, J. nevadensis, J. falcatus, Sisyrinchium californicum, and/or Salix hookeriana	
		<u>Ultramafic soil wetland (mainly southwestern Oregon)</u> : a low-elevation wetland, usually with a sponge-like organic soil layer, occurring in an area with exposed serpentine or peridotite rock, and/or in soils with very low Ca:Mg ratios.	0		
		None of above.	1		

Site: NEXT Renewable Fuels Oregon (Wetlands 1-3)		Name: Sue Brady		Date:10/1/20			
Form S Stresser Data ORWAP V 3.2					Data	Comments	
S1	Aberrant Timing of Water Inputs (AltTiming) <i>In the "Data" column, place an X next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times).</i>						
	Control structure that regulates inflow to the AA (including tide gates), or flow regulation in tributaries, or water level in adjoining water body is regulated.						
	Irrigation runoff or seepage.					X	
	Snow storage areas that drain directly to the wetland.						
	Increased pavement and other impervious surface in the CA.						
	Straightening, ditching, dredging, and/or lining of tributary channels in the CA.					X	
	<i>If any items were checked above, then for each row of the table below, you may assign points (3, 2, or 1). However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition, if the checked items never occurred or were no longer present.</i>						
		Severe (3 pts)	Medium (2 pts)	Mild (1 pt)			
	Spatial extent within the AA of timing shift.	>95% of AA.	5-95% of AA.	<5% of AA.	2		
	When most of the timing shift began.	<3 yrs ago.	3-9 yrs ago.	10-100 yrs ago.	1		
	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the AA that experiences those.</i>						
	Input timing now vs. previously.	Shift of weeks.	Shift of days.	Shift of hours or minutes.	0		
	Flashiness or muting.	Became very flashy or controlled.	Intermediate.	Became mildly flashy or controlled.	0		
				Sum=	3		
				Final score=	0.25		
S2	Accelerated Inputs of Nutrients (NutrLoad) <i>In the "Data" column, place an X next to any item – occurring in either the AA or its RCA – that is likely to have accelerated the inputs of nutrients (nitrogen, phosphorus) to the AA.</i>						
	Stormwater or wastewater effluent (including failing septic systems), landfills.						
	Fertilizers applied to lawns, ag lands, or other areas in the RCA.					X	
	Livestock, dogs.					X	
	Artificial drainage of upslope lands.					X	
	Other waterborne human-related nutrient sources within the RCA.						
	<i>If any items were checked above, then for each row of the table below, you may assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>						
		Severe (3 pts)	Medium (2 pts)	Mild (1 pt)			
	Usual load of nutrients.	Large (e.g., feedlots, extensive residential on septic) or 303d* for nutrients.	Moderate (e.g., grazing, light residential on septic, light agriculture).	Limited (e.g., a few animals, lawns, sewered residential).	2		
	Frequency & duration of input.	Frequent and year-round.	Frequent but mostly seasonal.	Infrequent & during high runoff events mainly.	3		
	AA proximity to main sources (actual or potential).	0 - <50 ft.	50-300 ft. or in groundwater.	In other part of contributing area.	3		
				Sum=	8		
				Final score=	0.89		
S3	Accelerated Inputs of Contaminants and/or Salts (Contamin). <i>In the "Data" column, place an X next to any item – occurring in either the AA or its RCA – that is likely to have accelerated the inputs of contaminants or salts to the AA.</i>						
	Stormwater or wastewater effluent (including failing septic systems), landfills, snow storage areas.						
	Metals & chemical wastes from mining, shooting ranges, oil/gas extraction, other sources.						
	Irrigation of lands, especially those with saline soils.					X	
	Oil or chemical spills (not just chronic inputs) from nearby roads.						
	Road salt.						
	Pesticides applied to lawns, ag lands, roadsides, or other areas in the RCA, but excluding spot applications for controlling non-natives in the AA.					X	
	Artificial drainage of contaminated or saline soils.						
	Erosion of contaminated soils.						
	Other contaminant sources within the RCA.						
	<i>If any items were checked above, then for each row of the table below, you may assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>						
		Severe (3 pts)	Medium (2 pts)	Mild (1 pt)			
	Usual toxicity of most toxic contaminants.	Industrial effluent or 303d* for toxics.	Wastewater treatment plant, cropland, fossil fuel extraction, pipeline, power station, managed landfill.	Low density residential or commercial.	2		
	Frequency & duration of input.	Frequent and year-round.	Frequent but mostly seasonal.	Infrequent & during high runoff events mainly.	2		
	AA proximity to main sources (actual or potential).	0 - <50 ft.	50-300 ft. or in groundwater.	In other part of contributing area.	3		
	<i>* See ORWAP Map Viewer for waters designated as 303d; see Oregon DEQ web site for reasons.</i>						
				Sum=	7		
				Final score=	0.78		

S4	Excessive Sediment Loading from Runoff Contributing Area (SedRCA).				
In the "Data" column, place an X next to any item present in the RCA that is likely to have elevated the load of waterborne or windborne sediment reaching the AA from its RCA.					
Erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires.				X	
Erosion from construction, in-channel machinery in the RCA.				X	
Erosion from off-road vehicles in the RCA.					
Erosion from livestock or foot traffic in the RCA.				X	
Stormwater or wastewater effluent.					
Sediment from road sanding, gravel mining, other mining, oil/ gas extraction.					
Accelerated channel downcutting or headcutting of tributaries due to altered land use.					
Other human-related disturbances within the RCA.					
If any items were checked above, then for each row of the table below you may assign points (3, 2, or 1) in the last column that describe the combined maximum effect of those items in increasing the amount or transport of sediment into the AA. To estimate that, contrast it with the condition if checked items never occurred or were no longer present.					
	Severe (3 pts)	Medium (2 pts)	Mild (1 pt)		
Erosion in RCA.	Extensive evidence, high intensity*.	Potentially (based on high-intensity* land use) or scattered evidence.	Potentially (based on low-intensity* land use) with little or no direct evidence.	2	
Recentness of significant soil disturbance in the RCA.	Current & ongoing.	1-12 months ago.	>1 yr ago.	2	
Duration of sediment inputs to the AA.	Frequent and year-round.	Frequent but mostly seasonal.	Infrequent & mainly during high runoff or severe wind events.	2	
AA proximity to actual or potential sources.	0 - <50 ft., or farther but on steep erodible slopes.	50-300 ft.	In other part of contributing area.	3	
*High-intensity= plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment.				Sum=	
				Final score=	
				0.75	
S5	Soil or Sediment Alteration Within the Assessment Area (SoilDisturb).				
In the "Data" column, place an X next to any item present in the AA that is likely to have compacted, eroded, or otherwise altered the AA's soil.					
Compaction from livestock, machinery, off-road vehicles, or mountain bikes, especially during wetter periods.				X	
Leveling or other grading not to the natural contour.				X	
Tillage, plowing (but excluding disking for enhancement of native plants).				X	
Fill, riprap, other armoring, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil stockpiled or imported from another wetland.					
Excavation.				X	
Dredging in or adjacent to the AA.				X	
Boat traffic in or adjacent to the AA and sufficient to cause shore erosion or stir bottom sediments.					
Artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments.					
If any items were checked above, then for each row of the table below you may assign points (3, 2, or 1) in the last column that describe the combined maximum effect of those items in altering the AA's soils. To estimate that, contrast it with the soil condition if checked items never occurred or were no longer present.					
	Severe (3 pts)	Medium (2 pts)	Mild (1 pt)		
Spatial extent of altered soil.	>95% of AA or >95% of its upland edge (if any).	5-95% of AA or 5-95% of its upland edge (if any).	<5% of AA and <5% of its upland edge (if any).	2	
Recentness of significant soil alteration in AA.	Current & ongoing.	1-12 months ago.	>1 yr ago.	3	
Duration.	Long-lasting, minimal veg recovery.	Long-lasting but mostly revegetated.	Short-term, revegetated, not intense.	2	
Timing of soil alteration.	Frequent and year-round.	Frequent but mostly seasonal.	Infrequent & mainly during scattered events.	2	
				Sum=	
				Final score=	
				0.75	

Oregon Rapid Wetland Assessment (ORWAP) V.3.2.*	Cover Page: Basic Description of Assessment
Site Name:	EXT Renewable Fuels Oregon (mitigation pre-construction)
Investigator Name:	Sue Brady
Date of Field Assessment:	5/6/2021
County:	Columbia
Nearest Town:	Clatskanie
Latitude (decimal degrees):	46.162572
Longitude (decimal degrees):	-123.177233
TRS, quarter/quarter section and tax lot(s):	T8N R4W Sections 21, 27, 28, 33, 34
Approximate size of the Assessment Area (AA, in acres):	580
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	50%
If delineated, DSL file number (WD #) if known:	delineation number not yet assigned
Cowardin Systems & Classes (indicate all present, based on field visit and/or aerial imagery): <u>Systems:</u> Palustrine =P, Riverine =R, Lacustrine =L, Estuarine =E <u>Classes:</u> Emergent =EM, Scrub-Shrub =SS, Forested =FO, Aquatic Bed (incl. SAV) =AB, Open Water =OW, Unconsolidated Bottom =UB, Unconsolidated Shore =US	PEM, PSS, PFO
Predominant HGM Class: Estuarine=E, Lacustrine=L, Riverine=R, S= Slope, F= Flats, D= Depressional	Flats
Soil Unit Mapped in Most of the AA:	Wauna-Locoda silt loams, protected
If tidal, the tidal phase during most of visit:	n/a
What percent (approximate) of the wetland were you able to visit?	50
What percent (approximate) of the AA were you able to visit?	100
Have you attended an ORWAP training session? If so, indicate approximate month & year.	Oct-11
How many wetlands have you assessed previously using ORWAP (approximate)?	20+
Comments about the site or this ORWAP assessment (attach extra page if desired):	In order to evaluate the pre-construction functions and values of the site, this assessment is for the projected condition after the existing timber plantations have been harvested.

ORWAP V.3.2 Site Name:	NEXT Renewable Fuels Oregon (mitigation pre-construction)
Investigator Name:	Sue Brady
Date of Field Assessment:	5/6/2021
<i>Scores will appear below after data are entered in worksheets OF, F, T, and S. See Manual for definitions and descriptions of how scores were computed and ratings assigned.</i>	

Normalized Scores & Ratings for this Assessment Area (AA):								
Specific Functions or Values:	Function Score	Function Rating	Rating Break Proximity	Values Score	Values Rating	Rating Break Proximity	Function Score (raw)	Values Score (raw)
Water Storage & Delay (WS)	3.13	Lower		0.00	Lower		3.13	0.00
Sediment Retention & Stabilization (SR)	3.55	Lower	LM	9.52	Higher		3.85	7.25
Phosphorus Retention (PR)	5.25	Moderate		8.02	Higher		5.43	6.67
Nitrate Removal & Retention (NR)	3.57	Lower	LM	10.00	Higher		4.81	10.00
Anadromous Fish Habitat (FA)	0.00	Lower		0.00	Lower		0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower		0.00	Lower		0.00	0.00
Amphibian & Reptile Habitat (AM)	7.76	Higher		3.57	Lower		7.04	3.57
Waterbird Nesting Habitat (WBN)	7.00	Higher	MH	10.00	Higher		5.81	10.00
Waterbird Feeding Habitat (WBF)	9.00	Higher		10.00	Higher		8.12	10.00
Aquatic Invertebrate Habitat (INV)	1.78	Lower		2.58	Lower		4.01	3.07
Songbird, Raptor, Mammal Habitat (SBM)	5.00	Moderate		10.00	Higher		6.31	10.00
Water Cooling (WC)	4.21	Moderate		10.00	Higher		3.69	9.55
Native Plant Diversity (PD)	6.20	Moderate	MH	2.05	Lower		5.56	2.05
Pollinator Habitat (POL)	6.88	Moderate	MH	5.15	Moderate	MH	6.01	4.17
Organic Nutrient Export (OE)	6.05	Moderate					5.36	
Carbon Sequestration (CS)	5.89	Moderate	MH				5.21	
Public Use & Recognition (PU)				3.40	Lower	LM		4.02

Other Attributes:	Score	Rating	Rating Break Proximity		
Wetland Sensitivity (SEN)	3.46	Moderate			5.22
Wetland Ecological Condition (EC)	5.52	Moderate	MH		6.45
Wetland Stressors (STR)	6.64	Higher			6.11

GROUPS	Selected Function	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity
Hydrologic Function (WS)	Water Storage & Delay (WS)	Lower		Lower	
Water Quality Support (SR, PR, or NR)	Phosphorus Retention (PR)	Moderate		Higher	
Fish Habitat (FA or FR)	Anadromous Fish Habitat (FA)	Lower		Lower	
Aquatic Habitat (AM, WBF, or WBN)	Waterbird Nesting Habitat (WBN)	Higher	MH	Higher	
Ecosystem Support (WC, INV, PD, POL, SBM, or OE)	Songbird, Raptor, Mammal Habitat (SBM)	Moderate		Higher	

NOTE: A score of 0 does not always mean the function or value is absent from the wetland. It usually means that this wetland has equal or less capacity than the lowest-scoring one, for that function or value, from among the 200 calibration wetlands that were assessed previously by Oregon Department of State Lands.

Date: 5/6/21		Name: Sue Brady		Site: NEXT Renewable Fuels Oregon (mitigation pre-construction)		
Form OF Office Data ORWAP V. 3.2		Conduct an assessment <u>only after reading the accompanying Manual and explanations in column E below</u> . Answering many of the following questions requires viewing aerial imagery and maps, covering an area up to within 2 miles of the AA. For each affirmative answer, change the 0 in the "Data" column to a "1" . Answer all items except where directed to skip to others. Questions whose cells in "Data" column have a "W" MUST be answered for the ENTIRE wetland and bordering waters.		For a list of functions to which each question pertains, see bracketed codes in column E. Codes for functions and their benefits are: WS= Water Storage, WC= Water Cooling, SR= Sediment Retention, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Aquatic Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibians & Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, & Mammal Habitat, POL= Pollinator Habitat, PD= Native Plant Diversity, PU= Public Use & Recognition, EC= Ecological Condition, Sens= Sensitivity, STR= Stressors.		For guidance and detailed descriptions of how Excel calculates the numbers in the Scores worksheet, see the Technical Supplement and Appendix C of the Manual. For a documented rationale for each indicator, open each of the worksheet tabs at the bottom (one for each function or value) and see column H.
#	Indicators	Condition Choices	Data	Explanations, Definitions. (Column E)	Cell Name	Comments
OF1	Distance to Extensive Perennial Cover (DistPerCov)	The distance from the <u>AA edge</u> to the edge of the closest patch or corridor of perennial cover (see definition in column E) larger than 100 acres is:		Corridor - is simply an elongated patch of perennial cover that is not narrower than 150 ft at any point.		
		<100 ft.	0	Perennial cover - is vegetation that includes wooded areas, native prairies, sagebrush, vegetated wetlands, as well as relatively unmanaged commercial lands in which the ground is disturbed less than annually, such as hayfields, lightly grazed pastures, timber harvest areas, and rangeland. <u>It does not</u> include water, row crops (e.g., vegetable, orchards, Christmas tree farms), lawns, residential areas, golf courses, recreational fields, pavement, bare soil, rock, bare sand, or gravel or dirt roads. [AM, WBN, PD, PDV, POL, SBM, Sens, STR]		
		100 to <300 ft.	0			
		300 to <1000 ft.	0			
		1000 ft. to <0.5 mile.	0			
		0.5 mile to 2 miles.	0			
> 2 miles.	0					
OF2	Distance to Tidal Waters (DistTidal)	The distance from the <u>AA edge</u> to the closest body of tidal water is:		Tidal water - If unclear whether a water body is tidal, check the <u>ORWAP Map Viewer's</u> Headtide layer (expand Hydrology), or check with local sources.		
		<1 mile.	1	Assume <u>Columbia River</u> is tidal east to Bonneville Dam and the Willamette River south to the Oregon City Falls.		
		1-5 miles.	0	[WBF]		
		>5 miles.	0			
OF3	Distance to Ponded Water (DistPond)	The distance from the <u>AA edge</u> to the closest (but separate) body of nontidal fresh water (wetland, pond, or lake) that is ponded all or most of the year is:		Use field observations, aerial imagery, and/or the <u>ORWAP Map Viewer's</u> Persistent Nontidal layer (expand Wetlands/National Wetlands Inventory).		
		<100 ft.	0	[AM, WBF, WBN, SBM, PD, Sens]		
		100 to <300 ft.	0			
		300 to <1000 ft.	0			
		1000 ft. to < 0.5 mile.	0			
		0.5 mile to 2 miles.	0			
>2 miles.	1					
OF4	Distance to Lake (DistLake)	The distance from the <u>AA edge</u> to the closest (but separate) body of nontidal fresh water (wetland, pond, or lake) that is ponded during most of the year and is larger than 20 acres (about 1000 ft on a side) is:		Use field observations, aerial imagery, and/or the <u>ORWAP Map Viewer's</u> Persistent Nontidal layer (expand Wetlands/National Wetlands Inventory).		
		<1 mile.	0	[WBF, WBN]		
		1-5 miles.	0			
		>5 miles.	1			
OF5	Distance to Herbaceous Open Land (DistOpenL)	The distance from the <u>AA edge</u> to the closest patch of herbaceous openland <u>larger than 10 acres</u> and in flat terrain is:		Herbaceous openland - includes both perennial and non-perennial cover. For example, it can include pasture, herbaceous wetland, meadow, prairie, ryegrass fields, row crops, herbaceous rangeland, golf courses, grassed airports, and hayfields.		
		<100 ft.	1	Do not include open water of lakes, ponds, or rivers; or unvegetated surfaces; or areas with woody vegetation. In dry parts of the state, croplands in flat areas are often irrigated and are distinctly greener in aerial images. Flat terrain - means slope of less than 5%. [WBF, WBN, POL]		
		100 to <300 ft.	0			
		300 to <1000 ft.	0			
		1000 ft. to < 0.5 mile.	0			
		0.5 mile to 2 miles.	0			
>2 miles.	0					
OF6	Distance to Nearest Busy Road (DistRd)	The distance from the <u>AA center</u> to the nearest road with an average daytime traffic rate of at least 1 vehicle/ minute is:		Estimate this traffic rate threshold using your judgment and considering the road width, local population, distance to densely settled areas, alternate routes, and other factors.		
		<100 ft.	0	[AM, SBM, PD, PU, STR]		
		100 to <300 ft.	0			
		300 to < 0.5 mile.	0			
		0.5 to <1 miles.	1			
		1 to 2 miles.	0			
>2 miles.	0					
OF7	Size of Largest Nearby Patch of Perennial Cover (SizePerenn)	Including the AA's vegetated area, the largest patch or corridor that is perennial cover and is contiguous with vegetation in the AA (i.e., not separated by roads or channels that create gaps wider than 150 ft), occupies:		Contiguous - Abutting, with no major physical separation that prohibits free exchange or flow of surface water (i.e., not separated by roads or channels that create gaps wider than 150 ft)		
		<.01 acre.	0	Perennial cover - See OF1. Disqualify any patch or corridor of perennial cover where it becomes separated from the AA by a gap of >150 ft, if the gap is comprised of unvegetated land or if the corridor narrows to less than 150 ft.		
		.01 to < 1 acre.	0			
		1 to <10 acres.	0			
		10 to <100 acres.	1			

		100 to <1000 acres.	0	100 ft.		
		1000 to 10,000 acres.	0	[AM,SBM,PD,POL,Sens,STR]		
		>10,000 acres.	0			
OF8	Wetland Type Local Uniqueness (UniqPatch)	Select EACH of the vegetation types below that comprise more than 10% of the AA AND less than 10% of a 0.5 mile radius around the AA. (See Column E).		This is a 2-part question: (1) If no vegetation class comprises more than 10% of the AA, answer "none of the above." (2) If a vegetation class does comprise more than 10%, determine if that vegetation class also comprises less than 10% of a 0.5 mile circle (~50 acres). [INV,AMy,WBFv,WBNv,SBMv,PDv,POLv,Sens]		
		Herbaceous vegetation (perennial grasses, sedges, forbs; not under a woody canopy; not crops).	0			
		Unshaded shrubland (woody plants shorter than 20 ft).	0			
		Trees (woody plants taller than 20 ft).	0			
		None of above.	1			
OF9	Perennial Cover Percentage (PerCovPct)	Within a 2-mile radius of the AA center, the percentage of land that has perennial cover is:		Perennial cover - is vegetation that includes wooded areas, native prairies, sagebrush, vegetated wetlands, as well as relatively unmanaged commercial lands in which the ground is disturbed less than annually, such as hayfields, lightly grazed pastures, timber harvest areas, and rangeland. It does not include water, row crops (e.g., vegetable, orchards, Christmas tree farms), lawns, residential areas, golf courses, recreational fields, pavement, bare soil, rock, bare sand, or gravel or dirt roads. [FA,AM,SBM,POL,Sens,STR]	PerennAll	
		<5% of the land.	0			
		5 to <20% of the land.	0			
		20 to <60% of the land.	1			
		60 to 90% of the land.	0			
		>90% of the land.	0			
OF10	Forest Percentage (ForestPct)	Within a 2-mile radius of the AA center, the cumulative amount of forest (regardless of forest patch sizes, and including any in the AA) is:		Forested patch - is a land cover patch that currently has >70% cover of woody plants taller than 20 ft. May be in a plantation. [FA,SBM,STR]		
		<5% of the circle.	0			
		5 to <20%.	0			
		20 to <50%.	1			
		50 to 80%.	0			
		>80%.	0			
OF11	Herbaceous Open Land Percentage (OpenLpct)	Within a 2-mile radius of the AA center, the amount of herbaceous openland in flat terrain is:		Herbaceous openland - can include both perennial and non-perennial cover. For example, it can include pasture, herbaceous wetland, meadow, prairie, ryegrass fields, row crops, herbaceous rangeland, golf courses, grassed airports, and hayfields. Do not include open water of lakes, ponds, or rivers; or unvegetated surfaces; or areas with woody vegetation. Flat terrain - means slope of less than 5%. [WBF,WBN,POL]		
		<5% of the land.	0			
		5 to <20%.	0			
		20 to <50%.	1			
		50 to 80%.	0			
		>80%.	0			
OF12	Landscape Wetland Connectivity (ConnScapeW)	Within a 2-mile radius of the AA center:		Corridor - is simply an elongated patch of perennial cover that is not narrower than 150 ft at any point. Regular traffic - is at least 1 vehicle per hour during the daytime throughout most of the growing season. Assess this based on local knowledge, type of road, and proximity to developed areas. Perennial - see OF9 for definition. [WBN,SBM,Sens,STR]		
		There are NO other wetlands.	0			
		There are other wetlands (or a wetland), but NONE are connected to the AA by a corridor of perennial vegetation. The corridor must be at least 150 ft wide along its entire length and not interrupted by roads with regular traffic.	0			
		There are other wetlands (or a wetland), and ALL are connected to the AA by the type of corridor described.	0			
		There are other wetlands (or a wetland), and ONE or MORE (but not all) are connected to the AA by the type of corridor described.	1			
OF13	Local Wetland Connectivity (ConnLocalW)	Within a 0.5 mile radius of the AA center:		Regular traffic - is at least 1 vehicle per hour during the daytime throughout most of the growing season. Assess this based on local knowledge, type of road, and proximity to developed areas. Perennial - see OF9 for definition. If possible, field verify. [AM,WBN,SBM,PD,Sens,STR]		
		There are NO other wetlands.	0			
		There are other wetlands (or a wetland), but NONE are connected to the AA by a corridor of perennial vegetation. The corridor must be at least 150 ft wide along its entire length and not interrupted by roads with regular traffic.	0			
		There are other wetlands (or a wetland), and ALL are connected to the AA by the type of corridor described.	0			
		There are other wetlands (or a wetland), and ONE or MORE (but not all) are connected to the AA by the type of corridor described.	1			
OF14	Wetland Number & Diversity Uniqueness (HUCbest)	According to the ORWAP Report, this AA is located in one of the HUCs that are listed as having a large diversity, area, or number of wetlands relative to the area of the HUC. Select ALL of the following that are true:		In the ORWAP Report, under the Watershed Information section and the HUC Best table, look at the columns "Is HUC Best?" and "Greatest Criteria Met." [AM,WBF,WBN,SBM,Sens]		
		Yes, for the HUC8 watershed	1			
		Yes, for the HUC10 watershed	0			
		Yes, for the HUC12 watershed	0			
		None of above.	0			
		Data are inadequate (NWI mapping not completed in HUC).	0			
OF15	Landscape Functional Deficit (GIScore)	In the ORWAP Report, find the HUC 12 Functional Deficit table. Select ALL functions below that have a notation for that HUC.		In the ORWAP Report, under the Watershed Information section, look at the Functional Deficit table. Enter 1 for each of the listed functions that are noted. These are HUCs in which a relatively small number, or proportional area, of the wetlands are likely to be performing the named function, thus adding value to those that are.		
		Water storage (WS)	0			
		Sediment retention (SR)	0			
		Nutrient transformation (NT)	0			

		Thermoregulation (WC)	0	See ORWAP's Technical Supplement for explanation of how the FundDeficit was calculated.		
		Aquatic invertebrate habitat (INV)	0			
		Amphibian habitat (AM)	0	[WCV, WCV, SRV, PRV, INV, FAV, AMV, WBNV]		
		Fish habitat (FH)	0			
		Waterbird habitat (WB)	0			
		None of above.	1			
		No data.	0			
OF16	Conservation Designations of the AA or Local Area (ConDesig)	On the ORWAP Map Viewer, use the layers indicated below to answer. Select All of the following that are true:		In the ORWAP Map Viewer, use the applicable layers.		
		(a) The AA is within or connected to a stream or other water body and this stream or water body has been designated as ESH within 0.5 miles of the AA, according to the Essential Salmonid Habitat (ESH) layer.	0	Include areas not shown as ESH, if ODFW has confirmed they qualify as ESH. [WCV, FA, FAV]		
		(b) The AA is within or contiguous to a designated Oregon's Greatest Wetlands , according to the map layer of that name.	0	Oregon's Greatest Wetlands identifies the most biologically and ecologically significant wetlands in the State of Oregon. [PU]		
		(c) The AA is within an Important Bird Area (IBA) , as officially designated, according to the map layer of that name.	1	[WBFV, WBNV]		
		None of above.	0			
OF17	Non-anadromous Fish Species of Conservation Concern (RareFR)	According to the ORWAP Report, the score for occurrences of rare non-anadromous fish species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp. Info file for a list of species.		
		High (≥ 0.75 for maximum score, or ≥ 0.90 for this group's sum score), or there is a recent (within 5 years) onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	Species include Miller Lake lamprey, Goose Lake lamprey, Pit sculpin, Lahontan cutthroat trout, Inland Columbia Basin redband trout, Steelhead (Snake River Basin ESU), Alvord chub, Goose Lake tui chub, Borax Lake chub, Lahontan redband, Oregon chub, Goose Lake sucker, Tahoe sucker, Warner sucker, Shorthorn sucker, Lost River sucker. Note that for some of these species, only specific geographic populations are designated. [FRV]		
		Intermediate (i.e., not as described above or below).	0			
		Low (≤ 0.33 for both the maximum score this group's sum score, but not 0 for both).	0			
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1	This question may need to be revised after the field visit.		
OF18	Amphibian or Reptile of Conservation Concern (AmphRare)	According to the ORWAP Report, the score for occurrences of rare amphibian or reptile species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp. Info file for a list of species.		
		High (≥ 0.60 for maximum score, or ≥ 0.90 for sum score), or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	Species include: Black salamander, California slender salamander, Copia's giant salamander, Rocky Mountain tailed frog, Woodhouse's toad, Foothill yellow-legged frog, Northern leopard frog, Oregon spotted frog, Columbia spotted frog.		
		Intermediate (i.e., not as described above or below).	0			
		Low (≤ 0.21 for maximum score AND < 0.15 for sum score, but not 0 for both).	0			
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1	[AMV] This question may need to be revised after the field visit.		
OF19	Feeding (Non-breeding) Waterbird Species of Conservation Concern (RareWBF)	According to the ORWAP Report, the score for occurrences of rare non-breeding (feeding) waterbird species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp. Info file for a list of species.		
		High (≥ 0.33 for maximum score, or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	Non-breeding - mainly refers to waterbird feeding during migration and winter. California brown pelican, Aleutian cackling goose, Dusky Canada goose.		
		Low (≤ 0.33 for maximum score and for sum score, but not 0 for both).	0	[WBFV]		
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1	This question may need to be revised after the field visit.		
OF20	Nesting Waterbird Species of Conservation Concern (RareWBN)	According to the ORWAP Report, the score for occurrences of rare nesting waterbird species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp. Info file for a list of species.		
		High (≥ 0.60 for maximum score, or ≥ 1.00 for this group's sum score), or there is a recent breeding-season observation of any of these species onsite by a qualified observer under conditions similar to what now occur.	0	Species include: Horned grebe, Red-necked grebe, Western grebe, Clark's grebe, American white pelican, Least bittern, Snowy egret, Trumpeter swan, White-faced ibis, Harlequin duck, Bufflehead, Yellow rail, Western snowy plover, Upland sandpiper, Franklin's gull, Marbled murrelet.		
		Intermediate (i.e., not as described above or below).	0			
		Low (≤ 0.09 for maximum score and for sum score, but not 0 for both).	0	[WBNV]		
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species during breeding season by a qualified observer under conditions similar to what now occur.	1	This question may need to be revised after the field visit.		
OF21	Songbird, Raptor, Mammal Species of Conservation Concern (RareSBM)	According to the ORWAP Report, the score for occurrences of rare songbird, raptor, or mammal species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp. Info file for a list of species.		
		High (≥ 0.60 for maximum score, or > 1.13 for sum score), or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	1	Species include: Bald eagle, American peregrine falcon, Arctic peregrine falcon, Greater sage-grouse, Columbian sharp-tailed grouse, Yellow-billed cuckoo, Northern spotted owl, Short-eared owl, Black swift, Lewis's woodpecker, Purple martin, Northern waterthrush, Bobolink, Tricolored blackbird, Fringed myotis, Spotted bat, Townsend's big-eared bat, Pallid bat, Northern sea lion, Fisher, Sea otter, Canada lynx, Columbian white-tailed deer. [SBMV]		
		Intermediate (i.e., not as described above or below).	0			
		Low (≤ 0.09 for maximum score AND < 0.13 for sum score, but not 0 for both).	0			
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	0	This question may need to be revised after the field visit.		
OF22	Invertebrate Species of Conservation Concern (RareInvert)	According to the ORWAP Report, the score for occurrences of rare invertebrate species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp. Info file for a list of species.		
		High (≥ 0.75 for maximum score, or for this group's sum score), or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	See the Supp. Info file's RareAnimals worksheet for list of species addressed by this question.		
		Low (< 0.75 for maximum score AND for this group's sum score, but not 0 for both).	0	[INV]		
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1	This question may need to be revised after the field visit.		
OF23	Plant Species of Conservation Concern	According to the ORWAP Report, the score for occurrences of rare wetland-indicator plant species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores.		

	(RarePscpp)	High (≥ 0.75 for maximum score, or > 4.00 for sum score), or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	See the Supp. Info's RareWetPlants worksheet for list of species addressed by this question.		
		Intermediate (i.e., not as described above or below).	0	[PDV,POLV]		
		Low (≤ 0.12 for maximum score AND < 0.20 for sum score, but not 0 for both).	0	This question may need to be revised after the field visit.		
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.				
OF24	River Proximity (RiverProx)	There is a nontidal river within 1 mile and it is adjacent to, OR downslope from, the AA (connected or not). Enter 1, if true. If not, SKIP TO OF27.	0	River - as used here is a channel wider than 50 ft between its banks. In the ORWAP Map Viewer, use the National Hydrography Dataset - Flowline layer (expand Hydrology). [WSV]	NearRiver	
OF25	Floodable Property (FloodProp)	Select ONE of the below:		Row crops - do not include pasture or other perennial cover.		
		Floodplain boundaries within 1 mile downslope or downriver from the AA have not been mapped. Enter 1 and SKIP TO OF27.	0	In the ORWAP Map Viewer, use the Floodplain layers. Also, the Seasonal Nontidal Wetland layer (expand Wetlands/National Wetlands Inventory) may indicate some floodplain areas.		
		Floodplain boundaries within 1 mile downslope from the AA have been mapped BUT there is neither infrastructure nor row crops vulnerable to river flooding located within the floodplain and within that distance. Enter 1 and SKIP TO OF27.	0	[WSV] Supplement with field observations at multiple seasons, if possible.		
		Floodplain boundaries have been mapped AND infrastructure or row crops are present within 1 mile downslope or downriver and those are not protected from 100-year floods, but actual damage has not been documented.	0			
		Damage to infrastructure or row crops from river flooding has been documented within that distance.	0			
OF26	Type of Flood Damage (DamageType)	The greatest financial damage in the floodplain is (or would be) to:		Row crops - do not include pasture or other perennial cover. On the ORWAP Map Viewer, use the Floodplain layers [WSV]		
		Buildings, roads, bridges.	0			
		Row crops (during some years).	0			
OF27	Hydrologic Landscape (Arid)	According to the ORWAP Report, the wetland is in a hydrologic landscape unit classified as:		In the ORWAP Report, under the Location Information table, find the Hydrologic Landscape Class.		
		Arid.	0	[AM, AMv, WBNv, SBMv, OE, Sens]		
		Semi-arid.	0			
		Dry.	0			
		Moist.	0			
		Wet.	1			
		Very Wet.	0			
OF28	Input Water - Recognized Quality Issues (WQin)	According to ORWAP Map Viewer's Water Quality Streams layer and Water Quality Lakes layer, ALL of the following are true: (a) within 1 mile upstream from the AA edge, a water body or stream reach is labeled as being 303d, Water Quality Limited (categories 3B-5); Potential Concern; or TMDL Approved AND (b) the problem concerns one or more of the parameters listed below. Select ALL that apply.		Use the ORWAP Map Viewer's Water Quality Streams layer and the Water Quality Lakes layer (expand Water Quality and Quantity) and the Distance tool. Use the Identify tool to determine the reason for the listings.		
		Total suspended solids (TSS), sedimentation, or turbidity.	0			
		Phosphorus, chlorophyll-a, or algae.	1	If the AA receives both inflow and outflow from river flooding, consider the polluted water to be both "upstream" and "downstream".		
		Nitrates, ammonia, chlorophyll-a, or algae.	0			
		Petrochemicals, heavy metals (iron, manganese, lead, zinc, etc.), other toxins.	1	[SRv,PRv,INV,FA,FR,AM,WBF,WBN,STR] This may need to be verified in the field.		
		Temperature or dissolved oxygen.	1			
		None of above, or no data. If true, enter 1 and SKIP to OF30.	0		NoDataWQup	
OF29	Duration of Connection Between Problem Area & the AA (ConnUp)	The upstream problem area mentioned above (OF28) has a surface water connection to the AA:		In the ORWAP Map Viewer, use the National Hydrography Dataset (expand Hydrology) and the Persistent, Seasonal, or Saturated nontidal layers (expand Wetlands/National Wetlands Inventory) to determine duration of surface water connection.		
		For 9 or more continuous months annually.	0			
		Intermittently (at least once annually, but for less than 9 months continually).	0	[SRv,PRv,INV,FA,FR,AM,WBF,WBN,STR] This may need to be determined or verified in the field.		
		Never (or less than annually).	1			
OF30	Downslope Water Quality Issues (ContamDown)	According to ORWAP Map Viewer's Water Quality Streams layer and Water Quality Lakes layer, ALL of the following are true: (a) within 1 mile downhill or downstream from the AA's edge, a water body is labeled as being 303d, Water Quality Limited (categories 3B-5); Potential Concern; or TMDL Approved AND (b) the problem concerns one or more of the parameters listed below. Select ALL that apply.		Use the ORWAP Map Viewer's Water Quality Streams layer and the Water Quality Lakes layer (expand Water Quality and Quantity) and the Distance tool. Use the Identify tool to determine the reason for the listings.		
		Total suspended solids (TSS), sedimentation, or turbidity.	0	[WCv,SRv,PRv,FA]		
		Phosphorus, chlorophyll-a, or algae.	1			
		Nitrates, ammonia, chlorophyll-a, or algae.	0			
		Petrochemicals, heavy metals (iron, manganese, lead, zinc, etc.), other toxins.	1			
		Temperature or dissolved oxygen.	1			
		None of above, or no data. Enter 1 and SKIP to OF32.	0		NoDataWQdo	
OF31	Duration of Connection Between AA & Water Quality Problem Area (ConnDown)	The connection between the downstream problem area mentioned above (OF30) and the AA:		In the ORWAP Map Viewer, use the National Hydrography Dataset (expand Hydrology) and the Persistent, Seasonal, or Saturated nontidal layers (expand Wetlands/National Wetlands Inventory) to determine duration of surface water connection.		
		Is a stream or water body that connects these areas for 9 or more continuous months annually.	1			
		Is a stream or water body that connects these areas intermittently (at least once annually, but for less than 9 months continually).	0	[WCv,SRv,PRv,FA]		
		Is a probable groundwater connection, or connection via direct runoff only (no channel connection).	0	This may need to be determined or verified in the field.		

		Never exists (a topographic ridge probably prevents all the AA's runoff and groundwater from reaching the problem area).	0			
OF32	Drinking Water Source (DEQ) (DWsource)	According to ORWAP Map Viewer's Surface Water Drinking Water Source Areas layer and the Ground Water Drinking Water Source Areas layer, the AA is within: The source area for a surface-water drinking water (DW) source. The source area for a groundwater drinking water source. Neither of above.	 -1 0 0	In the ORWAP Map Viewer, use the water source layers (expand Water Quality and Quantity). (NRV)		
OF33	Groundwater Risk Designations (GWrisk)	According to ORWAP Map Viewer's Groundwater Management Areas layer and the Sole Source Aquifer layer, the AA is: Select All that apply Within a designated Groundwater Management Area (ODEQ). Within a designated Sole Source Aquifer area (EPA): the North Florence Dunal Aquifer. Neither of above.	 0 0 -1	In the ORWAP Map Viewer, use the DEQ Groundwater Management Areas layer and the Sole source Aquifer layer (expand Water Quality and Quantity). (NRV)		
OF34	Relative Elevation in Watershed (Elev)	In the ORWAP Map Viewer, based on the Hydrologic Boundaries 4th Level (HUC 8) layer (expand Hydrology), determine if the AA is: (See Column E) In the upper one-third of its watershed. In the middle one-third of its watershed. In the lower one-third of its watershed.	 0 0 -1	1) Consider which end of the HUC is the bottom. Where streams join, the "V" that they form on the map points towards the bottom of the HUC. 2) If the AA is closer to the HUC's outlet than to its upper end, and is closer to the river or large stream that exits at the bottom of the HUC than it is to the boundary (margin) of the HUC, then check "lower 1/3". If not near that river, check "middle 1/3". 3) If the AA is not in a 100-yr floodplain, is closer to the HUC upper end than to its outlet, and is closer to the boundary (margin) of the HUC than to the river or large stream that exits at the bottom of the HUC, then check "upper 1/3". 4) For all other conditions, check "middle 1/3". (WSv, PRv, FA, FR, WCV, OE, Sens, SRv)	Lower/Shed	
OF35	Runoff Contributing Area (RCA) - Wetland as % of (WetPctRCA)	Delimit the wetland's Runoff Contributing Area (RCA) using a topographic base map. The area of the AA's wetland is: <1% of its RCA. 1 to <10% of its RCA. 10 to 100% of its RCA. Larger than the area of its RCA. Enter 1 and SKIP TO OF39.	 -1 0 -1 0	See the ORWAP Manual for specific protocol for delimiting the RCA (Section 4.1 Step 5). The RCA includes only the areas that potentially drain directly to the AA's wetland rather than to channels that flow or flood into that wetland. Exact precision in drawing the boundary is not required. (WS, WSV, SR, SRv, PR, PRv, WCV)	NoRCA	
OF36	Unvegetated % in the RCA (ImpervRCA)	The proportion of the RCA comprised of buildings, roads, parking lots, exposed bedrock, and other surface that is usually unvegetated at the time of peak annual runoff is about: <10%. 10 to 25%. >25%.	 -1 0 0	In the ORWAP Map Viewer, use an Aerial layer to determine the proportion of the RCA comprised of buildings, roads, parking lots, exposed bedrock, and other surfaces that are usually unvegetated at the time of peak annual runoff. (WSv, WCV, SRv, PRv, INV, FA, Sens, STR)		
OF37	Transport From Upslope (TransRCA)	A relatively large proportion of the precipitation that falls farther upslope in the RCA reaches this wetland quickly as indicated by the following: (a) RCA slopes are steep, and/or (b) upslope wetlands historically present have been filled or drained extensively, and/or (c) land cover is mostly non-forest, and/or (d) most RCA soils are shallow. This statement is: Mostly true. Somewhat true. Mostly untrue.	 0 -1 0	Refer to aerial imagery and/or consult local sources. See the ORWAP Manual for instructions. (WSv, SRv, PRv, STR)		
OF38	Upslope Soil Erodibility Risk (ErodeUp)	Use the ORWAP Report or the Map Viewer to determine if the erosion hazard rating of the soil within 200 ft away and upslope of the AA is: Slight. Moderate. Severe. Very severe. Could not determine.	 -1 0 0 0 0	If the soil unit is the same as the AA, the Erosion Hazard can be obtained from the ORWAP Report's Soil Information section. If the soil unit is different than the AA, use ORWAP Map Viewer's Oregon Soil layer and see the ORWAP Manual for instructions on how to determine the erosion hazard rating. (SRv, PRv, STR)		
OF39	Streamflow Contributing Area (SCA) - Wetland as % of (WetPctSCA)	Delimit (or visualize, for large river basins) the wetland's Streamflow Contributing Area (SCA) using a topographic base map. The area of the AA's wetland is: <1% of its SCA, or wetland is in the floodplain of a major river. 1 to <10% of its SCA. 10 to 100% of its SCA. Larger than the area of its SCA. Enter 1 and SKIP TO OF41. Wetland lacks tributaries and receives no overbank water. Enter 1 and SKIP to OF41.	 0 0 -1 0 0	See the ORWAP Manual for specific protocol for delimiting the SCA (section 4.1, Step 6). The SCA is all upland areas that drain into streams, rivers, and lakes that feed the AA's wetland either directly or during semi-annual floods. In addition, for wetlands intercepted by a mapped stream, the SCA can be delineated automatically and its area reported at this USGS web site: https://streamstats.usgs.gov/as/ . Enter the coordinates, select Oregon, select Delineate, zoom to level 15 or finer, and click on a stream. (WS, SR, SRv, PR, PRv, WCV)	NoSCA1 NoSCA	
OF40	Unvegetated % in the SCA (ImpervSCA)	The proportion of the SCA comprised of buildings, roads, parking lots, exposed bedrock, and other surface that is usually unvegetated at the time of peak annual runoff is about: <10%. 10 to 25%. >25%.	 0 -1 0	See the ORWAP Manual for instructions. (WCV, SRv, PRv, FA, STR)		
OF41	Upland Edge Shape Complexity	Most of the edge between the AA's wetland and upland is (select one):	-1	See ORWAP Manual for instructions and illustrations.		

	EdgeShape	Linear: a significant proportion of the wetland's upland edge is straight, as in wetlands bounded partly or wholly by dikes or roads, or the AA is entirely surrounded by water or other wetlands.	1	[NR, SBM, Sens]		
		Intermediate: Wetland's shape is (a) ovoid, or (b) mildly ragged edge, and/or (c) contains a lesser amount of artificially straight edge.	0			
		Convolutid: Wetland perimeter is many times longer than maximum width of the wetland, with many alcoves and indentations ("fingers").	0			
OF42	Zoning (Zoning)	According to ORWAP Map Viewer's Zoning layer, the dominant zoned land use designation for currently undeveloped parcels upslope from the AA and within 300 ft. of its upland edge is:		See the ORWAP Manual for instructions on how to determine the zoning designation. If information is not provided, check local zoning maps.		
		Development (Commercial, Industrial, Urban Residential, etc.), or no undeveloped parcels exist upslope from the AA.	1			
		Agriculture or Rural Residential.	0			
		Forest or Open Space, or entirely public lands.	0			
		Not zoned, or no information.	0			
OF43	Growing Degree Days (GDD)	According to ORWAP Map Viewer's Growing Degree Days layer, the long term normal Growing Degree Days category at the approximate location of the AA is:		See the ORWAP Manual for instructions on how to determine the growing degree days category.		
		<255.	0			
		256 - 1020.	0			
		1021-1785.	0			
		1786 - 2550.	1			
		2551 - 3315.	0			
		3316 - 4079.	0			
		> 4079.	0			

Date: 5/6/21		Name: Sue Brady		Site: NEXT Renewable Fuels Oregon (mitigation pre-construction)		
Form F Field Data (nontidal Wetlands) ORWAP V 3.2		Conduct an assessment <u>only after reading the accompanying Manual and explanations in column E below.</u> For each affirmative answer, change the 0 in the "Data" column to a "1". Answer all items except where directed to skip to others. Questions whose cells in "Data" column have a "W" MUST be answered for the ENTIRE wetland and bordering waters.		For a list of functions to which each question pertains, see bracketed codes in column E. Codes for functions and their benefits are: WS= Water Storage, WC= Water Cooling, SR= Sediment Retention, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Export, INV= Invertebrates, FA= Anadromous Fish, FR= Resident Fish, AM= Amphibians, WBF= Feeding Waterbirds, WBN= Nesting Waterbirds, SBM= Songbirds, Mammals, & Raptors, POL= Pollinators, PH= Plant Habitat, PU= Public Use & Recognition, EC= Ecological Condition, Sens= Sensitivity, STR= Stressors.		For guidance and detailed descriptions of how Excel calculates the numbers in the Scores worksheet, see the Technical Supplement and Appendix C of the accompanying Manual. For a documented rationale for each indicator, open each of the worksheet tabs at the bottom (one for each function or value) and see column H.
#	Indicators	Condition Choices	Data	Explanations, Definitions (Column E)	Cell Name	Comments
F1	Tidal Wetland (Tidal)	This is a tidal wetland (either freshwater or saltwater). If yes, GO TO worksheet " T ". Do not enter any data here. If nontidal, continue with F2.		Tidal wetland - a wetland that receives tidal water at least once during a normal year, regardless of salinity, and dominated by emergent or woody vegetation. Tidal flooding occurs on a 6-hour cycle DURING THE TIME it is flooded by tide, which may be as infrequent as once per year. If NWI map shows the wetland with a code beginning with E (for estuarine), assume the wetland to be tidal. However, some wetlands lacking that code are also tidal.		
F2	Ponded Condition (Lentic)	At least once every 2 years, some part of the AA contains a cumulative total of >900 sq.ft. of surface water that is ponded. The water persists for >6 days and may be hidden beneath emergent vegetation or scattered in small pools. Enter 1, if true.	1	Ponded - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle). [AM,WBF,WBN]	Lentic	
Reminder: For all questions, the AA should include all persistent waters in ponds smaller than 20 acres that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes or rivers larger than 20 acres – specifically, the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone.				Adjacent - is used synonymously with abutting, adjoining, bordering, contiguous – and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent – a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.		
F3	Water Regime (Hydropd)	The water regime (hydropd) of the most permanent (usually deepest) part of the AA is: Select only ONE. (To meet any of the definitions other than <u>Ephemeral</u> , there must be >100 sq ft of surface water for the duration described, otherwise mark the type listed above it.) <u>Ephemeral</u> . Surface water in the wettest part of the AA is present for fewer than 7 consecutive days during an average growing season. Includes some of the areas mapped as <u>Saturated</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and SKIP to F25. <u>Temporary</u> . Surface water present for 1-4 weeks consecutively during an average growing season, OR if persists for longer, it is almost entirely in scattered pools, each smaller than 1 sq.m. Dries up completely during part of most average years. Includes some of the areas mapped as <u>Saturated</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and SKIP to F25. <u>Seasonal</u> . Surface water present for 5-17 weeks (1-4 months) consecutively during an average growing season, but dries up completely during part of most average years. Includes some of the areas mapped as <u>Seasonal</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and SKIP to F5. <u>Semi-Persistent</u> . Surface water present for more than 17 weeks (4 months) consecutively during an average growing season, but dries up completely during part of most average years. Includes some of the areas mapped as <u>Seasonal</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and SKIP to F5. <u>Permanent</u> . Does not dry up completely during most average years. Includes some of the areas mapped as <u>Persistent</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and continue.	0 0 0 0 1	In the <u>NRCS county soil survey</u> , the Water Features table provides information about periods of flooding, ponding, and highwater table depths. Descriptions of the soil units may include information on saturation persistence. Also consider the hydropd label on NWI wetland polygons. [WS, FA, FR, WBN, WBF, WC] Permanent - usually has significant groundwater input, higher conductivity, less annual water level fluctuation. No woody vegetation in most persistently flooded parts. Often with extensive open water and subsurface aquatic plants.	NeverWater TempWet ShallowType DeepType PermType	
F4	Flooded Persistently - % of AA (PermW)	Identify the parts of the AA that still contain surface water even during the driest times of a normal year . At that time, the percentage of the AA that still contains surface water is: 1 to <25% of the AA. 25 to <50% of the AA. 50 to 95% of the AA. >95% of the AA.	1 0 0 0	driest times of a normal year - i.e., when the AA's surface water is at its lowest annual level. Sites fed by unregulated streams that descend on north-facing slopes, tend to remain wet longer into the summer. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [WS,PR,NR,CS,INV,FR,AM,WBF,WBN]	AllPermWater	
F5	Depth Class (Predominant) (DepthDom)	When water is present in the AA, the depth most of the time in most of inundated area is: [Note: NOT necessarily the maximum spatial or annual depth] >0 to <0.5 ft. 0.5 to < 1 ft deep. 1 to <3 ft deep. 3 to 6 ft deep. >6 ft deep.	0 0 1 0 0	This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the AA is brief, the answer will be based on the depth of the most persistently inundated part of the AA. Include surface water in channels and ditches as well as ponded areas. In the <u>ORWAP Manual</u> , see the diagram in Appendix B. [WC,SR,PR,CS,OE,INV,FA,FR,WBF,WBN,PD,Sens]		
F6	Depth Class Distribution (DepthEven)	Within the area described above, and during most of the time when surface water is present, the water area has: Select only one.		Estimate these proportions by considering the gradient and microtopography of the site.		

		One depth class covering >90% of the AA's inundated area (use the classes in the question above).	1	In the <u>UKWAP Manual</u> , see the diagram in Appendix B.		
		One depth class covering 51-90% of the AA's inundated area (use the classes in the question above).	0			
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0	[INV,FR,WBF,WBN,PD]		
F7	Emergent Plants – Area (EmArea)	Consider just the area that has surface water for >1 week during the growing season. Herbaceous plants (not moss, not woody) whose foliage extends above a water surface in this area (i.e., emergents) cumulatively occupy an annual maximum of:	W	If multiple small patches are separated by less than 150 ft, they may be combined when evaluating this question.		
		<0.01 acre (< 400 sq. ft). Enter 1 and SKIP TO F10, unless only part of a wetland is being assessed.	0	[SR,PR,OE,INV,FR,WBF,WBN,SBM,PD]	NoEm	
		0.01 to < 0.10 acres (3,920 sq. ft).	0			
		0.10 to <0.50 acres (21,340 sq. ft).	0			
		0.50 to <5 acres.	0			
		5 to 50 acres.	1			
		>50 acres.	0			
F8	% Emergent Plants (EmPct)	Emergent plants occupy an annual maximum of:		[WC,SR,PR,NR,CS,OE,INV,PD,FA,FR,AM,WBF,WBN,SBM]		
		<5% of the parts of the AA that are inundated for >7 days at some time of the year.	0			
		5 to <30% of the parts of the AA that are inundated for >7 days at some time of the year.	0			
		30 to <60% of the parts of the AA that are inundated for >7 days at some time of the year.	0			
		60 to 95% of the parts of the AA that are inundated for >7 days at some time of the year.	1			
		>95% of the parts of the AA that are inundated for >7 days at some time of the year.	0			
F9	Cattail or Tall Bulrush Cover (CtTail)	The percentage of the emergent vegetation cover in the AA that is cattail (<i>Typha</i> spp.) or tall bulrush is:		[WBN, SBM]		
		<1% of the emergent vegetation, or cattail and bulrush are absent.	0			
		1 to <25% of the emergent vegetation.	1			
		25 to 75% of the emergent vegetation.	0			
		>75% of the emergent vegetation.	0			
F10	Water Shading by AA's Woody Vegetation - Driest (WoodyDryShade)	During an average growing season, when water levels are lowest (but surface water still occupies >400 sq ft or >1% of the AA), the percentage of the remaining surface water within the AA that is shaded by trees and/or shrubs located within the AA is:		[WC,FA,WBN,SBM]		
		<5% of the water, and fewer than 10 woody plants taller than 3 ft shade it, or all surface water is flowing.	0			
		<5% of the water, but more than 10 woody plants taller than 3 ft shade it.	0			
		5 to <25% of the water.	1			
		25 to <50% of the water.	0			
		50 to 95% of the water.	0			
		>95% of the water.	0			
F11	Open Water - Extent	During most of the growing season, the largest patch of open water that is in or adjacent to the AA is >1 acre and mostly deeper than 1 ft. Enter 1, if true.	1	Open Water - is surface water of any depth that contains no emergent herbaceous or woody vegetation (may contain floating-leaved or completely submersed plants). It may be partially shaded by a tree canopy.	OpenW	
F12	All Ponded Water as Percentage - Wettest (PondWpctWet)	When water levels are highest, during a normal year, the surface water that is ponded continually for >6 days occupies:		Ponded - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle).	NoPond	
		<1% or none of the AA. Surface water is completely or nearly absent then, or is entirely flowing. Enter 1 and SKIP TO F22.	0			
		1 to <5% of the AA.	0	[WS,WC,CS,OE,INV,AM,WBF,WBN]		
		5 to <30% of the AA.	1			
		30 to <70% of the AA.	0			
		70 to 95% of the AA.	0			
		>95% of the AA.	0			
F13	Ponded Open Water Area - Wettest (OWAreaWet)	When water levels are highest, during a normal year, the AA's ponded open water occupies a cumulative area of:	W	Ponded - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle).	NoPondOW	
		<0.10 acre (< 4356 sq. ft) of the AA and adjacent ponded waters. Enter 1 and SKIP TO F16.	0			
		0.10 to <0.50 acres (21,340 sq. ft) of the AA and adjacent ponded waters.	0			
		0.50 to <1 acres of the AA and adjacent ponded waters.	0			
		1 to <5 acres of the AA and adjacent ponded waters.	1	Open water - is surface water of any depth that contains no emergent herbaceous or wood vegetation (may contain floating-leaved or completely submersed species). It may be partially shaded by a tree canopy.		
		5 to <50 acres of the AA and adjacent ponded waters.	0			
		50 to <640 acres (1 sq. mi) of the AA and adjacent ponded waters.	0			
		640 to <1000 acres of the AA and adjacent ponded waters.	0	[WS,WBF]		

		1000 to <2500 acres of the AA and adjacent ponded waters.	0			
		>2500 acres (>4 sq.mi) of the AA and adjacent ponded waters.	0			
F14	Ponded Open Water Distribution - Wettest (WaterMxWet)	When water levels are <u>highest</u> , during a normal year, the distribution (in aerial view) of ponded open water patches larger than 0.01 acre (400 sq. ft) within the AA is (must meet both a and b criteria):		[NR,AM,WBF,WBN,PD,SBM]		
		(a) Vegetation <u>and</u> open water <u>EACH</u> comprise 30-70% of the AA (including its bordering waters if any) <u>AND</u> (b) There are <u>many</u> small patches of open water scattered widely within vegetation or <u>many</u> small vegetation clump "islands" scattered widely within open water. Typical (for example) of some extensive bulrush and cattail marshes.	0			
		(a) Vegetation <u>and</u> open water <u>EACH</u> comprise 30-70% of the AA (including its bordering waters if any) <u>AND</u> (b) There are only a <u>few</u> (or no) small patches of open water scattered widely within vegetation or a <u>few</u> small vegetation clump "islands" scattered widely within open water.	0			
		(a) Vegetation <u>or</u> open water <u>comprise</u> >70% of the AA (and its bordering waters) <u>AND</u> (b) There are <u>several small patches</u> of open water scattered within vegetation or <u>several</u> small vegetation clump "islands" scattered within open water.	1			
		(a) Vegetation <u>or</u> open water <u>comprise</u> >70% of the AA (and its bordering waters) <u>AND</u> (b) Open water is <u>mostly in a single area</u> (e.g., center of the wetland) and vegetation is in the rest (e.g., periphery), with almost no intermixing. (Typical of many ponds excavated for livestock watering, stormwater treatment, mineral extraction as well as many wetlands that are inundated only temporarily each year).	0			
F15	Width of Vegetated Zone - Wettest (WidthWet)	When water levels are <u>highest</u> , during a normal year, the width of the <u>vegetated wetland</u> that separates the largest patch of open water within or bordering the AA from the closest adjacent uplands, is predominantly:		Vegetated wetland - in this case does not include underwater or floating-leaved plants, i.e., aquatic bed. In farmed wetlands that have different crops from year to year, consider vegetation condition as it probably existed during most of the past 5 years.		
		[Note: This is not asking for the maximum width.]				
		<5 ft. or no vegetation between upland and open water.	0	If open water exists as many patches, use the distance between the majority of those patches and uplands.		
		5 to <30 ft.	0			
		30 to <50 ft.	0			
		50 to <100 ft.	0	[WC,SR,PR,NR,CS,OE,AM,WBF,WBN,SBM,PD,Sens,EC]		
		100 to 300 ft.	0			
		> 300 ft.	1			
F16	All Ponded Water as a Percentage (Driest) (PondWpctDry)	When water levels are <u>lowest</u> , during a normal year, but surface water still occupies >1,076 sq feet (100 sq meter) OR >1% of the AA (whichever is more), the water that is <u>ponded</u> (either visible or concealed by vegetation) in the AA occupies:		Ponded - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle).	NoPond2	
		<1% or none. Surface water is completely or nearly absent then, or is entirely flowing. Enter 1 and SKIP TO F22.	0			
		1 to <5% of the AA.	1	[WC,FA,FR,AM,WBN,Sens]		
		5 to <30% of the AA.	0			
		30 to <70% of the AA.	0			
		70 to 95% of the AA.	0			
		>95% of the AA.	0			
F17	Ponded Open Water Area (Driest) (OWAreaDry)	When water levels are <u>lowest</u> , during a normal year, the AA's <u>ponded open water</u> occupies a cumulative area, including adjacent ponded waters, of:	W	Ponded - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle).	NoPondOW2	
		<0.10 acre (< 4356 sq. ft). Enter 1 and SKIP TO F24.	0			
		0.10 to <0.50 acres (21,340 sq. ft).	0			
		0.50 to <1 acres.	1	Open water - is surface water of any depth that contains no emergent herbaceous or wood vegetation (may contain floating-leaved or completely submersed species). It may be partially shaded by a tree canopy.		
		1- 4 acres.	0			
		5 to <50 acres.	0			
		50 to <640 acres (1 sq. mi).	0	[WBN,PUv]		
		640 to <1000 acres.	0			
		1000 to 2500 acres.	0			
		>2500 acres (>4 sq.mi).	0			
F18	Ponded Open Water Distribution - (Driest) (WaterMxDry)	When water levels are <u>lowest</u> , during a normal year, the distribution of ponded open water patches larger than 0.01 acre (400 sq. ft) within the AA is:		[NR,INV,AM,WBN]		
		(a) Vegetation <u>and</u> open water <u>EACH</u> comprise 30-70% of the AA (including its bordering waters if any) <u>AND</u> (b) There are <u>many small patches</u> of open water scattered widely within vegetation or many small vegetation clump "islands" scattered widely within open water. Typical (for example) of some extensive bulrush and cattail marshes.	0			
		(a) Vegetation <u>and</u> open water <u>EACH</u> comprise 30-70% of the AA (including its bordering waters if any) <u>AND</u> (b) There are only a <u>few</u> (or no) small patches of open water scattered widely within vegetation or a <u>few</u> small vegetation clump "islands" scattered widely within open water.	0			
		(a) Vegetation <u>or</u> open water <u>comprise</u> >70% of the AA (and its bordering waters) <u>AND</u> (b) There are <u>several small patches</u> of open water scattered within vegetation or several small vegetation clump "islands" scattered within open water.	1			

		(a) Vegetation or open water comprise <u>>70%</u> of the AA (and its bordering waters) AND (b) Open water is <u>mostly in a single area</u> (e.g., center of the wetland) and vegetation is in the rest (e.g., periphery), with almost no intermixing. Typical of many ponds excavated for livestock watering, stormwater treatment, mineral extraction as well as many wetlands that are inundated only temporarily each year.	0			
F19	Floating Algae & Duckweed (Algae)	At some time of the year, <u>most</u> of the AA's otherwise-unshaded water surface is covered by floating mats of algae, or small (<1 inch) floating plants such as duckweed, <i>Azolla</i> , <i>Wolffia</i> , or <i>Riccia</i> . Enter 1, if true.	0	This includes most nontidal wetlands labeled as Aquatic Bed (AB) on NWI maps. If wetland can be visited only during winter, it may not be possible to answer this question with much certainty unless local sources are contacted or indicators (e.g., dried remains of algae) are found.		
F20	Floating-leaved & Submerged Aquatic Vegetation (SAV)	SAV (submerged & floating-leaved aquatic vegetation, excluding the species listed above) occupies an annual maximum of: none, or <5% of the water area. 5 to <25% of the water area. 25 to <50% of the water area. 50 to 95% of the water area. >95% of the water area. many SAV plants present, but impossible to select from the above categories.	 1 0 0 0 0 0	SAV - are herbaceous plants that characteristically grow at or below the water surface, i.e., whose leaves are primarily and characteristically under or on the water surface during most of the part of the growing season when surface water is present. Some species are rooted in the sediment whereas others are not. If pond lily (<i>Nuphar</i>) is the predominant species, consider its maximum extent only during the period when surface water is present beneath the leaves. [PR,OE,INV,FR,AM,WBF,WBN]	NoSAV	
F21	Width of Vegetated Zone (Driest) (WidthDry)	When water levels are lowest, during a normal year, but surface water still occupies <u>>400 sq feet or >1% of the AA</u> (which ever is more), the width of the <u>vegetated wetland</u> that separates the largest patch of open water within or bordering the AA from the closest adjacent uplands, is predominantly: <5 ft, or no vegetation between upland and open water. 5 to <30 ft. 30 to <50 ft. 50 to <100 ft. 100 to 300 ft. > 300 ft.	 0 0 0 0 0 1	Measure the width perpendicular to the open water part. Vegetated wetland - in this case does not include underwater or floating-leaved plants, i.e., aquatic bed. In farmed wetlands that have different crops from year to year, consider vegetation condition as it probably existed during most of the past 5 years. Note: For most sites larger than 1 acre and with persistent water, measure the width using aerial imagery rather than estimating in the field. [WBN]		
F22	Beaver (Beaver)	Use of the AA by beaver during the past 5 years is: Select most applicable ONE. <u>Evident</u> from direct observation or presence of gnawed limbs, dams, tracks, dens, or lodges. <u>Very likely</u> based on known occurrence in this part of the region and <u>proximity to ALL of the following</u> (a) a persistent freshwater wetland, pond, or lake, or a perennial low-gradient (<5%) channel, and (b) average valley width is > 150 ft and (c) >20% cumulative cover of aspen, cottonwood, alder, and willow in vegetated areas within 150 ft of the AA's edge. Or there is evidence of beaver just outside the AA. <u>Somewhat likely</u> based on known occurrence in this part of the region and <u>proximity to ALL of the following</u> (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) average valley width is >50 ft, and (c) >20% cumulative cover of hardwood trees and shrubs in vegetated areas within 150 ft of the AA's edge. <u>Unlikely</u> because site characteristics above are deficient, and/or this is an area where beaver are routinely removed. But beaver occur within 2 miles. <u>None.</u> Beaver are absent from this part of the region.	 1 0 0 0 0	Valley width - is delimited by an abrupt increase in slope on both sides of the channel. [AM,WBN,SBM,PD,Sens]		
F23	Isolated Island (Island)	During June, the wetland contains (or is part of) an island that is isolated from the shore by water depths >3 ft. The island may be solid, or it may be a floating vegetation mat suitable for nesting waterbirds. The island must be larger than 400 sq.ft and without inhabited buildings. Enter 1, if true.	0	[WBF,WBN]		
F24	Ice-free (IceDura)	During most years, most of the AA's surface water (if any) does not freeze, or freezes for fewer than 4 continuous weeks. Enter 1, if true.	1	[PR,FR,WBF]		
F25	Water Fluctuation Range - Maximum (Fluctu)	The <u>maximum vertical fluctuation</u> in surface water within the AA, during a normal year is: <0.5 ft or stable. 0.5 to < 1 ft. 1 to <3 ft. 3 to 6 ft. >6 ft.	 0 1 0 0 0	maximum vertical fluctuation - is the difference between the highest annual and lowest annual water level during an average year. Use field indicators to assess this indicator. [WS,SR,PR,NR,CS,OE,INV,AM,WBN,PD]		
F26	% Only Saturated or Seasonally Flooded (SeasPct)	Identify the parts (if any) of the AA that never contain surface water (only saturated soil) or where the water (either ponded or flowing) usually remains on the land surface for <u>less than the entire growing season</u> . The percentage of the AA containing such areas is: <5% of the AA, or none (i.e., all water persists for >4 months). 5 to <25% of the AA. 25 to <50% of the AA.	 0 0 0	If you can identify plants, use their wetland indicator status to infer the possible extent of seasonal-only inundation within a wetland. Vegetation may be patterned in concentric or parallel zones, as one moves outward & away from the deepest part of the wetland or channel. Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) may be evident when not fully inundated. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualizing where that would intercept the land along the river. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. Although useful only as a general guide, the NRC's county soil survey descriptions of the soil units and water feature table	NoSeasonal	

		50 to 75% of the AA.	0	General Guidance: The Wetlands Inventory Worksheet is designed to be completed by the user and includes information on flooding frequency and saturation persistence.	
		>75% of the AA.	1	[SR,NR,CS,OE,INV,FA,WBF,WBN,POL,SBM,PD,Sens,EC]	
F27	Salinity, Alkalinity, Conductance (Salin)	The AA's surface water is mostly:		Saline or brackish conditions are commonly indicated by a prevalence of particular plant species. Consult the ORWAP SupplInfo file's P_Salt worksheet for a list of these.	
		Brackish or saline. Plants that indicate saline conditions dominate the vegetation. Salt crust may be obvious around the perimeter and on flats.	0	Brackish or saline - conductance of >5000 µS/cm, or >3200 ppm TDS	
		Slightly brackish. Plants that indicate saline conditions are common. Salt crust may or may not be present along perimeter.	0	Slightly brackish - conductance of 500- 5000 µS/cm, or 320 - 3200 ppm TDS	
		Fresh. (Note: Assume this to be the condition unless wetland is known to be a playa or there is other contradicting evidence).	1	Fresh - conductance of < 500 µS/cm, or <320 ppm TDS	FreshW
		Unknown.	0	[PR,CS,AM]	
F28	Fish & Waterborne Pests (FishAcc)	Select All that apply:		[INV,FA,FR,AM,WBF]	
		A regularly-used boat dock is present within or contiguous to the AA.	0		
		A regularly-used boat dock is not within the AA, but there is one within 300 ft. of the AA and there is a persistent surface connection between the dock and the AA.	0		
		Fish (native or stocked) are known to be present in the AA, or can access it during at least one day annually.	0		
		None of the above, and could not estimate fish presence/absence.	1		
F29	Non-native Aquatic Animals (PestAnim)	The following are known or likely to have reproducing populations in this AA, its wetland, or in water bodies within 300 ft that connect to the AA at least seasonally. Select All that apply:		Assume non-native fish to be present if wetland is associated with a nearby reservoir, fish pond, or perennial stream flowing through an agricultural or residential area. Assume bullfrog, nutria, and/or carp to be present if (a) the AA contains persistent water or is flooded seasonally by an adjoining body of permanent water, and (b) not a forested wetland, and (c) in western Oregon, elevation is lower than about 3000 ft. In the ORWAP_SupplInfo file, see Inverts_Exo worksheet for more complete list of non-native invertebrates of Oregon, and WetVerts worksheet for more complete list of fish that are not native to Oregon. You may also consult: http://nas.er.usgs.gov/queries/default.aspx http://www.dfw.state.or.us/conservationstrategy/invasive_species.asp	
		Non-native amphibians (e.g., bullfrog) or reptiles (e.g., red-ear slider).	1	[FA,FR,AM,EC]	
		Carp.	0		
		Non-native fish that prey on tadpoles or turtles (e.g., bass, walleye, crappie, brook trout).	0		
		Non-native invertebrates (e.g., New Zealand mudsnail, mitten crab, rusty crayfish).	0		
		Nutria.	0		
		None of above.	0		
F30	Shorebird Feeding Habitats (Shorebd)	The extent of mudflats, very shallow waters, or shortgrass meadows, within the AA, that meet the definition of shorebird habitat for at least 3 months during the period of late summer through the following May is:		Shorebird habitat - areas must have (a) grasses shorter than 6", or a mudflat, during any part of this period, AND (b) soils that either are saturated or covered with <2 inches of water during any part of this period, AND (c) no detectable surrounding slope (e.g., not the bottom of an incised dry channel), AND (d) not shaded by shrubs or trees. See photograph in Appendix A of manual. This addresses needs of most migratory sandpipers, plovers, curlews, and godwits.	
		None, or <100 sq. ft.	0	[WBF]	
		100 to <1000 sq. ft. within AA.	0		
		1000 to 10,000 sq. ft. within AA.	1		
		>10,000 sq. ft. within AA.	0		
F31	Outflow Duration (OutDura)	The most persistent surface water connection (outlet channel, pipe, ditch, or overbank water exchange) between the AA and the closest stream or lake located downslope is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection; the one between the AA and the rest of its wetland, OR the surface connection between the AA's wetland and a mapped stream or lake located within 300 ft downslope from this wetland].	W	The emphasis is on the connection to a mapped stream network. A larger difference in elevation between the wetland-upland boundary and the bottom of the wetland outlet (if any) indicates shorter outflow duration.	
		Persistent (>9 months/year).	1	Do not rely only on topographic maps or NWI maps to show this; inspect while in field if possible, and ask landowner. The durations given are only approximate and are for a "normal" year.	
		Seasonal (14 days to 9 months/year, not necessarily consecutive).	0	The connection need not occur during the growing season. Assume that depressions with effective nearby ditches or tile drains will connect for shorter periods.	
		Temporary (<14 days, not necessarily consecutive).	0	[WS,WCV,SR,PR,NR,CS,OE,FA,FR,Sens]	NoOutlet
		None -- no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. Enter 1 and SKIP to F33.	0		
F32	Outflow Confinement (Constric)	During major runoff events, in the places described above where surface water exits the AA, it:	W	Major runoff events - would include biennial high water caused by storms and/or rapid snowmelt.	
		is impeded as it mostly passes through a pipe, culvert, tidegate, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography).	0	Impeded - means causing a delay or reduction in water velocity or volume.	
		Leaves mainly through natural surface exits, not largely through artificial or temporary features which impede or accelerate outflow.	0	[WS,SR,PR,NR,CS,OE,Sens,STR]	
		Is exported more quickly than usual as it mostly passes through ditches or pipes intended to accelerate drainage. They may be within the AA or connected to its outlet or within 30 ft of the AA's edge.	1		
F33	Tributary or Overbank Inflow (Inflow)	At least once annually, surface water from upstream or another water body moves into the AA. It may enter directly, or as unconfined overflow from a contiguous river or lake. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. Enter 1, if true. If false, SKIP to F36.	0	[SRv,PRv,PD]	Inflow
F34	Input Channel Gradient (SlopeInChan)	The gradient of the tributary with the largest inflow, averaged over the 150 ft. before it enters the AA (but excluding any portion of the distance where water travels through a pipe) is:		[SRv,PRv]	
		<1%.	0		
		1 to <3%.	0		
		3 to 6%.	0		

		>6%.	0			
F35	Throughflow Complexity (ThruFlo)	<p>[Skip this question if the AA lacks both an inlet and outlet.] During peak annual flow, water entering the AA in channels encounters which of the following conditions as it travels through the AA: Select the ONE encountered most.</p> <p>Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel within unvegetated (often incised) channels and has minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.</p> <p>Bumps into <u>herbaceous vegetation</u> but mostly remains in fairly <u>straight channels</u>.</p> <p>Bumps into <u>herbaceous vegetation</u> and mostly <u>spreads throughout</u>, or follows a fairly <u>indirect path</u> (in widely meandering, multi-branched, or braided channels).</p> <p>Bumps into <u>tree trunks and/or shrub stems</u> but mostly remains in fairly <u>straight channels</u>.</p> <p>Bumps into <u>tree trunks and/or shrub stems</u> and follows a fairly <u>indirect path</u> (meandering, multi-branched, or braided) from entrance to exit.</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>This mainly refers to surface water that moves between the inlet and outlet. Some judgment is required in assessing straight vs. indirect flow path.</p> <p>See <u>ORWAP Manual</u> Appendix B diagram.</p> <p>[WS,SR,PR,NR,OE,INV,FA,FR,WBF,WBN,PD]</p>		
F36	Internal Gradient (Gradient)	<p>The gradient from the lowest to highest point of land <u>within the AA</u> (or from outlet to inlet) is:</p> <p><2% (internal flow is absent or barely detectable; basically flat).</p> <p>2 to <6%.</p> <p>6 to 10%.</p> <p>>10%.</p>	<p></p> <p>1</p> <p>0</p> <p>0</p> <p>0</p>	<p>Wetlands with no outlet, and wetlands where most surface water is impounded on site, should be considered flat (<2%).</p> <p>For other wetlands, estimate gradient as the elevation difference between the inlet and outlet (if any) divided by the distance between them, or the difference between the highest and lowest points in the wetland divided by the distance between them.</p> <p>[WS,SR,PR,NR,CS,OE,AM,WBF,WBN]</p>	<p>TooSteep1</p> <p>TooSteep2</p>	
F37	Groundwater Strength of Evidence (Groundw)	<p>Select first one that applies:</p> <p>In the AA or its wetland:</p> <p>(a) Springs are observed, OR</p> <p>(b) Water is markedly cooler in summer and warmer in winter (e.g., later ice formation) than in other local wetlands, OR</p> <p>(c) Measurements from shallow wells indicate groundwater is discharging to the wetland, OR</p> <p>(d) Water visibly seeps into pits dug within the AA during the driest time of the year and located >30 ft from the closest surface water.</p> <p>The AA's wetland:</p> <p>(a) Is very close to the base of a natural slope steeper than 15% and longer than 300 ft or is located at a geologic fault, OR</p> <p>(b) Has no persistently flowing tributary AND one or more is true:</p> <p>(b1) Is on a natural slope of >5%, OR</p> <p>(b2) Has rust deposits ("iron floc"), colored precipitates, or dispersible natural oil sheen, OR</p> <p>(b3) Is in an Arid or Semi-arid hydrologic unit.</p> <p>The AA is <u>not</u> in an Arid or Semi-arid hydrologic unit, but has persistent ponded water, no tributary, and is not fed by wastewater, concentrated stormwater, or irrigation water, or by an adjacent river or lake.</p> <p>None of above is true, OR AA contains a hot spring. Some groundwater may nonetheless discharge to or flow through the wetland.</p>	<p></p> <p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>[WS,WC,NR,CS,OE,INV,FA,FR,PD]</p> <p>Arid or Semi-arid hydrologic unit - See the ORWAP Report's Hydrologic Landscape Class (under Location Information).</p>		
F38	Unshaded Herbaceous Vegetation (Extent) (HerbExpos)	<p>The annual maximum areal cover of herbaceous vegetation (excluding SAV, ferns, and mosses, but including forbs & graminoids) that is not beneath a woody canopy reaches:</p> <p><5% of the vegetated part of the AA. Enter 1 and SKIP to F42.</p> <p>5 to <25% of the vegetated part of the AA.</p> <p>25 to <50% of the vegetated part of the AA.</p> <p>50-95% of the vegetated part of the AA.</p> <p>>95% of the vegetated part of the AA.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Do <u>not</u> include submersed and floating-leaved aquatics (SAV) in the category of "herbaceous vegetation", or when defining the "vegetated part" of the site.</p> <p>For sites larger than 10 acres, this should be determined from aerial imagery rather than estimated in the field.</p> <p>[WBF,WBN]</p>	NoHerb	
F39	Forb Cover (Forb)	<p>Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:</p> <p><5% of the herbaceous part of the AA.</p> <p>5 to <25% of the herbaceous part of the AA.</p> <p>25 to <50% of the herbaceous part of the AA.</p> <p>50 to 95% of the herbaceous part of the AA.</p> <p>>95% of the herbaceous part of the AA.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p>	<p>Forbs - are flowering non-woody vascular plants (excludes grasses, sedges, ferns, mosses).</p> <p>[POL]</p>		
F40	Species Dominance - Herbaceous (HerbDom)	<p>Determine which <u>two native</u> herbaceous (forb, fern, and graminoid) species comprise the greatest portion of the herbaceous cover that is unshaded by a woody canopy. Then select one:</p> <p>Those species together comprise <u>more than half</u> of the areal cover of <u>native</u> herbaceous plants at any time during the year, i.e., one dominant species or two co-dominants. Also mark this if <20% of the vegetated cover is native species.</p>	<p></p> <p>1</p>	<p>[INV,WBF,SBM,PD,POL,Sens,EC]</p>		

		Those species together comprise <u>less than half</u> of the areal cover of <u>native</u> herbaceous plants at any time during the year.	0			
F41	Invasive or Non-native - % of Vegetative Cover (Invas)	Vegetative cover (annual maximum) is: Overwhelmingly (>80% cover) non-native species AND >10% of the herbaceous cover is <u>invasive species</u> . (See ORWAP Suppinfo file for species designations). Overwhelmingly (>80% cover) non-native species AND <10% of the herbaceous cover is <u>invasive species</u> ; OR 50-80% of cover is non-native species regardless of invasiveness. Mostly (50-80%) native species. Overwhelmingly (>80%) native species.	 0 0 1 0	In the ORWAP <u>Suppinfo</u> , see P_Invas worksheet for list of invasives and P_Exo for non-native species list. Examples of woody invasives are Himalayan blackberry, English ivy, scotch broom, and gorse. For known distributions of Invasive plants in your area see: http://lnr.oregonstate.edu/orbic/invasive-species and http://www.weedmapper.org/maps.html but do not limit your answer based only on that information. Consider most crops to be non-native. [WBF,PD,POL,Sens,EC]	InvasDom	
F42	Mowing, Grazing, Fire (VegCut)	There is evidence that grazing by domestic or wild animals -- or mowing (multiple times per year), plowing, herbicides, harvesting, or fire -- has <u>repeatedly</u> reduced the AA's vegetation cover (plants that normally grows taller than 4") to <u>less than 4 inches</u> , or has created an obvious browse line, over the following extent: 0% (No evidence of such activities). Trace to 5% of the normally vegetated AA (grazing, mowing, or fire have occurred but vegetation height effects are mostly <u>unnoticeable</u>). 5 to <50% of the normally vegetated AA. 50 to 95% of the normally vegetated AA. >95% of the normally vegetated AA.	 0 0 0 1 0	Repeatedly - means the condition occurred in at least half of the last 10 years. [SR,AM,WBN,SBM,PD,EC]	NoMowGraze	
F43	Historically Lacking Trees (HistVeg)	According to the ORWAP Report, the <u>presettlement vegetation class</u> in the vicinity of the AA was prairie, sagebrush, or other open lands not dominated by trees. In addition, the AA is not within the biennial floodplain of a river where trees and shrubs typically dominate when conditions are unaltered. Enter 1, if true.	1	In the ORWAP <u>Report's</u> Location Information table. This question is used as a classification variable mainly to set appropriate expectations for the extent of forest cover.	HistOpenland	
F44	Moss Wetland (Moss)	The AA's ground cover is primarily a deep layer of moss, and/or soils are mainly peat or organic muck. Also, the soil remains water-saturated to within 3 inches of the surface during most of a normal year. Surface water within the AA often is absent or confined to small scattered pools or ditches. Enter 1, if true.	0	Includes most bogs and fens. May be a floating island. [NR,CS,OE,WBF,WBN,Sens]		
F45	Woody Extent (WoodyPct)	Within the vegetated part of the AA, woody vegetation (trees, shrubs, <u>robust vines</u>) taller than 3 ft occupies: <5% of the vegetated AA, and fewer than 10 trees are present. Enter 1 and SKIP to F51. <5% of the vegetated AA, but more than 10 trees are present. 5 to <25% of the vegetated AA. 25 to <50% of the vegetated AA. 50 to 95% of the vegetated AA. >95% of the vegetated part of the AA.	 1 0 0 0 0 0	Robust vines - include Himalayan blackberry and others that are generally erect and taller than 1 ft. Vegetated part - should not include floating-leaved or submersed aquatics. For sites larger than 1 acre, this should be determined from aerial imagery rather than estimated only in the field. [NR,WC,CS,SBM,PD,Sens]	NoWoody	
F46	Woody Diameter Classes (TreeDiams)	Select <u>All</u> the types that comprise >5% of the woody canopy cover in the AA or >5% of its wooded upland edge if any: Deciduous 1-4" diameter (DBH) and >3 ft tall. Evergreen 1-4" diameter and >3 ft tall. Deciduous 4-9" diameter. Evergreen 4-9" diameter. Deciduous 9-21" diameter. Evergreen 9-21" diameter. Deciduous >21" diameter. Evergreen >21" diameter.	 0 0 0 0 0 0 0	Wooded upland edge - includes woody plants located within one tree-height of the wetland-upland boundary. DBH is the diameter of the tree measured at 4.5 ft above the ground. [CS,SBM,POL,Sens]		
F47	Snags (Snags)	The number of large snags (diameter >12 inches) in the AA plus 100 ft uphill of its edge is: Few or none. Several.	 0 0	Snags - are standing trees at least 20 ft tall that are mainly without bark or foliage. [SBM,POL]		
F48	Abovewater Wood (WoodOver)	The number of horizontal wood pieces thicker than 4 inches that are <u>partly submerged</u> during most of the spring or early summer, thus <u>potentially serving as basking sites</u> for turtles, birds, or frogs and cover for fish is: None. Few. Several (e.g., >3 per 300 ft of channel or shoreline).	 0 0 0	Only the wood that is at or above the water surface is assessed because of the impracticality of assessing underwater wood accurately when using a rapid assessment method. [FA,FR,AM]		
F49	Downed Wood (WoodDown)	The number of downed wood pieces longer than 6 ft and with diameter >4 inches that are not submerged during most of the growing season, is: Few or none. Several.	 0 0	Exclude temporary "burn piles." [INV,AM,SBM,POL]		

F50	Exposed Shrub Canopy (ShrExpos)	Within the vegetated part of the AA, shrubs shorter than 20 ft that are not overtopped by trees occupy. Select first statement that is true.		Vegetated part - should not include floating-leaved or submersed aquatic.	
		<5% of the vegetated AA and <0.01 acre (400 sq ft).	0	[SBM,PD]	
		5 to <25% of the vegetated AA or the water edge (whichever is greater in early summer).	0		
		25 to <50% of the vegetated AA or the water edge (whichever is greater in early summer).	0		
		50 to 95% of the vegetated AA or the water edge (whichever is greater in early summer).	0		
		>95% of the vegetated part of the AA or the water edge (whichever is greater in early summer).	0		
F51	N Fixers (Nfix)	The percentage of the vegetated area in the AA or along its water edge (whichever has more) that contains nitrogen-fixing plants (e.g., alder, Baltic rush, scotch broom, lupine, clover, alfalfa, other legumes) is:		For a more complete list, see QRWAP_SupplInfo , worksheet NFIX (includes native and non-native species). Do not include algae.	
		<1% or none.	0	[OE,INV,Sens]	
		1 to <25%.	1		
		25 to <50%.	0		
		50 to 75%.	0		
		>75%.	0		
Note for the next four questions: If the AA lacks an upland edge, evaluate based on the AA's <u>entire perimeter</u> and outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.					
F52	Upland Perennial Cover % of Perimeter (PerimPctPer)	The percentage of the AA's <u>edge (perimeter)</u> that is comprised of a band of upland perennial cover wider than 10 ft and taller than 6 inches, during most of the growing season is:		Perennial cover - vegetation that includes wooded areas, native prairies, sagebrush, as well as relatively unmanaged commercial lands in which the ground is disturbed less frequently than annually such as perennial ryegrass fields, hayfields, lightly grazed pastures, timber harvest areas, and rangeland.	
		<5%.	1		
		5 to <25%.	0		
		25 to <50%.	0		
		50 to <75%.	0	It <u>does not</u> include water, row crops (vegetable, orchards, Christmas tree farms), residential areas, golf courses, recreational fields, pavement, bare soil, rock, bare sand, or gravel or dirt roads.	
		75 to 95%.	0	[WCv,SRv,PRv,INV,FA,AM,WBF,WBN,SBM,PD,POL,POLv,Sens,STR]	
		>95%.	0		
F53	Upland Perennial Cover Width (Buffer) (BufWidth)	Along the greatest extent of the AA's <u>upland edge</u> , the width of perennial cover taller than 6 inches that extends upslope from the AA until mostly shorter or non-perennial cover is reached is: [NOTE: the width is not necessarily the maximum width. Base on vegetation that occurs most of the growing season.]		Upland edge - is the land within 3 ft of the wetland's perimeter that is not wetland.	
		< 5 ft. or none.	1	[WCv,SRv,PRv,INV,FA,AM,WBN,SBM,PD,POL,Sens,STR]	NoUpPerCov
		5 to <30 ft.	0		
		30 to <50 ft.	0		
		50 to <100 ft.	0		
		100 to 300 ft.	0		
		> 300 ft.	0		AllUpPerren
F54	Upland Trees as % of All Perennial Cover (UpTreePctPer)	Within 100 ft landward from the AA's <u>edge (perimeter)</u> , the percentage of the upland perennial cover that is woody plants taller than 20 ft is:		Base this on the cumulative canopy width of the trees.	
		<5%, or there is no upland perennial cover along the upland edge.	1	[WSv,FA,WBF,WBN,SBM]	
		5 to <25% of perennial cover.	0		
		25 to <50% of perennial cover.	0		
		50 to <75% of perennial cover.	0		
		75 to 95% of perennial cover.	0		
		>95% of perennial cover.	0		
F55	Weeds - % of Upland Edge (UpWeed)	Along the AA's <u>edge (perimeter)</u> , the cover of invasive woody or herbaceous plants occupies: [If vegetation is so senesced that apparently-dominant edge species cannot be identified even to genus, answer "none"].		See QRWAP_SupplInfo file, worksheet P_Invas.	
		<5%, or none.	0	Some of the most common invaders along upland edges of Oregon wetlands are Himalayan blackberry, knotweed, sweetbrier rose, Russian olive, English ivy, nightshade, pepperweed, medusahead, white clover, ryegrass, quackgrass, false brome, bentgrass, dandelion, oxeye daisy, pennyroyal, bull and creeping thistles, tansy ragwort, poison hemlock, and teasel. If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an invasive species, assume the unidentified plant to also be invasive.	
		5 to <25%.	0		
		25 to <50%.	1		
		50 to <75%.	0		
		75 to 95%.	0		
		>95%.	0	[PD,STR]	
F56	Bare Ground & Accumulated Plant Litter	Consider the parts of the AA that go dry during a normal year. Viewed from <u>6 inches above the soil surface</u> , the condition in most of that area just before the year's longest inundation period begins is:		Bare ground - includes unvegetated soil, rock, sand, or mud between stems if any. Bare ground under a tree or shrub canopy should be counted.	

	(L)cover)	<p>Little or no (<5%) bare ground is visible between erect stems or under canopy and there is little or no dead detached plant tissue (thatch) remaining on top of the ground surface and ground surface is extensively blanketed by moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.</p> <p>Some (5-20%) bare ground or remaining thatch is visible. Herbaceous plants have moderate stem densities and do not closely hug the ground.</p> <p>Much (20-50%) bare ground or thatch is visible. Low stem density and/or tall plants with little living ground cover during early growing season.</p> <p>Mostly (>50%) bare ground or thatch.</p> <p>Not applicable. All of the AA is inundated throughout most years.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p>	<p>Wetlands that are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season.</p> <p>[WS,WC,SR,PR,NR,CS,OE,INV,AM,SBM,POL,Sens,EC]</p>		
F57	Ground Irregularity (Girreg)	<p>In parts of the AA that lack persistent water, the number of small pits, raised mounds, hummocks, boulders, upturned trunks, animal burrows, islands, natural levees, wide soil cracks, and microdepressions is:</p> <p>Few or none, or the entire AA is always water-covered. Minimal microtopography: <1% of the AA, e.g., many flat sites having a single hydroperiod.</p> <p>Intermediate.</p> <p>Several (extensive micro-topography).</p>	<p>0</p> <p>1</p> <p>0</p>	<p>Microtopography - refers mainly to vertical relief of <3 ft and is represented only by inorganic features, except where plants have created depressions or mounds of soil.</p> <p>Consider the microtopography to be "few or none" if one could walk easily through most of the AA once any slash and logs are removed. Consider it to be "several" if one has to constantly look down and check balance.</p> <p>[WS,SR,PR,NR,INV,AM,SBM,PD,POL,EC]</p>		
F58	Soil Composition (SoilTex)	<p>Based on digging into the substrate and examining the surface layer of the soil (2 inch depth) that was mapped as being predominant, its composition (excluding duff and living roots) is mostly:</p> <p>Loamy: includes silt, silt loam, loam, sandy loam.</p> <p>Clayey: includes clay, clay loam, silty clay, silty clay loam, sandy clay, sandy clay loam.</p> <p>Organic: includes muck, mucky peat, peat, and mucky mineral soils (blackish or grayish). Exclude live roots unless they are moss.</p> <p>Coarse: includes sand, loamy sand, gravel, cobble, stones, boulders, fluvents, fluvaquents, riverwash.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>Do not base the texture on soil maps unless the AA is inaccessible. See ORWAP Manual's protocol (Step 2 of section 5.3 and the soil chart in Appendix B).</p> <p>Judge which soil type is predominant only in the part of the AA that is not inundated at the time of your visit.</p> <p>Duff - is loose organic surface material, e.g., dead plant leaves and stems).</p> <p>Organic soils are much less common in floodplains.</p> <p>[WS,PR,NR,CS,OE,PD,Sens]</p>		
F59	Cliffs or Banks (Cliff)	<p>Within 300 ft of the AA, there are elevated terrestrial features such as cliffs, bluffs, talus slopes, or unarmored stream banks that extend at least 6 ft nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas.</p> <p>Enter 1, if true.</p>	<p>0</p>	<p>[SBM,POL]</p>		
F60	Restored or Created Wetland (NewWet)	<p>The AA is (or is within, or contains) a "new" wetland resulting from human actions (e.g., excavation, impoundment) or other factors affecting what was upland (non-hydric) soil. Or, some part of the AA was originally a wetland, was artificially drained for many years, and has since had its water regime partly or wholly restored or rehabilitated (e.g., by ditch plugs, berms, tile breakage, non-maintenance).</p> <p>Yes, and constructed or restored mostly within last 3 years.</p> <p>Yes, and constructed or restored mostly 3-7 years ago.</p> <p>Yes, and constructed or restored mostly >7 years ago.</p> <p>Yes, but time of origin or restoration unknown.</p> <p>No.</p> <p>Unknown if wetland is constructed, restored, or natural.</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Include wetlands whose area was likely expanded by road berms which impeded runoff, but do not include wetlands created by beaver dams except for the part where flooding affected uplands (not just existing wetlands and streams). Determine this using historical aerial photography, old maps, soil maps, consultation with landowners, and/or permit files as available.</p> <p>See ORWAP Map Viewer's Hydric Soil layer (expand Soils). Also, locations of some restoration wetlands can be found in the ORWAP Map Viewer under Restoration.</p> <p>Another potential source is the Conservation Registry: https://oregonexplorer.info/content/conservation-registry?topic&ptopic.</p> <p>[PR,NR,CS,OE,PD,Sens]</p>	NotNewWet	
F61	Ownership (Ownership)	<p>Most of the AA is:</p> <p>Publicly owned (municipal, county, state, federal).</p> <p>Owned by non-profit conservation organization or easement holder who allows public access to this AA.</p> <p>Other private ownership, including tribal. Enter 1 and SKIP to F63.</p>	<p>0</p> <p>0</p> <p>1</p>	<p>An initial indication of ownership can be found on the ORWAP Map Viewer under the Land Ownership layer (expand Land Classification). However, it is advisable to ask local sources or use local maps with higher precision.</p> <p>[PUV]</p>	PrivateOwn	
F62	Special Protected Area Designation (Des'g)	<p>The AA is part of an area designated as a Special Protected Area according to the USGS Protected Areas Database of the U.S.</p> <p>Enter 1, if true.</p>	<p>0</p>	<p>See the ORWAP Map Viewer Report under the Location Information section for "In Special Protected Area?" [PUV]</p>		
F63	Conservation Investment (ConsInvest)	<p>The AA is not a mitigation wetland, but public funds or community volunteer efforts have been applied to preserve, create, restore, or enhance the condition or functions of the wetland. (e.g. CRP or WRP wetlands, community projects).</p> <p>Enter 1, if true. (If unknown, leave 0).</p>	<p>0</p>	<p>Locations of some restoration wetlands can be found in the ORWAP Map Viewer under Restoration. Another potential source is the Conservation Registry: https://oregonexplorer.info/content/conservation-registry?topic&ptopic [PUV]</p>		
F64	Compensation Wetland (MitWet)	<p>The AA is all or part of a compensation site used explicitly to offset impacts elsewhere.</p> <p>Enter 1, if true. (If unknown, leave 0).</p>	<p>0</p>	<p>Answer to the best of your knowledge. Sources for information include the property owner, DSL, and/or the ACOE. [PUV]</p>		
F65	Sustained Scientific Use (SciUse)	<p>Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Enter 1, if true. (If unknown, leave 0)</p>	<p>0</p>	<p>[PUV]</p>		
F66	Visibility (Visibil)	<p>The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 300 ft of the AA is (Select ONE):</p> <p><25%.</p> <p>25 - 50%.</p> <p>>50%.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>[WBFV,WBNV,SBMV,PUV,STR]</p>		

F67	Non-consumptive Uses - Actual or Potential (Rec/Poten)	Select All statements that are true of this AA as it currently exists:		The question assumes access is allowed.		
		Walking is physically possible in >5% of the AA during most of year (e.g., free of deep water and dense shrub thickets).	1	[PUV]		
		All or part of the AA (or an area within sight of the AA and within 100 ft) would be physically accessible to people in wheelchairs (e.g., paved and flat).	0			
		Maintained roads, parking areas, or foot-trails are within 30 ft of the AA, or the AA can be accessed most of the year by boat.	1			
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0			
F68	Core Area 1 (Visit/No)	The percentage of the AA almost never walked or driven by humans during an average growing season probably comprises: [Note: If more than half the wetland is visible from areas within 100 ft of the AA, include visits by people to those areas that are actually walked or driven (not simply viewed from)].		Judge this based on proximity to population centers, roads, trails, accessibility of the AA to the public, wetland size, usual water depth, and physical evidence of human visitation.		
		<5% and no inhabited building is within 300 ft of the AA.	0	Exclude visits that are not likely to continue and/or that are not an annual occurrence (e.g., by construction, maintenance, or monitoring crews).		
		<5% and inhabited building is within 300 ft of the AA.	0			
		5 to <50% and no inhabited building is within 300 ft of the AA.	0	[AM,WBF,WBN,SBM,PD,PUV,STR]		
		5 to <50% and inhabited building is within 300 ft of the AA.	0			
		50 to 95% with or without inhabited building nearby.	1			
F69	Core Area 2 (Visit/Often)	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [The Note in the preceding question applies here as well].		See note above.		
		<5%.	0	[AM,WBF,WBN,SBM,PD,PUV,STR]		
		5 to <50%.	1			
		50 to 95%.	0			
		>95% of the AA.	0			
F70	Consumptive Uses (Provisioning Services) (Hunt)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select All that apply.		Evidence of these consumptive uses may consist of direct observation, or presence of physical evidence (e.g., recently cut stumps, fishing lures, shell cases), or might be obtained from communication with the land owner or manager.		
		Low-impact commercial timber harvest (e.g., selective thinning).	0			
		Commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0			
		Waterfowl hunting.	0	[FRV,WBFV,PUV]		
		Fishing.	0			
		Trapping of furbearers.	0			
F71	Domestic Wells (Wells)	Wells or water bodies that currently provide drinking water are:		If unknown, assume this is true if there is an inhabited structure within the specified distance and the neighborhood is known to not be connected to a municipal drinking water system (e.g., is outside an urban growth boundary or other densely settled area).		
		<300 ft and downslope from the AA or at same elevation.	0			
		300 to 1500 ft and downslope or at same elevation.	1			
		>1500 ft downslope, or none downslope, or no information.	0	[NRV]		
F72	Wetland Type of Conservation Concern (RareType)	Does the AA contain, or is it part of, any of these wetland types? Select All that apply.	W	Consult the ORWAP Report under the Location Information table for "Rare Wetland Types." But be aware that it may not apply to the exact AA you have delimited. [PDV, Sens]		
		Mature forested wetland (anywhere): a wetland in which mean diameter of trees (d.b.h., FACW and FAC species only) exceeds 18 inches, and/or the average age of trees exceeds 80 years, or there are >5 trees/acre with diameter >32 inches.	0	To qualify, the diameter of >18 inches must be the mean measured from at least 10 trees.		
		Bog or Fen: contains a sponge-like organic soil layer which covers most of the AA and often has extensive cover of sedges and/or broad-leaved evergreen shrubs (e.g., Ledum). Often lacks tributaries, being fed mainly by groundwater and/or direct precipitation.	0			
		Playa, Salt Flat, or Alkaline Lake: a nontidal ponded water body usually having saline (salinity >1 ppt or conductivity >1000 µS) or alkaline (conductivity >2000 µS and pH >9) conditions and large seasonal water level fluctuations (if inputs-outputs unregulated). If a playa or salt flat, vegetation cover is sparse and plants typical of saline or alkaline conditions (e.g., Distichlis, Atriplex) are common.	0	See ORWAP SupplInfo file, worksheet P_Salt for species typically occurring in tidal or saline conditions.	Playa	
		Hot spring (anywhere): a wetland where discharging groundwater in summer is >10 degrees (F) warmer than the expected water temperature.	0			
		Native wet prairie (west of the Cascade crest): a seasonally inundated wetland, usually without a naturally-occurring inlet or outlet, and dominated primarily by native graminoids often including species in column E.	0	Deschampsia caespitosa, Danthonia californica, Camassia quamash, Triteleia hyacinthina, Carex densa, C. aperta, and/or C. unilateralis		
		Vernal pool (Willamette Valley): a seasonally inundated wetland, underlain by hardpan or claypan, with hummocky micro-relief, usually without a naturally-occurring inlet or outlet, and with native plant species distinctly different from those in slightly higher areas, and often including species in column E.	0	Downingia elegans, Isoetes nuttallii, Triteleia hyacinthina, Eleocharis spp., Eryngium petiolatum, Plagiobothrys figuratus, Plagiobothrys scouleri, Grindelia nana, Veronica peregrina, Lasthenia glaberrima, Cileandia quadrangularis, Kickxia elatine, Gnaphalium palustre, and/or Callitriche spp.		

Vernal pool (Medford area): a seasonally inundated acidic wetland, underlain by hardpan, with hummocky micro-relief, usually without a naturally-occurring inlet or outlet, and having concentric rings of similar native vegetation, often including species in column E.	0	Downingia virens, Isoetes nuttallii, Pityrogramma americana, Triteleia hyacinthina, Eleocharis spp., Eryngium petiolatum, Plagiobothrys bracteatus, Plagiobothrys scouleri, Grindelia nana, Veronica peregrina, Alopecurus sacculus, Lasthenia californica, Deschampsia danthonioides, and/or Calochortus nuttallii.		
Vernal pool (Modoc basalt & Columbia Plateau): a seasonally inundated wetland, usually without a naturally-occurring inlet or outlet, located on shallow basalt bedrock and often having species in column E.	0	Blennosperma nanum, Camassia quamash, Epilobium densiflorum, Callitriche marginata, Cicendia quadrangularis, Eryngium vaseyi, Psilocarphus brevissimus, and/or Sedella pumila.		
Interdunal wetland (Coastal ecoregion): a seasonally inundated wetland, usually without a naturally-occurring inlet or outlet, located between sand dunes where wind has scoured the sand down to the water table (deflation plain, blowout pond), and often with significant cover of the native species in column E.	0	Carex obnupta, Argentina egedii, Juncus lesueurii, J. nevadensis, J. falcatus, Sisyrinchium californicum, and/or Salix hookeriana.		
Ultramafic soil wetland (mainly southwestern Oregon): a low-elevation wetland, usually with a sponge-like organic soil layer, occurring in an area with exposed serpentine or peridotite rock, and/or in soils with very low Ca:Mg ratios.	0			
None of above.	1			

Site: NEXT Renewable Fuels Oregon (mitigation pre-construction)		Name: Sue Brady		Date: 5/6/21	
Form S Stresser Data ORWAP V 3.2				Data	Comments
S1	Aberrant Timing of Water Inputs (AltTiming) <i>In the "Data" column, place an X next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times).</i>				
	Control structure that regulates inflow to the AA (including tide gates), or flow regulation in tributaries, or water level in adjoining water body is regulated.				
	Irrigation runoff or seepage.				x
	Snow storage areas that drain directly to the wetland.				
	Increased pavement and other impervious surface in the CA.				
	Straightening, ditching, dredging, and/or lining of tributary channels in the CA.				x
	<i>If any items were checked above, then for each row of the table below, you may assign points (3, 2, or 1). However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition, if the checked items never occurred or were no longer present.</i>				
		Severe (3 pts)	Medium (2 pts)	Mild (1 pt)	
	Spatial extent within the AA of timing shift.	>95% of AA.	5-95% of AA.	<5% of AA.	3
	When most of the timing shift began.	<3 yrs ago.	3-9 yrs ago.	10-100 yrs ago.	1
	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the AA that experiences those.</i>				
	Input timing now vs. previously.	Shift of weeks.	Shift of days.	Shift of hours or minutes.	0
	Flashiness or muling.	Became very flashy or controlled.	Intermediate.	Became mildly flashy or controlled.	0
		Sum=			4
		Final score=			0.33
S2	Accelerated Inputs of Nutrients (NutrLoad) <i>In the "Data" column, place an X next to any item – occurring in either the AA or its RCA – that is likely to have accelerated the inputs of nutrients (nitrogen, phosphorus) to the AA.</i>				
	Stormwater or wastewater effluent (including failing septic systems), landfills.				
	Fertilizers applied to lawns, ag lands, or other areas in the RCA.				x
	Livestock, dogs.				x
	Artificial drainage of upslope lands.				x
	Other waterborne human-related nutrient sources within the RCA.				
	<i>If any items were checked above, then for each row of the table below, you may assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 pts)	Medium (2 pts)	Mild (1 pt)	
	Usual load of nutrients.	Large (e.g., feedlots, extensive residential on septic) or 303d* for nutrients.	Moderate (e.g., grazing, light residential on septic, light agriculture).	Limited (e.g., a few animals, lawns, seowed residential).	2
	Frequency & duration of input.	Frequent and year-round.	Frequent but mostly seasonal.	Infrequent & during high runoff events mainly.	2
	AA proximity to main sources (actual or potential).	0 - <50 ft.	50-300 ft. or in groundwater.	In other part of contributing area.	3
		Sum=			7
		Final score=			0.78
S3	Accelerated Inputs of Contaminants and/or Salts (Contamin). <i>In the "Data" column, place an X next to any item – occurring in either the AA or its RCA – that is likely to have accelerated the inputs of contaminants or salts to the AA.</i>				
	Stormwater or wastewater effluent (including failing septic systems), landfills, snow storage areas.				
	Metals & chemical wastes from mining, shooting ranges, oil/ gas extraction, other sources.				
	Irrigation of lands, especially those with saline soils.				x
	Oil or chemical spills (not just chronic inputs) from nearby roads.				
	Road salt.				
	Pesticides applied to lawns, ag lands, roadsides, or other areas in the RCA, but excluding spot applications for controlling non-natives in the AA.				x
	Artificial drainage of contaminated or saline soils.				
	Erosion of contaminated soils.				
	Other contaminant sources within the RCA.				
	<i>If any items were checked above, then for each row of the table below, you may assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 pts)	Medium (2 pts)	Mild (1 pt)	
	Usual toxicity of most toxic contaminants.	Industrial effluent or 303d* for toxics.	Wastewater treatment plant, cropland, fossil fuel extraction, pipeline, power station, managed landfill.	Low density residential or commercial.	1
	Frequency & duration of input.	Frequent and year-round.	Frequent but mostly seasonal.	Infrequent & during high runoff events mainly.	2
	AA proximity to main sources (actual or potential).	0 - <50 ft.	50-300 ft. or in groundwater.	In other part of contributing area.	3
	* See ORWAP Map Viewer for waters designated as 303d; see Oregon DEQ web site for reasons.				
		Sum=			6
		Final score=			0.67
S4	Excessive Sediment Loading from Runoff Contributing Area (SedRCA). <i>In the "Data" column, place an X next to any item present in the RCA that is likely to have elevated the load of waterborne or windborne sediment reaching the AA from its RCA.</i>				
	Erosion from plowed fields, till, timber harvest, dirt roads, vegetation clearing, fires.				x
	Erosion from construction, in-channel machinery in the RCA.				x
	Erosion from off-road vehicles in the RCA.				
	Erosion from livestock or foot traffic in the RCA.				x
	Stormwater or wastewater effluent.				
	Sediment from road sanding, gravel mining, other mining, oil/ gas extraction.				
	Accelerated channel downcutting or headcutting of tributaries due to altered land use.				
	Other human-related disturbances within the RCA.				
	<i>If any items were checked above, then for each row of the table below you may assign points (3, 2, or 1) in the last column that describe the combined maximum effect of those items in increasing the amount or transport of sediment into the AA. To estimate that, contrast it with the condition if checked items never occurred or were no longer present.</i>				
		Severe (3 pts)	Medium (2 pts)	Mild (1 pt)	
	Erosion in RCA.	Extensive evidence, high intensity*.	Potentially (based on high-intensity* land use) or scattered evidence.	Potentially (based on low-intensity* land use) with little or no direct evidence.	2
	Recentness of significant soil disturbance in the RCA.	Current & ongoing.	1-12 months ago.	>1 yr ago.	3
	Duration of sediment inputs to the AA.	Frequent and year-round.	Frequent but mostly seasonal.	Infrequent & mainly during high runoff or severe wind events.	2

AA proximity to actual or potential sources.	0 - <50 ft., or farther but on steep erodible slopes.	50-300 ft.	In other part of contributing area.	3
* High-intensity= plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment.				Sum= 10
				Final score= 0.83

55	Soil or Sediment Alteration <i>Within the Assessment Area</i> (SoilDisturb).			
In the "Data" column, place an X next to any item present in the AA that is likely to have compacted, eroded, or otherwise altered the AA's soil.				
Compaction from livestock, machinery, off-road vehicles, or mountain bikes, especially during wetter periods.				X
Leveling or other grading not to the natural contour.				X
Tillage, plowing (but excluding disking for enhancement of native plants).				X
Fill, riprap, other armoring, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil stockpiled or imported from another wetland.				
Excavation.				X
Dredging in or adjacent to the AA.				X
Boat traffic in or adjacent to the AA and sufficient to cause shore erosion or stir bottom sediments.				
Artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments.				
If any items were checked above, then for each row of the table below you may assign points (3, 2, or 1) in the last column that describe the combined maximum effect of those items in altering the AA's soils. To estimate that, contrast it with the soil condition if checked items never occurred or were no longer present.				
	Severe (3 pts)	Medium (2 pts)	Mild (1 pt)	
Spatial extent of altered soil.	>95% of AA or >95% of its upland edge (if any).	5-95% of AA or 5-95% of its upland edge (if any).	<5% of AA and <5% of its upland edge (if any).	2
Recentness of significant soil alteration in AA.	Current & ongoing.	1-12 months ago.	>1 yr ago.	2
Duration.	Long-lasting, minimal veg recovery.	Long-lasting but mostly revegetated.	Short-term, revegetated, not intense.	3
Timing of soil alteration.	Frequent and year-round.	Frequent but mostly seasonal.	Infrequent & mainly during scattered events.	1
				Sum= 8
				Final score= 0.67

Oregon Rapid Wetland Assessment (ORWAP) V.3.2.*	Cover Page: Basic Description of Assessment
Site Name:	EXT Renewable Fuels Oregon (mitigation post-construction)
Investigator Name:	Sue Brady
Date of Field Assessment:	5/6/2021
County:	Columbia
Nearest Town:	Clatskanie
Latitude (decimal degrees):	46.147935
Longitude (decimal degrees):	-123.175378
TRS, quarter/quarter section and tax lot(s):	T8N R4W Sections 21, 27, 28, 33, 34
Approximate size of the Assessment Area (AA, in acres):	580
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	50%
If delineated, DSL file number (WD #) if known:	delineation number not yet assigned
Cowardin Systems & Classes (indicate all present, based on field visit and/or aerial imagery): Systems: Palustrine =P, Riverine =R, Lacustrine =L, Estuarine =E Classes: Emergent =EM, Scrub-Shrub =SS, Forested =FO, Aquatic Bed (incl. SAV) =AB, Open Water =OW, Unconsolidated Bottom =UB, Unconsolidated Shore =US	PEM, PSS, PFO
Predominant HGM Class: Estuarine=E, Lacustrine=L, Riverine=R, S= Slope, F= Flats, D= Depressional	Flats
Soil Unit Mapped in Most of the AA:	Wauna-Locoda silt loams, protected
If tidal, the tidal phase during most of visit:	n/a
What percent (approximate) of the wetland were you able to visit?	50
What percent (approximate) of the AA were you able to visit?	100
Have you attended an ORWAP training session? If so, indicate approximate month & year.	Oct-11
How many wetlands have you assessed previously using ORWAP (approximate)?	20+
Comments about the site or this ORWAP assessment (attach extra page if desired):	This assessment is for the projected condition after the mitigation site has been constructed.

ORWAP V.3.2 Site Name:	NEXT Renewable Fuels Oregon (mitigation post-construction)
Investigator Name:	Sue Brady
Date of Field Assessment:	5/6/2021
<i>Scores will appear below after data are entered in worksheets OF, F, T, and S. See Manual for definitions and descriptions of how scores were computed and ratings assigned.</i>	

Normalized Scores & Ratings for this Assessment Area (AA):								
Specific Functions or Values:	Function Score	Function Rating	Rating Break Proximity	Values Score	Values Rating	Rating Break Proximity	Function Score (raw)	Values Score (raw)
Water Storage & Delay (WS)	3.49	Lower		0.00	Lower		3.49	0.00
Sediment Retention & Stabilization (SR)	5.06	Moderate		9.33	Higher		5.28	7.11
Phosphorus Retention (PR)	5.39	Moderate		7.79	Higher		5.57	6.47
Nitrate Removal & Retention (NR)	4.79	Moderate		10.00	Higher		5.79	10.00
Anadromous Fish Habitat (FA)	0.00	Lower		0.00	Lower		0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower		0.00	Lower		0.00	0.00
Amphibian & Reptile Habitat (AM)	7.90	Higher		3.63	Lower		7.16	3.63
Waterbird Nesting Habitat (WBN)	7.71	Higher		10.00	Higher		6.40	10.00
Waterbird Feeding Habitat (WBF)	9.40	Higher		10.00	Higher		8.48	10.00
Aquatic Invertebrate Habitat (INV)	4.11	Moderate	LM	2.67	Lower		5.45	3.16
Songbird, Raptor, Mammal Habitat (SBM)	6.65	Higher	MH	10.00	Higher		7.53	10.00
Water Cooling (WC)	4.08	Moderate		9.96	Higher		3.57	9.49
Native Plant Diversity (PD)	7.46	Higher		2.38	Lower		6.69	2.38
Pollinator Habitat (POL)	7.76	Higher	MH	4.54	Moderate		6.78	3.67
Organic Nutrient Export (OE)	6.03	Moderate					5.34	
Carbon Sequestration (CS)	5.94	Moderate	MH				5.24	
Public Use & Recognition (PU)				5.46	Moderate			5.79

Other Attributes:	Score	Rating	Rating Break Proximity		
Wetland Sensitivity (SEN)	3.64	Moderate			5.34
Wetland Ecological Condition (EC)	6.63	Higher			7.33
Wetland Stressors (STR)	5.37	Moderate	MH		4.94

GROUPS	Selected Function	Function Rating	Rating Break Proximity	Values Rating	Rating Break Proximity
Hydrologic Function (WS)	Water Storage & Delay (WS)	Lower		Lower	
Water Quality Support (SR, PR, or NR)	Sediment Retention & Stabilization (SR)	Moderate		Higher	
Fish Habitat (FA or FR)	Anadromous Fish Habitat (FA)	Lower		Lower	
Aquatic Habitat (AM, WBF, or WBN)	Waterbird Nesting Habitat (WBN)	Higher		Higher	
Ecosystem Support (WC, INV, PD, POL, SBM, or OE)	Songbird, Raptor, Mammal Habitat (SBM)	Higher	MH	Higher	

NOTE: A score of 0 does not always mean the function or value is absent from the wetland. It usually means that this wetland has equal or less capacity than the lowest-scoring one, for that function or value, from among the 200 calibration wetlands that were assessed previously by Oregon Department of State Lands.

Date: 5/6/21		Name: Sue Brady		Site: NEXT Renewable Fuels Oregon (mitigation post-construction)	
Form Of Office Data ORWAP V. 3.2		Conduct an assessment only after reading the accompanying Manual and explanations in column E below. Answering many of the following questions requires viewing aerial imagery and maps, covering an area up to within 2 miles of the AA. For each affirmative answer, change the 0 in the "Data" column to a "1". Answer all items except where directed to skip to others. Questions whose cells in "Data" column have a "W" MUST be answered for the ENTIRE wetland and bordering waters.		For a list of functions to which each question pertains, see bracketed codes in column E. Codes for functions and their benefits are: WS= Water Storage, WC= Water Cooling, SR= Sediment Retention, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Aquatic Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibians & Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, & Mammal Habitat, POL= Pollinator Habitat, PD= Native Plant Diversity, PU= Public Use & Recognition, EC= Ecological Condition, Sens= Sensitivity, STR= Stressors.	
#	Indicators	Condition Choices	Data	Explanations, Definitions (Column E)	Cell Name
OF1	Distance to Extensive Perennial Cover (DistPerCov)	The distance from the AA edge to the edge of the closest patch or corridor of perennial cover (see definition in column E) larger than 100 acres is:		Corridor - is simply an elongated patch of perennial cover that is not narrower than 150 ft at any point.	
		<100 ft.	1	Perennial cover - is vegetation that includes wooded areas, native prairies, sagebrush, vegetated wetlands, as well as relatively unmanaged commercial lands in which the ground is disturbed less than annually, such as hayfields, lightly grazed pastures, timber harvest areas, and rangeland. It does not include water, row crops (e.g., vegetable, orchards, Christmas tree farms), lawns, residential areas, golf courses, recreational fields, pavement, bare soil, rock, bare sand, or gravel or dirt roads. [AM, WBN, PD, PDV, POL, SBM, Sens, STR]	
		100 to <300 ft.	0		
		300 to <1000 ft.	0		
		1000 ft. to <0.5 mile.	0		
		0.5 mile to 2 miles.	0		
		> 2 miles.	0		
OF2	Distance to Tidal Waters (DistTidal)	The distance from the AA edge to the closest body of tidal water is:		Tidal water - if unclear whether a water body is tidal, check the ORWAP Map Viewer's Headtide layer (expand Hydrology), or check with local sources.	
		<1 mile.	1	Assume Columbia River is tidal east to Bonneville Dam and the Willamette River south to the Oregon City Falls. [WBF]	
		1-5 miles.	0		
		>5 miles.	0		
OF3	Distance to Ponded Water (DistPond)	The distance from the AA edge to the closest (but separate) body of nontidal fresh water (wetland, pond, or lake) that is ponded all or most of the year is:		Use field observations, aerial imagery, and/or the ORWAP Map Viewer's Persistent Nontidal layer (expand Wetlands/National Wetlands Inventory).	
		<100 ft.	0	[AM, WBF, WBN, SBM, PD, Sens]	
		100 to <300 ft.	0		
		300 to <1000 ft.	0		
		1000 ft. to <0.5 mile.	0		
		0.5 mile to 2 miles.	0		
		>2 miles.	1		
OF4	Distance to Lake (DistLake)	The distance from the AA edge to the closest (but separate) body of nontidal fresh water (wetland, pond, or lake) that is ponded during most of the year and is larger than 20 acres (about 1000 ft on a side) is:		Use field observations, aerial imagery, and/or the ORWAP Map Viewer's Persistent Nontidal layer (expand Wetlands/National Wetlands Inventory).	
		<1 mile.	0	[WBF, WBN]	
		1-5 miles.	0		
		>5 miles.	1		
OF5	Distance to Herbaceous Open Land (DistOpenL)	The distance from the AA edge to the closest patch of herbaceous openland larger than 10 acres and in flat terrain is:		Herbaceous openland - includes both perennial and non-perennial cover. For example, it can include pasture, herbaceous wetland, meadow, prairie, ryegrass fields, row crops, herbaceous rangeland, golf courses, grassed airports, and hayfields.	
		<100 ft.	1	Do not include open water of lakes, ponds, or rivers; or unvegetated surfaces; or areas with woody vegetation. In dry parts of the state, croplands in flat areas are often irrigated and are distinctly greener in aerial images. Flat terrain - means slope of less than 5%. [WBF, WBN, POL]	
		100 to <300 ft.	0		
		300 to <1000 ft.	0		
		1000 ft. to <0.5 mile.	0		
		0.5 mile to 2 miles.	0		
		>2 miles.	0		

QF6	Distance to Nearest Busy Road (DistRd)	The distance from the AA center to the nearest road with an average daytime traffic rate of at least 1 vehicle/minute is:		Estimate this traffic rate threshold using your judgment and considering the road width, local population, distance to densely settled areas, alternate routes, and other factors.		
		<100 ft.	0	[AM,SBM,PD,PUV,STR]		
		100 to <300 ft.	0			
		300 to < 0.5 miles.	0			
		0.5 to <1 miles.	0			
		1 to 2 miles.	0			
		>2 miles.	0			
QF7	Size of Largest Nearby Patch of Perennial Cover (SizePerenn)	Including the AA's vegetated area, the largest patch or corridor that is perennial cover and is contiguous with vegetation in the AA (i.e., not separated by roads or channels that create gaps wider than 150 ft), occupies:		Contiguous - Abutting, with no major physical separation that prohibits free exchange or flow of surface water (i.e., not separated by roads or channels that create gaps wider than 150 ft)		
		<.01 acre.	0	Perennial cover - See QF1. Disqualify any patch or corridor of perennial cover where it becomes separated from the AA by a gap of >150 ft, if the gap is comprised of unvegetated land or if the corridor narrows to less than 150 ft. [AM,SBM,PD,POL,Sens,STR]		
		.01 to < 1 acre.	0			
		1 to <10 acres.	0			
		10 to <100 acres.	0			
		100 to <1000 acres.	0			
		1000 to 10,000 acres.	0			
		>10,000 acres.	0			
QF8	Wetland Type Local Uniqueness (UniqPatch)	Select EACH of the vegetation types below that comprise more than 10% of the AA AND less than 10% of a 0.5 mile radius around the AA. (See Column E).		This is a 2-part question: (1) If no vegetation class comprises more than 10% of the AA, answer 'none of the above.'		
		Herbaceous vegetation (perennial grasses, sedges, forbs; not under a woody canopy; not crops).	0	(2) If a vegetation class does comprise more than 10%, determine if that vegetation class also comprises less than 10% of a 0.5 mile circle (~50 acres). [INV,AMv,WBFv,WBNv,SBMv,PDv,POLv,Sens]		
		Unshaded shrubland (woody plants shorter than 20 ft).	0			
		Trees (woody plants taller than 20 ft).	0			
		None of above.	1			
QF9	Perennial Cover Percentage (PerCovPct)	Within a 2-mile radius of the AA center, the percentage of land that has perennial cover is:		Perennial cover - is vegetation that includes wooded areas, native prairies, sagebrush, vegetated wetlands, as well as relatively unmanaged commercial lands in which the ground is disturbed less than annually, such as hayfields, lightly grazed pastures, timber harvest areas, and rangeland. It does not include water, row crops (e.g., vegetable, orchards, Christmas tree farms), lawns, residential areas, golf courses, recreational fields, pavement, bare soil, rock, bare sand, or gravel or dirt roads. [FA,AM,SBM,POL,Sens,STR]		
		<5% of the land.	0	PerennAI		
		5 to <20% of the land.	0			
		20 to <60% of the land.	0			
		60 to 90% of the land.	0			
		>90% of the land.	0			
QF10	Forest Percentage (ForestPct)	Within a 2-mile radius of the AA center, the cumulative amount of forest (regardless of forest patch sizes, and including any in the AA) is:		Forested patch - is a land cover patch that currently has >70% cover of woody plants taller than 20 ft. May be in a plantation. [FA,SBM,STR]		
		<5% of the circle.	0			
		5 to <20%.	0			
		20 to <50%.	0			
		50 to 80%.	0			
		>80%.	0			
QF11	Herbaceous Open Land Percentage (OpenLpct)	Within a 2-mile radius of the AA center, the amount of herbaceous openland in flat terrain is:		Herbaceous openland - can include both perennial and non-perennial cover. For example, it can include pasture, herbaceous wetland, meadow, prairie, ryegrass fields, row crops, herbaceous rangeland, golf courses, grassed airports, and hayfields. Do not include open water of lakes, ponds, or rivers; or unvegetated surfaces; or areas with woody vegetation. Flat terrain - means slope of less than 5%. [WBF,WBN,POL]		
		<5% of the land.	0			
		5 to <20%.	0			
		20 to <50%.	0			
		50 to 80%.	0			
		>80%.	0			

OF12	Landscape Wetland Connectivity (ConnScapeW)	Within a 2-mile radius of the AA center:		Corridor - is simply an elongated patch of perennial cover that is not narrower than 150 ft at any point.		
		There are NO other wetlands.	0			
		There are other wetlands (or a wetland), but NONE are connected to the AA by a corridor of perennial vegetation. The corridor must be at least 150 ft wide along its entire length and not interrupted by roads with regular traffic.	0	Regular traffic - is at least 1 vehicle per hour during the daytime throughout most of the growing season. Assess this based on local knowledge, type of road, and proximity to developed areas.		
		There are other wetlands (or a wetland), and ALL are connected to the AA by the type of corridor described.	0	Perennial - see OF9 for definition. [WBN,SBM,Sens,STR]		
		There are other wetlands (or a wetland), and ONE or MORE (but not all) are connected to the AA by the type of corridor described.	1			
OF13	Local Wetland Connectivity (ConnLocalW)	Within a 0.5 mile radius of the AA center:		Regular traffic - is at least 1 vehicle per hour during the daytime throughout most of the growing season. Assess this based on local knowledge, type of road, and proximity to developed areas.		
		There are NO other wetlands.	0			
		There are other wetlands (or a wetland), but NONE are connected to the AA by a corridor of perennial vegetation. The corridor must be at least 150 ft wide along its entire length and not interrupted by roads with regular traffic.	0	Perennial - see OF9 for definition.		
		There are other wetlands (or a wetland), and ALL are connected to the AA by the type of corridor described.	0	IF possible, field verify		
		There are other wetlands (or a wetland), and ONE or MORE (but not all) are connected to the AA by the type of corridor described.	1	[AM,WBN,SBM,PD,Sens,STR]		
OF14	Wetland Number & Diversity Uniqueness (HUCbest)	According to the ORWAP Report, this AA is located in one of the HUCs that are listed as having a large diversity, area, or number of wetlands relative to the area of the HUC. Select ALL of the following that are true:		In the ORWAP Report, under the Watershed Information section and the HUC Best table, look at the columns "Is HUC Best?" and "Greatest Criteria Met."		
		Yes, for the HUC8 watershed	1	[AM,WBF,WBN,SBM,Sens]		
		Yes, for the HUC10 watershed	0			
		Yes, for the HUC12 watershed	0			
		None of above.	0			
		Data are inadequate (NWI mapping not completed in HUC).	0			
OF15	Landscape Functional Deficit (GScore)	In the ORWAP Report, find the HUC 12 Functional Deficit table. Select ALL functions below that have a notation for that HUC.		In the ORWAP Report, under the Watershed Information section, look at the Functional Deficit table. Enter 1 for each of the listed functions that are noted.		
		Water storage (WS)	0			
		Sediment retention (SR)	0	These are HUCs in which a relatively small number, or proportional area, of the wetlands are likely to be performing the named function, thus adding value to those that are.		
		Nutrient transformation (NT)	0			
		Thermoregulation (WC)	0	See ORWAP's Technical Supplement for explanation of how the FuncDeficit was calculated.		
		Aquatic invertebrate habitat (INV)	0			
		Amphibian habitat (AM)	0	[WSv,WCV,SRv,PRv,INVv,FAv,AMv,WBNv]		
		Fish habitat (FH)	0			
		Waterbird habitat (WB)	0			
		None of above.	1			
		No data.	0			
OF16	Conservation Designations of the AA or Local Area (ConDesign)	On the ORWAP Map Viewer, use the layers indicated below to answer. Select ALL of the following that are true:		In the ORWAP Map Viewer, use the applicable layers.		
		(a)The AA is within or connected to a stream or other water body and this stream or water body has been designated as ESH within 0.5 miles of the AA, according to the Essential Salmonid Habitat (ESH) layer.	0	Include areas not shown as ESH. If ODFW has confirmed they qualify as ESH. [WCV, FA, FAv]		
		(b)The AA is within or contiguous to a designated Oregon's Greatest Wetlands, according to the map layer of that name.	0	Oregon's Greatest Wetlands identifies the most biologically and ecologically significant wetlands in the State of Oregon. [PU]		
		(c)The AA is within an Important Bird Area (IBA), as officially designated, according to the map layer of that name.	1	[WBFv, WBNv]		
		None of above.	0			

OF17	Non-anadromous Fish Species of Conservation Concern (RareFR)	According to the ORWAP Report, the score for occurrences of rare non-anadromous fish species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp_Info file for a list of species.		
		High (≥ 0.75 for maximum score, or ≥ 0.90 for this group's sum score), or there is a recent (within 5 years) onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	Species include Miller Lake lamprey, Goose Lake lamprey, Pit sculpin, Lahontan cutthroat trout, Inland Columbia Basin redband trout, Steelhead (Snake River Basin ESU), Alvord chub, Goose Lake tui chub, Borax Lake chub, Lahontan redbelly, Oregon chub, Goose Lake sucker, Tahoe sucker, Warner sucker, Shorthorn sucker, Lost River sucker. Note that for some of these species, only specific geographic populations are designated. [FRV]		
		Intermediate (i.e., not as described above or below).	0			
		Low (≤ 0.33 for both the maximum score and for this group's sum score, but not 0 for both).	0			
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1	This question may need to be revised after the field visit.		
OF18	Amphibian or Reptile of Conservation Concern (AmphRare)	According to the ORWAP Report, the score for occurrences of rare amphibian or reptile species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp_Info file for a list of species.		
		High (≥ 0.60 for maximum score, or ≥ 0.90 for sum score), or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	Species include: Black salamander, California slender salamander, Cope's giant salamander, Rocky Mountain tailed frog, Woodhouse's toad, Foothill yellow-legged frog, Northern leopard frog, Oregon spotted frog, Columbia spotted frog.		
		Intermediate (i.e., not as described above or below).	0			
		Low (≤ 0.21 for maximum score AND <0.15 for sum score, but not 0 for both).	0			
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1	[AMV] This question may need to be revised after the field visit.		
OF19	Feeding (Non-breeding) Waterbird Species of Conservation Concern (RareWBF)	According to the ORWAP Report, the score for occurrences of rare non-breeding (feeding) waterbird species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp_Info file for a list of species.		
		High (≥ 0.33 for maximum score, or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	Non-breeding - mainly refers to waterbird feeding during migration and winter. California brown pelican, Aleutian cackling goose, Dusky Canada goose		
		Low (< 0.33 for maximum score and for sum score, but not 0 for both).	0	[WBFV]		
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1	This question may need to be revised after the field visit.		
OF20	Nesting Waterbird Species of Conservation Concern (RareWBN)	According to the ORWAP Report, the score for occurrences of rare nesting waterbird species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp_Info file for a list of species.		
		High (≥ 0.60 for maximum score, or ≥ 1.00 for this group's sum score), or there is a recent breeding-season observation of any of these species onsite by a qualified observer under conditions similar to what now occur.	0	Species include: Horned grebe, Red-necked grebe, Western grebe, Clark's grebe, American white pelican, Least bittern, Snowy egret, Trumpeter swan, White-faced ibis, Harlequin duck, Bufflehead, Yellow rail, Western snowy plover, Upland sandpiper, Franklin's gull, Marbled murrelet.		
		Intermediate (i.e., not as described above or below).	0			
		Low (≤ 0.09 for maximum score and for sum score, but not 0 for both).	0	[WBNV]		
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species during breeding season by a qualified observer under conditions similar to what now occur.	1	This question may need to be revised after the field visit.		
OF21	Songbird, Raptor, Mammal Species of Conservation Concern (RareSBM)	According to the ORWAP Report, the score for occurrences of rare songbird, raptor, or mammal species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp_Info file for a list of species.		
		High (≥ 0.60 for maximum score, or >1.13 for sum score), or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	1	Species include: Bald eagle, American peregrine falcon, Arctic peregrine falcon, Greater sage-grouse, Columbian sharp-tailed grouse, Yellow-billed cuckoo, Northern spotted owl, Short-eared owl, Black swift, Lewis's woodpecker, Purple martin, Northern waterthrush, Bobolink, Tricolored blackbird, Fringed myotis, Spotted bat, Townsend's big-eared bat, Pallid bat, Northern sea lion, Fisher, Sea otter, Canada lynx, Columbian white-tailed deer. [SBMV]		
		Intermediate (i.e., not as described above or below).	0			
		Low (≤ 0.09 for maximum score AND <0.13 for sum score, but not 0 for both).	0			
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	0	This question may need to be revised after the field visit.		
OF22	Invertebrate Species of Conservation Concern (RareInvert)	According to the ORWAP Report, the score for occurrences of rare invertebrate species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores. See Supp_Info file for a list of species.		
		High (≥ 0.75 for maximum score, or for this group's sum score), or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	See the Supp_Info file's RareAnimals worksheet for list of species addressed by this question.		
		Low (< 0.75 for maximum score AND for this group's sum score, but not 0 for both).	0	[INVV]		
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1	This question may need to be revised after the field visit.		

OF23	Plant Species of Conservation Concern (RarePepp)	According to the ORWAP Report, the score for occurrences of rare <u>wetland-indicator plant</u> species in the vicinity of this AA is:		Use ORWAP Report's Rare Species Scores max and sum scores.		
		High (≥ 0.75 for maximum score, or > 4.00 for sum score), or there is a recent onsite observation of any of these species by a qualified observer under conditions similar to what now occur.	0	See the Supp Info's Rare Wet Plants worksheet for list of species addressed by this question.		
		Intermediate (i.e., not as described above or below).	0	[PDV,POLV]		
		Low (≤ 0.12 for maximum score AND < 0.20 for sum score, but not 0 for both).	0	This question may need to be revised after the field visit.		
		Zero for both this group's maximum and its sum score, and no recent onsite observation of these species by a qualified observer under conditions similar to what now occur.	1			
OF24	River Proximity (RiverProx)	There is a nontidal river within 1 mile and it is adjacent to, OR downslope from, the AA (connected or not). Enter 1, if true. If not, SKIP to OF27.	0	River - as used here is a channel wider than 50 ft between its banks. In the ORWAP Map Viewer, use the National Hydrography Dataset - Flowline layer (expand Hydrology). [WSV]	NearRiver	
OF25	Floodable Property (FloodProp)	Select ONE of the below:		Row crops - do not include pasture or other perennial cover.		
		Floodplain boundaries within 1 mile downslope or downriver from the AA have not been mapped. Enter 1 and SKIP TO OF27.	0	In the ORWAP Map Viewer, use the Floodplain layers. Also, the Seasonal Nontidal Wetland layer (expand Wetlands/National Wetlands Inventory) may indicate some floodplain areas.		
		Floodplain boundaries within 1 mile downslope from the AA have been mapped BUT there is neither infrastructure nor row crops vulnerable to river flooding located within the floodplain and within that distance. Enter 1 and SKIP TO OF27.	0	[WSV]		
		Floodplain boundaries have been mapped AND infrastructure or row crops are present within 1 mile downslope or downriver and those are not protected from 100-year floods, but actual damage has not been documented.	0	Supplement with field observations at multiple seasons, if possible.		
		Damage to infrastructure or row crops from river flooding has been documented within that distance.	0			
OF26	Type of Flood Damage (DamageType)	The greatest financial damage in the floodplain is (or would be) to:		Row crops - do not include pasture or other perennial cover. On the ORWAP Map Viewer, use the Floodplain layers [WSV]		
		Buildings, roads, bridges.	0			
		Row crops (during some years).	0			
OF27	Hydrologic Landscape (Arid)	According to the ORWAP Report, the wetland is in a hydrologic landscape unit classified as:		In the ORWAP Report, under the Location Information table, find the Hydrologic Landscape Class.		
		Arid.	0	[AM, AMv, WBNv, SBMv, OE, Sans]		
		Semi-arid.	0			
		Dry.	0			
		Moist.	0			
		Wet.	1			
		Very Wet.	0			
OF28	Input Water - Recognized Quality Issues (WQin)	According to ORWAP Map Viewer's Water Quality Streams layer and Water Quality Lakes layer, ALL of the following are true: (a) within 1 mile upstream from the AA edge, a water body or stream reach is labeled as being 303d, Water Quality Limited (categories 3B-5); Potential Concern; or TMDL Approved AND (b) the problem concerns one or more of the parameters listed below. Select ALL that apply.		Use the ORWAP Map Viewer's Water Quality Streams layer and the Water Quality Lakes layer (expand Water Quality and Quantity) and the Distance tool. Use the Identify tool to determine the reason for the listings.		
		Total suspended solids (TSS), sedimentation, or turbidity.	0			
		Phosphorus, chlorophyll-a, or algae.	1	If the AA receives both inflow and outflow from river flooding, consider the polluted water to be both "upstream" and "downstream".		
		Nitrates, ammonia, chlorophyll-a, or algae.	0			
		Petrochemicals, heavy metals (iron, manganese, lead, zinc, etc.), other toxins.	1	[SRv,PRv,INV,FA,FR,AM,WBF,WBN,STR]		
		Temperature or dissolved oxygen.	1	This may need to be verified in the field.		
		None of above, or no data. If true, enter 1 and SKIP to OF30.	0		NoDataWQinp	
OF29	Duration of Connection Between Problem Area & the AA (ConnCUp)	The upstream problem area mentioned above (OF28) has a surface water connection to the AA:		In the ORWAP Map Viewer, use the National Hydrography Dataset (expand Hydrology) and the Persistent, Seasonal, or Saturated nontidal layers (expand Wetlands/National Wetlands Inventory) to determine duration of surface water connection.		
		For 9 or more continuous months annually.	0	[SRv,PRv,INV,FA,FR,AM,WBF,WBN,STR]		
		Intermittently (at least once annually, but for less than 9 months continually).	0	This may need to be determined or verified in the field.		
		Never (or less than annually).	1			
OF30	Downslope Water Quality Issues (ContamDown)	According to ORWAP Map Viewer's Water Quality Streams layer and Water Quality Lakes layer, ALL of the following are true: (a) within 1 mile downhill or downstream from the AA's edge, a water body is labeled as being 303d, Water Quality Limited (categories 3B-5); Potential Concern; or TMDL Approved AND (b) the problem concerns one or more of the parameters listed below. Select ALL that apply.		Use the ORWAP Map Viewer's Water Quality Streams layer and the Water Quality Lakes layer (expand Water Quality and Quantity) and the Distance tool. Use the Identify tool to determine the reason for the listings.		
		Total suspended solids (TSS), sedimentation, or turbidity.	0	[WCv,SRv,PRv,FA]		
		Phosphorus, chlorophyll-a, or algae.	1			
		Nitrates, ammonia, chlorophyll-a, or algae.	0			
		Petrochemicals, heavy metals (iron, manganese, lead, zinc, etc.), other toxins.	1			
		Temperature or dissolved oxygen.	1			
		None of above, or no data. Enter 1 and SKIP to OF32.	0		NoDataWQdo	
OF31	Duration of Connection Between AA & Water Quality Problem Area (ConnDown)	The connection between the downstream problem area mentioned above (OF30) and the AA:		In the ORWAP Map Viewer, use the National Hydrography Dataset (expand Hydrology) and the Persistent, Seasonal, or Saturated nontidal layers (expand Wetlands/National Wetlands Inventory) to determine duration of surface water connection.		
		Is a stream or water body that connects these areas for 9 or more continuous months annually.	1			
		Is a stream or water body that connects these areas intermittently (at least once annually, but for less than 9 months continually).	0	[WCv,SRv,PRv,FA]		

		Is a probable groundwater connection, or connection via direct runoff only (no channel connection).	0	This may need to be determined or verified in the field.		
		Never exists (a topographic ridge probably prevents all the AA's runoff and groundwater from reaching the problem area).	0			
OF32	Drinking Water Source (DEQ) (DWsource)	According to ORWAP Map Viewer's Surface Water Drinking Water Source Areas layer and the Ground Water Drinking Water Source Areas layer, the AA is within:		In the <u>ORWAP Map Viewer</u> , use the water source layers (expand Water Quality and Quantity).		
		The source area for a surface-water drinking water (DW) source.	1	(NRv)		
		The source area for a groundwater drinking water source.	0			
		Neither of above.	0			
OF33	Groundwater Risk Designations (GWrisk)	According to ORWAP Map Viewer's Groundwater Management Areas layer and the Sole Source Aquifer layer, the AA is:		In the <u>ORWAP Map Viewer</u> , use the DEQ Groundwater Management Areas layer and the Sole source Aquifer layer (expand Water Quality and Quantity).		
		Select All that apply				
		Within a designated Groundwater Management Area (ODEQ).	0	(NRv)		
		Within a designated Sole Source Aquifer area (EPA): the North Florence Dunal Aquifer.	0			
		Neither of above.	1			
OF34	Relative Elevation in Watershed (Elev)	In the ORWAP Map Viewer, based on the Hydrologic Boundaries 4th Level (HUC 8) layer (expand Hydrology), determine if the AA is: (See Column E)		1) Consider which end of the HUC is the bottom. Where streams join, the "V" that they form on the map points towards the bottom of the HUC.		
		In the upper one-third of its watershed.	0	2) If the AA is closer to the HUC's outlet than to its upper end, and is closer to the river or large stream that exits at the bottom of the HUC than it is to the boundary (margin) of the HUC, then check "lower 1/3" If not near that river, check "middle 1/3".		
		In the middle one-third of its watershed.	0	3) If the AA is not in a 100-yr floodplain, is closer to the HUC upper end than to its outlet, and is closer to the boundary (margin) of the HUC than to the river or large stream that exits at the bottom of the HUC, then check "upper 1/3"		
		In the lower one-third of its watershed.	1	4) For all other conditions, check "middle 1/3".	LowerShed	
				[WSv, PRv, FA, FR, WCV, OE, Sens, SRv]		
OF35	Runoff Contributing Area (RCA) - Wetland as % of (WetPctRCA)	Delimit the wetland's Runoff Contributing Area (RCA) using a topographic base map. The area of the AA's wetland is:	W	See the <u>ORWAP Manual</u> for specific protocol for delimiting the RCA (Section 4.1 Step 5). The RCA includes only the areas that potentially drain directly to the AA's wetland rather than to channels that flow or flood into that wetland. Exact precision in drawing the boundary is not required.		
		<1% of its RCA.	0			
		1 to <10% of its RCA.	0			
		10 to 100% of its RCA.	1	[WS, WSV, SR, SRv, PR, PRv, WCV]		
		Larger than the area of its RCA. Enter 1 and SKIP TO OF39.	0		NoRCA	

OF36	Unvegetated % in the RCA (ImpervRCA)	The proportion of the RCA comprised of buildings, roads, parking lots, exposed bedrock, and other surface that is usually unvegetated at the time of peak annual runoff is about:	W	In the ORWAP Map Viewer, use an Aerial layer to determine the proportion of the RCA comprised of buildings, roads, parking lots, exposed bedrock, and other surfaces that are usually unvegetated at the time of peak annual runoff. [WSv,WCv,SRv,PRv,INV,FA,Sens,STR]		
		<10%.	1			
		10 to 25%.	0			
		>25%.	0			
OF37	Transport From Upslope (TransRCA)	A relatively large proportion of the precipitation that falls farther upslope in the RCA reaches this wetland quickly as indicated by the following: (a) RCA slopes are steep, and/or (b) upslope wetlands historically present have been filled or drained extensively, and/or (c) land cover is mostly non-forest, and/or (d) most RCA soils are shallow. This statement is:	W	Refer to aerial imagery and/or consult local sources. See the ORWAP Manual for instructions. [WSv,SRv,PRv,STR]		
		Mostly true.	0			
		Somewhat true.	1			
		Mostly untrue.	0			
OF38	Upslope Soil Erodibility Risk (ErodeUp)	Use the ORWAP Report or the Map Viewer to determine if the erosion hazard rating of the soil within 200 ft away and upslope of the AA is:		If the soil unit is the same as the AA, the Erosion Hazard can be obtained from the ORWAP Report's Soil Information section. If the soil unit is different than the AA, use ORWAP Map Viewer's Oregon Soil layer and see the ORWAP Manual for instructions on how to determine the erosion hazard rating. [SRv,PRv,STR]		
		Slight.	1			
		Moderate.	0			
		Severe.	0			
		Very severe.	0			
		Could not determine.	0			
OF39	Streamflow Contributing Area (SCA) - Wetland as % of (WetPctSCA)	Delimit (or visualize, for large river basins) the wetland's Streamflow Contributing Area (SCA) using a topographic base map. The area of the AA's wetland is:	W	See the ORWAP Manual for specific protocol for delimiting the SCA (section 4.1, Step 6). The SCA is all upland areas that drain into streams, rivers, and lakes that feed the AA's wetland either directly or during semi-annual floods. In addition, for wetlands intercepted by a mapped stream, the SCA can be delineated automatically and its area reported at this USGS web site: https://streamstats.usgs.gov/ss/ . Enter the coordinates, select Oregon, select Delineate, zoom to level 15 or finer, and click on a stream. [WS, SR, SRv, PR, PRv, WCv]		
		<1% of its SCA, or wetland is in the floodplain of a major river.	0			
		1 to <10% of its SCA.	0			
		10 to 100% of its SCA.	1		NoSCA1	
		Larger than the area of its SCA. Enter 1 and SKIP TO OF41.	0		NoSCA	
		Wetland lacks tributaries and receives no overbank water. Enter 1 and SKIP TO OF41.	0			
OF40	Unvegetated % in the SCA (ImpervSCA)	The proportion of the SCA comprised of buildings, roads, parking lots, exposed bedrock, and other surface that is usually unvegetated at the time of peak annual runoff is about:	W	See the ORWAP Manual for instructions. [WCv,SRv,PRv,FA,STR]		
		<10%.	0			
		10 to 25%.	1			
		>25%.	0			
OF41	Upland Edge Shape Complexity (EdgeShape)	Most of the edge between the AA's wetland and upland is (select one):	W	See ORWAP Manual for instructions and illustrations. [NR, SBM, Sens]		
		Linear: a significant proportion of the wetland's upland edge is straight, as in wetlands bounded partly or wholly by dikes or roads, or the AA is entirely surrounded by water or other wetlands.	1			
		Intermediate: Wetland's shape is (a) ovoid, or (b) mildly ragged edge, and/or (c) contains a lesser amount of artificially straight edge.	0			
		Convolute: Wetland perimeter is many times longer than maximum width of the wetland, with many alcoves and indentations ("fingers").	0			
OF42	Zoning (Zoning)	According to ORWAP Map Viewer's Zoning layer, the dominant zoned land use designation for currently undeveloped parcels upslope from the AA and within 300 ft. of its upland edge is:		See the ORWAP Manual for instructions on how to determine the zoning designation. If information is not provided, check local zoning maps. [WSv,WCv,SRv,PRv,INV,FAv,FRv,AMv,WBFv,WBNv,SBMv,PDv,POLv,PUv]		
		Development (Commercial, Industrial, Urban Residential, etc.), or no undeveloped parcels exist upslope from the AA.	1			
		Agriculture or Rural Residential.	0			
		Forest or Open Space, or entirely public lands.	0			
		Not zoned, or no information.	0			

OF43	Growing Degree Days (GDD)	According to ORWAP Map Viewer's Growing Degree Days layer, the long term normal Growing Degree Days category at the approximate location of the AA is:		See the QRWAP Manual for instructions on how to determine the growing degree days category.		
		<256.	0	{NR, FR, AM, WBN, SBM, WCx, OE, CS, Sens}		
		256 - 1020.	0			
		1021-1785.	0			
		1786 - 2550.	1			
		2551 - 3315.	0			
		3316 - 4079.	0			
		> 4079.	0			

Date: 5/6/21		Name: Sue Brady		Site: NEXT Renewable Fuels Oregon (mitigation post-construction)		
Form F Field Data (nontidal Wetlands) ORWAP V 3.2		Conduct an assessment <u>only after reading the accompanying Manual and explanations in column E below</u> . For each affirmative answer, change the 0 in the "Data" column to a "1". Answer all items except where directed to skip to others. Questions whose cells in "Data" column have a "W" MUST be answered for the ENTIRE wetland and bordering waters.		For a list of functions to which each question pertains, see bracketed codes in column E. Codes for functions and their benefits are: WS= Water Storage, WC= Water Cooling, SR= Sediment Retention, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Export, INV= Invertebrates, FA= Anadromous Fish, FR= Resident Fish, AM= Amphibians, WBF= Feeding Waterbirds, WBN= Nesting Waterbirds, SBM= Songbirds, Mammals, & Raptors, POL= Pollinators, PH= Plant Habitat, PU= Public Use & Recognition, EC= Ecological Condition, Sens= Sensitivity, STR= Stressors.		For guidance and detailed descriptions of how Excel calculates the numbers in the Scores worksheet, see the Technical Supplement and Appendix C of the accompanying Manual. For a documented rationale for each indicator, open each of the worksheet tabs at the bottom (one for each function or value) and see column H.
#	Indicators	Condition Choices	Data	Explanations, Definitions (Column E)	Cell Name	Comments
F1	Tidal Wetland (Tidal)	This is a tidal wetland (either freshwater or saltwater). If yes, GO TO worksheet " T ". Do not enter any data here. If nontidal, continue with F2.		Tidal wetland - a wetland that receives tidal water at least once during a normal year, regardless of salinity, and dominated by emergent or woody vegetation. Tidal flooding occurs on a 6-hour cycle DURING THE TIME it is flooded by tide, which may be as infrequent as once per year. If NWI map shows the wetland with a code beginning with E (for estuarine), assume the wetland to be tidal. However, some wetlands lacking that code are also tidal.		
F2	Ponded Condition (Lentic)	At least once every 2 years, some part of the AA contains a cumulative total of >900 sq.ft. of surface water that is ponded. The water persists for >6 days and may be hidden beneath emergent vegetation or scattered in small pools. Enter 1, if true.	1	Ponded - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle). [AM,WBF,WBN]	Lentic	
Reminder: For all questions, the AA should include all persistent waters in ponds smaller than 20 acres that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes or rivers larger than 20 acres -- specifically, the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone.				Adjacent - is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.		
F3	Water Regime (Hydroprd)	The water regime (hydroperiod) of the most permanent (usually deepest) part of the AA is: Select only ONE . (To meet any of the definitions other than <u>Ephemeral</u> , there must be >100 sq ft of surface water for the duration described, otherwise mark the type listed above it) <u>Ephemeral</u> . Surface water in the wettest part of the AA is present for fewer than 7 consecutive days during an average growing season. Includes some of the areas mapped as <u>Saturated</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and SKIP to F25. <u>Temporary</u> . Surface water present for 1-4 weeks consecutively during an average growing season, OR if persists for longer, it is almost entirely in scattered pools, each smaller than 1 sq.m. Dries up completely during part of most average years. Includes some of the areas mapped as <u>Saturated</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and SKIP to F25. <u>Seasonal</u> . Surface water present for 5-17 weeks (1-4 months) consecutively during an average growing season, but dries up completely during part of most average years. Includes some of the areas mapped as <u>Seasonal</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and SKIP to F5. <u>Semi-Persistent</u> . Surface water present for more than 17 weeks (4 months) consecutively during an average growing season, but dries up completely during part of most average years. Includes some of the areas mapped as <u>Seasonal</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and SKIP to F5. <u>Permanent</u> . Does not dry up completely during most average years. Includes some of the areas mapped as <u>Persistent</u> Nontidal in the ORWAP Map Viewer (which is not comprehensive). Enter 1 and continue.	0 0 0 0 1	In the <u>NRCS county soil survey</u> , the Water Features table provides information about periods of flooding, ponding, and highwater table depths. Descriptions of the soil units may include information on saturation persistence. Also consider the hydroperiod label on NWI wetland polygons. [WS, FA, FR, WBN, WBF, WC] Permanent - usually has significant groundwater input, higher conductivity, less annual water level fluctuation. No woody vegetation in most persistently flooded parts. Often with extensive open water and subsurface aquatic plants.	NeverWater TempWet ShallowType DeepType PermType	
F4	Flooded Persistently - % of AA (PermW)	Identify the parts of the AA that still contain surface water even during the driest times of a normal year . At that time, the percentage of the AA that still contains surface water is: 1 to <25% of the AA. 25 to <50% of the AA. 50 to 95% of the AA. >95% of the AA.	1 0 0 0	driest times of a normal year - i.e., when the AA's surface water is at its lowest annual level. Sites fed by unregulated streams that descend on north-facing slopes, tend to remain wet longer into the summer. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [WS,PR,NR,CS,INV,FR,AM,WBF,WBN]	AllPermWater	
F5	Depth Class (Predominant) (DepthDom)	When water is present in the AA, the depth most of the time in most of inundated area is: [Note: NOT necessarily the maximum spatial or annual depth] >0 to <0.5 ft. 0.5 to <1 ft deep. 1 to <3 ft deep. 3 to 6 ft deep. >6 ft deep.	0 0 1 0 0	This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the AA is brief, the answer will be based on the depth of the most persistently inundated part of the AA. Include surface water in channels and ditches as well as ponded areas. In the <u>ORWAP Manual</u> , see the diagram in Appendix B. [WC,SR,PR,CS,OE,INV,FA,FR,WBF,WBN,PD,Sens]		
F6	Depth Class Distribution (DepthEven)	Within the area described above, and during most of the time when surface water is present, the water area has: Select only one.		Estimate these proportions by considering the gradient and microtopography of the site.		

		One depth class covering >90% of the AA's inundated area (use the classes in the question above).	0	In the <u>URWAP Manual</u> , see the diagram in Appendix B.		
		One depth class covering 51-90% of the AA's inundated area (use the classes in the question above).	1			
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0	[INV,FR,WBF,WBN,PD]		
F7	Emergent Plants -- Area (EmArea)	Consider just the area that has surface water for >1 week during the growing season. Herbaceous plants (not moss, not woody) whose foliage extends above a water surface in this area (i.e., emergents) cumulatively occupy an annual maximum of:	W	If multiple small patches are separated by less than 150 ft, they may be combined when evaluating this question.		
		<0.01 acre (< 400 sq. ft). Enter 1 and SKIP TO F10, unless only part of a wetland is being assessed.	0	[SR,PR,OE,INV,FR,WBF,WBN,SBM,PD]	NoEm	
		0.01 to < 0.10 acres (3,920 sq. ft).	0			
		0.10 to <0.50 acres (21,340 sq. ft).	0			
		0.50 to <5 acres.	0			
		5 to 50 acres.	0			
		>50 acres.	1			
F8	% Emergent Plants (EmPct)	Emergent plants occupy an annual maximum of:		[WC,SR,PR,NR,CS,OE,INV,PD,FA,FR,AM,WBF,WBN,SBM]		
		<5% of the parts of the AA that are inundated for >7 days at some time of the year.	0			
		5 to <30% of the parts of the AA that are inundated for >7 days at some time of the year.	0			
		30 to <60% of the parts of the AA that are inundated for >7 days at some time of the year.	0			
		60 to 95% of the parts of the AA that are inundated for >7 days at some time of the year.	1			
		>95% of the parts of the AA that are inundated for >7 days at some time of the year.	0			
F9	Cattail or Tall Bulrush Cover (Cttail)	The percentage of the emergent vegetation cover in the AA that is cattail (<i>Typha</i> spp.) or tall bulrush is:		[WBN, SBM]		
		<1% of the emergent vegetation, or cattail and bulrush are absent.	0			
		1 to <25% of the emergent vegetation.	0			
		25 to 75% of the emergent vegetation.	1			
		>75% of the emergent vegetation.	0			
F10	Water Shading by AA's Woody Vegetation - Driest (WoodyDryShade)	During an average growing season, when water levels are lowest (but surface water still occupies >400 sq ft or >1% of the AA), the percentage of the remaining surface water within the AA that is shaded by trees and/or shrubs located within the AA is:		[WC,FA,WBN,SBM]		
		<5% of the water, and fewer than 10 woody plants taller than 3 ft shade it, or all surface water is flowing.	0			
		<5% of the water, but more than 10 woody plants taller than 3 ft shade it.	0			
		5 to <25% of the water.	0			
		25 to <50% of the water.	1			
		50 to 95% of the water.	0			
		>95% of the water.	0			
F11	Open Water - Extent	During most of the growing season, the largest patch of open water that is in or adjacent to the AA is >1 acre and mostly deeper than 1 ft. Enter 1, if true.	1	Open Water - is surface water of any depth that contains no emergent herbaceous or woody vegetation (may contain floating-leaved or completely submersed plants). It may be partially	OpenW	
F12	All Pondered Water as Percentage - Wettest (PondWpctWet)	When water levels are <u>highest</u> , during a normal year, the surface water that is <u>pondered</u> continually for >6 days occupies:		Pondered - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle).	NoPond	
		<1% or none of the AA. Surface water is completely or nearly absent then, or is entirely flowing. Enter 1 and SKIP TO F22.	0			
		1 to <5% of the AA.	0	[WS,WC,CS,OE,INV,AM,WBF,WBN]		
		5 to <30% of the AA.	1			
		30 to <70% of the AA.	0			
		70 to 95% of the AA.	0			
		>95% of the AA.	0			
F13	Pondered Open Water Area - Wettest (OWAreaWet)	When water levels are <u>highest</u> , during a normal year, the AA's <u>pondered open water</u> occupies a cumulative area of:	W	Pondered - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle).		
		<0.10 acre (< 4356 sq. ft) of the AA and adjacent pondered waters. Enter 1 and SKIP TO F16.	0		NoPondOW	
		0.10 to <0.50 acres (21,340 sq. ft) of the AA and adjacent pondered waters.	0			
		0.50 to <1 acres of the AA and adjacent pondered waters.	0			
		1 to <5 acres of the AA and adjacent pondered waters.	0			
		5 to <50 acres of the AA and adjacent pondered waters.	1			
		50 to <640 acres (1 sq. mi) of the AA and adjacent pondered waters.	0	[WS,WBF]		
		640 to <1000 acres of the AA and adjacent pondered waters.	0			
		1000 to <2500 acres of the AA and adjacent pondered waters.	0			

		>2500 acres (>4 sq.mi) of the AA and adjacent ponded waters.	0			
F14	Ponded Open Water Distribution - Wettest (WaterMixWet)	When water levels are <u>highest</u> , during a normal year, the distribution (in aerial view) of ponded open water patches larger than 0.01 acre (400 sq. ft) within the AA is (must meet both a and b criteria):		[NR,AM,WBF,WBN,PD,SBM]		
		(a) Vegetation <u>and</u> open water <u>EACH</u> comprise 30-70% of the AA (including its bordering waters if any) AND (b) There are <u>many</u> small patches of open water scattered widely within vegetation or <u>many</u> small vegetation clump "islands" scattered widely within open water. Typical (for example) of some extensive bulrush and cattail marshes.	0			
		(a) Vegetation <u>and</u> open water <u>EACH</u> comprise 30-70% of the AA (including its bordering waters if any) AND (b) There are only a <u>few</u> (or no) small patches of open water scattered widely within vegetation or a <u>few</u> small vegetation clump "islands" scattered widely within open water.	0			
		(a) Vegetation <u>or</u> open water <u>comprise</u> >70% of the AA (and its bordering waters) AND (b) There are <u>several</u> small patches of open water scattered within vegetation or <u>several</u> small vegetation clump "islands" scattered within open water.	1			
		(a) Vegetation <u>or</u> open water <u>comprise</u> >70% of the AA (and its bordering waters) AND (b) Open water is <u>mostly</u> in a single <u>area</u> (e.g., center of the wetland) and vegetation is in the rest (e.g., periphery), with almost no intermixing. (Typical of many ponds excavated for livestock watering, stormwater treatment, mineral extraction as well as many wetlands that are inundated only temporarily each year).	0			
F15	Width of Vegetated Zone - Wettest (WidthWet)	When water levels are <u>highest</u> , during a normal year, the width of the <u>vegetated wetland</u> that separates the largest patch of open water within or bordering the AA from the closest adjacent uplands, is predominantly: (Note: This is not asking for the maximum width.)		Vegetated wetland - in this case does not include underwater or floating-leaved plants, i.e., aquatic bed. In farmed wetlands that have different crops from year to year, consider vegetation condition as it probably existed during most of the past 5 years.		
		<5 ft. or no vegetation between upland and open water.	0	If open water exists as many patches, use the distance between the majority of those patches and uplands.		
		5 to <30 ft.	0			
		30 to <50 ft.	0			
		50 to <100 ft.	0	[WC,SR,PR,NR,CS,OE,AM,WBF,WBN,SBM,PD,Sens,EC]		
		100 to 300 ft.	0			
		> 300 ft.	1			
F16	All Ponded Water as a Percentage (Driest) (PondWpctDry)	When water levels are <u>lowest</u> , during a normal year, but surface water still occupies >1,076 sq feet (100 sq meter) OR >1% of the AA (whichever is more), the water that is <u>ponded</u> (either visible or concealed by vegetation) in the AA occupies:		Ponded - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle).	NoPond2	
		<1% or none. Surface water is completely or nearly absent then, or is entirely flowing. Enter 1 and SKIP TO F22.	0			
		1 to <5% of the AA.	0	[WC,FA,FR,AM,WBN,Sens]		
		5 to <30% of the AA.	1			
		30 to <70% of the AA.	0			
		70 to 95% of the AA.	0			
		>95% of the AA.	0			
F17	Ponded Open Water Area (Driest) (OWAreaDry)	When water levels are <u>lowest</u> , during a normal year, the AA's <u>ponded open water</u> occupies a cumulative area, including adjacent ponded waters, of:	W	Ponded - Most surface water is not visibly flowing. Flow, if any, is not sufficient to suspend fine sediment. These include pools in floodplains and may be either large (e.g., an off-channel pond) or small (size of a puddle).	NoPondOW2	
		<0.10 acre (< 4356 sq. ft). Enter 1 and SKIP TO F24.	0			
		0.10 to <0.50 acres (21,340 sq. ft).	0	Open water - is surface water of any depth that contains no emergent herbaceous or wood vegetation (may contain floating-leaved or completely submersed species). It may be partially shaded by a tree canopy.		
		0.50 to <1 acres.	0			
		1- 4 acres.	0			
		5 to <50 acres.	1	[WBN,PUV]		
		50 to <640 acres (1 sq. mi).	0			
		640 to <1000 acres.	0			
		1000 to 2500 acres.	0			
		>2500 acres (>4 sq.mi).	0			
F18	Ponded Open Water Distribution - (Driest) (WaterMixDry)	When water levels are <u>lowest</u> , during a normal year, the distribution of ponded open water patches larger than 0.01 acre (400 sq. ft) within the AA is:		[NR,INV,AM,WBN]		
		(a) Vegetation <u>and</u> open water <u>EACH</u> comprise 30-70% of the AA (including its bordering waters if any) AND (b) There are <u>many</u> small patches of open water scattered widely within vegetation or <u>many</u> small vegetation clump "islands" scattered widely within open water. Typical (for example) of some extensive bulrush and cattail marshes.	0			
		(a) Vegetation <u>and</u> open water <u>EACH</u> comprise 30-70% of the AA (including its bordering waters if any) AND (b) There are only a <u>few</u> (or no) small patches of open water scattered widely within vegetation or a <u>few</u> small vegetation clump "islands" scattered widely within open water.	0			
		(a) Vegetation <u>or</u> open water <u>comprise</u> >70% of the AA (and its bordering waters) AND (b) There are <u>several</u> small patches of open water scattered within vegetation or <u>several</u> small vegetation clump "islands" scattered within open water.	1			

		(a) Vegetation or open water comprise ≥70% of the AA (and its bordering waters) AND (b) Open water is mostly in a single area (e.g., center of the wetland) and vegetation is in the rest (e.g., periphery), with almost no intermixing. Typical of many ponds excavated for livestock watering, stormwater treatment, mineral extraction as well as many wetlands that are inundated only temporarily each year.	0			
F19	Floating Algae & Duckweed (Algae)	At some time of the year, most of the AA's otherwise-unshaded water surface is covered by floating mats of algae, or small (<1 inch) floating plants such as duckweed, <i>Azolla</i> , <i>Wolffia</i> , or <i>Riccia</i> . Enter 1, if true.	0	This includes most nontidal wetlands labeled as Aquatic Bed (AB) on NWI maps. If wetland can be visited only during winter, it may not be possible to answer this question with much certainty unless local sources are contacted or indicators (e.g., dried remains of algae) are found.		
F20	Floating-leaved & Submerged Aquatic Vegetation (SAV)	SAV (submerged & floating-leaved aquatic vegetation, excluding the species listed above) occupies an annual maximum of:		SAV - are herbaceous plants that characteristically grow at or below the water surface, i.e., whose leaves are primarily and characteristically under or on the water surface during most of the part of the growing season when surface water is present. Some species are rooted in the sediment whereas others are not. If pond lily (<i>Nuphar</i>) is the predominant species, consider its maximum extent only during the period when surface water is present beneath the leaves.	NoSAV	
		none, or <5% of the water area.	0			
		5 to <25% of the water area.	0			
		25 to <50% of the water area.	1			
		50 to 95% of the water area.	0			
		>95% of the water area.	0	[PR,OE,INV,FR,AM,WBF,WBN]		
		many SAV plants present, but impossible to select from the above categories.	0			
F21	Width of Vegetated Zone (Driest) (WidthDry)	When water levels are lowest, during a normal year, but surface water still occupies ≥400 sq feet or ≥1% of the AA (which ever is more), the width of the vegetated wetland that separates the largest patch of open water within or bordering the AA from the closest adjacent uplands, is predominantly:		Measure the width perpendicular to the open water part.		
		<5 ft, or no vegetation between upland and open water.	0	Vegetated wetland - in this case does not include underwater or floating-leaved plants, i.e., aquatic bed. In farmed wetlands that have different crops from year to year, consider vegetation condition as it probably existed during most of the past 5 years.		
		5 to <30 ft.	0			
		30 to <50 ft.	0	Note: For most sites larger than 1 acre and with persistent water, measure the width using aerial imagery rather than estimating in the field.		
		50 to <100 ft.	0			
		100 to 300 ft.	0			
		> 300 ft.	1	[WBN]		
F22	Beaver (Beaver)	Use of the AA by beaver during the past 5 years is: Select most applicable ONE.		Valley width - is delimited by an abrupt increase in slope on both sides of the channel.		
		Evident from direct observation or presence of gnawed limbs, dams, tracks, dens, or lodges.	1	[AM,WBN,SBM,PD,Sens]		
		Very likely based on known occurrence in this part of the region and proximity to ALL of the following (a) a persistent freshwater wetland, pond, or lake, or a perennial low-gradient (<5%) channel, and (b) average valley width is > 150 ft and (c) >20% cumulative cover of aspen, cottonwood, alder, and willow in vegetated areas within 150 ft of the AA's edge. Or there is evidence of beaver just outside the AA.	0			
		Somewhat likely based on known occurrence in this part of the region and proximity to ALL of the following (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) average valley width is >50 ft, and (c) >20% cumulative cover of hardwood trees and shrubs in vegetated areas within 150 ft of the AA's edge.	0			
		Unlikely because site characteristics above are deficient, and/or this is an area where beaver are routinely removed. But beaver occur within 2 miles.	0			
		None. Beaver are absent from this part of the region.	0			
F23	Isolated Island (Island)	During June, the wetland contains (or is part of) an island that is isolated from the shore by water depths >3 ft. The island may be solid, or it may be a floating vegetation mat suitable for nesting waterbirds. The island must be larger than 400 sq.ft and without inhabited buildings. Enter 1, if true.	0	[WBF,WBN]		
F24	Ice-free (IceDura)	During most years, most of the AA's surface water (if any) does not freeze, or freezes for fewer than 4 continuous weeks. Enter 1, if true.	1	[PR,FR,WBF]		
F25	Water Fluctuation Range - Maximum (Fluctu)	The maximum vertical fluctuation in surface water within the AA, during a normal year is:		maximum vertical fluctuation - is the difference between the highest annual and lowest annual water level during an average year.		
		<0.5 ft or stable.	0			
		0.5 to < 1 ft.	0	Use field indicators to assess this indicator.		
		1 to <3 ft.	1			
		3 to 6 ft.	0	[WS,SR,PR,NR,CS,OE,INV,AM,WBN,PD]		
		>6 ft.	0			
F26	% Only Saturated or Seasonally Flooded (SeasPct)	Identify the parts (if any) of the AA that never contain surface water (only saturated soil) or where the water (either ponded or flowing) usually remains on the land surface for less than the entire growing season. The percentage of the AA containing such areas is:		If you can identify plants, use their wetland indicator status to infer the possible extent of seasonal-only inundation within a wetland. Vegetation may be patterned in concentric or parallel zones, as one moves outward & away from the deepest part of the wetland or channel. Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) may be evident when not fully inundated. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualizing where that would intercept the land along the river. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. Although useful only as a general guide, the NRCS county soil series descriptions of the soil units and water feature table	NoSeasonal	
		<5% of the AA, or none (i.e., all water persists for >4 months).	0			
		5 to <25% of the AA.	0			
		25 to <50% of the AA.	0			

		50 to 75% of the AA.	1	general guide, and include existing data and any observations of the area and other nearby features. usually includes information on flooding frequency and saturation persistence.		
		>75% of the AA.	0	[SR,NR,CS,OE,INV,FA,WBF,WBN,POL,SBM,PD,Sens,EC]		
F27	Salinity, Alkalinity, Conductance (Salin)	The AA's surface water is mostly:		Saline or brackish conditions are commonly indicated by a prevalence of particular plant species. Consult the ORWAP Suppinfo file's P_Salt worksheet for a list of these.		
		Brackish or saline. Plants that indicate saline conditions dominate the vegetation. Salt crust may be obvious around the perimeter and on flats.	0	Brackish or saline - conductance of >5000 µS/cm, or >3200 ppm TDS		
		Slightly brackish. Plants that indicate saline conditions are common. Salt crust may or may not be present along perimeter.	0	Slightly brackish - conductance of 500- 5000 µS/cm, or 320 - 3200 ppm TDS		
		Fresh. <i>[Note: Assume this to be the condition unless wetland is known to be a playa or there is other contradicting evidence].</i>	1	Fresh - conductance of < 500 µS/cm, or <320 ppm TDS	FreshW	
		Unknown.	0	[PR,CS,AM]		
F28	Fish & Waterborne Pests (FishAcc)	Select All that apply:		[INV,FA,FR,AM,WBF]		
		A regularly-used boat dock is present within or contiguous to the AA.	0			
		A regularly-used boat dock is not within the AA, but there is one within 300 ft. of the AA and there is a persistent surface connection between the dock and the AA.	0			
		Fish (native or stocked) are known to be present in the AA, or can access it during at least one day annually.	0			
		None of the above, and could not estimate fish presence/absence.	1			
F29	Non-native Aquatic Animals (PestAnim)	The following are known or likely to have reproducing populations in this AA, its wetland, or in water bodies within 300 ft that connect to the AA at least seasonally. Select All that apply:		Assume non-native fish to be present if wetland is associated with a nearby reservoir, fish pond, or perennial stream flowing through an agricultural or residential area. Assume bullfrog, nutria, and/or carp to be present if (a) the AA contains persistent water or is flooded seasonally by an adjoining body of permanent water, and (b) not a forested wetland, and (c) in western Oregon, elevation is lower than about 3000 ft. In the ORWAP_Suppinfo file, see inverts_Exo worksheet for more complete list of non-native invertebrates for Oregon, and WetVerts worksheet for more complete list of fish that are not native to Oregon. You may also consult: http://nas.er.usgs.gov/queries/default.aspx http://www.dfw.state.or.us/conservationstrategy/invasive_species.asp		
		Non-native amphibians (e.g., bullfrog) or reptiles (e.g., red-ear slider).	1	[FA,FR,AM,EC]		
		Carp.	0			
		Non-native fish that prey on tadpoles or turtles (e.g., bass, walleye, crappie, brook trout).	0			
		Non-native invertebrates (e.g., New Zealand mudsnail, mitten crab, rusty crayfish).	0			
		Nutria.	0			
		None of above.	0			
F30	Shorebird Feeding Habitats (Shorebd)	The extent of <u>mudflats</u> , <u>very shallow waters</u> , or <u>shortgrass meadows</u> , within the AA, that meet the definition of shorebird habitat for at least 3 months during the period of late summer through the following May is:		Shorebird habitat - areas must have (a) grasses shorter than 6", or a mudflat, during any part of this period, AND (b) soils that either are saturated or covered with <2 inches of water during any part of this period, AND (c) no detectable surrounding slope (e.g., not the bottom of an incised dry channel), AND (d) not shaded by shrubs or trees. See photograph in Appendix A of manual. This addresses needs of most migratory sandpipers, plovers, curlews, and godwits.		
		None, or <100 sq. ft.	0	[WBF]		
		100 to <1000 sq. ft. within AA.	0			
		1000 to 10,000 sq. ft. within AA.	1			
		>10,000 sq. ft. within AA.	0			
F31	Outflow Duration (OutDura)	The most persistent surface water connection (outlet channel, pipe, ditch, or overbank water exchange) between the AA and the closest stream or lake located downslope is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of its wetland, OR the surface connection between the AA's wetland and a mapped stream or lake located within 300 ft downslope from this wetland].	W	The emphasis is on the connection to a mapped stream network. A larger difference in elevation between the wetland-upland boundary and the bottom of the wetland outlet (if any) indicates shorter outflow duration.		
		Persistent (>9 months/year).	1	Do not rely only on topographic maps or NWI maps to show this; inspect while in field if possible, and ask landowner. The durations given are only approximate and are for a "normal" year. The connection need not occur during the growing season. Assume that depressions with effective nearby ditches or tile drains will connect for shorter periods.		
		Seasonal (14 days to 9 months/year, not necessarily consecutive).	0	[WS,WCV,SR,PR,NR,CS,OE,FA,FR,Sens]	NoOutlet	
		Temporary (<14 days, not necessarily consecutive).	0			
		None – no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. Enter 1 and SKIP TO F33.	0			
F32	Outflow Confinement (Constric)	During major runoff events , in the places described above where surface water exits the AA, it:	W	Major runoff events - would include biennial high water caused by storms and/or rapid snowmelt.		
		is impeded as it mostly passes through a pipe, culvert, tidegate, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography).	0	Impeded - means causing a delay or reduction in water velocity or volume.		
		Leaves mainly through natural surface exits, not largely through artificial or temporary features which impede or accelerate outflow.	1	[WS,SR,PR,NR,CS,OE,Sens,STR]		
		Is exported more quickly than usual as it mostly passes through ditches or pipes intended to accelerate drainage. They may be within the AA or connected to its outlet or within 30 ft of the AA's edge.	0			
F33	Tributary or Overbank Inflow (Inflow)	At least once annually, surface water from upstream or another water body moves into the AA. It may enter directly, or as unconfined overflow from a contiguous river or lake. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. Enter 1, if true. If false, SKIP TO F36.	0	[SRv,PRv, PD]	Inflow	
F34	Input Channel Gradient (SlopeInChan)	The gradient of the tributary with the largest inflow, averaged over the 150 ft. before it enters the AA (but excluding any portion of the distance where water travels through a pipe) is:		[SRv, PRv]		
		<1%.	0			
		1 to <3%.	0			
		3 to 6%.	0			

		>6%.	0			
F35	Throughflow Complexity (ThruFlo)	[Skip this question if the AA lacks both an inlet and outlet.] During peak annual flow, water entering the AA in channels encounters which of the following conditions as it travels through the AA: Select the ONE encountered most.		This mainly refers to surface water that moves between the inlet and outlet. Some judgment is required in assessing straight vs. indirect flow path.		
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel within unvegetated (often inoised) channels and has minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0	See ORWAP Manual Appendix B diagram.		
		Bumps into <u>herbaceous vegetation</u> but mostly remains in fairly <u>straight channels</u> .	0	[WS,SR,PR,NR,OE,INV,FA,FR,WBF,WBN,PD]		
		Bumps into <u>herbaceous vegetation</u> and mostly <u>spreads throughout</u> , or follows a fairly <u>indirect path</u> (in widely meandering, multi-branched, or braided channels).	0			
		Bumps into <u>tree trunks and/or shrub stems</u> but mostly remains in fairly <u>straight channels</u> .	0			
		Bumps into <u>tree trunks and/or shrub stems</u> and follows a fairly <u>indirect path</u> (meandering, multi-branched, or braided) from entrance to exit.	0			
F36	Internal Gradient (Gradient)	The gradient from the lowest to highest point of land <u>within the AA</u> (or from outlet to inlet) is:		Wetlands with no outlet, and wetlands where most surface water is impounded on site, should be considered flat (<2%).		
		<2% (internal flow is absent or barely detectable; basically flat).	1	For other wetlands, estimate gradient as the elevation difference between the inlet and outlet (if any) divided by the distance between them, or the difference between the highest and lowest points in the wetland divided by the distance between them.		
		2 to <6%.	0	[WS,SR,PR,NR,CS,OE,AM,WBF,WBN]	TooSteep1	
		6 to 10%.	0		TooSteep2	
		>10%.	0			
F37	Groundwater Strength of Evidence (Groundw)	Select first one that applies:		[WS,WC,NR,CS,OE,INV,FA,FR,PD]		
		In the AA or its wetland: (a) Springs are observed, OR (b) Water is markedly cooler in summer and warmer in winter (e.g., later ice formation) than in other local wetlands, OR (c) Measurements from shallow wells indicate groundwater is discharging to the wetland, OR (d) Water visibly seeps into pits dug within the AA during the driest time of the year and located >30 ft from the closest surface water.	0			
		The AA's wetland: (a) Is very close to the base of a natural slope steeper than 15% and longer than 300 ft or is located at a geologic fault, OR (b) Has no persistently flowing tributary AND one or more is true: (b1) Is on a natural slope of >5%, OR (b2) Has rust deposits ("iron flocc"), colored precipitates, or dispersible natural oil sheen, OR (b3) Is in an Arid or Semi-arid hydrologic unit .	0	Arid or Semi-arid hydrologic unit - See the ORWAP Report's Hydrologic Landscape Class (under Location Information).		
		The AA is <u>not</u> in an Arid or Semi-arid hydrologic unit , but has persistent ponded water, no tributary, and is not fed by wastewater, concentrated stormwater, or irrigation water, or by an adjacent river or lake.	1			
		None of above is true, OR AA contains a hot spring. Some groundwater may nonetheless discharge to or flow through the wetland.	0			
F38	Unshaded Herbaceous Vegetation (Extent) (HerbExpos)	The annual maximum areal cover of herbaceous vegetation (excluding SAV, ferns, and mosses, but including forbs & graminoids) that is not beneath a woody canopy reaches:		Do not include submersed and floating-leaved aquatics (SAV) in the category of "herbaceous vegetation", or when defining the "vegetated part" of the site.		
		<5% of the vegetated part of the AA. Enter 1 and SKIP to F42.	0		NoHerb	
		5 to <25% of the vegetated part of the AA.	0	For sites larger than 10 acres, this should be determined from aerial imagery rather than estimated in the field.		
		25 to <50% of the vegetated part of the AA.	0			
		50-95% of the vegetated part of the AA.	1	[WBF,WBN]		
		>95% of the vegetated part of the AA.	0			
F39	Forb Cover (Forb)	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		Forbs - are flowering non-woody vascular plants (excludes grasses, sedges, ferns, mosses).		
		<5% of the herbaceous part of the AA.	0	[POL]		
		5 to <25% of the herbaceous part of the AA.	0			
		25 to <50% of the herbaceous part of the AA.	1			
		50 to 95% of the herbaceous part of the AA.	0			
		>95% of the herbaceous part of the AA.	0			
F40	Species Dominance - Herbaceous (HerbDom)	Determine which <u>two native</u> herbaceous (forb, fern, and graminoid) species comprise the greatest portion of the herbaceous cover that is unshaded by a woody canopy. Then select one:		[INV,WBF,SBM,PD,POL,Sens,EC]		
		Those species together comprise <u>more than half</u> of the areal cover of <u>native</u> herbaceous plants at any time during the year, i.e., one dominant species or two co-dominants. Also mark this if <20% of the vegetated cover is native species.	0			

		Those species together comprise <u>less than half</u> of the areal cover of <u>native</u> herbaceous plants at any time during the year.	1			
F41	Invasive or Non-native - % of Vegetative Cover (Invas)	Vegetative cover (annual maximum) is: Overwhelmingly (>80% cover) non-native species AND ≥10% of the herbaceous cover is <u>invasive species</u> . (See ORWAP Suppinfo file for species designations). Overwhelmingly (>80% cover) non-native species AND ≤10% of the herbaceous cover is <u>invasive species</u> ; OR 50-80% of cover is non-native species regardless of invasiveness. Mostly (50-80%) native species. Overwhelmingly (>80%) native species.	0 0 0 1	In the ORWAP Suppinfo, see P_Invas worksheet for list of invasives and P_Exo for non-native species list. Examples of woody invasives are Himalayan blackberry, English ivy, scotch broom, and gorse. For known distributions of invasive plants in your area see: http://nr.oregonstate.edu/orbic/invasive-species and http://www.weedmapper.org/maps.html but do not limit your answer based only on that information. Consider most crops to be non-native. [WBF,PD,POL,Sens,EC]	InvasDom	
F42	Mowing, Grazing, Fire (VegCut)	There is evidence that grazing by domestic or wild animals – or mowing (multiple times per year), plowing, herbicides, harvesting, or fire – has <u>repeatedly</u> reduced the AA's vegetation cover (plants that normally grows taller than 4") to <u>less than 4 inches</u> , or has created an obvious browse line, over the following extent: 0% (No evidence of such activities). Trace to 5% of the normally vegetated AA (grazing, mowing, or fire have occurred but vegetation height effects are mostly unnoticeable). 5 to <50% of the normally vegetated AA. 50 to 95% of the normally vegetated AA. >95% of the normally vegetated AA.	1 1 0 0 0 0	Repeatedly - means the condition occurred in at least half of the last 10 years. [SR,AM,WBN,SBM,PD,EC]	NoMowGraze	
F43	Historically Lacking Trees (HistVeg)	According to the ORWAP Report, the <u>presettlement vegetation class</u> in the vicinity of the AA was prairie, sagebrush, or other open lands not dominated by trees. In addition, the AA is not within the biennial floodplain of a river where trees and shrubs typically dominate when conditions are unaltered. Enter 1, if true.	1	In the ORWAP Report's Location Information table. This question is used as a classification variable mainly to set appropriate expectations for the extent of forest cover.	HistOpenland	
F44	Moss Wetland (Moss)	The AA's ground cover is primarily a deep layer of moss, and/or soils are mainly peat or organic muck. Also, the soil remains water-saturated to within 3 inches of the surface during most of a normal year. Surface water within the AA often is absent or confined to small scattered pools or ditches. Enter 1, if true.	0	Includes most bogs and fens. May be a floating island. [NR,CS,OE,WBF,WBN,Sens]		
F45	Woody Extent (WoodyPct)	Within the vegetated part of the AA, woody vegetation (trees, shrubs, robust vines) taller than 3 ft occupies: <5% of the vegetated AA, and fewer than 10 trees are present. Enter 1 and SKIP to F51. <5% of the vegetated AA, but more than 10 trees are present. 5 to <25% of the vegetated AA. 25 to <50% of the vegetated AA. 50 to 95% of the vegetated AA. >95% of the vegetated part of the AA.	0 0 0 1 0 0	Robust vines - include Himalayan blackberry and others that are generally erect and taller than 1 ft. Vegetated part - should not include floating-leaved or submersed aquatics. For sites larger than 1 acre, this should be determined from aerial imagery rather than estimated only in the field. [NR,WC,CS,SBM,PD,Sens]	NoWoody	
F46	Woody Diameter Classes (TreeDiams)	Select All the types that comprise >5% of the woody canopy cover in the AA or >5% of its wooded upland edge if any: Deciduous 1-4" diameter (DBH) and >3 ft tall. Evergreen 1-4" diameter and >3 ft tall. Deciduous 4-9" diameter. Evergreen 4-9" diameter. Deciduous 9-21" diameter. Evergreen 9-21" diameter. Deciduous >21" diameter. Evergreen >21" diameter.	1 0 1 0 1 0 0 0	Wooded upland edge - includes woody plants located within one tree-height of the wetland-upland boundary. DBH is the diameter of the tree measured at 4.5 ft above the ground. [CS,SBM,POL,Sens]		
F47	Snags (Snags)	The number of large snags (diameter >12 inches) in the AA plus 100 ft uphill of its edge is: Few or none. Several.	0 1	Snags - are standing trees at least 20 ft tall that are mainly without bark or foliage. [SBM,POL]		
F48	Abovewater Wood (WoodOver)	The number of horizontal wood pieces thicker than 4 inches that are <u>partly submerged</u> during most of the spring or early summer, thus <u>potentially serving as basking sites</u> for turtles, birds, or frogs and cover for fish is: None. Few. Several (e.g., >3 per 300 ft of channel or shoreline).	0 0 1	<u>Only the wood that is at or above the water surface is assessed</u> because of the impracticality of assessing underwater wood accurately when using a rapid assessment method. [FA,FR,AM]		
F49	Downed Wood (WoodDown)	The number of downed wood pieces longer than 6 ft and with diameter >4 inches that are not submerged during most of the growing season, is: Few or none. Several.	0 1	Exclude temporary "burn piles." [INV,AM,SBM,POL]		

F50	Exposed Shrub Canopy (ShrExpos)	<p>Within the vegetated part of the AA, shrubs shorter than 20 ft that are not overtopped by trees occupy: Select first statement that is true.</p> <p><5% of the vegetated AA and <0.01 acre (400 sq ft).</p> <p>5 to <25% of the vegetated AA or the water edge (whichever is greater in early summer).</p> <p>25 to <50% of the vegetated AA or the water edge (whichever is greater in early summer).</p> <p>50 to 95% of the vegetated AA or the water edge (whichever is greater in early summer).</p> <p>>95% of the vegetated part of the AA or the water edge (whichever is greater in early summer).</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>Vegetated part - should not include floating-leaved or submersed aquatics.</p> <p>[SBM,PD]</p>		
F51	N Fixers (Nfix)	<p>The percentage of the vegetated area in the AA <u>or</u> along its water edge (whichever has more) that contains nitrogen-fixing plants (e.g., alder, baltic rush, scotch broom, lupine, clover, alfalfa, other legumes) is:</p> <p><1% or none.</p> <p>1 to <25%.</p> <p>25 to <50%.</p> <p>50 to 75%.</p> <p>>75%.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>For a more complete list, see QRWAP_SuppInfo, worksheet NFIX (includes native and non-native species). Do not include algae.</p> <p>[OE,INV,Sens]</p>		
Note for the next four questions: If the AA lacks an upland edge, evaluate based on the AA's <u>entire perimeter</u> and outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.						
F52	Upland Perennial Cover - % of Perimeter (PerimPctPer)	<p>The percentage of the AA's <u>edge (perimeter)</u> that is comprised of a band of upland perennial cover wider than 10 ft and taller than 6 inches, during most of the growing season is:</p> <p><5%.</p> <p>5 to <25%.</p> <p>25 to <50%.</p> <p>50 to <75%.</p> <p>75 to 95%.</p> <p>>95%.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Perennial cover - vegetation that includes wooded areas, native prairies, sagebrush, as well as relatively unmanaged commercial lands in which the ground is disturbed less frequently than annually such as perennial ryegrass fields, hayfields, lightly grazed pastures, timber harvest areas, and rangeland.</p> <p>It <u>does not</u> include water, row crops (vegetable, orchards, Christmas tree farms), residential areas, golf courses, recreational fields, pavement, bare soil, rock, bare sand, or gravel or dirt roads.</p> <p>[WCv,SRv,PRv,INV,FA,AM,WBF,WBN,SBM,PD,POL,POLv,Sens,STR]</p>		
F53	Upland Perennial Cover - Width (Buffer) (BuffWidth)	<p>Along the greatest extent of the AA's <u>upland edge</u>, the width of perennial cover taller than 6 inches that extends upslope from the AA until mostly shorter or non-perennial cover is reached is: [NOTE: the width is not necessarily the maximum width. Base on vegetation that occurs most of the growing season.]</p> <p>< 5 ft. or none.</p> <p>5 to <30 ft.</p> <p>30 to <50 ft.</p> <p>50 to <100 ft.</p> <p>100 to 300 ft.</p> <p>> 300 ft.</p>	<p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Upland edge - is the land within 3 ft of the wetland's perimeter that is not wetland.</p> <p>[WCv,SRv,PRv,INV,FA,AM,WBN,SBM,PD,POL,Sens,STR]</p>	NoUpPerCov	
F54	Upland Trees as % of All Perennial Cover (UpTreePctPer)	<p>Within 100 ft landward from the AA's <u>edge (perimeter)</u>, the percentage of the upland perennial cover that is woody plants taller than 20 ft is:</p> <p><5%, or there is no upland perennial cover along the upland edge.</p> <p>5 to <25% of perennial cover.</p> <p>25 to <50% of perennial cover.</p> <p>50 to <75% of perennial cover.</p> <p>75 to 95% of perennial cover.</p> <p>>95% of perennial cover.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Base this on the cumulative canopy width of the trees.</p> <p>[WSv,FA,WBF,WBN,SBM]</p>	AllUpPerren	
F55	Weeds - % of Upland Edge (UpWeed)	<p>Along the AA's <u>edge (perimeter)</u>, the cover of invasive woody or herbaceous plants occupies: [If vegetation is so senesced that apparently-dominant edge species cannot be identified even to genus, answer "none"].</p> <p><5%, or none.</p> <p>5 to <25%.</p> <p>25 to <50%.</p> <p>50 to <75%.</p> <p>75 to 95%.</p> <p>>95%.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>See QRWAP_SuppInfo file, worksheet P_Invas.</p> <p>Some of the most common invaders along upland edges of Oregon wetlands are Himalayan blackberry, knotweed, sweetbrier rose, Russian olive, English ivy, nightshade, pepperweed, medusahead, white clover, ryegrass, quackgrass, false brome, bentgrass, dandelion, oxeye daisy, pennyroyal, bull and creeping thistles, tansy ragwort, poison hemlock, and teasel. If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an invasive species, assume the unidentified plant to also be invasive.</p> <p>[PD,STR]</p>		
F56	Bare Ground & Accumulated Plant Litter	<p>Consider the parts of the AA that go dry during a normal year. Viewed from <u>6 inches above the soil surface</u>, the condition in most of that area just before the year's longest inundation period begins is:</p>		<p>Bare ground - includes unvegetated soil, rock, sand, or mud between stems if any. Bare ground under a tree or shrub canopy should be counted.</p>		

	(Uncover)	<p>Little or no (<5%) bare ground is visible between erect stems or under canopy and there is little or no dead detached plant tissue (thatch) remaining on top of the ground surface and ground surface is extensively blanketed by moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.</p> <p>Some (5-20%) bare ground or remaining thatch is visible. Herbaceous plants have moderate stem densities and do not closely hug the ground.</p> <p>Much (20-50%) bare ground or thatch is visible. Low stem density and/or tall plants with little living ground cover during early growing season.</p> <p>Mostly (>50%) bare ground or thatch.</p> <p>Not applicable. All of the AA is inundated throughout most years.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p>	<p>Wetlands that are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season.</p> <p>[WS,WC,SR,PR,NR,CS,OE,INV,AM,SBM,POL,Sens,EC]</p>		
F57	Ground Irregularity (Girreg)	<p>In parts of the AA that lack persistent water, the number of small pits, raised mounds, hummocks, boulders, upturned trees, animal burrows, islands, natural levees, wide soil cracks, and microdepressions is:</p> <p>Few or none, or the entire AA is always water-covered. Minimal microtopography, <1% of the AA, e.g., many flat sites having a single hydroperiod.</p> <p>Intermediate.</p> <p>Several (extensive micro-topography).</p>	<p>0</p> <p>1</p> <p>0</p>	<p>Microtopography - refers mainly to vertical relief of <3 ft and is represented only by inorganic features, except where plants have created depressions or mounds of soil.</p> <p>Consider the microtopography to be "<u>few or none</u>" if one could walk easily through most of the AA once any slash and logs are removed. Consider it to be "<u>several</u>" if one has to constantly look down and check balance.</p> <p>[WS,SR,PR,NR,INV,AM,SBM,PD,POL,EC]</p>		
F58	Soil Composition (SoilTex)	<p>Based on digging into the substrate and examining the <u>surface layer</u> of the soil (2 inch depth) that was mapped as being predominant, its composition (excluding duff and living roots) is mostly:</p> <p>Loamy: includes silt, silt loam, loam, sandy loam.</p> <p>Clayey: includes clay, clay loam, silty clay, silty clay loam, sandy clay, sandy clay loam.</p> <p>Organic: includes muck, mucky peat, peat, and mucky mineral soils (blackish or grayish). Exclude live roots unless they are moss.</p> <p>Coarse: includes sand, loamy sand, gravel, cobble, stones, boulders, fluvents, fluvaquents, riverwash.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>Do not base the texture on soil maps unless the AA is inaccessible. See <u>ORWAP Manual's</u> protocol (Step 2 of section 5.3 and the soil chart in Appendix B).</p> <p>Judge which soil type is predominant <u>only in the part of the AA that is not inundated</u> at the time of your visit.</p> <p>Duff - is loose organic surface material, e.g., dead plant leaves and stems). Organic soils are much less common in floodplains.</p> <p>[WS,PR,NR,CS,OE,PD,Sens]</p>		
F59	Cliffs or Banks (Cliff)	<p>Within 300 ft of the AA, there are elevated terrestrial features such as cliffs, bluffs, talus slopes, or unarmored stream banks that extend at least 6 ft nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas.</p> <p>Enter 1, if true.</p>	<p>0</p>	<p>[SBM,POL]</p>		
F60	Restored or Created Wetland (NewWet)	<p>The AA is (or is within, or contains) a "new" wetland resulting from human actions (e.g., excavation, impoundment) or other factors affecting what was upland (non-hydric) soil. Or, some part of the AA was originally a wetland, was artificially drained for many years, and has since had its water regime partly or wholly restored or rehabilitated (e.g., by ditch plugs, berms, tile breakage, non-maintenance).</p> <p>Yes, and constructed or restored mostly within last 3 years.</p> <p>Yes, and constructed or restored mostly 3-7 years ago.</p> <p>Yes, and constructed or restored mostly >7 years ago.</p> <p>Yes, but time of origin or restoration unknown.</p> <p>No.</p> <p>Unknown if wetland is constructed, restored, or natural.</p>	<p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Include wetlands whose area was likely expanded by road berms which impeded runoff, but do not include wetlands created by beaver dams except for the part where flooding affected uplands (not just existing wetlands and streams). Determine this using historical aerial photography, old maps, soil maps, consultation with landowners, and/or permit files as available.</p> <p>See <u>ORWAP Map Viewer's</u> Hydric Soil layer (expend Soils). Also, locations of some restoration wetlands can be found in the <u>ORWAP Map Viewer</u> under Restoration.</p> <p>Another potential source is the <u>Conservation Registry</u>: https://oregonexplorer.info/content/conservation-registry?topic&ptopic.</p> <p>[PR,NR,CS,OE,PD,Sens]</p>	NotNewWet	
F61	Ownership (Ownership)	<p>Most of the AA is:</p> <p>Publicly owned (municipal, county, state, federal).</p> <p>Owned by non-profit conservation organization or easement holder who allows public access to this AA.</p> <p>Other private ownership, including tribal. Enter 1 and SKIP to F63.</p>	<p>0</p> <p>0</p> <p>1</p>	<p>An initial indication of ownership can be found on the <u>ORWAP Map Viewer</u> under the Land Ownership layer (expand Land Classification). However, it is advisable to ask local sources or use local maps with higher precision.</p> <p>[PUV]</p>	PrivateOwn	
F62	Special Protected Area Designation (Desig)	<p>The AA is part of an area designated as a Special Protected Area according to the USGS Protected Areas Database of the U.S.</p> <p>Enter 1, if true.</p>	<p>0</p>	<p>See the <u>ORWAP Map Viewer Report</u> under the Location Information section for "In Special Protected Area?"</p> <p>[PUV]</p>		
F63	Conservation Investment (Conslvest)	<p>The AA is not a mitigation wetland, but public funds or community volunteer efforts have been applied to preserve, create, restore, or enhance the condition or functions of the wetland. (e.g. CRP or WRP wetlands, community projects).</p> <p>Enter 1, if true. (If unknown, leave 0).</p>	<p>0</p>	<p>Locations of some restoration wetlands can be found in the <u>ORWAP Map Viewer</u> under Restoration. Another potential source is the <u>Conservation Registry</u>: https://oregonexplorer.info/content/conservation-registry?topic&ptopic [PUV]</p>		
F64	Compensation Wetland (MitWet)	<p>The AA is all or part of a compensation site used explicitly to offset impacts elsewhere.</p> <p>Enter 1, if true. (If unknown, leave 0).</p>	<p>1</p>	<p>Answer to the best of your knowledge. Sources for information include the property owner, DSL, and/or the ACCOE [PUV]</p>		
F65	Sustained Scientific Use (SciUse)	<p>Plants, animals, or water in the AA have been monitored for >2 years, <u>unrelated to any regulatory requirements, and data are available to the public</u>. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Enter 1, if true. (If unknown, leave 0)</p>	<p>0</p>	<p>[PUV]</p>		
F66	Visibility (Visibil)	<p>The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 300 ft of the AA is (Select ONE):</p> <p><25%.</p> <p>25 - 50%.</p> <p>>50%.</p>	<p>0</p> <p>1</p> <p>0</p>	<p>[WBFv,WBNv,SBMv,PUv,STR]</p>		

F67	Non-consumptive Uses - Actual or Potential (RecPoten)	Select All statements that are true of this AA as it currently exists:		The question assumes access is allowed.		
		Walking is physically possible in >5% of the AA during most of year (e.g., free of deep water and dense shrub thickets).	1	[PUv]		
		All or part of the AA (or an area within sight of the AA and within 100 ft) would be physically accessible to people in wheelchairs (e.g., paved and flat).	0			
		Maintained roads, parking areas, or foot-trails are within 30 ft of the AA, or the AA can be accessed most of the year by boat.	1			
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0			
F68	Core Area 1 (VisitNo)	The percentage of the AA almost never walked or driven by humans during an average growing season probably comprises: [Note: If more than half the wetland is visible from areas within 100 ft of the AA, include visits by people to those areas that are actually walked or driven (not simply viewed from).]		Judge this based on proximity to population centers, roads, trails, accessibility of the AA to the public, wetland size, usual water depth, and physical evidence of human visitation.		
		<5% and no inhabited building is within 300 ft of the AA.	0	Exclude visits that are not likely to continue and/or that are not an annual occurrence (e.g., by construction, maintenance, or monitoring crews).		
		<5% and inhabited building is within 300 ft of the AA.	0			
		5 to <50% and no inhabited building is within 300 ft of the AA.	0	[AM,WBF,WBN,SBM,PD,PUv,STR]		
		5 to <50% and inhabited building is within 300 ft of the AA.	0			
		50 to 95% with or without inhabited building nearby.	1			
		>95% of the AA with or without inhabited building nearby.	0			
F69	Core Area 2 (VisitOften)	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [The Note in the preceding question applies here as well].		See note above.		
		<5%.	0	[AM,WBF,WBN,SBM,PD,PUv,STR]		
		5 to <50%.	1			
		50 to 95%.	0			
		>95% of the AA.	0			
F70	Consumptive Uses (Provisioning Services) (Hunt)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select All that apply.		Evidence of these consumptive uses may consist of direct observation, or presence of physical evidence (e.g., recently cut stumps, fishing lures, shell cases), or might be obtained from communication with the land owner or manager.		
		Low-impact commercial timber harvest (e.g., selective thinning).	0			
		Commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0			
		Waterfowl hunting.	0	[FRv,WBFv,PUv]		
		Fishing.	0			
		Trapping of furbearers.	0			
		None of the above.	1			
F71	Domestic Wells (Wells)	Wells or water bodies that currently provide drinking water are:		If unknown, assume this is true if there is an inhabited structure within the specified distance and the neighborhood is known to not be connected to a municipal drinking water system (e.g., is outside an urban growth boundary or other densely settled area).		
		<300 ft and downslope from the AA or at same elevation.	0			
		300 to 1500 ft and downslope or at same elevation.	1			
		>1500 ft downslope, or none downslope, or no information.	0	[NRv]		
F72	Wetland Type of Conservation Concern (RareType)	Does the AA contain, or is it part of, any of these wetland types? Select All that apply.	W	Consult the ORWAP Report under the Location Information table for "Rare Wetland Types." But be aware that it may not apply to the exact AA you have delimited. [PDv, Sens]		
		Mature forested wetland (anywhere): a wetland in which mean diameter of trees (d.b.h., FACW and FAC species only) exceeds 18 inches, and/or the average age of trees exceeds 80 years, or there are >5 trees/acre with diameter >32 inches.	0	To qualify, the diameter of >18 inches must be the mean measured from at least 10 trees.		
		Bog or Fen: contains a sponge-like organic soil layer which covers most of the AA and often has extensive cover of sedges and/or broad-leaved evergreen shrubs (e.g., Ledum). Often lacks tributaries, being fed mainly by groundwater and/or direct precipitation.	0			
		Playa, Salt Flat, or Alkaline Lake: a nontidal ponded water body usually having saline (salinity >1 ppt or conductivity >1000 µS) or alkaline (conductivity >2000 µS and pH >9) conditions and large seasonal water level fluctuations (if inputs-outputs unregulated). If a playa or salt flat, vegetation cover is sparse and plants typical of saline or alkaline conditions (e.g., Distichlis, Atriplex) are common.	0	See ORWAP Supplinfo file, worksheet P_Salt for species typically occurring in tidal or saline conditions.	Playa	
		Hot spring (anywhere): a wetland where discharging groundwater in summer is >10 degrees (F) warmer than the expected water temperature.	0			
		Native wet prairie (west of the Cascade crest): a seasonally inundated wetland, usually without a naturally-occurring inlet or outlet, and dominated primarily by native graminoids often including species in column E.	0	Deschampsia caespitosa, Danthonia californica, Camassia quamash, Triteleia hyacinthina, Carex densa, C. aperta, and/or C. unilateralis		
		Vernal pool (Willamette Valley): a seasonally inundated wetland, underlain by hardpan or claypan, with hummocky micro-relief, usually without a naturally-occurring inlet or outlet, and with native plant species distinctly different from those in slightly higher areas, and often including species in column E.	0	Downingia elegans, Isoetes nuttallii, Triteleia hyacinthina, Eleocharis spp., Eryngium petiolatum, Plagiobothrys figuratus, Plagiobothrys scouleri, Grindelia nana, Veronica peregrina, Lasthenia glaberrima, Cicendia quadrangularis, Kickxia elatine, Gnaphalium palustre, and/or Callitriche spp.		

Vernal pool (Medford area): a seasonally inundated acidic wetland, underlain by hardpan, with hummocky micro-relief, usually without a naturally-occurring inlet or outlet, and having concentric rings of similar native vegetation, often including species in column E.	0	Downingia virens, Isoetes nuttallii, Ptilularia americana, Tritoleia hyacinthina, Eleocharis spp., Eryngium petiolatum, Plagiobothrys bracteatus, Plagiobothrys scouleri, Grindelia nana, Veronica peregrina, Alopecurus saccatus, Lasthenia californica, Deschampsia danthonioides, and/or		
Vernal pool (Modoc basalt & Columbia Plateau): a seasonally inundated wetland, usually without a naturally-occurring inlet or outlet, located on shallow basalt bedrock and often having species in column E.	0	Blennosperma nanum, Camassia quamash, Epilobium densiflorum, Callitriche marginata, Cicendia quadrangularis, Eryngium vaseyi, Psilocarphus brevissimus, and/or Sedella pumila.		
Interdunal wetland (Coastal ecoregion): a seasonally inundated wetland, usually without a naturally-occurring inlet or outlet, located between sand dunes where wind has scoured the sand down to the water table (deflation plain, blowout pond), and often with significant cover of the native species in column E.	0	Carex obnupta, Argentina egedii, Juncus lesoueuilii, J. nevadensis, J. falcatus, Sisyrinchium californicum, and/or Salix hookeriana		
Ultramafic soil wetland (mainly southwestern Oregon): a low-elevation wetland, usually with a sponge-like organic soil layer, occurring in an area with exposed serpentine or peridotite rock, and/or in soils with very low Ca:Mg ratios.	0			
None of above.	1			

Site: NEXT Renewable Fuels Oregon (mitigation post-construction)		Name: Sue Brady		Date: 5/6/21		
Form S Stresser Data ORWAP V 3.2					Data	Comments
51	Aberrant Timing of Water Inputs (AltTiming) <i>In the "Data" column, place an X next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times).</i> Control structure that regulates inflow to the AA (including tide gates), or flow regulation in tributaries, or water level in adjoining water body is regulated. Irrigation runoff or seepage. Snow storage areas that drain directly to the wetland. Increased pavement and other impervious surface in the CA. Straightening, ditching, dredging, and/or lining of tributary channels in the CA. <i>If any items were checked above, then for each row of the table below, you may assign points (3, 2, or 1). However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 pts)	Medium (2 pts)	Mild (1 pt)		
Spatial extent within the AA of timing shift.		>95% of AA.	5-95% of AA.	<5% of AA.	3	
When most of the timing shift began.		<3 yrs ago.	3-9 yrs ago.	10-100 yrs ago.	1	
<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the AA that experiences those.</i>						
Input timing now vs. previously.		Shift of weeks.	Shift of days.	Shift of hours or minutes.	0	
Flashiness or muling.		Became very flashy or controlled.	Intermediate.	Became mildly flashy or controlled.	0	
				Sum=	4	
				Final score=	0.33	
52	Accelerated Inputs of Nutrients (NutrLoad) <i>In the "Data" column, place an X next to any item – occurring in either the AA or its RCA – that is likely to have accelerated the inputs of nutrients (nitrogen, phosphorus) to the AA.</i> Stormwater or wastewater effluent (including failing septic systems), landfills. Fertilizers applied to lawns, ag lands, or other areas in the RCA. Livestock, dogs. Artificial drainage of upslope lands. Other waterborne human-related nutrient sources within the RCA. <i>If any items were checked above, then for each row of the table below, you may assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 pts)	Medium (2 pts)	Mild (1 pt)		
Usual load of nutrients.		Large (e.g., feedlots, extensive residential on septic) or 303d* for nutrients.	Moderate (e.g., grazing, light residential on septic, light agriculture).	Limited (e.g., a few animals, lawns, sewer residential).	2	
Frequency & duration of input.		Frequent and year-round.	Frequent but mostly seasonal.	Infrequent & during high runoff events mainly.	2	
AA proximity to main sources (actual or potential).		0 - <50 ft.	50-300 ft. or in groundwater.	In other part of contributing area.	2	
				Sum=	6	
				Final score=	0.67	
53	Accelerated Inputs of Contaminants and/or Salts (Contamin). <i>In the "Data" column, place an X next to any item – occurring in either the AA or its RCA – that is likely to have accelerated the inputs of contaminants or salts to the AA.</i> Stormwater or wastewater effluent (including failing septic systems), landfills, snow storage areas. Metals & chemical wastes from mining, shooting ranges, oil/gas extraction, other sources. Irrigation of lands, especially those with saline soils. Oil or chemical spills (not just chronic inputs) from nearby roads. Road salt. Pesticides applied to lawns, ag lands, roadsides, or other areas in the RCA, but excluding spot applications for controlling non-natives in the AA. Artificial drainage of contaminated or saline soils. Erosion of contaminated soils. Other contaminant sources within the RCA. <i>If any items were checked above, then for each row of the table below, you may assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 pts)	Medium (2 pts)	Mild (1 pt)		
Usual toxicity of most toxic contaminants.		Industrial effluent or 303d* for toxics.	Wastewater treatment plant, cropland, fossil fuel extraction, pipeline, power station, managed landfill.	Low density residential or commercial.	1	
Frequency & duration of input.		Frequent and year-round.	Frequent but mostly seasonal.	Infrequent & during high runoff events mainly.	2	
AA proximity to main sources (actual or potential).		0 - <50 ft.	50-300 ft. or in groundwater.	In other part of contributing area.	2	
* See ORWAP Map Viewer for waters designated as 303d; see Oregon DEQ web site for reasons.						
				Sum=	5	
				Final score=	0.56	

54	Excessive Sediment Loading from Runoff Contributing Area (SedRCA).				
In the "Data" column, place an X next to any item present in the RCA that is likely to have elevated the load of waterborne or windborne sediment reaching the AA from its RCA.					
Erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires.				X	
Erosion from construction, in-channel machinery in the RCA.				X	
Erosion from off-road vehicles in the RCA.					
Erosion from livestock or foot traffic in the RCA.				X	
Stormwater or wastewater effluent.					
Sediment from road sanding, gravel mining, other mining, oil/gas extraction.					
Accelerated channel downcutting or headcutting of tributaries due to altered land use.					
Other human-related disturbances within the RCA.					
If any items were checked above, then for each row of the table below you may assign points (3, 2, or 1) in the last column that describe the combined maximum effect of those items in increasing the amount or transport of sediment into the AA. To estimate that, contrast it with the condition if checked items never occurred or were no longer present.					
		Severe (3 pts)	Medium (2 pts)	Mild (1 pt)	
Erosion in RCA.	Extensive evidence, high intensity*.	Potentially (based on high-intensity* land use) or scattered evidence.	Potentially (based on low-intensity* land use) with little or no direct evidence.	2	
Recentness of significant soil disturbance in the RCA.	Current & ongoing.	1-12 months ago.	>1 yr ago.	3	
Duration of sediment inputs to the AA.	Frequent and year-round.	Frequent but mostly seasonal.	Infrequent & mainly during high runoff or severe wind events.	2	
AA proximity to actual or potential sources.	0 - <50 ft., or farther but on steep erodible slopes.	50-300 ft.	In other part of contributing area.	3	
* High-intensity= plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment.				Sum=	10
				Final score=	0.83
55	Soil or Sediment Alteration Within the Assessment Area (SolidDisturb).				
In the "Data" column, place an X next to any item present in the AA that is likely to have compacted, eroded, or otherwise altered the AA's soil.					
Compaction from livestock, machinery, off-road vehicles, or mountain bikes, especially during wetter periods.				X	
Leveling or other grading not to the natural contour.				X	
Tillage, plowing (but excluding disking for enhancement of native plants).				X	
Fill, riprap, other armoring, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil stockpiled or imported from another wetland.					
Excavation.				X	
Dredging in or adjacent to the AA.				X	
Boat traffic in or adjacent to the AA and sufficient to cause shore erosion or stir bottom sediments.					
Artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments.					
If any items were checked above, then for each row of the table below you may assign points (3, 2, or 1) in the last column that describe the combined maximum effect of those items in altering the AA's soils. To estimate that, contrast it with the soil condition if checked items never occurred or were no longer present.					
		Severe (3 pts)	Medium (2 pts)	Mild (1 pt)	
Spatial extent of altered soil.	>95% of AA or >95% of its upland edge (if any).	5-95% of AA or 5-95% of its upland edge (if any).	<5% of AA and <5% of its upland edge (if any).	3	
Recentness of significant soil alteration in AA.	Current & ongoing.	1-12 months ago.	>1 yr ago.	2	
Duration.	Long-lasting, minimal veg recovery.	Long-lasting but mostly revegetated.	Short-term, revegetated, not intense.	2	
Timing of soil alteration.	Frequent and year-round.	Frequent but mostly seasonal.	Infrequent & mainly during scattered events.	1	
				Sum=	8
				Final score=	0.67

Report Generated: October 28, 2020 02:02 PM

Assessment Area: 178 Acres

Location Map



Location Information

Latitude	46.1667679158424	Longitude	-123.163463650944
Elevation	11 ft	Annual precipitation	53 in
Watershed (HUC12)	Lower Beaver Creek-Frontal Columbia River (170800030407)		
Presettlement Vegetation Class	Marsh/Wetland		
Rare Wetland Type(s)	None		
Hydrologic Landscape Class	Wet		
In Special Protected Area?	No		

[View Salinity Maps \(pdf\)](#)

Soil Information

Soil Name	Udipsamments, nearly level, protected
Soil Symbol	61
Hydric Rating	Yes
Hydric Percent	97
Percent Area	82.9%
Erosion Hazard	Slight

This report was generated using the ORWAP Map Viewer, a tool of the Oregon Explorer (<http://oregonexplorer.info>).

Dom. Cond. Non-irrigated Capability Class	Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
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Soil Name	Wauna-Locoda silt loams, protected
Soil Symbol	68
Hydric Rating	Yes
Hydric Percent	94
Percent Area	8.5%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Wauna silt loam, protected
Soil Symbol	66
Hydric Rating	Yes
Hydric Percent	98
Percent Area	3.1%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Soil Name	Crims silt loam, protected
Soil Symbol	15
Hydric Rating	Yes
Hydric Percent	99
Percent Area	2.6%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Locoda silt loam, protected
Soil Symbol	29
Hydric Rating	Yes

Hydric Percent	97
Percent Area	1.4%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Crims silt loam, protected
Soil Symbol	15
Hydric Rating	Yes
Hydric Percent	99
Percent Area	1.3%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Wauna silt loam, protected
Soil Symbol	66
Hydric Rating	Yes
Hydric Percent	98
Percent Area	0.1%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Soil Name	Crims silt loam, protected
Soil Symbol	15
Hydric Rating	Yes
Hydric Percent	99
Percent Area	0.1%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Watershed Information

HUC Best

HUC Code	HUC Name	Is HUC Best?	Greatest Criteria met	FW, s/f, lg (Acres)	FW, em, lg (Acres)	EST, em, lg (Acres)	EST, s/f, lg (Acres)
HUC8: 17080003	Lower Columbia-Clatskanie	Yes	proportional	330.6	784.6	57.6	0
HUC10: 1708000304	n/a	No	n/a	n/a	n/a	n/a	n/a
HUC12: 170800030407	Lower Beaver Creek-Frontal Columbia River	No	n/a	n/a	n/a	n/a	n/a

[abbreviations: FW- freshwater (wetland); em- Emergent; lg- largest; s/f- Shrub/Forested; EST- Estuarine (wetland)]

HUC 12 Functional Deficit

HUC Code	HUC Name	WS	SR	NT	WC	INV	AM	FH	WB
HUC12: 170800030407	Lower Beaver Creek-Frontal Columbia River								

[abbreviations: WS= Water Storage, SR= Sediment Retention, NT= Nutrient Retention (PR or NR), WC= Water Cooling (Thermoregulation), INV= Invertebrate Habitat, AM= Amphibian Habitat, FH= Fish Habitat (FA or FR), WB= Waterbird Habitat (WBF or WBN)]

Rare Species Scores

Rare Species Type	Maximum score	Sum Score	Rating
Non-anadromous Fish Species	0	0	None
Amphibian & Reptile Species	0	0	None
Feeding Waterbirds	0	0	None
Nesting Waterbirds	0	0	None
Songbirds, Raptors, and Mammals	0	0	None
Invertebrate Species	0	0	None
Plant Species	0	0	None

Scores have taken into account several factors for each rare species record contained in the official database of the Oregon Biodiversity Information Center (ORBIC): (a) the regional rarity of the species, (b) their proximity to the point of interest, and (c) the "certainty" that ORBIC assigns to each of those records.

Element of Occurrence (Rare Species)

[View wildlife list for Lower Beaver Creek-Frontal Columbia River \(170800030407\)](#)

Within Assessment Area No EO Records
 Within 1 mile No EO Records
 In HUC12 watershed 4 EO Records

Element of Occurrence Record(s) in HUC12

- 1 Chinook salmon (Lower Columbia River ESU, fall run)
 [2 occurrences]
Oncorhynchus tshawytscha pop. 22
 ORBIC State Status: S2
 ORBIC Global Status: G5T2Q
 ODFW Strategy Species: Yes
- 2 Steelhead (Southwest Washington ESU, winter run)
 [1 occurrences]
Oncorhynchus mykiss pop. 35
 ORBIC State Status: S2
 ORBIC Global Status: G5T3Q
 ODFW Strategy Species: Yes
- 3 Coho salmon (Lower Columbia River ESU)
 [1 occurrences]
Oncorhynchus kisutch pop. 1
 ORBIC State Status: S2
 ORBIC Global Status: G5T2Q
 ODFW Strategy Species: No

- *HUC Best: Oregon watersheds (HUC8, HUC10, HUC12) with greatest type diversity, proportional area, or density of wetlands according to available National Wetland Inventory maps.*

"Type diversity" is the number of unique NWI codes in the watershed (e.g., PEMA, PEMC, PEMCx) and excluded types that have no vegetation component (e.g., PUBH, R3US2).

"Density" is the number of vegetated NWI polygons divided by the acreage of the watershed; many of these polygons may be contiguous with each other, forming a single wetland.

"Proportional Area" is the proportion of the watershed's total area occupied by vegetated wetlands as mapped by NWI.

- *The digital maps used to determine this do not show many wetlands or cover the entire state. Data were compiled only from watersheds that have been at least 90% mapped by NWI (see worksheets for HUC8, 10, and 12). Data were received in November 2008 from ORBIC.*

• *METHODS: The above 3 metrics can be strongly correlated with watershed size and with each other. To minimize that bias, the rankings of the residuals from a regression analysis were used, rather than simply the top-ranking watersheds, to identify the most "important" watersheds for each metric at each scale. That is, the watersheds were identified that were in the top 5% in terms of variety of mapped wetland types for watersheds of that size, the largest area of mapped wetlands as a proportion of the watershed area for watersheds of that size, and/or the greatest number of mapped wetland polygons for watersheds with that much wetland area.*

• *Global rank. ORBIC participates in an international system for ranking rare, threatened and endangered species throughout the world. The system was developed by The Nature Conservancy and is now maintained by NatureServe in cooperation with Heritage Programs or Conservation Data Centers (CDCs) in all 50 states, in 4 Canadian provinces, and in 13 Latin American countries. The ranking is a 1-5 scale, primarily based on the number of known occurrences, but also including threats, sensitivity, area occupied, and other biological factors. In this book, the ranks occupy two lines. The top line is the Global Rank and begins with a "G". If the taxon has a trinomial (a subspecies, variety or recognized race), this is followed by a "T" rank indicator. A "Q" at the end of this line indicates the taxon has taxonomic questions. The second line is the State Rank and begins with the letter "S". The ranks are summarized as follows: 1 = Critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation, typically with 5 or fewer occurrences; 2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation), typically with 6-20 occurrences; 3 = Rare, uncommon or threatened, but not immediately imperiled, typically with 21-100 occurrences; 4 = Not rare and apparently secure, but with cause for long-term concern, usually with more than 100 occurrences; 5 = Demonstrably widespread, abundant, and secure; H = Historical Occurrence, formerly part of the native biota with the implied expectation that it may be rediscovered; X = Presumed extirpated or extinct; U = Unknown rank; ? = Not yet ranked, or assigned rank is uncertain.*

- *This report contains both centroid-based and polygon-based data. The Location Information and Watershed Information sections of the report contain centroid based data (determined by the center point of the polygon), while the remaining sections are polygon-based (determined from the entire polygon).*

Report Generated: July 13, 2021 06:45 PM

Assessment Area: 576 Acres

Location Map



Location Information

Latitude	46.1485710776345	Longitude	-123.173400905364
Elevation	12 ft	Annual precipitation	53 in
Watershed (HUC12)	Lower Beaver Creek-Frontal Columbia River (170800030407)		
Presettlement Vegetation Class	Marsh/Wetland		
Rare Wetland Type(s)	None		
Hydrologic Landscape Class	Wet		
In Special Protected Area?	No		

[View Salinity Maps \(pdf\)](#)

Soil Information

Soil Name	Wauna silt loam, protected
Soil Symbol	66
Hydric Rating	Yes
Hydric Percent	98
Percent Area	55.6%
Erosion Hazard	Slight

This report was generated using the ORWAP Map Viewer, a tool of the Oregon Explorer (<http://oregonexplorer.info>).

Dom. Cond. Non-irrigated Capability Class	Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
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Soil Name	Crims silt loam, protected
Soil Symbol	15
Hydric Rating	Yes
Hydric Percent	99
Percent Area	15.8%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Wauna-Locoda silt loams, protected
Soil Symbol	68
Hydric Rating	Yes
Hydric Percent	94
Percent Area	14.3%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Crims silt loam, protected
Soil Symbol	15
Hydric Rating	Yes
Hydric Percent	99
Percent Area	7%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Crims silt loam, protected
Soil Symbol	15
Hydric Rating	Yes

Hydric Percent	99
Percent Area	3.7%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Locoda silt loam, protected
Soil Symbol	29
Hydric Rating	Yes
Hydric Percent	97
Percent Area	1.3%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Soil Name	Water
Soil Symbol	W
Hydric Rating	Unranked
Hydric Percent	0
Percent Area	1.3%
Erosion Hazard	Not rated
Dom. Cond. Non-irrigated Capability Class	n/a

Soil Name	Water
Soil Symbol	W
Hydric Rating	Unranked
Hydric Percent	0
Percent Area	1%
Erosion Hazard	Not rated
Dom. Cond. Non-irrigated Capability Class	n/a

Soil Name	Crims silt loam, protected
Soil Symbol	15
Hydric Rating	Yes
Hydric Percent	99
Percent Area	0%
Erosion Hazard	Slight
Dom. Cond. Non-irrigated Capability Class	Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Watershed Information

HUC Best							
HUC Code	HUC Name	Is HUC Best?	Greatest Criteria met	FW, s/f, lg (Acres)	FW, em, lg (Acres)	EST, em, lg (Acres)	EST, s/f, lg (Acres)
HUC8: 17080003	Lower Columbia-Clatskanie	Yes	proportional	330.6	784.6	57.6	0
HUC10: 1708000304	n/a	No	n/a	n/a	n/a	n/a	n/a
HUC12: 170800030407	Lower Beaver Creek-Frontal Columbia River	No	n/a	n/a	n/a	n/a	n/a

[abbreviations: FW- freshwater (wetland); em- Emergent; lg- largest; s/f- Shrub/Forested; EST- Estuarine (wetland)]

HUC 12 Functional Deficit									
HUC Code	HUC Name	WS	SR	NT	WC	INV	AM	FH	WB
HUC12: 170800030407	Lower Beaver Creek-Frontal Columbia River								

[abbreviations: WS= Water Storage, SR= Sediment Retention, NT= Nutrient Retention (PR or NR), WC= Water Cooling (Thermoregulation), INV= Invertebrate Habitat, AM= Amphibian Habitat, FH= Fish Habitat (FA or FR), WB= Waterbird Habitat (WBF or WBN)]

Rare Species Scores

Rare Species Type	Maximum score	Sum Score	Rating
Non-anadromous Fish Species	0	0	None
Amphibian & Reptile Species	0	0	None
Feeding Waterbirds	0	0	None
Nesting Waterbirds	0	0	None
Songbirds, Raptors, and Mammals	0	0	None
Invertebrate Species	0	0	None
Plant Species	0	0	None

Scores have taken into account several factors for each rare species record contained in the official database of the Oregon Biodiversity Information Center (ORBIC): (a) the regional rarity of the species, (b) their proximity to the point of interest, and (c) the “certainty” that ORBIC assigns to each of those records.

Element of Occurrence (Rare Species)

[View wildlife list for Lower Beaver Creek-Frontal Columbia River \(170800030407\)](#)

Within Assessment Area	No EO Records	Element of Occurrence Record(s) in HUC12
Within 1 mile	3 EO Records	<ol style="list-style-type: none"> Chinook salmon (Lower Columbia River ESU, fall run) [2 occurrences] Oncorhynchus tshawytscha pop. 22 ORBIC State Status: S2 ORBIC Global Status: G5T2Q ODFW Strategy Species: Yes Steelhead (Southwest Washington ESU, winter run) [1 occurrences] Oncorhynchus mykiss pop. 35 ORBIC State Status: S2 ORBIC Global Status: G5T3Q ODFW Strategy Species: Yes Coho salmon (Lower Columbia River ESU) [1 occurrences] Oncorhynchus kisutch pop. 1 ORBIC State Status: S2 ORBIC Global Status: G5T2Q ODFW Strategy Species: No
In HUC12 watershed	4 EO Records	

- HUC Best: Oregon watersheds (HUC8, HUC10, HUC12) with greatest type diversity, proportional area, or density of wetlands according to available National Wetland Inventory maps.

"Type diversity" is the number of unique NWI codes in the watershed (e.g., PEMA, PEMC, PEMCx) and excluded types that have no vegetation component (e.g., PUBH, R3US2).

"Density" is the number of vegetated NWI polygons divided by the acreage of the watershed; many of these polygons may be contiguous with each other, forming a single wetland.

"Proportional Area" is the proportion of the watershed's total area occupied by vegetated wetlands as mapped by NWI.

- The digital maps used to determine this do not show many wetlands or cover the entire state. Data were compiled only from watersheds that have been at least 90% mapped by NWI (see worksheets for HUC8, 10, and 12). Data were received in November 2008 from ORBIC.
- METHODS: The above 3 metrics can be strongly correlated with watershed size and with each other. To minimize that bias, the rankings of the residuals from a regression analysis were used, rather than simply the top-ranking watersheds, to identify the most "important" watersheds for each metric at each scale. That is, the watersheds were identified that were in the top 5% in terms of variety of mapped wetland types for watersheds of that size, the largest area of mapped wetlands as a proportion of the watershed area for watersheds of that size, and/or the greatest number of mapped wetland polygons for watersheds with that much wetland area.
- Global rank. ORBIC participates in an international system for ranking rare, threatened and endangered species throughout the world. The system was developed by The Nature Conservancy and is now maintained by NatureServe in cooperation with Heritage Programs or Conservation Data Centers (CDCs) in all 50 states, in 4 Canadian provinces, and in 13 Latin American countries. The ranking is a 1-5 scale, primarily based on the number of known occurrences, but also including threats, sensitivity, area occupied, and other biological factors. In this book, the ranks occupy two lines. The top line is the Global Rank and begins with a "G". If the taxon has a trinomial (a subspecies, variety or recognized race), this is followed by a "T" rank indicator. A "Q" at the end of this line indicates the taxon has taxonomic questions. The second line is the State Rank and begins with the letter "S". The ranks are summarized as follows: 1 = Critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation, typically with 5 or fewer occurrences; 2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation), typically with 6-20 occurrences; 3 = Rare, uncommon or threatened, but not immediately imperiled, typically with 21-100 occurrences; 4 = Not rare and apparently secure, but with cause for long-term concern, usually with more than 100 occurrences; 5 = Demonstrably widespread, abundant, and secure; H = Historical Occurrence, formerly part of the native biota with the implied expectation that it may be rediscovered; X = Presumed extirpated or extinct; U = Unknown rank; ? = Not yet ranked, or assigned rank is uncertain.
- This report contains both centroid-based and polygon-based data. The Location Information and Watershed Information sections of the report contain centroid based data (determined by the center point of the polygon), while the remaining sections are polygon-based (determined from the entire polygon).
- The rare species results in this report are based on a subset of the ORBIC rare species dataset. The ORWAP tool only reports on rare species that meet the following criteria: wetland habitat species that are tracked by ORBIC, excluding historical or extirpated sites or those with low mapping accuracy. More information about specific sites and additional species can be obtained from ORBIC through data requests, see <https://nr.oregonstate.edu/orbic/data-requests> for details.

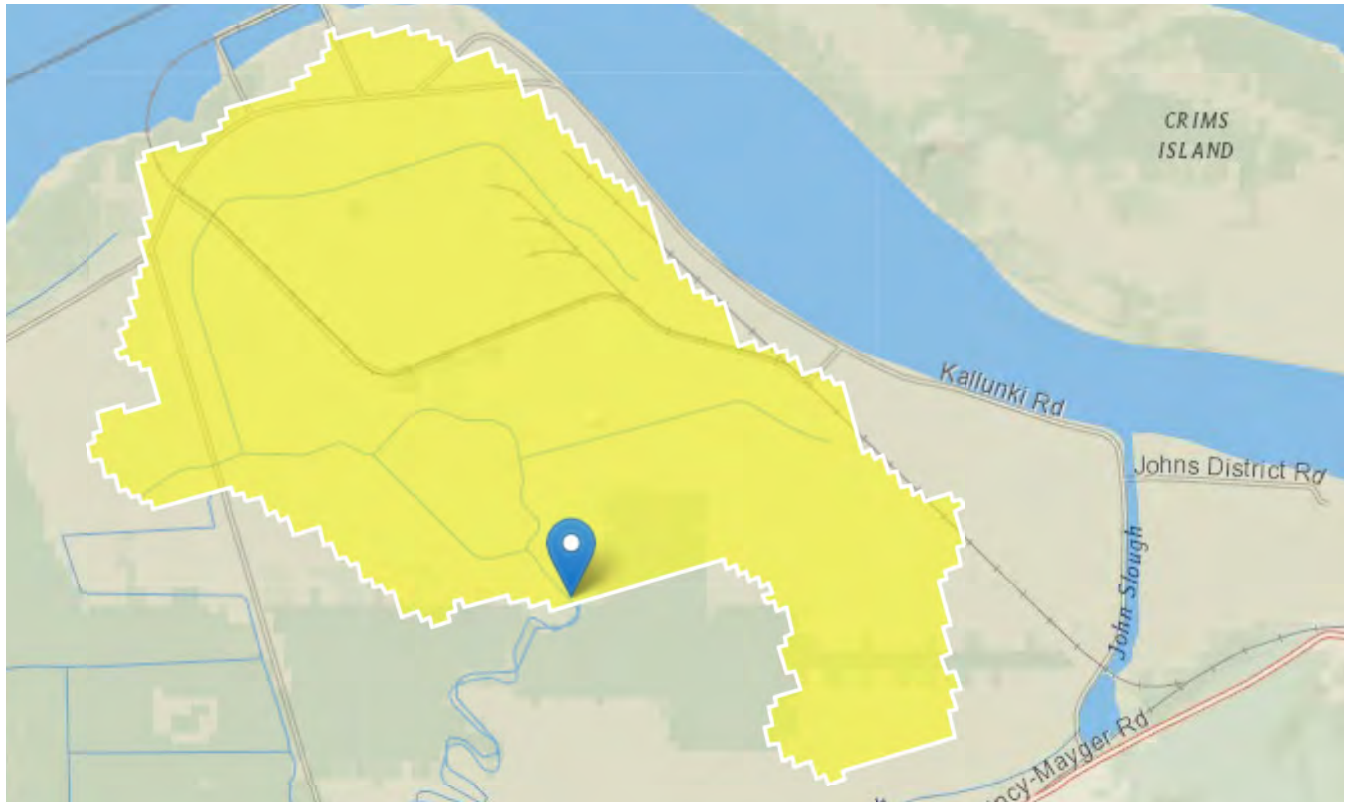
StreamStats Report

Region ID: OR

Workspace ID: OR20201130170107032000

Clicked Point (Latitude, Longitude): 46.16418, -123.16980

Time: 2020-11-30 09:01:25 -0800



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.41	square miles

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Application Version: 4.4.0

APPENDIX C

Adjacent Property Owners

TAX MAP	TAX LOT	PROPERTY OWNER
T8NR4W21	500	Port of Columbia County P.O. Box 190 Columbia City, Oregon 97018
	600	Port of Columbia County P.O. Box 190 Columbia City, Oregon 97018
T8NR4W22	400	Port of Columbia County P.O. Box 190 Columbia City, Oregon 97018
	900	Gary and Constance M. Leinonen 79859 Kola Road Clatskanie, Oregon 97016
T8NR4W27	500	Brian E. Cicerchi 9181 N.W. Sharp Road Prineville, Oregon 97754
	600	Brian E. Cicerchi 9181 N.W. Sharp Road Prineville, Oregon 97754
	1100	Warren Seely 18865 Hermo Road Clatskanie, Oregon 97016
	1200	Warren Seely 18865 Hermo Road Clatskanie, Oregon 97016
	1400	Trung M. Huynh and Wendy J. Schmidt 19396 Hermo Road Clatskanie, Oregon 97016
	1500	Trung M. Huynh and Wendy J. Schmidt 19396 Hermo Road Clatskanie, Oregon 97016
T8NR4W27A0	200	Gary and Constance M. Leinonen 79859 Kola Road Clatskanie, Oregon 97016
	400	Densie D. Stram-Youngblood P.O. Box 1256 Clatskanie, Oregon 97016
	500	Debra L. Smiley 79711 Kola Road Clatskanie, Oregon 97016
	700	Beaver Drainage Improvement Company P.O. Box 201 Clatskanie, Oregon 97016
T8NR4W28	100	Michael P. Seely 18865 Hermo Road Clatskanie, Oregon 97016

TAX MAP	TAX LOT	PROPERTY OWNER
T8NR4W28	200	Lower Columbia River Tree Farm, LLC 1500 S.W. First Street, No. 1150 Portland, Oregon 97231
	300	Lower Columbia River Tree Farm, LLC 1500 S.W. First Street, No. 1150 Portland, Oregon 97231
	400	Dan M. and Lynn C. Green 79426 Collins Road Clatskanie, Oregon 97016
	1000	Michael P. Seely 18865 Hermo Road Clatskanie, Oregon 97016
	1100	Dan M. and Lynn C. Green 79426 Collins Road Clatskanie, Oregon 97016
	1200	Tyler Brame 76885 Maple Lane Clatskanie, Oregon 97016
	1300	Tyler Brame 76885 Maple Lane Clatskanie, Oregon 97016
T8NR4W33	200	Warren C. Seely 19069 Beaver Dike Road Clatskanie, Oregon 97016
	201	Warren C. Seely 19069 Beaver Dike Road Clatskanie, Oregon 97016
	300	Hazze, LLC 78802 Rantala Road Clatskanie, Oregon 97016
	901	Michael P. Seely 18865 Hermo Road Clatskanie, Oregon 97016
T8NR4W34	100	Curtis A. Ollila 19459 Beaver Dike Road Clatskanie, Oregon 97016
	200	Wayne and Lois Horness Trust 19381 Beaver Dike Road Clatskanie, Oregon 97016
	400	Ross B. and Christine W. Barkhurst Living Trust 151 N. Nemah Road W. South Bend, Washington 98586-0074
T8NR4W34C0	100	Randy E Anderson 19157 Kallio Road Clatskanie, Oregon 97016