WETLAND DELINEATION AND IMPACTS REPORT

Beebe Springs Natural Area – Phase 2
Chelan County, Washington

Prepared for

Washington Department of Fish and Wildlife

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1.0 INTRODUCTION

The Beebe Springs Phase 2 project would restore vegetation communities, create fish and wildlife habitat, and provide educational and recreation opportunities to the public. Phase 1 of the project removed a former fruit orchard from the property and created additional stream habitat. Phase 2 would restore the floodplain and upslope habitats by removing invasive species and creating off-channel fish habitat. It would also integrate walking trails, viewing platforms, and interpretive displays across the site for use by the general public.

URS conducted a wetland delineation of the Phase 2 area on March 6, 2007 to determine the presence and extent of wetlands on the project site. URS Corporation confirmed the presence of two wetlands in the Phase 2 area. The first is an extension of a wetland delineated during Phase 1 of the project and represents Lake Entiat's shoreline wetlands. The second is a lake-fringe wetland that lies on the floodplain between the orchard toe of slope and the dirt driveway paralleling the shoreline. This report documents the delineated wetlands and characterizes the vegetation communities, soils, and hydrologic regimes occurring on the property that were used to distinguish wetlands from uplands.

2.0 METHODS

2.1 WETLAND DELINEATION

Documents reviewed to aid in the identification and determination of wetlands in the Phase 2 vicinity include the:

- Soil Survey for Chelan County Area, Washington (NRCS 2006);
- National Wetlands Inventory Online Mapping Tool (USFWS 2007);
- Project reports (WDFW 2007); and
- Photographs (WDFW 2007).

Additional supporting evidence was provided by Washington Department of Fish and Wildlife (WDFW) staff observations of standing water in the project area during previous high water periods.

Wetland determination and delineations were made on site by wetland biologists using the:

- 1987 U.S. Army Corps of Engineers (Corps) *Wetlands Delineation Manual;*
- 1997 Washington State Department of Ecology (Ecology) *Wetland Identification and Delineation Manual*; and
- 2006 Corps *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region.*

The 1997 Ecology methodology was developed to be consistent with the 1987 Corps manual. Delineated and surveyed wetland boundaries are subject to agency verification and approval.

For regulatory purposes, wetlands are defined as follows (Corps 1987):

> Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

According to the two manuals, the following three characteristics usually must be present for an area to be identified as a wetland: (1) wetland hydrology, (2) hydric soil, and (3) hydrophytic vegetation. Wetland hydrology includes seasonal, periodic, or permanent inundation or soil saturation that creates anaerobic conditions in the soil for a portion of the growing season sufficient for wetland soil and vegetation to be maintained. Hydric soils are saturated, flooded, or ponded long enough during the growing season to become deoxygenated in the upper soil horizon. Hydrophytic vegetation consists of those plant species growing in water, in soil, or on a substrate that at least periodically lacks oxygen.

The growing season is technically defined as the period when soil temperatures 19.7 inches below the ground surface (bgs) are greater than 5°C (41°F), according to the 1987 Corps *Wetlands Delineation Manual* and regulatory guidance (Corps 1992). However, Corps regulatory guidance letters and the Ecology manual state that the final determination of growing season should be based on careful observations of evidence that active growth is occurring. This evidence can include new or recent growth such as flowers, new shoots, new leaves, or swollen buds on plants. It was determined that the site visit did occur just after the beginning of growing season as evidenced by sprouting grasses and buds opening on shrubs.

A total of eleven sample plots were used to investigate the Phase 2 project area. The sample plots are located in places that adequately represent the variation in vegetation, soils, and hydrologic regime across the site. The presence or absence of hydrophytic vegetation, hydric soil, and wetland hydrology indicators were documented for each sample plot as a means of justifying the delineated wetland boundaries. Wetland delineation data forms can be found in Appendix A.

2.1.1 Wetland Hydrology

To determine whether a vegetation community has wetland hydrology, an area is examined for inundation, soil saturation, shallow groundwater tables, or other hydrologic indicators. An area in which soils are saturated to the surface for at least 5 to 12 percent of the growing season meets the criterion for wetland hydrology. Seasonal changes in water levels and the effect of recent precipitation events must be considered when evaluating an area's hydrology. Wetland hydrology can also be inferred from the presence of any of the following indicators: watermarks on vegetation, drift lines, sediment deposits, water-stained leaves, surface-scoured areas, wetland drainage patterns, algae growth, and oxidized root channels.

2.1.2 Hydric Soil

Soil observations were made in wetlands and adjacent upland areas by digging 1.5-foot-deep soil profiles in each sample plot. Soil color and other characteristics used to indicate hydric soils were documented using the Munsell Soil Color Chart (GretagMacbeth 2000). The Natural Resources Conservation Service (NRCS) soil survey provided soil taxonomy, map unit name (soil series), and drainage class data. Soil in which any of the following indicators is present meets the criteria for hydric soil:

- **Gleyed soil (gray colors)**. Gleyed soils develop when mineral soil is saturated or inundated for periods of time sufficient to result in anaerobic (no oxygen) conditions. Anaerobic conditions cause elements common in soil, such as iron and manganese, to exist in reduced forms that are usually bluish, greenish, or grayish in color. Soil colors are determined using a Munsell soil color chart (GretagMacbeth 2000), which has separate pages for gley-colored soils.
- **Low chroma matrix**. A low chroma matrix develops when mineral soil is saturated or inundated for substantial periods of time during the growing season (but not long enough to produce gleyed soil) to result in anaerobic or hypoxic (low oxygen) conditions. A soil matrix is the portion of a given soil layer (usually more than 50 percent by volume) that has the predominant color. The Munsell system uses three dimensions to describe soil color: hue, value, and chroma. The Munsell soil color chart uses abbreviations to describe the colors, for example, 10YR 3/2. In the abbreviation, the first number and letters indicate the hue (10YR), the next number indicates the value (3), and the last number indicates chroma (2). A chroma of 1 or 2 is considered low. Soils with a matrix chroma of 2 are usually considered hydric when mottles are present. Mottles are rust-colored spots or blotches in the soil formed by the oxidation of iron compounds via fluctuating water levels. Mottles found in soil with a matrix chroma of 2 (or less) often indicate that a soil is hydric.
- **High organic content**. Soil retains high levels of organic matter when saturation prevents decomposition over long periods, thus allowing organic debris to accumulate. Organic content is considered high if the soil is composed of more than 20 to 30 percent (threshold differs depending upon other soil characteristics) organic material by weight in a layer at least 8 inches thick located in the upper 32 inches of the soil profile.
- **Soils appearing on the hydric soils list**. A list of hydric soils has been compiled by the U.S. Department of Agriculture's National Technical Committee for Hydric Soils (NRCS 2001). Listed soils have reducing conditions for a significant portion of the growing season in a major portion of the root zone and are frequently saturated within 12 inches of the soil surface.
- **Other hydric indicators**. Other positive indicators of hydric soil include sulfide or "rotten egg" odor, aquic or peraquic moisture regimes (reducing soil moisture regimes due to groundwater at or near the soil surface), and the presence of iron or manganese concretions.

2.1.3 Hydrophytic Vegetation

The dominant plant species in each vegetation community were identified within each sample plot. Vegetation communities are defined here as a contiguous assortment of plants in a given area sharing similar environmental conditions. Dominant plants are those species that comprise at least 20 percent areal cover within a sample plot. The sample plots are circular and have a 30-foot radius for trees and shrubs and a 5-foot radius for herbaceous plants. Plots were situated so that they best represent the vegetation present within each community.

The hydrophytic indicator status for each dominant species, as designated by the U.S. Fish and Wildlife Service for Region 9 (USFWS 1993), was used to determine whether the vegetation in each community is hydrophytic. To meet the hydrophytic vegetation criteria, more than 50 percent of the dominant species must have an indicator status of obligate, facultative wetland, and/or facultative. Indicator status categories are defined in Table 1. The facultative status categories are often modified using minus (-) or plus (+) symbols. For example, FAC+ species are considered to have a somewhat greater estimated probability of occurring in wetlands than FAC species, whereas FAC- species are considered to have a somewhat lesser estimated probability of occurring in wetlands than FAC species.

Table 1. Plant Species Wetland Indicator Categories

Indicator Category	Occurrence	Probability in Wetlands (estimated)
Obligate (OBL)	Occurs almost always in wetlands under natural conditions	>99%
Facultative Wetland (FACW)	Usually occurs in wetlands, but occasionally found in non-wetlands	67-99%
Facultative (FAC)	Equally likely to occur in wetlands and non-wetlands	34–66%
Facultative Upland (FACU)	Usually occurs in non-wetlands, but occasionally found in wetlands	1–33%
Upland (UPL)	Occurs almost always under natural conditions in non-wetlands in this region but may occur in wetlands in another region	<1%

Source: Corps 1987

2.2 WETLAND CLASSIFICATION

2.2.1 Cowardin Classification

Wetlands are classified according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). Under the Cowardin classification scheme, wetlands and deepwater habitats are grouped into systems based on shared hydrologic factors. These systems are marine, estuarine, riverine, lacustrine, and palustrine. Palustrine systems are present in the Phase 2 project area.

Palustrine Systems include all wetlands having less than 0.5% salinity and containing persistent vegetation. Vegetation may include trees, shrubs, erect (emergent) or floating (aquatic bed) herbaceous plants, mosses, and/or lichens. Wetlands included in the palustrine system are those

commonly referred to as marshes, swamps, bogs, fens, prairies, seeps, and intermittent ponds. A palustrine system can exist directly adjacent to or within the lacustrine, riverine, or estuarine systems.

Palustrine wetlands are divided into classes by the dominant vegetation. Palustrine forested (PFO) wetlands or forested wetland communities are dominated by trees or arborescent shrubs greater than 20 feet tall having greater than 30 percent cover. Palustrine scrub-shrub (PSS) wetlands or scrub-shrub wetland communities are dominated by woody shrubs less than 20 feet tall with at least 30 percent cover. Palustrine emergent (PEM) wetlands or emergent wetland communities are dominated by nonwoody, rooted vascular plants having at least 30 percent cover.

The U. S. Fish and Wildlife Service National Wetlands Inventory (NWI) provides information on the characteristics, extent, and status of the nation's wetlands and deepwater habitats. The NWI collects data from aerial photography to produce maps that correspond to the USGS 7.5 or 15 minute topographic quadrangles. NWI quadrangles use the Cowardin classification system to characterize wetland features on each map.

2.2.2 HGM Classification

Wetlands were also classified according to the Hydrogeomorphic (HGM) classification. The HGM classification groups wetlands into categories based on the geomorphic and hydrologic characteristics that control many wetland functions. The modified version of this classification system that is found in the *Washington State Wetland Rating System for Eastern Washington* (Ecology 2004) was used for HGM classification. The HGM class found in the project area is lake-fringe.

Lake-fringe wetlands occur in or adjacent to bodies of water greater than 20 acres in size with at least 30% of the open water areas are more than 10 feet deep. The HGM definition of lake-fringe, which accounts for geomorphology, differs from the Cowardin definition of lacustrine that uses persistence of vegetation. The hydrologic characteristics of the two systems also provide subtle differences in definition.

2.3 WETLAND RATINGS AND BUFFERS

Wetlands were rated using Ecology's *Revised Wetlands Rating System for Eastern Washington* (Ecology 2004). Chelan County Code also uses Ecology's rating system (Chelan County 2007). The Eastern Washington Wetland Rating Data Forms are provided in Appendix B.

2.3.1 Department of Ecology Wetland Rating System

Category I are those wetlands of exceptional value in terms of protecting water quality, storing flood and storm water, and/or providing habitat for wildlife as indicated by a rating system score of 70 points or more on the Ecology rating forms. These wetlands are communities of infrequent occurrence that often provide documented habitat for sensitive, threatened, or endangered species, and/or have other attributes that are very difficult or impossible to replace if altered.

Category II wetlands are those wetlands that are difficult, though not impossible, to replace, generally have little to no disturbance, and provide high levels of some functions. The primary criteria for category II wetlands are that they score 51–69 out of 100 points on the rating questions related to functions. Category II wetlands also include estuarine wetlands less than 1 acre, or greater than 1 acre that are disturbed, and interdunal wetlands greater than 1 acre. Although category II wetlands occur more commonly than category I wetlands, they are deemed to warrant a relatively high level of protection.

Category III wetlands generally provide a moderate level of functions, have been disturbed in some way, and are often less diverse or more isolated from other natural resources. The primary criteria for category III wetlands are they score 30–50 out of 100 points as defined in Ecology's *Wetlands Rating System for Eastern Washington.* Interdunal wetlands between 0.1 and 1 acre in size are also category III regardless of their score. Category III wetlands are regulated wetlands that do not contain features or levels outlined in Categories I, II, or IV. They occur more frequently, are less difficult to replace, and need a moderate level of protection compared to higher rated wetlands.

Category IV wetlands have the lowest levels of functions (less than 30 points on the rating questions relating to functions). They do not meet the criteria for Category I, II or III wetlands. These are wetlands that should be replaceable and, in some cases, can be improved from a functions standpoint. These wetlands may provide important functions and values and should be protected to some degree.

2.3.2 Chelan County Wetland Buffers

Chelan County enforces wetland buffers (Chelan County 2005) to provide additional protections to a wetland's physical and biological function. Buffers are calculated based on the wetland's categorical rating and the intensity of adjacent land uses (Table 2).

Table 2. Chelan County Wetland Buffer Widths for High and Low Intensity Land Uses.

Wetland Category	High Intensity (feet)	Low Intensity (feet)
Category 1	300	200
Category 2	200	100
Category 3	100	50
Category 4	50	25

Source: Chelan County Code Section 11.80.060

Guidance issued jointly by the Corps and Ecology also addresses buffers needed to protect wetland functions (Ecology et al. 2006). This guidance provides buffer widths that vary by wetland type and rating and the intensity of adjacent land uses. Protecting wildlife habitat functions of wetlands generally requires larger buffers than protecting the water-quality functions of wetlands.

2.4 WETLAND FUNCTIONS ASSESSMENT

Wetland functions were analyzed using methodology developed by Ecology and published in the *Revised Wetlands Rating System for Eastern Washington* (Ecology 2004). These functions are assessed in three broad categories: water quality improvement, hydrologic function, and habitat quality. Both the potential and opportunity to provide each function is analyzed. The potential to perform a function is based on the physical, biological, and chemical characteristics within the wetland itself. The opportunity is to what degree the wetland's position in the landscape will allow it to perform a specific function.

2.5 WETLAND MAPPING

The boundary between wetland and upland areas was marked in the field with pink flagging. Sample plots were also marked with pink flagging. Flag locations were collected using a mapping-grade Trimble GeoXT global positioning system and post-processed to obtain sub-meter accuracy of the regulatory wetland edge.

2.6 ORDINARY HIGH WATER MARK

The Ordinary High Water Mark (OHWM) on Lake Entiat (Columbia River) was established by locating where the fluctuations of water in the reservoir have created a clear, natural line on the bank indicated by changes in the character of the soil/substrate and destruction of terrestrial vegetation. In the case of Lake Entiat in the project area, there is a clearly defined embankment of 1 to 2 feet in height where wave action and current have removed all terrestrial vegetation. The landward side is vegetated with terrestrial or wetland vegetation, while the stream channel is composed of exposed mineral substrate (primarily gravel, sand and cobble). The top of this embankment is approximately 1 to 3 feet landward from this line. The top of the embankment was the elevation level at which point water begins to leave the channel and move into the floodplain of the Lake (Rosgen, 1996). This was surveyed as the OHWM.

During a February 7, 2007 site visit, a single point along this line was flagged by Tim Erkel (U.S. Corps of Engineers, Eastern Washington Regional Office). A URS biologist made a visit to the Beebe Springs Natural Area Development project area on February 9, 2007, to record OHWM elevations along the shoreline of Lake Entiat (Columbia River). After locating the flag, a Trimble GeoExplorer Geo XT GPS unit was used to record the marked location and similar locations along the length of the shoreline of Lake Entiat in the project area. The data were post-processed with Trimble TerraSync software to obtain sub-meter points for each location. The OHWM locations were then added to CADD coverage of the project area and elevations were derived from surveyed topographic lines (2 foot interval lines). Based on the surveyed locations, the line for OHWM falls between an elevation of 708 and 709 feet (1927 Datum) and this elevation line was defined as the OHWM for the project area.

3.0 RESULTS

URS conducted a pre-field review of the NWI, the local NRCS soil survey, and topographic maps. Additional information was gathered from discussion and photos provided by WDFW staff. The NWI indicates that a series of palustrine scrub-shrub and emergent wetlands occur along the river right shoreline of the Columbia River in the project area and the greater vicinity (Figure 2). A review of the Chelan County hydric soils list determined that the four soil types mapped in the project area are not hydric soils (NRCS 2001). Photographs provided by WDFW documents that water ponds in depressions on the floodplain terrace immediately upslope of the Columbia River shoreline.

A field investigation and wetland delineation was performed on March 6, 2007. The presence of two wetlands was confirmed during the field visit.

3.1 SITE SOILS

According to the USDA Natural Resources Conservation Service (NRCS) *Soil Survey of Chelan County Area, Washington (Parts of Chelan and Kittitas Counties)*, four soil types are mapped within the project area (Figure 3). They include Chelan gravelly sandy loam, 0 to 3 and 3 to 8 percent slopes (C1A and ClB), Pogue gravelly fine sandy loam, 3 to 8 percent slopes (PrB), and Supplee very fine sandy loam, 3 to 8 percent slopes (SuB). Although all four soil types are present, Chelan soils represent the majority of the site.

The Chelan series is comprised of well-drained, moderately coarse textured soils that formed in pumice, volcanic ash, and loess over non-sorted gravelly, cobbly, or bouldery deposits of ablation glacial till. The surface soil layer is gray gravelly sandy loam about 18-inches thick, underlain by dark grayish brown gravelly sandy loam 17-inches thick, underlain by pale brown very gravelly sandy loam that extends to a depth of 60 inches. Runoff is very slow for soils ClA and ClB, and the hazard of water erosion is none to slight.

The Pogue series is comprised of somewhat excessively drained, moderately coarse textured soils that formed in glacial outwash derived mainly from quartz-bearing rocks. The surface soil layer is grayish brown fine sandy loam, gravelly or very stony in places, 6-inches thick, underlain by brown fine sandy loam 11-inches thick, underlain by brown gravelly fine sandy loam 13-inches thick. Outwash sand and gravel underlie these soils at a depth of 30 inches. Runoff is slow for soil PrB, and the hazards of soil blowing and water erosion are slight. If this soil is irrigated, runoff is medium and the hazard of water erosion is moderate.

The Supplee series is comprised of well-drained, medium-textured soils that formed in pumice, volcanic ash, and deposits of loess over gravelly and cobbly glacial outwash. The surface soil layer is grayish brown very fine sandy loam 6 inches thick, underlain by brown gravelly fine sandy loam and very gravelly sandy loam 25 inches thick, underlain by glacial outwash material of sand, gravel, and cobblestones at a depth of 31 inches, which extends to a depth of 60 inches and more. Runoff is slow for soil SuB, and the hazard of water erosion is slight. If this soil is irrigated, runoff is medium and the hazard of erosion is moderate.

3.2 SITE HYDROLOGY

The Beebe Springs project area contains two major sources of water – Beebe Springs Creek and the Columbia River/Lake Entiat. Beebe Springs Creek flows through the site rapidly along a moderate gradient and does not provide much hydrologic input to the project area. Lake Entiat is a reservoir pool created by the Rocky Reach Dam. The project area is located in the upper most third of the reservoir where the pool levels are more heavily influenced by the highly fluctuating flows being released from the nearby upstream Wells Dam. Therefore, the hydrology along this section of the river/reservoir acts like a river and a lake simultaneously.

The two wetlands in the Phase 2 project area sit on the river's floodplain. Their hydrology is associated with the daily reservoir elevations and/or seasonal overbank flooding during upstream spring runoff. The wetlands' deeper soils, greater than two feet below the ground surface, are directly influenced by the normal average daily river/pool elevation controlled by hydroelectric generation demand by Wells Dam and Rocky Reach Dam.

The surface soils, down to two feet deep, are more directly influenced by seasonal higher than normal river flows/pool elevations that result in overbank flooding. These flood occurrences correspond to seasonal snowmelt and the instantaneous volume of snowmelt. According to WDFW staff, this flooding occurs in middle and late spring, with multiple events possible that correspond with snowmelt timing in the North Cascades and the Canadian Rockies. During these events, flood waters are detained in shallow depressions on the terrace upslope and behind the ordinary high water line. Water captured in these depressions provides temporary inundation in the wetlands and infiltrates through the porous sandy loam soils to provide temporary to seasonally saturated soils for wetland conditions to develop.

3.3 WETLANDS

Two wetlands were identified in the Phase 2 project area. Wetland A comprises the Columbia River (Lake Entiat) shoreline and was partially delineated during Phase 1 of the project. Wetland A was further delineated between the Phase 2 project area boundaries. Wetland B sits in a shallow depression on the floodplain terrace upslope of Wetland A.

3.3.1 Wetland A

The segment of Wetland A within the Phase 2 area is a 0.38-acre wetland that represents the vegetated shoreline of Lake Entiat (Figure 4a and 4b). It is classified under Cowardin as palustrine scrub-shrub and as a lake-fringe wetland using the HGM system. The Wetland A boundary was defined on the waterward side by the edge of persistent vegetation and on the upslope side by the ordinary high water line delineated by URS on February 9, 2007.

Since this wetland is immediatelhy adjacent to Lake Entiat, its hydrology is directly controlled by both the river/reservoir's daily and seasonal water elevation. This would be described as regularly saturated or flooded by Cowardin (Cowardin 1979). Hydrology may range from dry to flooded depending on the time of day, time of year, and hydroelectric generation demand by both Wells Dam and Rocky Reach Dam.

Soils closely match the Chelan soils series described in Section 3.1 *Site Soils*. They consist of dark grayish brown (10YR 4/2) to very dark grayish brown (10YR3/2) sandy loams containing a very high percentage of gravels and cobbles throughout the surface soil profile. The wetland soils were distinguished from upland soils by the difference in size, abundance, and distinction of redoximorphic feature versus matrix color. Upland soils typically had redoximorphic features that were too fine, faint, and infrequent to distinguish the color. Wetland soils had fine to medium, distinct strong brown (7.5YR 4/6) redoximorphic features found commonly throughout the soil.

The vegetation in Wetland A is dominated by a scrub-shrub overstory and an herbaceous emergent layer. Dominant plant species include red alder (*Alnus rubra*/FAC), coyote willow (*Salix exigua*/OBL), red-osier dogwood (*Cornus sericea*/FACW), Himalayan blackberry (*Rubus armeniacus*/FACU), and reed canarygrass (*Phalaris arundinacea*/FACW). Also present are bentgrasses (*Agrostis* sp.) and horsetails (*Equisetum arvense*/FAC and *E. laevigatum*/FACW), and other herbaceous species that were not identifiable at the time of the field visit in March 2007.

According to the state and county rating methods, Wetland A is rated as a Category III wetland having a moderate potential and opportunity to provide habitat and water quality functions. Its position on a reservoir significantly reduces its opportunity to provide hydrologic functions. The wetland rating form is available in Appendix B.

Federal, state, and local regulations and guidance require buffers be placed around wetlands to protect and enhance the biotic, physical, and chemical functions that wetlands perform. Chelan County requires that a 50-foot buffer be located around Category III wetlands situated in low intensity developed areas. The Corps and Ecology joint guidance requires a 75-foot boundary around wetland A.

3.3.2 Wetland B

Wetland B is a 0.52-acre wetland positioned on the river's floodplain terrace (Figure 4a). It is separated from Wetland A by a small berm at its south end and an old orchard road and a small berm at its north end. It is classified under Cowardin as palustrine scrub-shrub/emergent and as a lake-fringe wetland using the HGM system. Wetland B's boundary is defined by changes in the presence, extent, and size of redoximorphic features, topographic changes, and subtle changes in vegetation composition.

Wetland B has a temporarily flooded hydrologic regime that is directly or indirectly controlled by the river flows and reservoir water elevation. Though the subsoils greater than two feet below the surface may have a groundwater influence from the daily average reservoir elevations, the surface soils likely maintain a distinctly different hydrologic regime. The surface soils are positioned above the reasonable distance that capillary rise may occur, typically about 12 inches. Surface soil hydrology may range from dry to flooded depending on the seasonal conditions described in Section 3.2 *Site Hydrology*. Inundation has been observed in this wetland by WDFW and other project staff at least periodically from April through June during most years.

Soils closely match the Chelan soils series described in Section 3.1 *Site Soils*. They consist of dark grayish brown (2.5YR 4/2) to very dark grayish brown (10YR 3/2) very fine sandy loams to

sandy clay loams containing a very high percentage of gravels and cobbles below about seven inches in the soil profile. The wetland soils were distinguished from upland soils by the difference in size, abundance, and distinction of redoximorphic feature versus matrix color. Upland soils typically lacked or had redoximorphic features that were too fine, faint, and infrequent to color. Wetland soils had fine to medium, distinct strong brown (7.5YR 4.6) redoximorphic features found commonly throughout the soil.

The vegetation in Wetland B is dominated by a scrub-shrub community in the south half and an herbaceous emergent community in the north half. Dominant plant species include coyote willow, Himalayan blackberry, and English plantain (*Plantago lanceolata*/FAC) in the scrub-shrub community. The emergent community is dominated by English plantain, quackgrass (*Elytrigia repens*/FAC) and horsetails. Also present are red-osier dogwood, reed canarygrass and other herbaceous species that were unidentifiable at the time of the delineation.

According to the state and county rating methods, Wetland B is rated as a Category III wetland having a moderate potential and opportunity to provide habitat and water quality functions. Its position on a reservoir significantly reduces its opportunity to provide hydrology functions. The wetland rating form is available in Appendix B.

State and local regulations require buffers be placed around wetlands to protect and enhance the biotic, physical, and chemical functions that wetlands perform. Chelan County requires that a 50 foot buffer be located around Category III wetlands situated in low intensity developed areas. The Corps and Ecology joint guidance requires a 40-foot boundary around wetland A.

4.0 PROJECT IMPACTS

The proposed project would grade and recontour about 26 acres of upland, wetland, and shoreline areas to enhance the existing site conditions and create off channel fish habitat along the Columbia River. About 0.08 acre of Wetland A and about 0.33 acre of Wetland B would be excavated to create new wetland and open water habitat (Figures 5a and 5b). Restored vegetation along the new shoreline will be a combination of native trees, shrubs, and herbaceous vegetation.

If the Wetland B hydrology is primarily maintained by the overbank flooding events with the water being perched and retained, then the excavation of one end of wetland to a lower elevation may cause the water to drain more quickly than under current conditions. If the water does not remain long enough to sustain hydrophytic vegetation, then the upper part of the wetland would cease to be a wetland. The lower part of the wetland that is excavated will be converted into open water habitat (an extension of the Lake) with a narrow fringe of lake-fringe wetland.

5.0 REFERENCES

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APPENDIX A

WETLAND DELINEATION DATA FORMS

URS Routine On-site Wetlands Determination

URS Seattle Office, 1501 4th Ave. Suite 1400, Seattle, Washington 98102 Tele: 206.438.2700

Project Name: BEEBE SPRINGS PHASE 2 Fieldwork Date: 6 MARCH 2007
Project Location: CHELAN, WA HWY 97 County: CHELAN State: WA
Applicant/Owner: WDFW Investigator(s): WTK, JAW
Transect/Plot: SP-1 Plot Location: 120 FT UPSLOPE of OHW, 100FT NORTH OF CURVE IN DRIVEWAY
Normal circumstances exist on site? Yes [X] No [ ]
Significantly disturbed (atypical situation)? Yes [ ] No [X]
Is this a potential Problem Area? Yes [ ] No [X]

Vegetation

Normal plot size/shape? (radius – trees & shrubs = 30', herbs = 5' circular) Yes [X] No [ ]

	Species	Ind. Status	% Raw Cover		Species	Ind. Status	% Raw Cover
Trees				Herbs	PLANTAGO LANCEOLATA	FAC	40 ✓
					CAREX SP	–	5
					EQUISETUM ARVENSE	FACW	15 ✓
					ASCLEPIAS SPECIOSA	FAC+	5
Shrubs	RUBUS ARMENIACUS	FACU	5 ✓		BROMUS SP	–	T
					UNIDENTIFIABLE GRASS		60 ✓

Percent of dominant plant species that are OBL, FACW, FAC+, & FAC: 50% (66% w/o Rubus armeniacus) ✓ = dominant species
Is the hydrophytic vegetation criteria met? Yes [X] No [ ] * = also includes saplings (woody plants <20 ft tall)

Comments: HERBACEOUS VEGETATION IS DEAD WITH MOST FLOWERS/SEEDHEADS MISSING, MOST HERBS UNIDENTIFIABLE IN PLOT

Soil

Mapped Series: Chelan gravelly sandy loam Taxonomy: Vitrixerandic Haploxeroll Drainage Class:
On Hydric Soils List? Yes [ ] No [ ] Confirmed map soil type or inclusion:

Horizon	Depth	Matrix Color	Redoximorphic Features	Texture, Other
A	0-3	10YR 3/2		LOAM
B	3-13	2.5 Y 4/2	7.5YR 4/6 DISTINCT FINE, common	SANDY LOAM w/ gravel and cobble to 3 inches Ø
	13+	ROCK REFUSAL		

[ ] Histosol/Histic epipedon [ ] Gleyed within 10" bgs [ ] Sandy soils - High organic content in surface horizon
[ ] Sulfidic odor [ ] On Hydric Soils List and matches profile [ ] Sandy soils - Organic streaking or pan
[ ] Concretions within 3" bgs [ ] Reducing conditions [ ] Other:
[X] Low matrix chroma and redox. within 10" bgs [ ] Aquic moisture regime

Is the hydric soil criterion met? Yes [X] No [ ]

Comments:

Hydrology

Recorded Data:
Recorded Data Available: [ ] Aerial Photos: [X] Stream Gauge: [ ] Other: [X] DIRECT OBSERVATIONS BY WDFW STAFF

Field Data: Growing Season? Yes [X] No [ ] NEW GREEN HERB SHOOTS STARTING UNDER
Depth of Inundation: N/A Depth to Saturation: N/A Depth to Free Water: N/A

Primary Hydrology Indicators:
[ ] Inundated [ ] Drift lines
[ ] Saturated within 12" bgs [ ] Sediment deposits
[ ] Wetland drainage pattern [ ] Water marks

Secondary Hydrology Indicators:
[ ] Oxidized Root Channels within 12" bgs [ ] FAC-neutral test
[ ] Local soil survey [ ] Water-stained leaves
[ ] Other:

Is the hydrology criterion met? Yes [X] No [ ]

Comments: WDFW STAFF STATED THIS AREA FLOODS EACH SPRING (APRIL - JUNE)

Determination

Wetland? Yes [X] No [ ]
Cowardin Class/ HGM Class: PEM LAKE-FRINGE

Comments:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: BECHE SPRINGS Phase 2 City/County: Chelan Sampling Date: 6 March 2007

Applicant/Owner: WDFW State: WA Sampling Point: SP-1

Investigator(s): WTK, JAW Section, Township, Range: T27N/R23E / Sec 20

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): ----

Subregion (LRR): B Lat: 47° 49' 15" Long: 119° 58' 19" Datum: ----

Soil Map Unit Name: Chelan gravelly sandy loam NWI classification: PSS/EM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes √	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes √	No ____	
Wetland Hydrology Present?	Yes √	No ____	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover: N/A			
Sapling/Shrub Stratum			
1. Rubus armeniacus	5	√	FACW
2.			
3.			
4.			
5.			
Total Cover: 5			
Herb Stratum			
1. Plantago lanceolata	40	√	FAC
2. Equisetum laevigatum	15	√	FACW
3. Asclepias speciosa	5		FAC
4.			
5.			
6.			
7.			
8. Unidentifiable grasses	60		
Total Cover: 100+			
Woody Vine Stratum			
1.			
2.			
Total Cover: N/A			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Vegetation dormant or dead, many herbaceous species not identifiable

Young shoots breaking through indicating grow season just began

SOIL

Sampling Point SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	100	—				loam	
3-13	2.5Y 4/2	98	7.5YR 4/6	2	C	M	sandy loam	gravels and cobbles to 3 inches diam.
13+	Rock refusal							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ✓ No ___

Remarks

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available

photos showing flooding state & observations in other state

Remarks

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beaver Springs Phase 2 City/County: Chelan Sampling Date: 6 March 2007

Applicant/Owner: WDFW State: WA Sampling Point: SP-2

Investigator(s): WTK, JAW Section, Township, Range: T27N/R23E/Sec 22

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): ---

Subregion (LRR): B Lat: Long: Datum:

Soil Map Unit Name: Chelan gravelly sandy loam NWI classification: PSS/EM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	—		
Sapling/Shrub Stratum			
1. Rubus armeniacus	5%	✓	FACU
2.			
3.			
4.			
5.			
Total Cover:	5%		
Herb Stratum			
1. Phalaris arundinacea	100%	✓	FACW
2. Rumex crispus	1		FAC
3. Oenothera sp.	1		
4.			
5.			
6.			
7.			
8.			
Total Cover:	100%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	—		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of		Multiply by	
OBL species	0	x 1 =	0
FACW species	1	x 2 =	2
FAC species	1	x 3 =	3
FACU species	1	x 4 =	4
UPL species	0	x 5 =	0
Column Totals:	3 (A)		9 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ✓ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100	—				SL	
4-16	2.5Y 3/2	98	7.5YR 4/4	2	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

photos showing standing water, etc. [illegible]

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs Phase 2 City/County: Chelan Sampling Date: 6 March 2007

Applicant/Owner: WDFW State: WA Sampling Point: SP-3

Investigator(s): JAW, WTK Section, Township, Range: T27N/R23E/Sec 20

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Slope Slope (%): 25

Subregion (LRR): B Lat: Long: Datum:

Soil Map Unit Name: Chelan gravelly sandy loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	—		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	—		
Herb Stratum			
1. Equisetum laevigatum	25	✓	FACW
2. Elytrigia repens	10		FAC
3. Setaria	T		UPL
4. Bromus tectorum	50	✓	UPL
5. Plantago lanceolata	5		FAC
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:	—		

% Bare Ground in Herb Stratum — % Cover of Biotic Crust —

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by:	
OBL species 0	x 1 =	
FACW species 1	x 2 =	2
FAC species 0	x 3 =	
FACU species 0	x 4 =	
UPL species 1	x 5 =	5
Column Totals: 2 (A)		7 (B)

Prevalence Index = B/A = 3.5

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-19	2.5Y 4/2	100	—				very fine sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

upslope of wetland

Remarks:

URS Routine On-site Wetlands Determination

URS Seattle Office, 1501 4th Ave, Suite 1400, Seattle, Washington 98102 Tele: 206.438.2700

Project Name: Beebe Springs Phase 2 Fieldwork Date: 6 March 2007
Project Location: Leavenworth, WA Hwy 97 County: Chelan State: WA
Applicant/Owner: WDFW Investigator(s): WTK, JAW
Transect/Plot: SP-4 Plot Location:

Normal circumstances exist on site? Yes ☒ No ☐
Significantly disturbed (atypical situation)? Yes ☐ No ☑
Is this a potential Problem Area? Yes ☐ No ☑

Vegetation

Normal plot size/shape? (radius – trees & shrubs = 30', herbs = 5' circular) Yes ☒ No ☐

	Species	Ind. Status	% Raw Cover		Species	Ind. Status	% Raw Cover
Trees				Herbs	Hypericum perforatum	UPL	5
					Verbascum thapsus	UPL	5
					Carex sp	-	5
					Iris pseudacorus c.f.	OBL	5
					Equisetum laevigatum	FACW	10
Shrubs	Rubus armeniacus	FACW	20 ✓		Juncus tenuis	FAC	30
					unidentified grass	*	40

Percent of dominant plant species that are OBL, FACW, FAC+, & FAC: 100 or 33 depending on grass ID ✓ = dominant species
Is the hydrophytic vegetation criteria met? Yes ☒ No ☐ * = also includes saplings (woody plants <20 ft tall)

Comments: Problem vege - OBL + FACW growing together as dominants

Soil

Mapped Series: Chelan gravelly sandy loam Taxonomy: Vitritorandic Haploxeroll Drainage Class:
On Hydric Soils List? Yes ☐ No ☐ Confirmed map soil type or inclusion:

Horizon	Depth	Matrix Color	Redoximorphic Features	Texture, Other
A_1	0-3	10YR 2/2	—	silt loam
A_2	3-6	2.5Y 4/1.5	—	Fine sandy loam
B_1	6-9	10YR 3/2	7.5YR 4/6 fine, distinct, common	Sandy clay loam
B_2	9-16	10YR 3/2	7.5YR 4/6 fine, distinct, common	lots of gravel, cobbles to 4"

☐ Histosol/Histic epipedon ☐ Gleyed within 10" bgs ☐ Sandy soils - High organic content in surface horizon
☐ Sulfidic odor ☐ On Hydric Soils List and matches profile ☐ Sandy soils - Organic streaking or pan
☐ Concretions within 3" bgs ☐ Reducing conditions ☐ Other:
☒ Low matrix chroma and redox within 10" bgs ☐ Aquic moisture regime

Is the hydric soil criterion met? Yes ☒ No ☐

Comments: rock refusal at 16"

Hydrology

Recorded Data:
Recorded Data Available: ☐ Aerial Photos: ☒ Stream Gauge: ☐ Other: ☒ WDFW observations

Field Data: Growing Season? Yes ☒ No ☐
Depth of Inundation: N/A Depth to Saturation: N/A Depth to Free Water: N/A

Primary Hydrology Indicators:
☐ Inundated ☐ Drift lines
☐ Saturated within 12" bgs ☐ Sediment deposits
☐ Wetland drainage pattern ☐ Water marks

Secondary Hydrology Indicators:
☐ Oxidized Root Channels within 12" bgs ☐ FAC- neutral test
☐ Local soil survey ☐ Water-stained leaves
☐ Other:

Is the hydrology criterion met? Yes ☒ No ☐

Comments: ACCORDING TO WDFW, THIS AREA IS INUNDATED (APRIL - JUNE)

Determination

Wetland? Yes ☒ No ☐
Cowardin Class/ HGM Class: PSS / LAKE-FRINGE

Comments:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs Phase 2 City/County: Chelan Sampling Date: 6 March 2007

Applicant/Owner: WDFW State: WA Sampling Point: SP-4

Investigator(s): WTK JAW Section, Township, Range: T27N/R23E / Sec 20

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): —

Subregion (LRR): B Lat: Long: Datum:

Soil Map Unit Name: Chelan gravelly sandy loam NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation X, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

Vegetation challenging because obligates and upland species thriving together

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover: —			
Sapling/Shrub Stratum			
1. Rubus armeniacus	20	✓	FACU
2.			
3.			
4.			
5.			
Total Cover: 20			
Herb Stratum			
1. Hypericum perforatum	5	✓	UPL
2. Verbascum thapsis	5	✓	UPL
3. Carex sp	5		
4. Iris pseudacorus	5	✓	OBL
5. Equisetum laevigatum	10	✓	FACW
6. Juncus tenuis	30	✓	FAC
7.			
8. evident fine grasses	40		
Total Cover: 100			
Woody Vine Stratum			
1.			
2.			
Total Cover: —			

% Bare Ground in Herb Stratum — % Cover of Biotic Crust —

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of		Multiply by:	
OBL species	1	x 1 =	1
FACW species	1	x 2 =	2
FAC species	1	x 3 =	3
FACU species	1	x 4 =	4
UPL species	2	x 5 =	10
Column Totals:	6	(A)	20 (B)

Prevalence Index = B/A = 3.2

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

X Problematic Hydrophytic Vegetation[1] (Explain)

obligate and upland species growing side by side

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	100					silt loam	
3-6	2.5 Y 4/1.5	100					fine sandy loam	
6-9	10YR 3/2	95	7.5YR 4/6	5% distinct	C	M	sandy clay loam	
9-16	10YR 3/2	95	7.5 YR 4/6	5% distinct	C	M	sandy clay loam w/ lots gravels to 4"	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) ____

Water Table Present? Yes ____ No X Depth (inches) ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches) ____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

WDFW staff state area floods during spring runoff

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs Phase 2 City/County: Chelan Sampling Date: 6 March 2007
Applicant/Owner: WDFW State: WA Sampling Point: SP-5
Investigator(s): JAW, WTK Section, Township, Range: T27N R23E Sec 20
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): convex Slope (%): ~2%
Subregion (LRR): B Lat: Long: Datum:
Soil Map Unit Name: Chelan gravelly sandy loam NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	Is the Sampled Area within a Wetland? Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Rubus armeniacus	10	✓	FACU
2.			
3.			
4.			
5.			
Total Cover:	10		
Herb Stratum			
1. Hypericum perforatum	2		UPL
2. Centaurea diffusa	5		UPL
3. Solidago canadensis	5		FACU-
4. Gnaphalium sp	5		
5. Plantago lanceolata	10		FAC
6. Bromus tectorum	20	✓	UPL
7. Poa sp	T		
8. Carex sp	30	✓	(assumed OBL)
Total Cover:	77		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species 1	x 3 = 3
FACU species 2	x 4 = 8
UPL species 4	x 5 = 20
Column Totals: 7 (A)	31 (B)

Prevalence Index = B/A = 4.4

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: SP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					sandy loam	
4-6	2.5Y 3/2	100	too fine for % color				loamy sand	
6-13	2.5Y 3/2	100	too fine for % color				loamy sand w/ gravels + cobble	
13+	rock refusal							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No X

Remarks

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

URS Routine On-site Wetlands Determination

URS Seattle Office, 1501 4th Ave, Suite 1400, Seattle, Washington 98102 Tele: 206.438.2700

Project Name: Beebe Springs PHASE 2
Project Location: Chelan, WA
Applicant/Owner: WDFW
Transect/Plot: SP-6 Plot Location:
Fieldwork Date: 6 March 2007
County: Chelan State: WA
Investigator(s): WTK, JAW

Normal circumstances exist on site? Yes [X] No [ ]
Significantly disturbed (atypical situation)? Yes [ ] No [X]
Is this a potential Problem Area? Yes [ ] No [X]

Vegetation

Normal plot size/shape? (radius – trees & shrubs = 30', herbs = 5'/ circular) Yes [X] No [ ]

	Species	Ind. Status	% Raw Cover		Species	Ind. Status	% Raw Cover
Trees				Herbs	Plantago lanceolata	FAC	25 ✓
					Juncus tenuis	FACW-	5 ✓
Shrubs	Salix exigua	OBL	50 ✓				
	Rubus armeniacus	FACW	5				

Percent of dominant plant species that are OBL, FACW, FAC+, & FAC: 100
Is the hydrophytic vegetation criteria met? Yes [X] No [ ]

✓ = dominant species
* = also includes saplings (woody plants <20 ft tall)

Comments: Vegetation is dominated by hydrophytic species

Soil

Mapped Series: Chelan gravelly sandy loam Taxonomy: Vitrixerandic Haploxeroll Drainage Class:
On Hydric Soils List? Yes [ ] No [ ] Confirmed map soil type or inclusion:

Horizon	Depth	Matrix Color	Redoximorphic Features	Texture, Other
A	0-11	2.5Y 3/2	7.5YR 4/6 common, fine, distinct	silty clay loam
11+	Rock refusal			

- [ ] Histosol/Histic epipedon
- [ ] Sulfidic odor
- [ ] Concretions within 3" bgs
- [X] Low matrix chroma and redox within 10" bgs
- [ ] Gleyed within 10" bgs
- [ ] On Hydric Soils List and matches profile
- [ ] Reducing conditions
- [ ] Aquic moisture regime
- [ ] Sandy soils - High organic content in surface horizon
- [ ] Sandy soils - Organic streaking or pan
- [ ] Other:

Is the hydric soil criterion met? Yes [X] No [ ]

Comments:

Hydrology

Recorded Data:
Recorded Data Available: [ ] Aerial Photos: [X] Stream Gauge: [ ] Other: [ ]

Field Data:
Growing Season? Yes [X] No [ ] Beginning
Depth of Inundation: N/A Depth to Saturation: N/A Depth to Free Water: N/A

Primary Hydrology Indicators:
- [ ] Inundated
- [ ] Saturated within 12" bgs
- [ ] Wetland drainage pattern
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Water marks

Secondary Hydrology Indicators:
- [X] Oxidized Root Channels within 12" bgs
- [ ] Local soil survey
- [ ] Other:
- [ ] FAC- neutral test
- [ ] Water-stained leaves

Is the hydrology criterion met? Yes [X] No [ ]

Comments: soils damp but not saturated WDFW staff indicate ponding w/in 20 ft of pit occurs (APRIL - JUNE)

Determination

Wetland? Yes [X] No [ ]
Cowardin Class/HGM Class: PSS / LAKE-FRINGE

Comments:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs Phase 2 City/County: Chelan Sampling Date: 6 March 2007
Applicant/Owner: WDFW State: WA Sampling Point: SP-6
Investigator(s): JAW, WTK Section, Township, Range: T27N / R23E / Sec
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): flat Slope (%): 1
Subregion (LRR): B Lat. Long Datum:
Soil Map Unit Name: Chelan gravelly sandy loam NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	Is the Sampled Area within a Wetland? Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Salix exigua	50	✓	OBL
2. Rubus armeniacus			FACW
3.			
4.			
5.			
Total Cover: 55			
Herb Stratum			
1. Plantago lanceolata	25	✓	FAC
2. Juncus tenuis	5	✓	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover: 30			
Woody Vine Stratum			
1			
2.			
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL

Sampling Point: P-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	2.5Y 3/2	98	7.5 YR 4/6	2	C	M	silty clay loam	
11+	rock refusal							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches) _____

Water Table Present? Yes ____ No X Depth (inches) _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches) _____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

photo documented ; WDFW state observe water pooling in this area

Remarks:

URS Routine On-site Wetlands Determination

URS Seattle Office, 1501 4th Ave, Suite 1400, Seattle, Washington 98102 Tele: 206.438.2700

Project Name: Beebe Springs Phase 2 Fieldwork Date: 6 March 2007
Project Location: Chelan WA County: Chelan State: WA
Applicant/Owner: WDFW Investigator(s): WTK JAW
Transect/Plot: SP-7 Plot Location: mid slope south of road
Normal circumstances exist on site? Yes ☑ No ☐
Significantly disturbed (atypical situation)? Yes ☐ No ☒
Is this a potential Problem Area? Yes ☐ No ☒

Vegetation

Normal plot size/shape? (radius – trees & shrubs = 30', herbs = 5'/ circular) Yes ☒ No ☐

	Species	Ind. Status	% Raw Cover		Species	Ind. Status	% Raw Cover
Trees				Herbs	Elytrigia repens	FAC-	30 ✓
					Equisetum laevigatum	FACW	10
					Verbascum thapsus	UPL	10
					Poa sp		T
					Bromus tectorum	UPL	50 ✓
Shrubs	Rubus armeniacus	FACU	10 ✓		Lactuca serriola	FACU	2
	Salix exigua	OBL	10 ✓				

Percent of dominant plant species that are OBL, FACW, FAC+, & FAC: 25 %
Is the hydrophytic vegetation criteria met? Yes ☐ No ☑

✓ = dominant species
* = also includes saplings (woody plants <20 ft tall)

Comments: Vegetation is not dominated by hydrophyte species

Soil

Mapped Series: Chelan gravelly sandy loam Taxonomy: Vitrichrandic Haploxeroll Drainage Class:
On Hydric Soils List? Yes ☐ No ☐ Confirmed map soil type or inclusion:

Horizon	Depth	Matrix Color	Redoximorphic Features	Texture, Other
A	0-2	10YR3/2		silt loam
B	2-18	2.5Y4/2		silt loam

☐ Histosol/Histic epipedon ☐ Gleyed within 10" bgs ☐ Sandy soils - High organic content in surface horizon
☐ Sulfidic odor ☐ On Hydric Soils List and matches profile ☐ Sandy soils - Organic streaking or pan
☐ Concretions within 3" bgs ☐ Reducing conditions ☐ Other:
☐ Low matrix chroma and redox, within 10" bgs ☐ Aquic moisture regime

Is the hydric soil criterion met? Yes ☐ No ☑

Comments:

Hydrology

Recorded Data:
Recorded Data Available: ☐ Aerial Photos: ☑ Stream Gauge: ☐ Other: ☐

Field Data: Growing Season? Yes ☒ No ☐
Depth of Inundation: N/A Depth to Saturation: N/A Depth to Free Water: N/A

Primary Hydrology Indicators:
☐ Inundated ☐ Drift lines
☐ Saturated within 12" bgs ☐ Sediment deposits
☐ Wetland drainage pattern ☐ Water marks

Secondary Hydrology Indicators:
☐ Oxidized Root Channels within 12" bgs ☐ FAC- neutral test
☐ Local soil survey ☐ Water-stained leaves
☐ Other:

Is the hydrology criterion met? Yes ☐ No ☒

Comments:

Determination

Wetland? Yes ☐ No ☒
Cowardin Class/ HGM Class: Upland

Comments:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs Phase 2 City/County: Chelan Sampling Date: 6 March 2007

Applicant/Owner: WDFW State: WA Sampling Point: SP-7

Investigator(s): JAW, WTK Section, Township, Range: T27N / R23E / Sec. 20

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): slope Slope (%): >5

Subregion (LRR): B Lat. Long. Datum:

Soil Map Unit Name: Chelan gravelly sandy loam NWI classification

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Rubus armeniacus	10	✓	FACU
2. Salix exigua	10	✓	OBL
3.			
4.			
5.			
Total Cover: 20			
Herb Stratum			
1. Elytrigia repens	30	✓	FAC
2. Equisetum laevigatum	10		FACW
3. Verbascum thapsis	10		UPL
4. Bromus tectorum	50	✓	UPL
5. Lactuca serriola	T		FACU
6. Poa sp.	T		
7.			
8.			
Total Cover: 100			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by	
OBL species 1	x 1 =	1
FACW species ____	x 2 =	____
FAC species 1	x 3 =	3
FACU species 1	x 4 =	4
UPL species 1	x 5 =	5
Column Totals: 4 (A)		13 (B)

Prevalence Index = B/A = 3.25

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100					[illegible]	
2-18	2.5Y 4/2	100					[illegible]	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

URS Routine On-site Wetlands Determination

URS Seattle Office, 1501 4th Ave, Suite 1400, Seattle, Washington 98102 Tele: 206.438.2700

Project Name: Beebe Springs Phase 2 — Fieldwork Date: 8 March 2007
Project Location: Chelan, WA — County: Chelan — State: WA
Applicant/Owner: WDFW — Investigator(s): JAW, WTK
Transect/Plot: SP-8 — Plot Location: South end of wetland

Normal circumstances exist on site? Yes [X] No [ ]
Significantly disturbed (atypical situation)? Yes [ ] No [X]
Is this a potential Problem Area? Yes [ ] No [X]

Vegetation

Normal plot size/shape? (radius – trees & shrubs = 30', herbs = 5'/ circular) Yes [X] No [ ]

	Species	Ind. Status	% Raw Cover	Species	Ind. Status	% Raw Cover
Trees				Melilotus alba	FACU	20 ✓
				Plantago lanceolata	FAC	30 ✓
				Carex sp	-	25
Shrubs				Unidentified grasses	-	20

Percent of dominant plant species that are OBL, FACW, FAC+, & FAC: 50 %
Is the hydrophytic vegetation criteria met? Yes [ ] No [X]

✓ = dominant species
* = also includes saplings (woody plants <20 ft tall)

Comments: Vegetation is not dominated by hydrophytic species

Soil

Mapped Series: Chelan gravelly sandy loam — Taxonomy: Vitritorrantic Haploxeroll — Drainage Class:
On Hydric Soils List? Yes [ ] No [ ] Confirmed map soil type or inclusion:

Horizon	Depth	Matrix Color	Redoximorphic Features	Texture, Other
	0-9	10 YR3/2	cannot get color very few very faint, fine	Sandy loam
	9-14	10 YR3/2		sandy loam gravels and cobbles
	14+	rock refusal		to 4 inches

- [ ] Histosol/Histic epipedon
- [ ] Sulfidic odor
- [ ] Concretions within 3" bgs
- [ ] Low matrix chroma and redox. within 10" bgs
- [ ] Gleyed within 10" bgs
- [ ] On Hydric Soils List and matches profile
- [ ] Reducing conditions
- [ ] Aquic moisture regime
- [ ] Sandy soils - High organic content in surface horizon
- [ ] Sandy soils - Organic streaking or pan
- [ ] Other:

Is the hydric soil criterion met? Yes [ ] No [X]

Comments:

Hydrology

Recorded Data:
Recorded Data Available: [ ] Aerial Photos: [ ] Stream Gauge: [ ] Other: [ ]

Field Data: Growing Season? Yes [X] No [ ]
Depth of Inundation: N/A — Depth to Saturation: N/A — Depth to Free Water: N/A

Primary Hydrology Indicators:
- [ ] Inundated
- [ ] Saturated within 12" bgs
- [ ] Wetland drainage pattern
- [ ] Drift lines
- [ ] Sediment deposits
- [ ] Water marks

Secondary Hydrology Indicators:
- [ ] Oxidized Root Channels within 12" bgs
- [ ] Local soil survey
- [ ] Other:
- [ ] FAC- neutral test
- [ ] Water-stained leaves

Is the hydrology criterion met? Yes [ ] No [X]

Comments:

Determination

Wetland? Yes [ ] No [X]
Cowardin Class/ HGM Class: Upland

Comments: open area south of willow/blackberry thicket middle of bench

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs Phase 2 City/County: Chelan Sampling Date: 6 March 2007

Applicant/Owner: WDFW State: WA Sampling Point: SP-8

Investigator(s): WTK, JAW Section, Township, Range: T27N / R23E / Sec 20

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): slope Slope (%): 2

Subregion (LRR): B Lat: Long: Datum:

Soil Map Unit Name: Chelan gravelly sandy loam NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Melilotus alba	20	Y	FACU
2. Plantago lanceolata	30	Y	FAC
3. Carex sp	25		
4.			
5. unidentifiable grasses	20		
6.			
7.			
8.			
Total Cover:	95		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species 1	x 3 =	3
FACU species 1	x 4 =	4
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = 3.5

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/2	100	few small and faint	10 color	M		Sandy loam	
9-14	10YR 3/2	100					Sandy loam w/ gravels and cobble	
14+	rock refusal							to 41 inches

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

URS Routine On-site Wetlands Determination

URS Seattle Office, 1501 4th Ave, Suite 1400, Seattle, Washington 98102 Tele: 206.438.2700

Project Name: Beebe Springs Phase 2 Fieldwork Date: 8 March 2007
Project Location: Chelan, WA County: Chelan State: WA
Applicant/Owner: WDFW Investigator(s): JAW, WTK
Transect/Plot: SP-9 Plot Location:

Normal circumstances exist on site? Yes ☒ No ☐
Significantly disturbed (atypical situation)? Yes ☐ No ☒
Is this a potential Problem Area? Yes ☐ No ☒

Vegetation

Normal plot size/shape? (radius – trees & shrubs = 30', herbs = 5'/ circular) Yes ☒ No ☐

	Species	Ind. Status	% Raw Cover		Species	Ind. Status	% Raw Cover
Trees				Herbs	Phalaris arundinacea	FACW	70 ✓
					Verbascum thapsus	UPL	20 ✓
					Equisetum arvense	FAC	5
Shrubs	Rubus armeniacus	FACU	25 ✓				
	Crataegus sp.	–	T				
	Cornus stolonifera	FACW	5 ✓				

Percent of dominant plant species that are OBL, FACW, FAC+, & FAC: 50%
Is the hydrophytic vegetation criteria met? Yes ☐ No ☒

✓ = dominant species
* = also includes saplings (woody plants <20 ft tall)

Comments:

Soil

Mapped Series: Chelan gravelly sandy loam Taxonomy: Vitritorrandic Haploxeroll Drainage Class:
On Hydric Soils List? Yes ☐ No ☐ Confirmed map soil type or inclusion:

Horizon	Depth	Matrix Color	Redoximorphic Features	Texture, Other
A_1	0-9	10YR 4/2	—	sandy loam
A_2	9-16	10YR 4/2	few, fine, tr faint to color	sandy loam, very gravelly

☐ Histosol/Histic epipedon ☐ Gleyed within 10" bgs ☐ Sandy soils - High organic content in surface horizon
☐ Sulfidic odor ☐ On Hydric Soils List and matches profile ☐ Sandy soils - Organic streaking or pan
☐ Concretions within 3" bgs ☐ Reducing conditions ☐ Other:
☐ Low matrix chroma and redox. within 10" bgs ☐ Aquic moisture regime

Is the hydric soil criterion met? Yes ☐ No ☒

Comments:

Hydrology

Recorded Data:
Recorded Data Available: ☐ Aerial Photos: ☐ Stream Gauge: ☐ Other: ☐

Field Data: Growing Season? Yes ☒ No ☐
Depth of Inundation: N/A Depth to Saturation: N/A Depth to Free Water: N/A

Primary Hydrology Indicators:		Secondary Hydrology Indicators:	
☐ Inundated	☐ Drift lines	☐ Oxidized Root Channels within 12" bgs	☐ FAC- neutral test
☐ Saturated within 12" bgs	☐ Sediment deposits	☐ Local soil survey	☐ Water-stained leaves
☐ Wetland drainage pattern	☐ Water marks	☐ Other:	

Is the hydrology criterion met? Yes ☐ No ☒

Comments: near top of bank

Determination

Wetland? Yes ☐ No ☒
Cowardin Class/ HGM Class: Upland

Comments:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs Phase 2 City/County: Chelan Sampling Date: 6 March 2007
Applicant/Owner: WDFW State: WA Sampling Point: SP-9
Investigator(s): JAW, WTK Section, Township, Range: T27N R23E Sec 20
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): convex Slope (%): N1-2
Subregion (LRR): Lat: Long: Datum:
Soil Map Unit Name: NWI classification PSS/EM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation X, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	Is the Sampled Area within a Wetland? Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION

Tree Stratum (Use scientific names)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Rubus armeniacus	25	√	FACU
2. Crataegus sp.	7		
3. Cornus sericea	5	√	FACW
4.			
5.			
Total Cover:	30		
Herb Stratum			
1. Phalaris arundinacea	70	√	FACW
2. Verbascus thapsis	20	√	UPL
3. Equisetum arvense	5		FAC
4.			
5.			
6.			
7			
8.			
Total Cover:	95		
Woody Vine Stratum			
1			
2.			
Total Cover:			

% Bare Ground in Herb Stratum: % Cover of Biotic Crust:

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by
OBL species	x 1 =
FACW species 2	x 2 = 4
FAC species 1	x 3 = 3
FACU species 1	x 4 = 4
UPL species 1	x 5 = 5
Column Totals: 5 (A)	16 (B)

Prevalence Index = B/A = 3.2

Hydrophytic Vegetation Indicators:
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes No X

Remarks:

Vegetation dominants include FACW growing beside UPL species

SOIL

Sampling Point SP-9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 4/2	100	—				Sandy loam	
9-16	10YR 4/2	100	—				sandy loam, very gravelly	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

just upslope of ordinary high water line at top of slope

Remarks:

URS Routine On-site Wetlands Determination

URS Seattle Office, 1501 4th Ave, Suite 1400, Seattle, Washington 98102 Tele: 206.438.2700

Project Name: Beebe Springs Phase 2 — Fieldwork Date: 6 March 2007
Project Location: Chelan, WA — County: Chelan — State: WA
Applicant/Owner: WDFW — Investigator(s): JAW WTK
Transect/Plot: SP-10 — Plot Location:

Normal circumstances exist on site? Yes ☒ No ☐
Significantly disturbed (atypical situation)? Yes ☐ No ☒
Is this a potential Problem Area? Yes ☐ No ☒

Vegetation

Normal plot size/shape? (radius – trees & shrubs = 30', herbs = 5'/ circular) Yes ☒ No ☐

	Species	Ind. Status	% Raw Cover		Species	Ind. Status	% Raw Cover
Trees				Herbs	Plantago lanceolata	FAC	20
					Verbascum thapsus	UPL	10
					Agrostis sp	FAC	25
					Equisetum arvense	FAC	T
					Oenothera sp	—	10
Shrubs	Rubus armeniacus	FACU	30		Carex sp.		T
	Alnus rubra	FAC	15		Juncus sp. tenuis		5
	Salix exigua	OBL	10				

Percent of dominant plant species that are OBL, FACW, FAC+, & FAC: 57%
Is the hydrophytic vegetation criteria met? Yes ☒ No ☐

✓ dominant species
* – also includes saplings (woody plants <20 ft tall)

Comments:

Soil

Mapped Series: Chelan gravelly sandy loam — Taxonomy: Vitritorrandic Haploxeroll — Drainage Class:
On Hydric Soils List? Yes ☐ No ☐ Confirmed map soil type or inclusion:

Horizon	Depth	Matrix Color	Redoximorphic Features	Texture, Other
A	0-3	10YR 3/2	—	silt loam
B	3-12	2.5Y 3/2	very few too faint to color	heavy gravel and cobble sandy loam
	12+	rock refusal		

☐ Histosol/Histic epipedon ☐ Gleyed within 10" bgs ☐ Sandy soils - High organic content in surface horizon
☐ Sulfidic odor ☐ On Hydric Soils List and matches profile ☐ Sandy soils - Organic streaking or pan
☐ Concretions within 3" bgs ☐ Reducing conditions ☐ Other:
☐ Low matrix chroma and redox. within 10" bgs ☐ Aquic moisture regime

Is the hydric soil criterion met? Yes ☐ No ☒

Comments:

Hydrology

Recorded Data:
Recorded Data Available: ☐ Aerial Photos: ☐ Stream Gauge: ☐ Other: ☐

Field Data: Growing Season? Yes ☒ No ☐
Depth of Inundation: N/A — Depth to Saturation: — — Depth to Free Water: —

Primary Hydrology Indicators:
☐ Inundated ☐ Drift lines
☐ Saturated within 12" bgs ☐ Sediment deposits
☐ Wetland drainage pattern ☐ Water marks

Secondary Hydrology Indicators:
☐ Oxidized Root Channels within 12" bgs ☐ FAC- neutral test
☐ Local soil survey ☐ Water-stained leaves
☐ Other:

Is the hydrology criterion met? Yes ☐ No ☒

Comments:

Determination

Wetland? Yes ☐ No ☒
Cowardin Class/ HGM Class: Upland

Comments:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs Phase 2 City/County: Chelan Sampling Date: 6 March 2007

Applicant/Owner: WDFW State: WA Sampling Point: SP-10

Investigator(s): WTK, JAW Section, Township, Range: T27N R23E Sec 20

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 0%

Subregion (LRR): B Lat. Long. Datum:

Soil Map Unit Name: Chelan gravelly sandy loam NWI classification: PSS/EM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	Is the Sampled Area within a Wetland? Yes No X
Hydric Soil Present?	Yes No X	
Wetland Hydrology Present?	Yes No X	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Rubus armeniacus	30	J	FACU
2. Alnus rubra	15	J	FAC
3. Salix exigua	10	J	OBL
4.			
5.			
Total Cover:	55		
Herb Stratum			
1. Plantago lanceolata	20	J	FAC
2. Verbascum thapsus	10	J	UPL
3. Agrostis sp.	25	V	FAC (assumed)
4. Equisetum arvense	T		FAC
5. Juncus tenuis	5		FAC
6. Carex sp	T		
7. Oenothera sp	10	V	UPL (assumed)
8.			
Total Cover:	80		
Woody Vine Stratum			
1			
2.			
Total Cover:			

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57% (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL

Sampling Point: SP-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1-3	10YR 3/2	100					silt loam	
3-12	2.5Y 3/2	100	very few too small to color			M	sandy loam w/ gravel and cobble	
12+	rock refusal							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

just upslope of OHW line at top of slope

Remarks:

On Hydric Soils List? Yes ☐ No ☐ Confirmed map soil type or inclusion:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Beebe Springs Phase 2 City/County: Chelan Sampling Date: 6 March 2007
Applicant/Owner: WDFW State: WA Sampling Point: SP-11
Investigator(s): WTK, JAW Section, Township, Range: T27N / R23E / Sec 20
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): _____ Slope (%): ~
Subregion (LRR): B Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: Chelan gravelly sandy loam NWI classification: PSS/EM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (if no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	Is the Sampled Area within a Wetland? Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	20	✓	FAC
2.			
3.			
4.			
Total Cover:	20		
Sapling/Shrub Stratum			
1. Rubus armeniacus	30	✓	FACU
2.			
3.			
4.			
5.			
Total Cover:	30		
Herb Stratum			
1. Phalaris arundinacea	70	✓	FACW
2. Solidago canadensis	5		UPL
3. Equisetum laevigatum	5		FACW
4. Agrostis capillaris s.l.	~5	✓	FAC
5.			
6.			
7.			
8.			
Total Cover:	110		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point SP-11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	98	7.5YR 5/4	2	C	M	Sandy loam w/ cobbles & gravel	
10+	rock refusal							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Approx 3 feet above current lake elevation but lake is managed at higher levels during spring snowmelt which inundates this area

APPENDIX B

WASHINGTON STATE DEPARTMENT OF ECOLOGY

WETLAND RATING DATA FORMS

Wetland name or number A

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): A Date of site visit: 6 March 2007

Rated by B. K'Odea Trained by Ecology? Yes X No___ Date of training April 2006

SEC: 20 TWNSHP: 27 N RNGE: 23 E Is S/T/R in Appendix D? Yes___ No X

Map of wetland unit: Figure 4 Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for "Water Quality" Functions	8
Score for Hydrologic Functions	4
Score for Habitat Functions	22
TOTAL score for functions	34

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ III___ Does not Apply X

Final Category (choose the "highest" category from above) III

Summary of basic information about the wetland unit

Wetland Type		Wetland Class	
Vernal Pool		Depressional	
Alkali		Riverine	
Natural Heritage Wetland		Lake-fringe	X
Bog		Slope	
Forest			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number A

Does the wetland being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That Need Special Protection, and That Are Not Included in the Rating	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	X	
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	X	
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

bull trout; Upper Columbia Steelhead; Upper Columbia spring run Chinook are all in Lake Entiat

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. Classifying the wetland first simplifies the questions needed to answer how it functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 20 for more detailed instructions on classifying wetlands.

Wetland name or number A

Classification of Vegetated Wetlands for Eastern Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Does the entire wetland unit **meet both** of the following criteria?

X The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

X At least 30% of the open water area is deeper than 3 m (10 ft)?

Columbia R. reservoir pool

NO – go to Step 2 **YES** – The wetland class is **Lake-fringe (lacustrine fringe)**

2. Does the entire wetland unit **meet all** of the following criteria?

____The wetland is on a slope (*slope can be very gradual*),

____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.

____The water leaves the wetland **without being impounded**?

NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than a foot deep).*

NO – go to Step 3 **YES** – The wetland class is **Slope**

3. Is the entire wetland unit in a valley or stream channel where it gets inundated by overbank flooding from that stream or river? In general, the flooding should occur at least once every ten years to answer "yes." *The wetland can contain depressions that are filled with water when the river is not flooding.*

NO – go to Step 4 **YES** – The wetland class is **Riverine**

4. Is the entire wetland unit in a topographic depression, outside areas that are inundated by overbank flooding, in which water ponds, or is saturated to the surface, at some time of the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to Step 5 **YES** – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes Within One Delineated Wetland Boundary	Class to Use for Rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine (riverine is within boundary of depression)	Depressional
Depressional + Lake-fringe	Depressional

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number A

		Points (only 1 score per box)
L	**Lake-fringe Wetlands** **WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality**	
L	**L 1.0 Does the wetland have the potential to improve water quality?**	*(see p.52)*
L	L 1.1 Average width of vegetation along the lakeshore: Vegetation is more than 33ft (10m) wide — points = 6 Vegetation is between 16 ft (5m) and 33ft wide — points = 3 Vegetation is 6ft (2m) wide to < 16 ft wide — points = 1 Map of Cowardin classes with widths marked	Figure 4 1
L	L 1.2 Characteristics of the vegetation in the wetland *choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* Herbaceous plants cover > 90% of the vegetated area — points = 6 Herbaceous plants cover > 2/3 of the vegetated area — points = 4 √ Herbaceous plants cover > 1/3 of the vegetated area — points = 3 √ Other vegetation that is not aquatic bed in > 2/3 vegetated area — points = 3 Other vegetation that is not aquatic bed in > 1/3 vegetated area — points = 1 Aquatic bed cover > 2/3 of the vegetated area — points = 0 Map with polygons of different vegetation types	Figure 4 3
L	**Total for L1** *Add the points in the boxes above*	4
L	**L 2.0 Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or surface water flowing through the wetland to the lake is polluted. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Wetland is along the shores of a lake or reservoir that does not meet water quality standards — Grazing in the wetland or within 150ft — Untreated stormwater flows into the wetland X Tilled fields or orchards within 150 feet of wetland (only recently removed) — Residential or urban areas are within 150 ft of wetland X Powerboats with gasoline or diesel engines use the lake (Columbia River reservoir) — Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of shore of lake) — Other_____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 53)* multiplier 2
L	**TOTAL - Water Quality Functions** Multiply the score from L1 by the multiplier in L2 ***Record score on p. 1 of field form***	8

Wetland name or number A

L	**Lake-fringe Wetlands** **HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce shoreline erosion**	**Points** (only 1 score per box)
L	**L 3.0 Does the wetland have the potential to reduce shoreline erosion?**	***(see p.54)***
L	L 3.1 Average width and characteristics of vegetation along the lakeshore (**do not** include aquatic bed): *(choose the highest scoring description that matches conditions in the wetland)* ≥ ¼ of the vegetation is shrubs or trees at least 33 ft (10m) wide — points = 6 √ ≥ ¼ of the vegetation is shrubs or trees at least 6 ft. (2 m) wide — points = 4 ≥ ¼ of the vegetation is shrubs or trees at least 33 ft (10m) wide — points = 4 Vegetation is at least 6 ft (2m) wide — points = 2 Vegetation is less than 6 ft (2m) wide — points = 0 Aerial photo or map with Cowardin vegetation classes	Figure 4 4
L	**L 4.0 Does the wetland have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply:* — There are human structures and activities along the shore behind the wetland (buildings, fields) that can be damaged by erosion. — There are undisturbed natural resources along the shore (e.g. mature forests, other classes of wetland) behind the wetland than can be damaged by shoreline erosion — Other _____ **YES** multiplier is 2 **NO** multiplier is 1	***(see p. 55)*** Multiplier 1
L	**TOTAL - Hydrologic Functions** Multiply the score from L3 by the multiplier in L4 ***Record score on p. 1 of field form***	4

within reservoir pool

Comments

Wetland name or number A

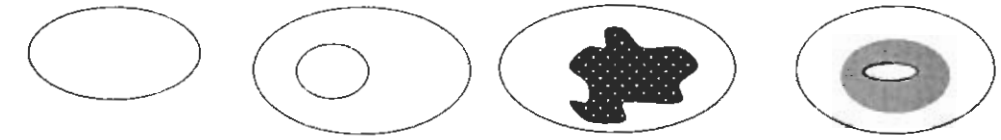
These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Categories of vegetation structure *(see p.62)* *Check the vegetation classes (as defined by Cowardin) and heights of emergents present. Size threshold for each class or height category is ¼ acre or more than 10% of the area if unit is < 2.5 acres.* ___ Aquatic bed X Emergent plants 0-12 in. (0 - 30 cm) high are the highest layer and have > 30% cover X Emergent plants >12 - 40 in.(>30 - 100cm) high are the highest layer with >30% cover ___ Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover X Scrub/shrub (areas where shrubs have >30% cover) ___ Forested (areas where trees have >30% cover) *Add the number of vegetation types that qualify. If you have:* 4-6 types points = 3 3 types points = 2 2 types points = 1 1 type points = 0 Map of Cowardin vegetation classes and areas with different heights of emergents	Figure 4 2
H 1.2. Is one of the vegetation types "aquatic bed?" *(see p .64)* YES = 1 point NO = 0 points	0
H 1.3. Surface Water *(see p.65)* H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre or 10% of its area during the spring (March – early June) OR in early fall (August - end of September)? *Note: answer YES for Lake-fringe wetlands* YES = 3 points & **go to H 1.4** NO = go to H 1.3.2 H 1.3.2 Does the unit have an intermittent or permanent stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, AND that has an unvegetated bottom (*answer yes only if H 1.3.1 is NO*)? YES = 3 points NO = 0 points Map showing areas of open water	Figure 4 3
H 1.4. Richness of Plant Species *(see p. 66)* Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites ,Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)* If you counted: > 9 species points = 2 4-9 species points = 1 # of species 7 < 4 species points = 0 points *List species below if you wish* Rosa rubra Rubus armeniacus Salix exigua Cornus sericea Crataegus sp. Equisetum arvense Agrostis sp.	1

Wetland name or number A

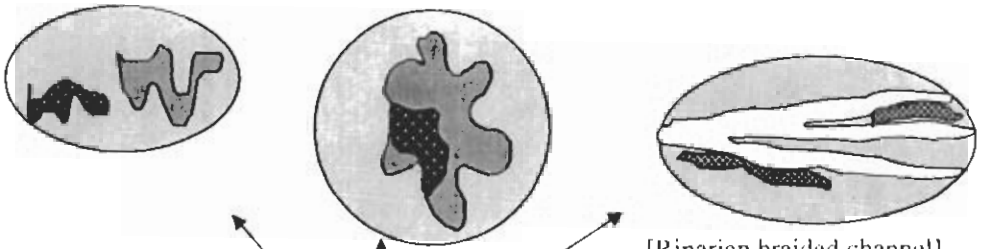
H 1.5. Interspersion of habitats *(see p. 67)*

Figure 4

Decided from the diagrams below whether interspersion between categories of vegetation (described in H 1.1), or categories and un-vegetated areas (can include open water or mudflats) is high, medium, low, or none.



None = 0 points Low = 1 point Moderate = 2 points



[Riparian braided channel]

High = 3 points

NOTE: If you have four or more vegetation categories or three vegetation categories and open water the rating is always "high". Use maps from H1.1 and H1.3

H 1.6. Special Habitat Features: *(see p. 68)*

Check the habitat features that are present in the wetland unit. The number of checks is the number of points you put into the next column.

X Loose rocks larger than 4" **or** large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.

___ Cattails or bulrushes are present within the unit.

X Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.

___ Emergent or shrub vegetation in areas that are permanently inundated/ponded. *The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.*

___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>45 degree slope) OR **signs of recent beaver activity**

___ Invasive species cover **less than 20% in each stratum of vegetation** *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*

Maximum score possible = 6

TOTAL Potential to provide habitat
Add the scores in the column above

9

Comments

Wetland name or number A

H 2.0 Does the wetland have the opportunity to provide habitat for many species?

H 2.1 Buffers *(see p. 71)*

Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed." Relatively undisturbed also means no grazing, no landscaping, no daily human use, and no structures or paving within undisturbed part of buffer.

- X 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference **Points = 5**
- — 330 ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4**
- — 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4**
- — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3**
- — 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3**

If buffer does not meet any of the criteria above

- — No paved areas (except paved trails) or buildings within 80ft (25 m) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**
- — No paved areas or buildings within 170ft (50m) of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**
- — Heavy grazing in buffer. **Points = 1**
- — Vegetated buffers are <6.6ft wide (2m) for more than 95% of the circumference (e.g . tilled fields, paving, basalt bedrock extend to edge of wetland). **Points = 0**
- — Buffer does not meet any of the criteria above. **Points = 1**

Aerial photo showing buffers

Figure 4

5

H 2.2 Wet Corridors *(see p. 72)*

H 2.2.1 Is the wetland unit part of a relatively undisturbed and unbroken, > 30 ft wide, vegetated corridor at least ¼ mile long with surface water or flowing water throughout most of the year (> 9 months/yr)? (*dams, heavily used gravel roads, paved roads, fields tilled to edge of stream, or pasture to edge of stream are considered breaks in the corridor*).

YES = 4 points (go to H 2.3) NO = go to H 2.2.2

4

H 2.2.2 Is the unit part of a relatively undisturbed and unbroken, > 30 ft wide, vegetated corridor, at least ¼ mile long with water flowing seasonally, **OR** a lake-fringe wetland without a "wet" corridor, **OR** a riverine wetland without a surface channel connecting to the stream?

YES = 2 points (go to H 2.3) NO go to H 2.2.3

H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (*do not include man-made ditches*)?

YES = 1 point **NO = 0 points**

Wetland name or number A

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 74)*

Which of the following priority habitats are within 330ft (100m) of the wetland unit?

*NOTE: the connections **do not** have to be relatively undisturbed. These are DFW definitions. Check with your local DFW biologist if there are any questions.*

X **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

____ **Aspen Stands:** Pure or mixed stands of aspen greater than 2 acres.

____ **Cliffs:** Greater than 25 ft high and occurring below 5000 ft.

____ **Old-growth forests:** (east of Cascade crest): In general, stands will be >150 years of age, with 10 trees/acre that are > 21 in dbh, and 1 - 3 snags/acre > 12-14 in diameter.

____ **Mature forests:** Stands with average diameters exceeding 21 in dbh; crown cover may be less that 100%; decay, 80 - 160 years old east of the Cascade crest.

____ **Prairies and Steppe:** Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.

____ **Shrub-steppe:** Tracts of land consisting of plant communities with one or more layers of perennial grasses and a conspicuous but discontinuous layer of shrubs.

____ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft, composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

____ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages

____ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.

____ **Urban Natural Open Space**: A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.

____ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.8 ha (2 acres).

If wetland has **2 or more** Priority Habitats = **4 points**
If wetland has 1 Priority Habitat = **2 points**
No Priority habitats = **0 points**

2

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)

Comments

Wetland name or number A

H 2.4 Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 76)***	
— The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. (*Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs*) **points = 5**	
— There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing in the connection or an open water connection along a lake shore without heavy boat traffic are OK, but connections should NOT be bisected by paved roads, fill, fields, heavy boat traffic or other development) **points = 5**	2
X There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed? **points = 2**	
— There is at least 1 wetland within ½ mile. **points = 1**	
— Does not meet any of the four criteria above **points = 0**	
H 2. TOTAL Score - opportunity for providing habitat *Add the scores in the column above*	13
H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?	
H 3.1 Indicator of reduced habitat functions ***(see p. 75)*** Do the areas of open water in the wetland unit have a resident population of carp (see text for indicators of the presence of carp)? *(NOTE: This question does not apply to reservoirs with water levels controlled by dams, such as the reservoirs on the Columbia and Snake Rivers)* YES = **- 5 points** NO = 0 points	*Points will be subtracted* 0
Total Score for Habitat Functions – *add the points for H 1, H 2, and H 3 and record the result on p. 1*	22

Comments

Wetland name or number A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools *(see p. 79)* Is the wetland unit **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the "wet" season. YES = Go to SC 1.1 (NO) - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO - *not a vernal pool with special characteristics*	
SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)? YES = Category II NO = Category III	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands *(see p. 81)* Does the wetland unit meets **one** of the following two criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 2 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ⅓ of the plant cover consists of species listed on Table 2 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. **YES = Category I** **NO** - *not an alkali wetland*	**Cat. I**

SC 5.0 Forested Wetlands *(see p. 85)* Does the wetland unit have an area of forest (*you should have identified a forested class, if present, in question H 1.1*) rooted within its boundary that meet **at least one** of the following three criteria? — The wetland is within the "100 year" floodplain of a river or stream — aspen (*Populus tremuloides*) are a dominant or co-dominant of the "woody" vegetation. (*Dominants means it represents at least 50% of the cover of woody species, co-dominant means it represents at least 20% of the total cover of woody species*) — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see p. 83)* YES = go to SC 5.1 NO – *not a forested wetland with special characteristics*	
SC 5.1 Does the wetland unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees Slow growing trees are: western red cedar (*Thuja plicata*), Alaska yellow cedar (*Chamaecyparis nootkatensis*), pine spp. mostly "white" pine (*Pinus monticola*), western hemlock (*Tsuga heterophylla*), Englemann spruce (*Picea engelmannii*). YES = Category I NO = go to SC 5.2	**Cat. I**
SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) are a dominant or co-dominant species? YES = Category I NO = go to SC 5.3	**Cat. I**
SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species. Fast growing species are: Alders – red (*Alnus rubra*), thin-leaf (*A. tenuifolia*) Cottonwoods – narrow-leaf (*Populus angustifolia*), black (*P. balsamifera*) Willows- peach-leaf (*Salix amygdaloides*), Sitka (*S. sitchensis*), Pacific (*S. lasiandra*), Aspen - (*Populus tremuloides*), Water Birch (*Betula occidentalis*) YES = Category II NO = go to SC 5.5	**Cat. II**
SC 5.5 Is the forested component of the wetland within the "100 year floodplain" of a river or stream? YES = Category II	**Cat. II**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories.* If you answered NO for all types enter "Not Applicable" on p.1	N/A

Wetland name or number B

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): Wetland B Date of site visit: 6 March 2007

Rated by William Kidder Trained by Ecology? Yes X No ___ Date of training April 2006

SEC: 20 TWNSHP: 27N RNGE: 23 E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure 4 **Estimated size** 0.52 ac

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ II ___ III X IV ___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for "Water Quality" Functions	24
Score for Hydrologic Functions	4
Score for Habitat Functions	18
TOTAL score for functions	46

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

Final Category (choose the "highest" category from above) III

Summary of basic information about the wetland unit

Wetland Type		Wetland Class	
Vernal Pool		Depressional	
Alkali		Riverine	
Natural Heritage Wetland		Lake-fringe	X
Bog		Slope	
Forest			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number B

Does the wetland being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That Need Special Protection, and That Are Not Included in the Rating	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. Classifying the wetland first simplifies the questions needed to answer how it functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 20 for more detailed instructions on classifying wetlands.

Wetland name or number B

Classification of Vegetated Wetlands for Eastern Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Does the entire wetland unit **meet both** of the following criteria?

X The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) at least 20 acres (8 ha) in size; → Lake Entiat water level management compared to water level in wetland

X At least 30% of the open water area is deeper than 3 m (10 ft)?

NO – go to Step 2 **YES** – The wetland class is **Lake-fringe (lacustrine fringe)**

2. Does the entire wetland unit **meet all** of the following criteria?

___ The wetland is on a slope (*slope can be very gradual*),

___ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.

___ The water leaves the wetland **without being impounded**?

NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than a foot deep).*

NO - go to Step 3 **YES** – The wetland class is **Slope**

3. Is the entire wetland unit in a valley or stream channel where it gets inundated by overbank flooding from that stream or river? In general, the flooding should occur at least once every ten years to answer "yes." *The wetland can contain depressions that are filled with water when the river is not flooding.*

NO - go to Step 4 **YES** – The wetland class is **Riverine**

4. Is the entire wetland unit in a topographic depression, outside areas that are inundated by overbank flooding, in which water ponds, or is saturated to the surface, at some time of the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to Step 5 **YES** – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

Wetland name or number B

Classification of Vegetated Wetlands for Eastern Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Does the entire wetland unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) at least 20 acres (8 ha) in size:
   ___At least 30% of the open water area is deeper than 3 m (10 ft)?

   NO – go to Step 2 **YES** – The wetland class is **Lake-fringe (lacustrine fringe)**

2. Does the entire wetland unit **meet all** of the following criteria?
   ___The wetland is on a slope (*slope can be very gradual*),
   ___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   ___The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than a foot deep).*

   NO - go to Step 3 **YES** – The wetland class is **Slope**

3. Is the entire wetland unit in a valley or stream channel where it gets inundated by overbank flooding from that stream or river? In general, the flooding should occur at least once every ten years to answer "yes." *The wetland can contain depressions that are filled with water when the river is not flooding.*

   NO - go to Step 4 **YES** – The wetland class is **Riverine**

4. Is the entire wetland unit in a topographic depression, outside areas that are inundated by overbank flooding, in which water ponds, or is saturated to the surface, at some time of the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to Step 5 **YES** – The wetland class is **Depressional**

hydrology likely linked to adjacent Columbia R. pool elevation and receives overbank flooding during spring runoff (per WDFW staff)

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes Within One Delineated Wetland Boundary	Class to Use for Rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine (riverine is within boundary of depression)	Depressional
Depressional + Lake-fringe	Depressional

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number L

L	**Lake-fringe Wetlands** **WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality**	**Points** (only 1 score per box)
L	**L 1.0 Does the wetland have the potential to improve water quality?**	*(see p.52)*
L	L 1.1 Average width of vegetation along the lakeshore: Vegetation is more than 33ft (10m) wide — points = 6 Vegetation is between 16 ft (5m) and 33ft wide — points = 3 Vegetation is 6ft (2m) wide to < 16 ft wide — points = 1 Map of Cowardin classes with widths marked	Figure ___ 6
L	L 1.2 Characteristics of the vegetation in the wetland *choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* Herbaceous plants cover >90% of the vegetated area — points = 6 Herbaceous plants cover >2/3 of the vegetated area — points = 4 Herbaceous plants cover >1/3 of the vegetated area — points = 3 Other vegetation that is not aquatic bed in > 2/3 vegetated area — points = 3 Other vegetation that is not aquatic bed in > 1/3 vegetated area — points = 1 Aquatic bed cover > 2/3 of the vegetated area — points = 0 Map with polygons of different vegetation types	Figure 4 6
L	**Total for L1** *Add the points in the boxes above*	12
L	**L 2.0 Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or surface water flowing through the wetland to the lake is polluted. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Wetland is along the shores of a lake or reservoir that does not meet water quality standards — Grazing in the wetland or within 150ft — Untreated stormwater flows into the wetland X Tilled fields or orchards within 150 feet of wetland — Residential or urban areas are within 150 ft of wetland X Powerboats with gasoline or diesel engines use the lake — Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of shore of lake) — Other _____ **YES** multiplier is **2** **NO** multiplier is **1** hydro reservoir	*(see p. 53)* multiplier 2
L	**TOTAL - Water Quality Functions** Multiply the score from L1 by the multiplier in L2 ***Record score on p. 1 of field form***	24

Wetland name or number B

L	**Lake-fringe Wetlands** HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce shoreline erosion	**Points** (only 1 score per box)
L	**L 3.0 Does the wetland have the potential to reduce shoreline erosion?**	*(see p.54)*
L	L 3.1 Average width and characteristics of vegetation along the lakeshore (**do not** include aquatic bed): *(choose the highest scoring description that matches conditions in the wetland)* > ⅔ of the vegetation is shrubs or trees at least 33 ft (10m) wide — points = 6 √ > ⅔ of the vegetation is shrubs or trees at least 6 ft. (2 m) wide — points = 4 > ⅓ of the vegetation is shrubs or trees at least 33 ft (10m) wide — points = 4 Vegetation is at least 6 ft (2m) wide — points = 2 Vegetation is less than 6 ft (2m) wide — points = 0 Aerial photo or map with Cowardin vegetation classes	Figure 4 4
L	**L 4.0 Does the wetland have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* — There are human structures and activities along the shore behind the wetland (buildings, fields) that can be damaged by erosion. — There are undisturbed natural resources along the shore (e.g. mature forests, other classes of wetland) behind the wetland than can be damaged by shoreline erosion — Other controlled by dam **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 55)* Multiplier 1
L	**TOTAL - Hydrologic Functions** Multiply the score from L3 by the multiplier in L4 ***Record score on p. 1 of field form***	4

Comments

Wetland name or number B

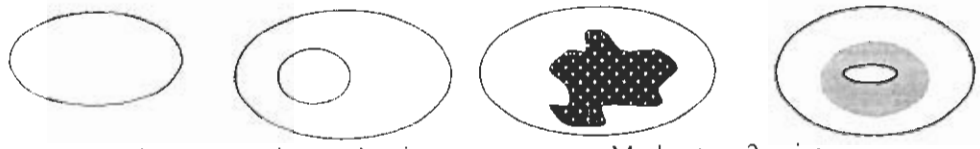
These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Categories of vegetation structure *(see p.62)* *Check the vegetation classes (as defined by Cowardin) and heights of emergents present. Size threshold for each class or height category is ¼ acre or more than 10% of the area if unit is < 2.5 acres.* ___ Aquatic bed X Emergent plants 0-12 in. (0 30 cm) high are the highest layer and have > 30% cover X Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover ___ Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover X Scrub/shrub (areas where shrubs have >30% cover) ___ Forested (areas where trees have >30% cover) *Add the number of vegetation types that qualify. If you have:* 4-6 types points = 3 3 types points = 2 2 types points = 1 1 type points = 0 Map of Cowardin vegetation classes and areas with different heights of emergents	Figure 4 2
H 1.2. Is one of the vegetation types "aquatic bed?" *(see p .64)* YES = 1 point NO = 0 points	Ø
H 1.3. Surface Water *(see p.65)* H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre or 10% of its area during the spring (March – early June) OR in early fall (August - end of September)? *Note: answer YES for Lake-fringe wetlands* YES = 3 points & **go to H 1.4** NO = go to H 1.3.2 H 1.3.2 Does the unit have an intermittent or permanent stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, AND that has an unvegetated bottom *(answer yes only if H 1.3.1 is NO)*? YES 3 points NO = 0 points Map showing areas of open water	Figure 4 0
H 1.4. Richness of Plant Species *(see p. 66)* Count the number of plant species in the wetland that cover at least 10 ft². *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites ,Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)* If you counted: > 9 species points = 2 4-9 species points = 1 # of species 8 <4 species points = 0 points *List species below if you wish* Salix exigua Carex sp. Rubus armeniacus Alnus rubra Juncus sp. Plantago lanceolata Elytrigia repens Equisetum laevigatum	1

Wetland name or number B

H 1.5. Interspersion of habitats *(see p. 67)*

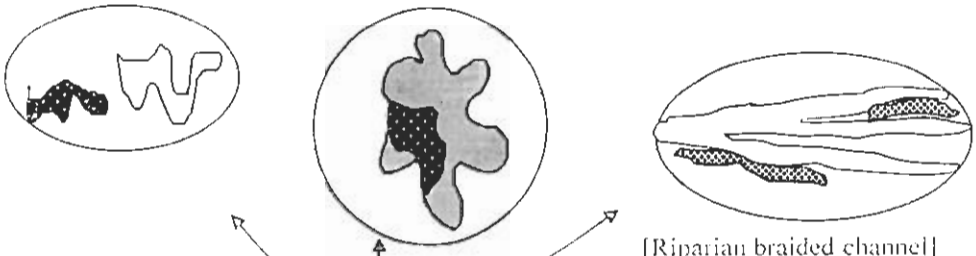
Decided from the diagrams below whether interspersion between categories of vegetation (described in H 1.1), or categories and un-vegetated areas (can include open water or mudflats) is high, medium, low, or none.

Figure 4



None = 0 points Low = 1 point Moderate = 2 points

1



[Riparian braided channel]

High = 3 points

NOTE: If you have four or more vegetation categories or three vegetation categories and open water the rating is always "high". Use maps from H1.1 and H1.3

H 1.6. Special Habitat Features: *(see p. 68)*

Check the habitat features that are present in the wetland unit. The number of checks is the number of points you put into the next column

___ Loose rocks larger than 4" **or** large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.

___ Cattails or bulrushes are present within the unit.

X Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.

1

___ Emergent or shrub vegetation in areas that are permanently inundated/ponded. *The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.*

___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>45 degree slope) OR signs of recent beaver activity

___ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*

Maximum score possible = 6

TOTAL Potential to provide habitat
Add the scores in the column above

5

Comments

Wetland name or number B

H 2.0 Does the wetland have the opportunity to provide habitat for many species?

H 2.1 Buffers *(see p. 71)*

Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed." Relatively undisturbed also means no grazing, no landscaping, no daily human use, and no structures or paving within undisturbed part of buffer.

- X 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference **Points = 5**
- — 330 ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4**
- — 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4**
- — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference. . **Points = 3**
- — 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3**

If buffer does not meet any of the criteria above

- — No paved areas (except paved trails) or buildings within 80ft (25 m) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**
- — No paved areas or buildings within 170ft (50m) of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**
- — Heavy grazing in buffer. **Points = 1**
- — Vegetated buffers are <6.6ft wide (2m) for more than 95% of the circumference (e.g . tilled fields, paving, basalt bedrock extend to edge of wetland). **Points = 0**
- — Buffer does not meet any of the criteria above. **Points = 1**

Aerial photo showing buffers

Figure 4

5

H 2.2 Wet Corridors *(see p. 72)*

H 2.2.1 Is the wetland unit part of a relatively undisturbed and unbroken, > 30 ft wide, vegetated corridor at least ¼ mile long with surface water or flowing water throughout most of the year (> 9 months/yr)? (*dams, heavily used gravel roads, paved roads, fields tilled to edge of stream, or pasture to edge of stream are considered breaks in the corridor*).

(YES) = 4 points (go to H 2.3) NO – go to H 2.2.2

4

H 2.2.2 Is the unit part of a relatively undisturbed and unbroken, > 30 ft wide, vegetated corridor, at least ¼ mile long with water flowing seasonally, **OR** a lake-fringe wetland without a "wet" corridor, **OR** a riverine wetland without a surface channel connecting to the stream?

YES = 2 points (go to H 2.3) NO go to H 2.2.3

H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (*do not include man-made ditches*)?

YES = 1 point NO = 0 points

Wetland name or number B

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 74)*

Which of the following priority habitats are within 330ft (100m) of the wetland unit?

*NOTE: the connections **do not** have to be relatively undisturbed. These are DFW definitions. Check with your local DFW biologist if there are any questions.*

X **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

____**Aspen Stands:** Pure or mixed stands of aspen greater than 2 acres.

____**Cliffs:** Greater than 25 ft high and occurring below 5000 ft.

____**Old-growth forests: (east of Cascade crest):** In general, stands will be >150 years of age, with 10 trees/acre that are > 21 in dbh, and 1 - 3 snags/acre > 12-14 in diameter.

____**Mature forests:** Stands with average diameters exceeding 21 in dbh; crown cover may be less that 100%; decay, 80 - 160 years old east of the Cascade crest.

____**Prairies and Steppe:** Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.

____**Shrub-steppe:** Tracts of land consisting of plant communities with one or more layers of perennial grasses and a conspicuous but discontinuous layer of shrubs.

____**Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft, composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

____**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages

____**Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.

____**Urban Natural Open Space**: A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.

____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.8 ha (2 acres).

2

If wetland has **2 or more** Priority Habitats = **4 points**
If wetland has **1** Priority Habitat = **2 points**
No Priority habitats = **0 points**

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)

Comments

Wetland name or number B

H 2.4 Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 76)***	
— The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. (*Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs*) **points = 5**	
— There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing in the connection or an open water connection along a lake shore without heavy boat traffic are OK, but connections should NOT be bisected by paved roads, fill, fields, heavy boat traffic or other development) **points = 5**	2
X There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed? **points = 2**	
— There is at least 1 wetland within ½ mile. **points = 1**	
— Does not meet any of the four criteria above **points = 0**	
H 2. TOTAL Score - opportunity for providing habitat *Add the scores in the column above*	13
H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?	
H 3.1 Indicator of reduced habitat functions *(see p. 75)* Do the areas of open water in the wetland unit have a resident population of carp (see text for indicators of the presence of carp)? *(NOTE: This question does not apply to reservoirs with water levels controlled by dams, such as the reservoirs on the Columbia and Snake Rivers)* YES - **- 5 points** **NO = 0 points**	*Points will be subtracted* Ø
Total Score for Habitat Functions – *add the points for H 1, H 2, and H 3 and record the result on p. 1*	18

Comments

Wetland name or number B

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools *(see p. 79)* Is the wetland unit **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the "wet" season. YES = Go to SC 1.1 NO - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO - *not a vernal pool with special characteristics*	
SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)? YES = Category II NO = Category III	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands *(see p. 81)* Does the wetland unit meets **one** of the following two criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 2 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ⅓ of the plant cover consists of species listed on Table 2 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. YES = Category I NO - *not an alkali wetland*	**Cat. I**

Wetland name or number B

SC 3.0 Natural Heritage Wetlands *(see p. 81)*

Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species.

SC 3.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)*

S/T/R information from Appendix D X or accessed from WNHP/DNR database __

YES ___ – contact WNHP/DNR (see p. 79) and go to SC 3.2 NO X

SC 3.2 Has DNR identified the wetland unit as a high quality undisturbed wetland or as or as a site with state threatened, endangered, or sensitive plant species? **Cat. I**

YES = Category I NO – *not a natural heritage wetland*

SC 4.0 Bogs *(see p. 82)*

Does the wetland unit **(or any part of the wetland unit)** meet both the criteria for soils and vegetation in bogs. *Use the key below to identify if the wetland is a bog. If you answer yes you will still need to rate the wetland based on its functions.*

SC 4.1. Does the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)?

Yes - go to SC 4.3 No - go to SC 4.2

SC 4.2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond??

Yes - go to SC 4.3 No - *Is not a bog for rating*

SC 4.3. Does the wetland unit have more than 70% cover of mosses at ground level in any area within its boundaries, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? **Cat. I**

Yes – Category I bog No - go to Q. 4.4

NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog.

SC 4.4. Is the unit, or any part of it, forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)*? **Cat. I**

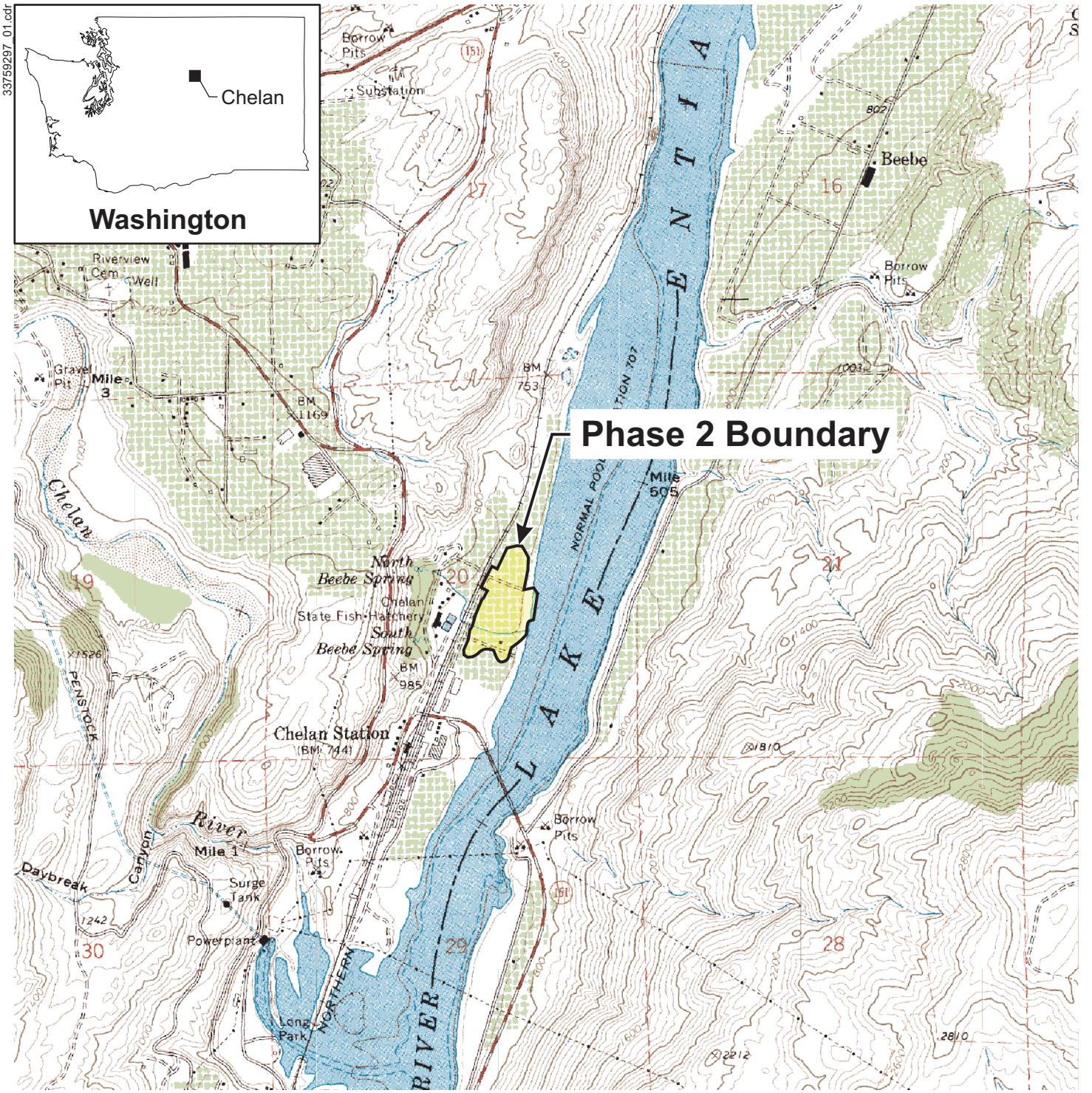
Yes – Category I bog NO

Wetland name or number B

SC 5.0 Forested Wetlands *(see p. 85)* Does the wetland unit have an area of forest (*you should have identified a forested class, if present, in question 11.1.1*) rooted within its boundary that meet **at least one** of the following three criteria? --- The wetland is within the "100 year" floodplain of a river or stream — aspen (*Populus tremuloides*) are a dominant or co-dominant of the "woody" vegetation. (*Dominants means it represents at least 50% of the cover of woody species, co-dominant means it represents at least 20% of the total cover of woody species*) — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see p. 83)* YES = go to SC 5.1 NO = *not a forested wetland with special characteristics*	
SC 5.1 **Does the wetland** unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees Slow growing trees are: western red cedar (*Thuja plicata*), Alaska yellow cedar (*Chamaecyparis nootkatensis*), pine spp. mostly "white" pine (*Pinus monticola*), western hemlock (*Tsuga heterophylla*), Englemann spruce (*Picea engelmannii*). YES = Category I NO = go to SC 5.2	**Cat. I**
SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) are a dominant or co-dominant species? YES = Category I NO = go to SC 5.3	**Cat. I**
SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species. Fast growing species are: Alders – red (*Alnus rubra*), thin-leaf (*A. tenuifolia*) Cottonwoods – narrow-leaf (*Populus angustifolia*), black (*P. balsamifera*) Willows- peach-leaf (*Salix amygdaloides*), Sitka (*S. sitchensis*), Pacific (*S. lasiandra*), Aspen - (*Populus tremuloides*), Water Birch (*Betula occidentalis*) YES = Category II NO = go to SC 5.5	**Cat. II**
SC 5.5 Is the forested component of the wetland within the "100 year floodplain" of a river or stream? YES = Category II	**Cat. II**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories.* If you answered NO for all types enter "Not Applicable" on p.1	—

APPENDIX C

SITE PHOTOGRAPHS



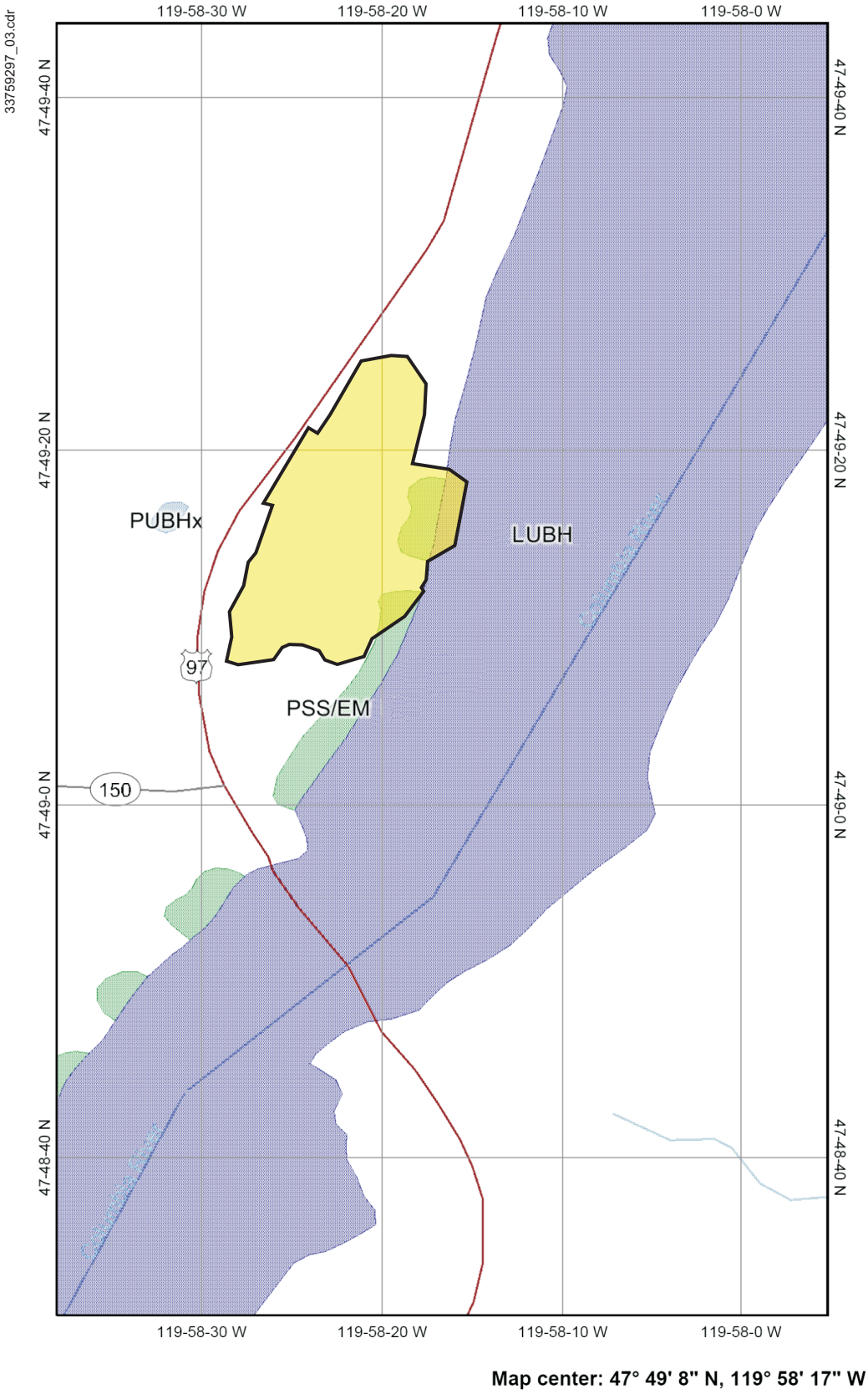
SOURCE: 7.5-minute USGS topographic quadrangle, Chelan Falls, Washington, 1981

Job No. 33759297

Figure 1
Site Vicinity

URS

Wetland Delineation and Impacts Report
Beebe Springs Natural Area – Phase 2
Chelan County, Washington



LEGEND

LUB	Lacustrine unconsolidated bottom
PSS/EM	Palustrine scrub-shrub/emergent
PUB	Palustrine unconsolidated bottom

SOURCE: U.S. Fish and Wildlife Service NWI mapping tool, 1998

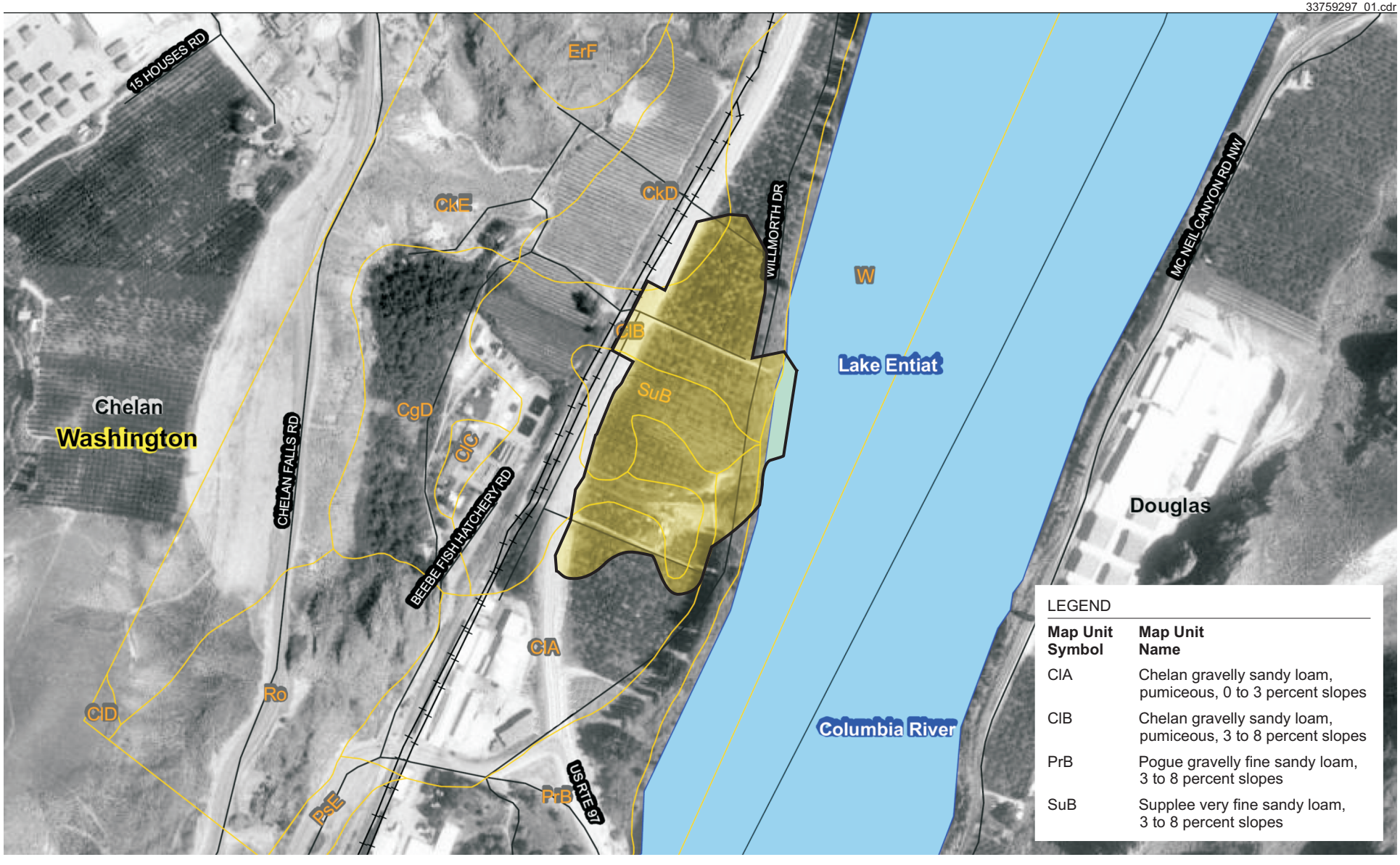
Job No. 33759297

Figure 2
National Wetlands Inventory

URS

Wetland Delineation and Impacts Report
Beebe Springs Natural Area – Phase 2
Chelan County, Washington

33759297_01.cdr



SOURCE: Soil Survey of Chelan County Area, Washington, USDA Natural Resources Conservation Service

0 600 1,200

Scale in Feet

Job No. 33759297

Figure 3
Soils

URS

Wetland Delineation and Impacts Report
Beebe Springs Natural Area – Phase 2
Chelan County, Washington

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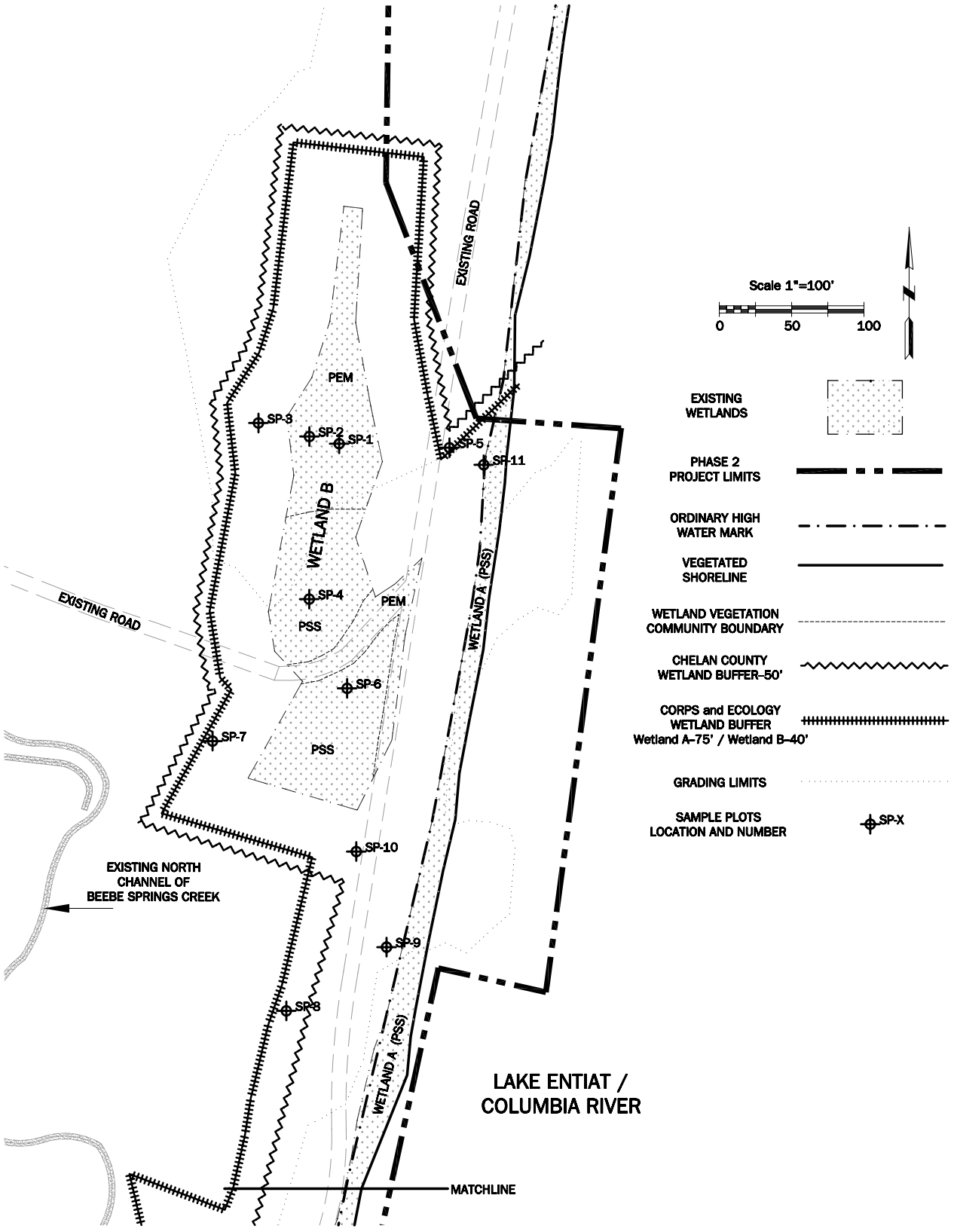

Figure 4a

Existing Wetlands

Job No. 33758342

URS

Wetland Delineation and Impacts Report
Beebe Springs Natural Area - Phase 2
Chelan County, Washington

33758342_95.cdr

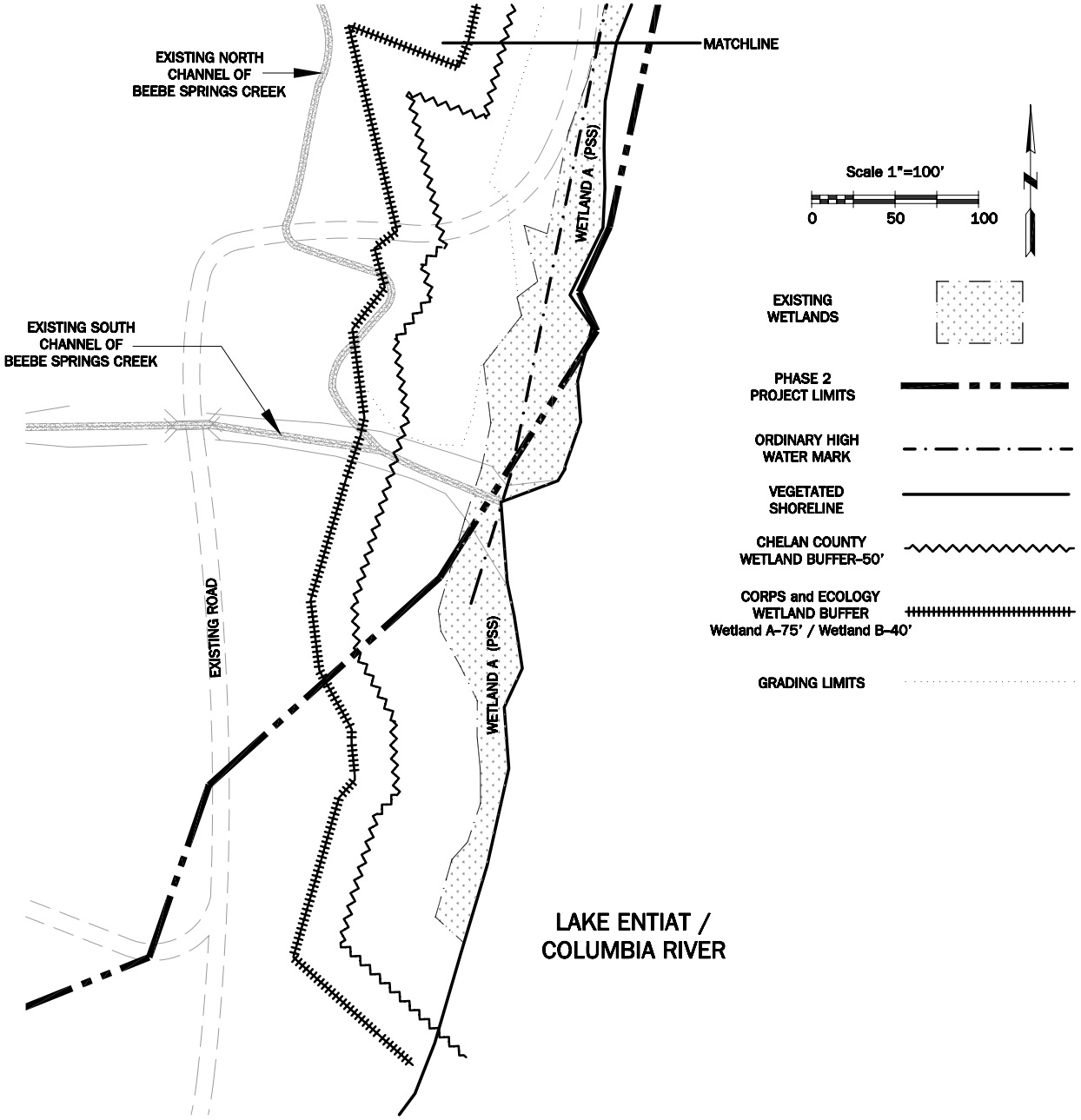

Figure 4b

Existing Wetlands

Job No. 33758342

URS

Wetland Delineation and Impacts Report
Beebe Springs Natural Area - Phase 2
Chelan County, Washington

33758342_95.cdr

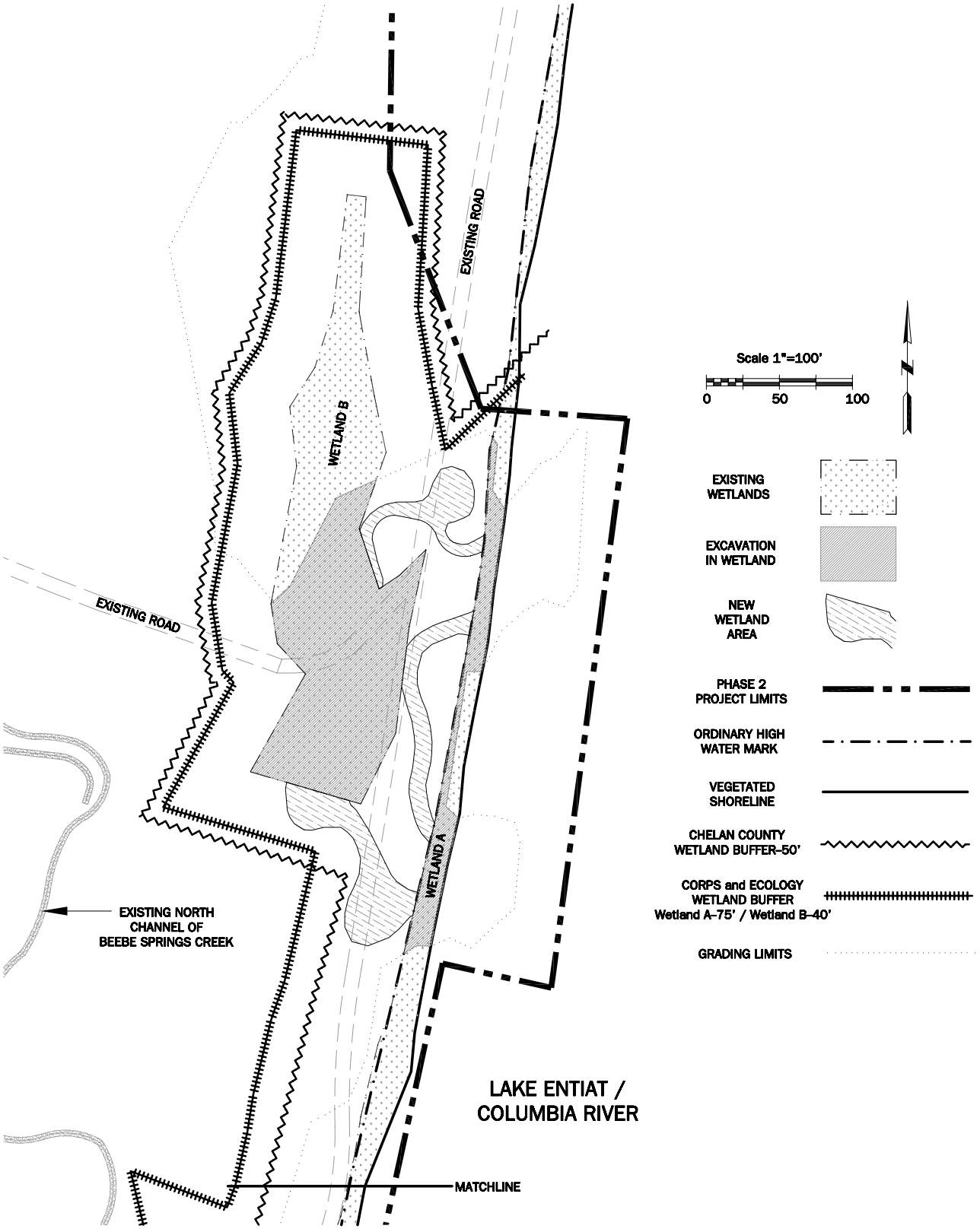

Figure 5a

Wetland Impacts

Job No. 33758342

URS

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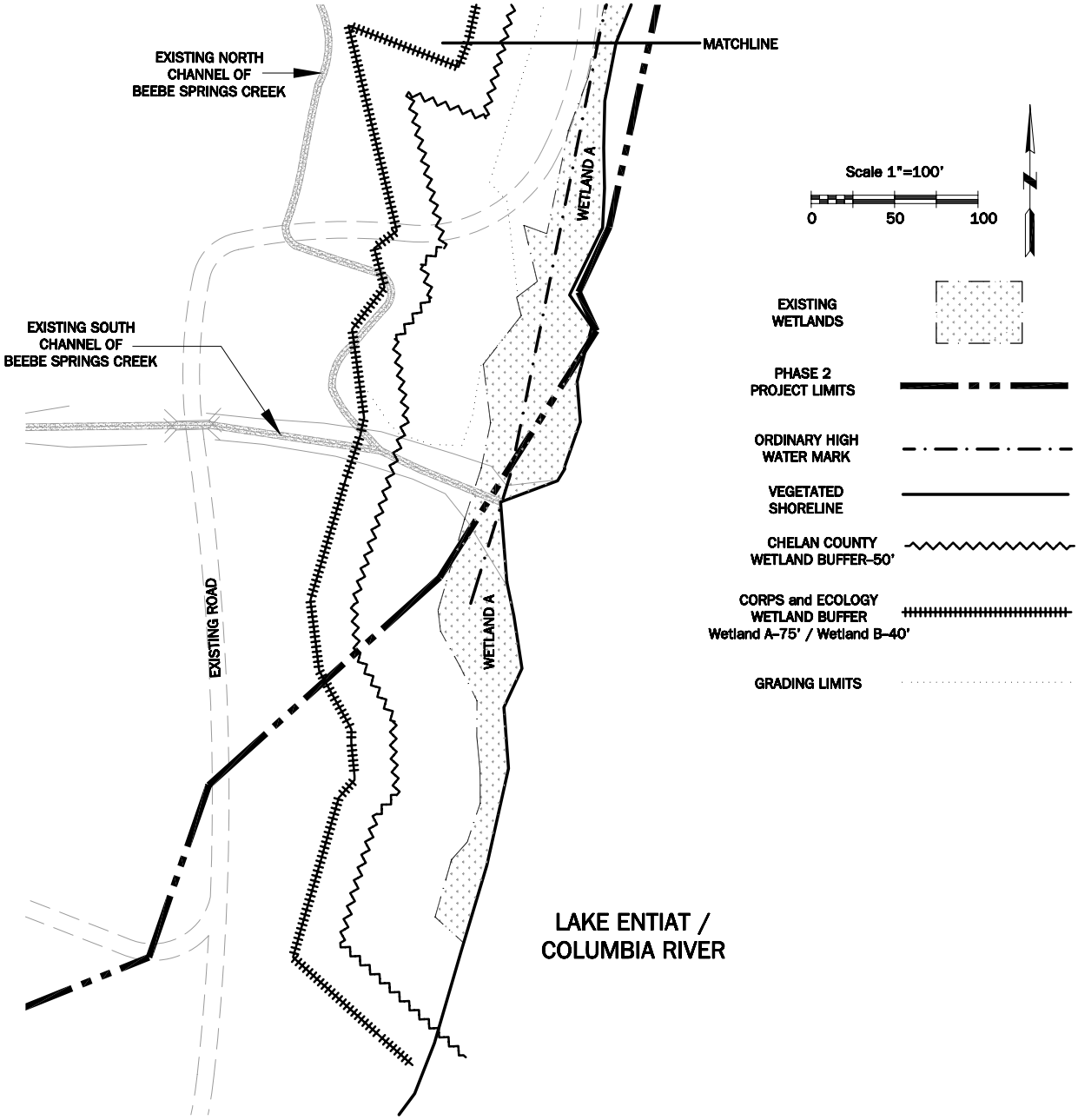

Figure 5b

Wetland Impacts

Job No. 33758342

URS