UPRR Second Mainline Track Project, Wasco County

Tooley Lake Wetland Mitigation Updates

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As a follow up to the August 17, 2015, conference call and follow-on discussions with the U.S. Army Corps of Engineers (USACE), National Marine Fisheries Service (NMFS, Wasco County, Union Pacific Railroad (UPRR) and CH2M, this memorandum presents revisions being made to the *Draft Compensatory Mitigation Plan for the Union Pacific Railroad Second Mainline Track Project* (CH2M, June 2015). The updates are clarifications of information provided in the draft plan and updates to the plan that have been developed on the basis of additional site-specific information gathered since the draft plan was submitted for agency review in June 2015. In addition, the updated grading plan for the Tooley Lake wetland mitigation is attached (Figure 1).

Additional minor modifications have been made based on the hydrologic regime and the modified approach, as described below. Key among these is the depiction of the buffer area on project maps and the removal of the proposed culvert as a design feature for delivering water to the wetland.

Tooley Lake Mitigation Site

Wetland construction activities will be conducted within the boundaries of the site's existing agricultural area. The mitigation wetlands will be constructed by excavating to the elevation of the water table, resulting in a depressional wetland supported by groundwater and containing open water, palustrine emergent, palustrine emergent/scrub-shrub and palustrine scrub-shrub/forested zones. The wetland will have adjacent riparian areas and buffer areas separating it from Interstate 84 and adjacent properties. The wetland will not have a surface or culvert connection to Tooley Lake or other water bodies.

Buffer Area

The draft plan has been revised to show a reserved buffer area at the wetland site (Figure 1). After the wetland is constructed, the buffer area will be managed according to the conditions of the Columbia River Gorge National Scenic Area Management Plan, which requires a buffer around an existing wetland (NSA LUDO Section 14.610.A.2.a(2)(a)). Portions of the buffer could be modified at a later date if potential future wetland expansion were requested by UPRR and received agency approval under a separate permitting process.

Removal of Culvert from Wetland Design

The surface water connection to Tooley Lake, previously shown as a culvert, has been removed from the plan. Hydrologic data collected at the site have shown that the wetland will be viable as a groundwater-

fed resource. Based on discussions with the Oregon Water Resource Department **(**OWRD**)**, the existing water right can be modified to allow this use, as described below.

Wetland Grade

The wetland grade was developed based on preliminary data on Columbia River and Tooley Lake elevations and groundwater monitoring well data at the proposed wetland site. Based on data collected at the site from June through early September 2015 and historical and recent data reported for Columbia River elevations at The Dalles, the conclusions about wetland grade are:

- Surface water levels at the Tooley Lake and groundwater observation wells within the wetland creation area are the same as the levels in the Columbia River. Horizontal gradients in groundwater flow are variable. During lower lake levels, a gradient from the wetland creation area toward Tooley Lake is evident. During periods of higher levels, a gradient exists from Tooley Lake toward the wetland creation area.
- Groundwater levels track the Columbia River stage (estimated by levels upstream at The Dalles), which indicates a hydraulic connection between the wetland creation area and the river. The data indicate that abundant groundwater is present to support wetland creation without the need for connecting to a surface water source.
- Observed elevations in Tooley Lake include an ordinary high water elevation of approximately 80.5 feet. Elevations of wetlands along the margin of Tooley Lake are between 78 feet and 82 feet.
- Hydroperiod seasonality and elevation range at the proposed wetland site can be inferred from the Columbia River elevation data and will be refined with the ongoing collection of Tooley Lake and groundwater elevation data.

Based on this information, the wetland cell will be excavated to a bottom depth of 77 feet to allow open water areas for other waters creation and habitat interspersion with the wetland areas. Wetland cell elevations between 77 feet and 78 feet are not anticipated to develop wetland vegetation but will generally retain standing water year-round. Wetland cell grade between 78 feet and 82 feet is expected to support wetland vegetation and will be planted with wetland plant species.

Elevations of wetland vegetation communities within the existing wetlands along Tooley Lake will be used as reference elevations for establishment of wetland vegetation communities in the created wetland. Areas above 82 feet are not expected to develop into wetland conditions, but will support riparian habitat creation. Areas between elevation 82 feet and the existing ground surface, which varies from 82 to 85 feet, will be planted with riparian species and/or upland vegetation, depending on site-specific conditions.

Slopes within the wetland cell vary from 4:1 (horizontal:vertical) to 8:1 on upper banks, and from 7:1 to 20:1 within the wetland and water areas. Slopes and elevations will vary to mimic natural conditions, provide a visual aesthetic, and provide varying conditions for wetland and riparian establishment along hydraulic gradients. The grading plan will be finalized after field investigations are completed.

Soils resulting from excavation of the wetland site will be retained on site and graded to create natural contours.

Soil Engineering

Geotechnical investigations of the wetland site are underway. The objectives of these studies are to:

- Identify subsurface constraints to excavation to better support mitigation project cost estimates,
- Characterize subsurface soil conditions and identify soil engineering needed for wetland creation, and

- Determine elevation and movement of groundwater to estimate potential contribution of groundwater to wetland hydrology.

A limited field investigation was conducted on June 11, 2015, using an excavator to dig test pits at 12 locations distributed across the site. Elevations on the site range from a high of approximately 86.5 feet along the northern portion of the site bordering I-84 to a low of approximately 79.4 feet at the water's edge at Tooley Lake. The soil profile was consistent across the site, with a sand and silt mixture from 1 to 4 feet below ground surface that is underlain by clean fine sand. The fine sand that is present from approximately 4 feet to the bottom of the test pit resulted in unstable test pit walls. Despite efforts to excavate deeper, all pits were terminated at depths between 5.5 feet and 9 feet below ground surface. Visible groundwater was encountered in 11 of the 12 tests pits at depths generally between 4.8 feet and 6 feet below ground surface.

Starting on June 22, 2015, a follow-on investigation advanced seven borings to approximately 20 feet below ground surface to evaluate subsurface conditions below the depths previously excavated with test pits (5.5 feet to 9 feet). Selected soil samples were collected from the borings and submitted for laboratory testing, including sieve analysis and Atterberg limits. The explorations encountered variable mixtures of silt, lean clay, and sand extending from the ground surface to the maximum depths of the explorations. The soil ranged from brown to gray, was damp to wet above the groundwater level, and wet or saturated below the groundwater level. The silt and clay was non-plastic to low plastic, and the sand was fine-grained. In general, the profiles graded from primarily fine-grained and silty sand deposits near the ground surface, to primarily fine-grained sand deposits with increasing depth. Because the soils are sandy, slope stabilization might be required within the created wetland to prevent slumping of areas of higher elevation.

Planting Plan

Planting will be conducted within the wetland and riparian areas and within areas disturbed by grading. A preliminary species planting list by planting zone has been developed (provided in the Draft Mitigation Plan, CH2M, June 2015). Plants were selected based on suitability for varying hydrologic conditions, desirability for habitat restoration quality, and propensity for rapid establishment.

Emergent vegetation will be installed either as plug or containerized material or as wetland sod installed in accordance with the manufacturer's specification. Riparian plantings will be canes/live cuttings or containerized material. Areas identified as temporary slope stabilization outside of the anticipated wetland hydrology limits will be planted with herbaceous vegetation to support slope stability, but will not be part of the required mitigation acreage. These areas will be designed to accommodate grading for future wetland expansion separate from the requirements of compensatory mitigation for the proposed Project.

Wetland and riparian planting is planned for implementation in the fall/winter. If construction schedules preclude the ability to acquire dormant cutting material, some planting of cuttings will be scheduled for the winter/spring following wetland construction.

Wildlife Habitat Features

Woody debris of varying diameters will be placed in the wetland and riparian areas to improve habitat for aquatic invertebrates, pollinators, amphibians, reptiles, birds, and small mammals. Approximately 40 pieces between 4 to 12 inches in diameter and at least 6 feet long will be placed throughout the site. Approximately eight logs greater than 18 inches in diameter and at least 8 feet long will be installed throughout the site, primarily in the wetland areas.

Approximately four snags will be placed in the wetland and riparian areas to provide roosting and nesting habitat for birds and other animals. Snags will be at least 18 inches in diameter at ground level and will extend a minimum of 8 feet but no higher than 12 feet (for safety reasons) above-ground following installation. Snags will be embedded a minimum of 6 feet below ground for stability.

Water Rights

Existing Water Rights at Tooley Lake Mitigation Site

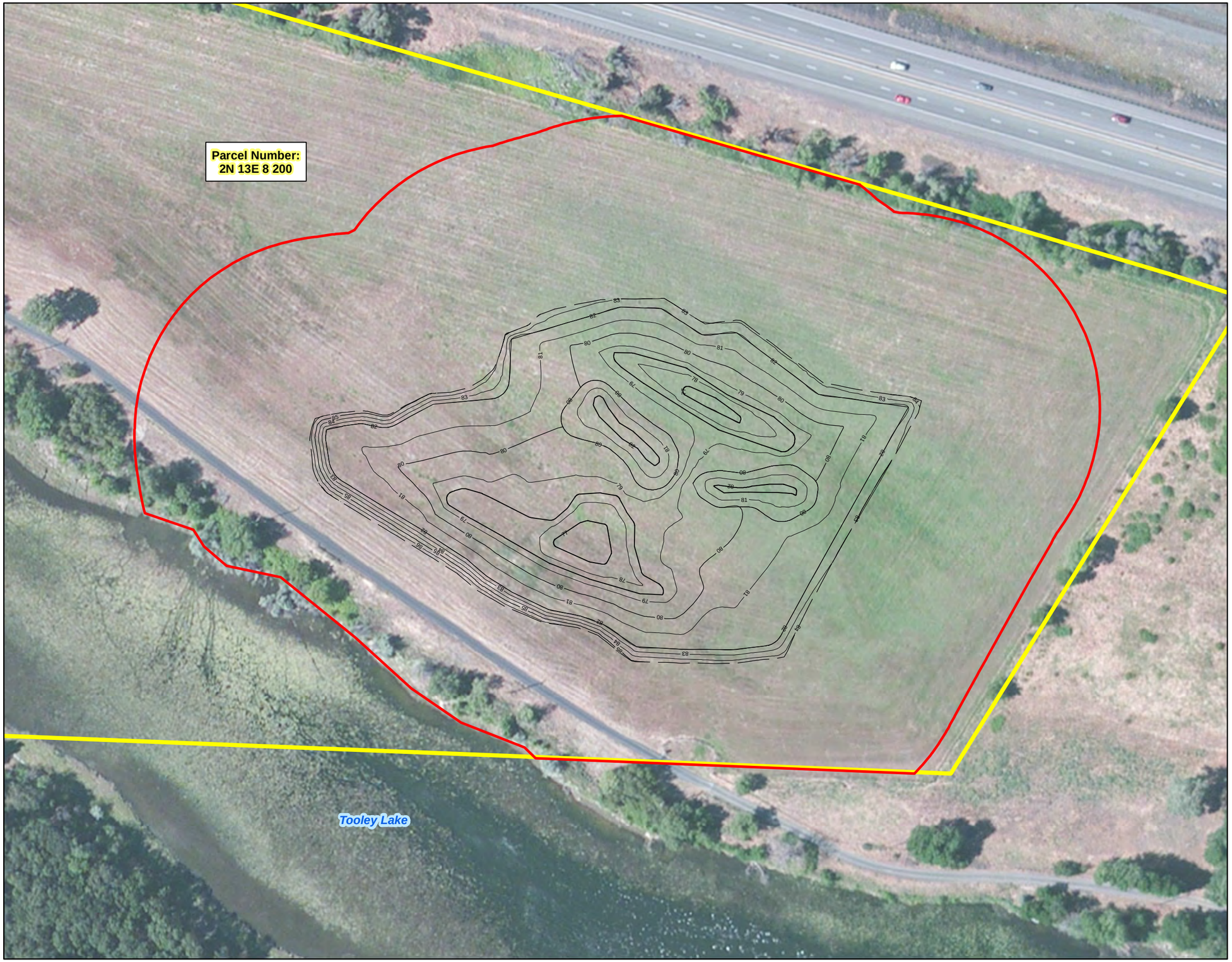
Water Right Certificate 64084 (Permit 49914) allows water of Tooley Lake, which is a tributary of the Columbia River, to be used for irrigating 14.4 acres on the mitigation site. The priority date of this certificate is December 19, 1986. The right is limited to no more than 0.18 cubic foot per second as measured at the point of diversion. The amount of water used for irrigation, together with the amount secured under any other water right for the same property, is limited to 1/80 of 1 cubic foot per second per acre or its equivalent for each acre irrigated, and will be limited to a diversion of no more than 2.5 acre-feet per acre for each acre irrigated during the irrigation season of each year.

Planned Water Rights Applications

To obtain sufficient water for the mitigation site, three separate applications are being submitted to the Oregon Water Resources Department (OWRD). The first is an application for a Limited Water Use License to store groundwater. A limited license will provide temporary authorization to store water from Tooley Lake in the wetland in the short term while the permanent water right transactions are under review by OWRD.

Second, UPRR is filing an application for a Permit to Appropriate Ground Water (for storage in the wetland). The wetland will be designed to meet OWRD's definition of a "sump," that will intercept shallow groundwater for use in the wetland. Because shallow groundwater is known to be hydraulically connected to surface water, surface-water availability limitations will apply to the use of groundwater under this permit, limiting the use of ground water during the months when water is available in the Columbia River (water cannot be diverted between April 15 and September 30). All new use outside of that time frame would require "bucket-for-bucket" mitigation (replacing the amount of water being used with an equal amount of water). As a result, UPRR will limit this permitted use to October 1 through April 14.

To provide water during the timeframe between April 15 and September 30, UPRR will file an application for a Water Rights Transfer. This application will request a change of the existing certificated water right from a surface water right for irrigation to a groundwater right for wetlands enhancement.



LEGEND

- Reserved Wetland Buffer
- Surveyed Property Line

Basemap Source: ESRI

Note: Wetland buffer is shown to demonstrate a reserved area that would be managed following wetland construction for compliance with the Columbia River Gorge National Scenic Area Management Plan, which requires a buffer around an existing wetland (NSA LUDO Section 14.610.A.2.a (2)(a)). Portions of the buffer shown could be modified at a later date if future wetland expansion were to be authorized.

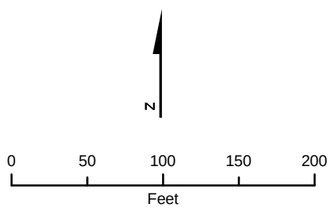


FIGURE 1
Tooley Lake Mitigation Site
UPRR Second Mainline Track Project