
SEPA Checklist

**Teaway Solar Reserve
Expanded SEPA Checklist
Kittitas County, Washington**

Submitted to

Kittitas County, Washington

by

Teaway Solar Reserve, LLC

August 2009



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- A Sensitive Species Report
- B Wetland Delineation Report
- C Cultural Resources Report (*privileged and confidential: restricted distribution*)
- D Figures Referenced in Text
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- F Zone of Visual Influence Technical Memorandum

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Acronyms and Abbreviations

ADT	average daily traffic
Applicant	Teaway Solar Reserve, LLC
BMP	best management practice
BPA	Bonneville Power Administration
CAO	Critical Areas Ordinance
CF	Commercial Forest
Checklist	Expanded SEPA Checklist
CO	carbon monoxide
CUP	conditional use permit
cy	cubic yards
DA	Development Agreement
dba	decibels on an A-weighted scale
Ecology	Washington Department of Ecology
F&R	Forest and Range
FAA	Federal Aviation Administration
FDCP	Fugitive Dust Control Plan
FPA	Forest Practices Act
GIS	geographic information system
I-90	Interstate 90
JARPA	Joint Aquatic Resources Permit Application
KCC	Kittitas County Code
kV	kilovolt(s)
MP	milepost
mph	miles per hour
MW	megawatt
MWdc	direct current megawatt

N/A	Information not available
NEC	National Electrical Code
NHP	Natural Heritage Program
NO _x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPDES 1200-C	National Pollutant Discharge Elimination System and State Wastewater Discharge General Permit for stormwater discharges associated with construction activities
O&M	operations and maintenance
PEM	palustrine emergent
PHS	Priority Habitats and Species
PM ₁₀	particulate matter less than 10 micrometers in aerodynamic diameter
PV	photovoltaic
PVC	polyvinyl chloride
RCW	Revised Code of Washington
ROW	right-of-way
SEPA	State Environmental Policy Act
SR	State Route
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WSDOT	Washington State Department of Transportation

Environmental Checklist

State Environmental Policy Act (SEPA)

WAC 197-11-960

Background

1. *Name of proposed project:*

Teanaway Solar Reserve

2. *Name of Applicant:*

Teanaway Solar Reserve, LLC

3. *Address and phone number of applicant and contact person:*

Applicant

Howard Trott
Teanaway Solar Reserve, LLC
218 E. First Street, Suite B
Cle Elum, WA 98922
(206) 972-3800

Contact Person

Nichole Seidell
CH2M HILL
2020 SW Fourth Ave., Suite 300
Portland, OR 97201
(503) 872-4803

4. *Date checklist prepared:*

August 14, 2009

5. *Agency requesting checklist:*

Kittitas County Planning Department

6. *Proposed timing or schedule:*

Project construction will occur over a period of 2 to 3 years, with 7- to 9-month construction periods (weather dependent) in each year. Table 1 presents the start and finish dates for major tasks and key milestones. The schedule will depend on time of year, ability to obtain permits, and weather and ground conditions.

Timber harvesting will be done only as necessary to facilitate construction and will be performed pursuant to the terms and conditions of a Washington Department of Natural Resources (WDNR) Forest Practices Act (FPA) permit.

The proposed project schedule is outlined in Table 1.

TABLE 1
Proposed Project Schedule

Task/Milestone	Start	Finish
Obtain Necessary Permits	June 2009	April 1, 2010
Engineering	June 2009	October 2010
Construction	April 1, 2010	As early as October 2011 or as late as December 2012
Initial Operation	Fall 2010	Not applicable

Note: Two or three 7- to 9-month construction seasons are anticipated, from April 1 to October 31 in 2010, 2011, and 2012.

7. *Do you have any plans for future additions, expansion, or further activity related to this proposal?*

Future additions, expansion, or further activities are not known at this time.

8. *List any environmental information that has/will be prepared related to this proposal.*

Contractors conducted the following supplemental environmental studies in preparation for this project:

- Sensitive Species surveys were conducted in June and July 2009 (Attachment A)
- Wetlands and waters of the U.S. and State were delineated in June and July 2009 (Attachment B)
- Cultural resource surveys were conducted in June and July 2009 (Attachment C [restricted distribution])

9. *Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal?*

The Applicant is not aware of pending approvals for any other projects directly affecting the properties involved in this application.

10. *Government approvals or permits needed:*

Table 2 outlines the permits and authorizations required to construct the proposed project.

TABLE 2
Required Permits and Authorizations

Act/Law	Permit/Authorization	Agency/Contact
Section 404 Clean Water Act Compliance	Section 404—Nationwide Permit	U.S. Army Corps of Engineers
Historic Preservation Act Compliance	Section 106 Review	State Historic Preservation Office
State Environmental Policy Act	Chapter 197-11 Washington Administrative Code	Kittitas County Planning Department
Hydraulic Project Approval/Joint Aquatic Resources Permit Application	Chapter 77.55 Revised Code of Washington/Hydraulic Code of Washington	Washington Department of Fish and Wildlife
Clean Water Act—Section 401 Compliance	Water Quality Certification	Washington Department of Ecology
Forest Practices Act	Forest Practices Permit	Washington Department of Natural Resources
Land Use Review	Conditional Use Permit	Kittitas County
Land Use Review	Cultural Resources	Kittitas County
Land Use Review	Stormwater	Kittitas County
Land Use Review	Critical Areas Ordinance	Kittitas County
Land Use Review	Development Agreement	Kittitas County

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site.

Project Description

The Applicant proposes to construct and operate the project on approximately 982 acres of private land within the Forest and Range (F&R) zoning district in an unincorporated area of Kittitas County, Washington. The project will generate up to 75 direct current megawatts (MWdc) of photovoltaic (PV) solar energy utilizing approximately 580 acres of land within the proposed project area.

Purpose and Need

The purpose of the proposed project is to generate up to 75 MWdc of PV solar energy for distribution to utilities and communities seeking to optimize their renewable and sustainable energy sources. The project was conceived in response to the growing need for sustainable energy sources and the State of Washington’s Renewable Electricity Standard, Revised Code of Washington (RCW) Title 19, mandate that by the year 2020, the state’s largest electric utilities meet 15 percent of their retail electric load with renewable electricity (for example, wind and solar energy). The standard first takes effect in 2012 with a

requirement of 3 percent through 2015, then 9 percent from 2016 through 2019 and 15 percent thereafter.

Oregon and California have adopted similar standards. Depending on the commercial terms available for the power sales, the utilities that may buy the power from the project could change over time.

The Applicant proposes to develop the site described below to maximize its solar energy potential, based on its commitment to providing renewable energy and becoming the leading (in terms of energy production and environmentally sensitive development and management of its solar production site) sustainable energy production location in North America. The following factors will be analyzed to determine optimal location within the site defined below:

- Significant solar radiation (insolation)
- Site accessibility
- Avoidance of environmentally sensitive areas
- Limited visibility from offsite locations

Site Setting

The proposed project site is located approximately 4 miles northeast of Cle Elum, Washington, in Township 20N, Range 16E, within Sections 22, 23, and 27 (Attachment D, Figure 1 for site location). The site is located on the eastern slopes of the Cascade Mountains on Cle Elum Ridge, which runs generally from east to west at elevations ranging from approximately 2,200 to 2,600 feet (Attachment D, Figure 2). The Teanaway River is approximately 1 mile to the northeast of Cle Elum Ridge. The site is accessed from Highway 970 by way of County roads such as Red Bridge Road (Attachment D, Figure 3), and private roads such as Loping Lane and Weihl Road.

The proposed project area consists of 982 acres. Based on site surveys, the project will utilize approximately 580 acres within the proposed project area. The remaining acres are currently undeveloped open space, but may accommodate some future expansion of the project after appropriate surveys are conducted to address any environmental concerns and compliance with any underlying federal, state, or local permitting requirements.

The Bonneville Power Administration's (BPA) 345-kilovolt (kV) Rocky Reach-Maple Valley transmission line runs east to west along the southern site boundary (Attachment D, Figure 2). The proposed project is expected to interconnect to the regional transmission grid using this line. An interconnection substation with an approximate footprint of 10 acres will be located either on the project site, or within the BPA line right-of-way (ROW) (Attachment D, Figure 2).

Some structural and residential development has taken place in the southern portion of the proposed project area. Attachment D, Figure 4 shows the identified structures within the vicinity of the project area. The closest identified residence is approximately 200 feet southeast of the project area. Attachment D, Figure 5 shows the conceptual site layout.

The site is currently zoned Forest and Range (F&R) (Attachment D, Figure 6). The site was most recently selectively logged in 2001 and existing site vegetation consists of low grasses, shrubs, and plants with scattered 50- to 60-foot, 6- to 18-inch-diameter ponderosa pine (*Pinus ponderosa*) trees. Shrub and riparian plant communities are predominantly snowberry (*Symphoricarpos albus*) and Rose (*Rosa* spp.) bushes. Herbaceous plant communities are predominantly Lupine (*Lupinus seiceus*), yarrow (*Achillea millefolium*), arrowleaf balsamroot (*Balsamorhiza sagittata*), and various grass species. Wetland plant communities are dominated by rushes (*Juncus* spp.), sedges (*Carex* spp.), wild onion (*Allium douglasii*), and various grass species.

Key Components

The proposed project will consist of the following key components:

- Solar modules
- Inverter Buildings
- Underground Electrical Conductors
- Substation
- Transmission Line
- Access and Maintenance Roads
- Operations and Maintenance (O&M) Building

Key components are described in the following subsections.

Solar Modules

Solar modules in a metal frame on supporting mounting structures will be used for the proposed project. The solar modules are manufactured offsite and will be delivered to the site by truck in wooden crates or cardboard boxes. A representative module from Sharp Electronics Corporation is shown in Attachment E, Photo 1. The module measures 1.0 by 1.6 meters (3.3 feet by 5.3 feet) and is rated at 216 watts (Sharp Electronics, 2009). The solar modules are mounted in a fashion that orients the modules toward the sun.

Several mounting types will be considered to best address the slope of land at the project site. For example, large land areas with a slope toward the south are excellent for single-axis tracking systems. Land areas that are sloped to the east, southeast, west, or southwest will not as easily accommodate single-axis tracking systems, and are better suited to a fixed-tilt mounting structure or a pole-mounted tracking system.

A representative single-axis tracking system is presented in Attachment E, Photo 2. The mounting system foundations could consist of precast foundations or embedded posts or poles. The embedment could be done by driving a ground screw, or by boring the ground to a depth of approximately 4 to 6 feet and width of approximately 8 to 10 inches, then backfilling with concrete. For one type of support approach, one post is needed for every five to six solar modules. If the entire 75 MWdc were to be installed with this mounting system, then approximately 70,000 posts would need to be set. About 70 percent of the solar modules for the proposed site will likely use this mounting type, meaning that about 50,000 posts would need to be set (primarily on lands with a south-facing slope). The excavated earth would not be removed from the site.

Another mounting method is to place the solar modules on top of a single pole. The “top of pole mount” system could be installed in areas with a slope facing the southeast. This system consists of a large steel pole that supports the solar module. The pole would attach to a post buried into the ground to a depth of 10 to 15 feet, with a width of 10 to 24 inches. A representative top of pole mount system is shown in Attachment E, Photo 3. The system shown attaches eight solar modules. The most likely configuration is to have between 12 to 20 solar modules mounted on one pole. It is estimated that about 10 percent of the solar installation will be installed using this method, and approximately 3,000 posts will need to be set.

Fixed-tilt systems typically have a galvanized or corrosion-resistant metal frame to hold the solar modules at a 20 to 30 degree tilt, as shown in Attachment E, Photo 4. A dimensioned view is shown in Attachment E, Photo 5, and a cutaway view is shown in Attachment E, Photo 6. It is estimated that 20 percent of the solar installation will be installed using this mounting method.

Inverter Buildings

Up to 40 inverter buildings will be needed for the project. The inverters can be placed outdoors, as shown in Attachment E, Photo 8. While the inverter enclosures are rated for outdoor use, the manufacturer recommends an enclosure to protect the inverters from the elements and extreme temperature changes. An example inverter building includes a concrete pad, and prefabricated facilities are available such as the 2-MW enclosed system offered by Xantrex. Systems similar to the offering from Xantrex enclose four 500-kilowatt (kW) inverters and a 2-MW transformer in a weather-resistant structure measuring 40 feet by 9 feet by 8 feet 6 inches tall. The 2-MW structure shown in Attachment E, Photo 9, is representative of an inverter building that will be used onsite.

Underground Electrical Conductors

Underground electrical conductors will be installed in trenches at a depth in compliance with the Kittitas County (36 inches or greater). Conductors either will be direct burial or in a polyvinylchloride (PVC) conduit.

Substation

The Applicant proposes to construct an electrical substation that will interconnect with the 345-kV BPA transmission line. The substation will require a level, fenced area of approximately 10 acres. The 10-acre area will be graveled with no vegetation. The substation will contain a small control house, transformer(s), circuit breakers and switches, steel support structures, and overhead electrical bus work. Its appearance will be similar to that of many other substations throughout the Pacific Northwest.

Transmission Line

A new 345-kV transmission line will be needed to connect the new substation to the existing BPA line. If the substation is located at the BPA ROW, this line would be very short. The line would have two circuits, one into the substation and one out of the substation. The construction could be similar to the existing lattice towers, and require a ROW of up to 300 feet in width.

Access and Maintenance Roads

The site will be accessed via Kittitas County and private roads that interconnect with Highway 970. The major County access road is Red Bridge Road. Weihl Road and Loping Lane are private roads over which the Applicant has easement rights. Loping Lane is subject to several road use and cost-sharing agreements, and the Applicant will be subject to those agreements. Additionally, the Applicant will work with neighbors who use Loping Lane to identify measures that will minimize disruption to their use during construction and to the roadway itself. The project will be served internally by a network of existing and new maintenance roads. The existing maintenance roads will be improved pursuant to County requirements. As set forth in the Draft DA, the Applicant will coordinate any improvements to these roads with the Kittitas County Public Works Department. Attachment D, Figure 3 shows the location of the access and maintenance roads in relation to the project site.

Summary of Construction Activities and Components

Site preparation will consist of clearing the existing vegetation only in those areas where driveways and modular construction will be undertaken, grading, and establishing temporary staging areas (including stockpile and laydown areas). Site preparation will be limited to staging areas, maintenance roads, O&M facilities, and some extreme portions of the larger site as needed to accommodate a level field for the solar facility. Once the site is prepared, the installation of foundations, trackers, modules, inverter equipment pads, and substation foundation can begin.

Site Clearing and Grading

The project site will require clearing to address the potential for damage to the project from blown down trees, decreased power efficiency of the solar modules, the risk of fire from fuel buildup within the project area, and the need to create a 100-foot firebreak along the project's perimeters as provided below. To clear the site for installing the project, trees will be harvested within the project area on an as-needed basis for facilitating the next construction phase of the project (Table 1). Trees will generally be harvested to a stump level of 6 to 12 inches above ground level. The Applicant will obtain a permit from WDNR and contract with a professional forester to harvest these trees in accordance with the permit. Because the bottoms of the solar modules will be approximately 3 feet above grade, any vegetation taller than 3 feet or expected to exceed 3 feet in height will be removed. Shrubs, grass, and groundcover will, to the maximum extent practicable, remain between rows and under the solar modules.

Construction equipment such as tractors, backhoes, loaders, dozers, and graders will be needed to clear brush and vegetation from the site as needed, and to grade roads and foundation locations. If the slope of the land is excessive, terracing, or retaining walls may be required.

Staging Areas

A temporary staging area of approximately 5 acres will be used as a laydown area for parts and materials such as solar crates, electric cable, structural supports, and perhaps a concrete batching facility. The staging area could be located at the intersection of logging roads on

the property, as illustrated on Figure 7. Attachment E, Photo 10, shows a typical staging area for a 10-MW solar project. Mobilization of the site will consist of fencing off a 5-acre section of land that will be needed to store materials. Mobilization will also include a temporary facility and staging area for solar module deliveries, and metal racking. Mobilization will last approximately 1 month.

Foundations, Trackers, and Modules

The foundations securing the solar modules will be designed to withstand high winds and snow loads. The site may have multiple foundation types to match the ground conditions and type of mounting structure used. One foundation type consists of boring a hole approximately 12 inches wide and 48 inches deep to hold a steel support pipe. The hole is then filled with concrete. A support pier will be required for every 45 square feet of land area, or approximately 1,000 piers per installed MW of solar capacity. Approximately 145 acres of modules will be installed within the 982-acre proposed project area.

A second type of foundation consists of an above-grade concrete ballast used to support the uplift forces of the solar mounting structure. These ballasts will contain .25 to .35 cubic yards of concrete per block, and two concrete ballasts will support a small array of solar modules.

Pending final design, the solar module foundations will require site work, potential boring, trucking of materials, and concrete. The number of foundations could be as high as 70,000, and require approximately four thousand truck deliveries.

Installation of foundations, trackers, and modules will occur over a period of approximately 7 to 9 months during two or three construction seasons (between April and October or April and December).

Inverter Equipment Pads and Substation Foundation

Electrical equipment will be located onsite in multiple locations. There will be one inverter building (that houses two inverters and one associated transformer) for every approximately 7 acres of solar field. One inverter building will house (2) 500-kW inverters, so there will be one inverter building for every 1 MW of solar field. Approximately 7 acres are needed for a 1-MW solar array. Approximately 145 acres of modules will be installed within the 982-acre proposed project area.

Up to 75 inverter buildings will be needed. The inverter stations will require a concrete pad of approximately 40 by 10 feet. The inverter buildings will be approximately 10 feet tall.

Wiring connecting module arrays to the inverters and the inverters to the substation will need to be run in underground cables (Attachment E, Photos 11, 12, and 13). Trenching is required for the conductors from the inverter buildings to the main substation. Trenching requires removing earth in a section of several feet wide by approximately 2 to 3 feet deep.

The substation will require an area of approximately 10 acres. The substation consists of a steel support structure that is 15 to 20 feet tall. The substation will be surrounded by a cyclone fence that is approximately 10 feet tall. The substation will include a small control building, approximately 20 feet wide by 20 feet long, that is enclosed with air conditioning.

Pending location of the substation, overhead electrical distribution lines may be required to connect the substation with BPA's transmission line. Poles supporting the overhead lines will be required approximately every 750 feet.

Installation of inverter equipment pads and other foundations will occur over a period of approximately 5 to 6 months.

Construction Materials and Equipment

If the project uses aboveground mounting methods with ballasted (concrete) blocks, the amount of concrete required is subject to wind loading and engineering analysis. An estimated 33,000 cubic yards of concrete could be used to create the ballasted footings, equivalent to approximately 3,500 truckloads of concrete. The concrete is expected to be premixed. If a concrete batch plant is necessary for the site, it will only be used for onsite purposes and will be removed when construction is completed. The structural supports and other mounting materials will require an estimated 800 trucks to deliver materials to the site based on vendor estimates. Thus, a total number of truck deliveries to the site will be in the range of 4,300 for deliveries of goods and materials.

The 75 MWdc anticipated to be generated from this project equates to 75,000,000 watts-dc, or 347,222 solar modules of 216 watts-dc each. It is estimated that the project will require up to 450 shipping containers of solar modules.

Gravel and concrete for the project will be sourced in the Cle Elum area to the extent possible.

Construction equipment such as backhoes, loaders, concrete trucks, and graders will likely be used. A crane may be necessary, but is typically not required.

Transportation and Traffic

Materials for the project (e.g., solar modules, supporting racks, foundation materials, electrical gear) will be brought to the site by truck. The trucks will travel on Interstate 90 (I-90) and access Highway 970 by way of County roads such as Red Bridge Road (see Figure 3), and private roads such as Loping Lane and Weihl Road. Road service within the project area will be provided by an existing network of maintenance roads, although new maintenance roads or segments may be necessary. Road improvements will be conducted as needed, and are anticipated to include upgrades to local gravel and dirt roads as discussed above. Road improvements are further addressed in the DA with Kittitas County. For further discussion of traffic impacts, see the Transportation section of this checklist.

Employment

A typical construction workforce for a multiple-megawatt solar facility consists of between 200 and 450 full-time workers, during the construction period. Typically, 100 to 150 workers are involved in the site prep, and 100 to 150 are involved in fabricating the concrete forms and placing the concrete ballasts in the field. When the solar installation begins, the workload will peak, and will likely remain at between 300 and 450 workers for a period of up to 27 months (three 9-month construction seasons). Workers could be brought in by vanpool or bus. Workers are not typically housed onsite, but this is subject to the cost of transportation to the site. Subject to the needs of any security personnel for the project, , it is

not expected that a significant number of workers will remain onsite outside and require temporary housing. Security crews will likely consist of up to eight onsite workers. In addition, access control in the form of an electric gate with an associated keypad security code for entry will be installed.

Safety and Fire Protection

The fire protection needs of the site are currently served by WDNR. After the project is constructed, the site will likely be served by the Kittitas County Fire Protection District #7. Further, the project will be bordered by a firebreak no less than 100 feet wide. Should the construction of the project require additional or different fire protections services, the Applicant will work with Kittitas County Fire Protection District #7 to ensure that suitable fire suppression services are in place during the construction and ongoing operations of the project. Separate safety or fire protection systems will not be required at the site. Basic safety and fire protection equipment such as fire extinguishers, personal protective equipment, and other equipment as determined by the site's safety and emergency response plan can be stored in the O&M equipment storage building.

Police protection of the proposed project area is provided by the County's Sheriff's Office. The construction contractor will notify the fire protection and police services of staging and active construction locations so these services can respond efficiently to emergencies, should any arise.

Water Use

Water will be needed for activities such as dust control and module cleaning. The Applicant proposes to truck in water from the Cle Elum area or elsewhere. Subject to any restrictions imposed by the County or the Washington Department of Ecology (Ecology), an alternative approach would be to establish a groundwater well onsite. For initial project permitting, it is assumed that water will be trucked to the site.

Sewer and Solid Waste

Sewer services are not anticipated. Portable toilets will be placed onsite during construction. The onsite toilets will require regular service visits.

Summary of Operations and Maintenance Activities and Components

Photovoltaic power plants typically have low O&M requirements. During the life of the plant, there will be regular O&M site activity. The actual O&M requirements will be determined by the specific plant components.

Materials and Equipment

A storage and O&M building will store spare parts (e.g., modules and fuses), equipment testing equipment, and cleaning equipment. The building will be of cinderblock construction or pre-engineered with dimensions of roughly 20 feet by 20 feet.

Transportation and Traffic

Routine vehicular traffic will occur along the site access roads and any maintenance roads within the PV array. One to two small to medium-duty pickup trucks will be required. Larger delivery trucks occasionally may be required if major equipment is in need of replacement such as structural elements, inverters, or large quantities of PV modules (not likely).

Employment

Personnel for system monitoring, maintenance, and troubleshooting will likely be needed onsite. A staff of 2 to 4 technicians will perform system monitoring. The staff will work out of the O&M building and make frequent trips to the facility by way of passenger pickup truck or off-road vehicle. If issues regarding plant performance are detected, additional troubleshooting or maintenance may be required through special visits from vendors or specialty technicians.

Routine onsite activities will consist of maintaining vegetation so that it does not interfere with operation of the plant (as often as weekly during periods of high rain and growth), and cleaning the solar modules of dirt and debris. In a heavily vegetated area such as the proposed site, it is not anticipated that cleaning will be required on a weekly basis (as it would be in a desert environment). The firebreak will require periodic monitoring and clearing to remove vegetation buildup. The project is also anticipated to require the need for personnel to monitor and secure the site.

Safety and Fire Protection

As previously discussed, separate safety or fire protection systems will not be required at the site. The Applicant will create and maintain a firebreak of no less than 100 feet between all outer edges of the project site and adjacent property lines. Basic safety and fire protection equipment such as fire extinguishers, personal protective equipment, and other equipment as determined by the site's safety and emergency response plan can be stored in the O&M equipment storage building.

Police protection of the proposed project area is provided by the County's Sheriff's Office. During the operational phase, the Applicant will contact fire protection and police services in the event of an emergency.

Water Use

The solar modules must be kept clear from dirt and debris, the presence of which can affect the performance of the PV plant. Because the proposed site is heavily vegetated and has sufficient rainfall, it is not anticipated that monthly washing will be required. Annual cleaning may be recommended based on soiling conditions. It may be possible to use special brushes in lieu of water to remove any dirt that accumulates on the solar modules. However, if it is determined that water is required for cleaning the solar modules or other purposes, a water tanker truck could be brought onsite to fill portable canisters with water to be used throughout the PV array.

Sewer and Solid Waste

Sewer services are not anticipated. If necessary, portable toilets can be placed onsite. Onsite toilets would require regular service visits.

Weed Control and Site Reclamation

Routine weed control will be required to ensure vegetation growth does not interfere with the operation of any equipment. The frequency of visits will be determined by the growth rate and density of the vegetation left on the site once construction is complete. The Applicant is under a contractual obligation with the landowner to return the site in good condition and, at the landowner's request, to remove any or all of the project's components. Applicant is also contractually bound to reclaim the site to address any damage caused by the demolition and removal of any alterations or improvements to the site, including the project.

Environmental Elements

Earth

a. General description of the site:

The proposed project site is located approximately 4 miles northeast of Cle Elum, Washington, in Township 20N, Range 16E, within Sections 22, 23, and 27 (see Attachment D, Figure 1 for site location). The site is located on the eastern slopes of the Cascade Mountains on Cle Elum Ridge, which runs generally from east to west at elevations ranging from approximately 2,200 to 2,600 feet (Attachment D, Figure 2). The Teanaway River is approximately 1 mile to the northeast of Cle Elum Ridge. The site is accessed from Highway 970 by way of County roads such as Red Bridge Road (Attachment D, Figure 3), and private roads such as Loping Lane and Weihl Road. The project is located on approximately 580 acres of land within the 982-acre proposed project area.

The solar facility components and other related appurtenant improvements are described in detail in the project description above.

The ground surface elevation for the solar facility is at approximately elevation 2,600 feet. The elevation along the potential transmission line varies from approximately 2,200 feet (near the location of the existing BPA transmission line) to approximately 2,600 feet (near the substation).

b. What is the steepest slope on the site and the approximate percentage of the slope?

The proposed solar facility will be installed on the eastern slopes of the Cascade Mountains on Cle Elum Ridge. The Cle Elum Ridge area has an estimated maximum slope of 50 percent, although the majority of the area has slopes with a gradient of less than 25 percent. The area does not contain steep slopes. During the initial corridor selection process, the Applicant selected a corridor that minimized the need to site the facility components and other related appurtenant improvements in steep-slope areas. The design phase will fully address the exact locations and how the slopes will be spanned or traversed.

The elevation in the proposed project area of Cle Elum Ridge changes from approximately 2,200 feet to about 2,600 feet, with an approximate slope ratio of about 6 horizontal to 1 vertical (6H:1V), or 9.5 percent.

Other, less significant slopes in the Cle Elum Ridge area that have a lower elevation differential may also have lower slope ratios. Prior to construction, the Applicant will perform a more detailed slope evaluation prior to construction.

c. What general types of soils are found on the site (e.g., clay, sand, gravel, peat, muck)? Please specify the classification of agricultural soils and note any prime farmland.

Prior to construction, the Applicant or its contractor(s) will complete geotechnical surveys along the route to determine soil types at a more detailed level.

It is expected that the majority of the soils encountered along the Cle Elum Ridge will consist of clayey-, silty-, sandy-loam of the Teanaway series. The loam is grayish-brown, well-drained soil derived from glacial drift and old alluvium deposits. These soils occur at both the lower and higher elevations. Some volcanic ash influence exists near the surface at higher elevations.

Two different soil types occur in the proposed project area. The first is nard ashy loam, which is used for timber production, livestock grazing, recreation, wildlife habitat and watershed. These soils are not traditionally used for agriculture and do not constitute prime farmland. The Nard series consists of deep and very deep, moderately well-drained soils formed in residuum and colluvium from sandstone and old alluvium with an influence of volcanic ash and loess in the surface. Nard soils are on foothills, dipslopes, and terraces and have slopes of 0 to 65 percent (NRCS, 2009).

The second type of soil present is Teanaway loam, which is used for timber production, cropland, livestock grazing, wildlife habitat, recreation, and watershed. This soil type is not traditionally used for agriculture and do not constitute prime farmland. The native vegetation is ponderosa pine and Douglals-fir. The Teanaway series consists of very deep, moderately well-drained soils formed in loess over glacial till with a minor influence of volcanic ash in the surface. Teanaway soils are on terraces, terrace escarpments, and foothills. Slopes are 0 to 50 percent (NRCS, 2009).

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, please describe.

There is no indication of unstable soils in the immediate vicinity of the project. If, during geotechnical surveying and engineering design efforts, unstable soils are found, the Applicant will locate the project to avoid those areas. Areas with a slope of 0 to 25 percent are considered to have a low risk of erosion and landslides.

e. Describe the purpose, type, and approximate quantities of any filling or proposed grading. Also, indicate the source of fill.

The construction contract may use imported gravel from a quarry located in West Cle Elum to fill the 10-acre area level-ground substation. The substation will contain a 6-inch-thick layer of gravel, and no vegetation will be present. The overall estimated amount of gravel fill required for the substation will be 8,100 cubic yards (cy).

The construction contractor may use imported gravels or crushed rock as backfill for the transmission line-pole auger holes, if required. If imported gravel is not required, the construction contractor will use native materials, removed when the auger holes are made, for backfill. If imported materials are used, the construction contractor will spread the native materials, resulting in a level area in the vicinity. The approximate quantity of fill material is 4.2 cy per pole. The project will include approximately up to four (4) transmission line poles, which will require a total of 500 cy of fill. The construction contractor may also grade some areas for construction access and to create level areas for the pole-structure locations.

The estimated transmission line-pole-related fill is no more than 500 cy. The amount of grading for access roads is estimated to be 4,000 cy.

f. Could erosion occur as a result of clearing, construction, or use? If so, please describe.

While erosion could occur, none is expected. The construction contractor will use best management practices (BMPs) to minimize erosion. Existing vegetation helps to resist erosion. Clearing of the vegetation for construction roads will expose the soil to a higher risk of erosion during rainfall.

g. What percentage of the site will be covered with impervious surfaces after the project construction (e.g., asphalt or buildings)?

Project construction will not result in impervious areas within the project corridor, except at the bases of the transmission line-pole structures. The adjacent soils will absorb stormwater runoff. No buildings are proposed, and the new, nongraveled access roads will be pervious.

h. Proposed measures to reduce or control erosion, or other impacts to the earth include:

The construction contractor will implement erosion-control measures during construction, including the following from the required Ecology National Pollutant Discharge Elimination System (NPDES) construction stormwater permits:

1. Maintenance of vegetative buffer strips between the areas affected by construction activities and any receiving waters
2. Installation of sediment fence and straw bale barriers
3. Straw mulching at locations that have suffered impacts
4. Provision of temporary sediment traps downstream of intermittent stream crossings
5. Provision of sediment-type mats downstream of perennial stream crossings
6. Planting of designated seed mixes at affected areas
7. Installation of a sediment fence along the downslope side of pulling and tensioning areas, as appropriate

The construction contractor will reseed all areas affected by the construction, as agreed upon with landowners. Where installed, sediment fences and check dams will remain in place until the affected areas are well vegetated and the risk of erosion has been eliminated. The construction contractor may remove the sediment fence at that time.

The construction contractor will construct roadways so that natural surface drainage is maintained.

If project structures are to be located on steep slopes, the construction contractor will locate them to avoid potential landslide or rockfall hazards.

Air

a. *What types of emissions to the air would result from this proposal (e.g., dust, automobile, odors, industrial wood smoke) during construction and after completion? Please describe and give approximate quantities.*

Construction activities will produce dust and heavy-duty-vehicle emissions. These emissions, which will include nitrogen oxides (NO_x), carbon monoxide (CO), and particulate matter less than 10 micrometers in aerodynamic diameter (PM₁₀; dust), will be temporary in nature. Although the quantity of these emissions is unknown at this time, the small number of vehicles to be used (see the Transportation section of this checklist) and the relatively short duration of the construction period will limit such emissions. The potential for dust generation will be greatest during dry, windy weather.

When the project is operational, no emissions from any source are expected.

Burning of woody debris from land clearing will produce combustion emissions, including NO_x, CO, and PM₁₀. To the extent possible, however, woody debris will be directed towards beneficial reuse.

b. *Are there any offsite sources of emissions or odor that may affect your proposal? If so, please describe.*

None. No offsite sources of emissions will affect the proposed project.

c. *Proposed measures to reduce or control emissions or other impacts to air:*

A Fugitive Dust Control Plan (FDCCP), to minimize air emissions from construction-related ground disturbance and traffic, will be developed before this project begins. The FDCCP will include the following BMPs:

- Vehicles and equipment will comply with applicable state and federal emissions standards.
- Vehicles and equipment used during construction will be properly maintained to minimize exhaust emissions.
- Operational measures such as limiting engine idling time, minimizing driving speeds and shutting down equipment when not in use will be implemented.
- Open soil areas and road surfaces will be watered. The Applicant expects to have one water truck onsite during construction to minimize fugitive dust.
- Carpooling among construction workers will be encouraged to minimize construction-related traffic and associated emissions.

- Disturbed sites will be revegetated in a timely manner with a seed mixture consistent with local vegetation.

Because the construction equipment and vehicles will be dispersed across a large, sparsely populated area, no impacts to surrounding residences are anticipated. Because the construction is of limited duration (up to 9 months for two or three construction seasons), total construction emissions will be relatively minor.

Water

a. Surface

1. *Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, and wetlands)? If yes, describe the type and provide names and into which stream or river it flows.*

Biologists identified and delineated a total of 12 wetlands and six ephemeral streams within the site survey area (Attachment D, Figure 5). The wetlands cover 0.97 acre within the survey area.

Wetland boundaries were determined using procedures found in *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and in *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valley and Coast* (U.S. Army Corps of Engineers [USACE], 2008). Some wetlands extend outside the proposed project area.

Eleven of the wetlands (W1 through W11) are classified as palustrine emergent (PEM) (Cowardin), depressionnal (HGM) wetlands. Wetlands W1 through W6 are located in the northwest portion of the project area, and W7 through W11 are located adjacent to roads. W12 is a pond and is classified as a PEM, depressionnal wetland. W12 is located near the southwest corner of the project area (Attachment D, Figure 5).

Six streams within the Teanaway River and Yakima River watersheds flow within the survey area (Attachment D, Figure 5). One NWI-mapped wetland is in the southwest corner of section 22. It is labeled as *palustrine emergent, semi-permanently flooded*. Five streams were mapped by WDNR. All five are classified as *non-fish, seasonal*. All of the streams flow into ponds, ditches, and vegetated swales. Water from these tributaries not used for irrigation practices may eventually flow into the Yakima River several miles to the south with the following exception. One unnamed tributary (S6) flows directly into the Teanaway River, which flows into the Yakima River.

Table 3 shows the waterbody name, width, type, and eventual hydrologic connection for each drainage of the potentially jurisdictional waters.

TABLE 3
Streams Summary Table

Waterbody Name	Width (feet)	Type	Hydrologic Connection
S1	2-5	Ephemeral	Yakima River
S2	2-6	Ephemeral	Yakima River
S3	2-5	Ephemeral	Yakima River
S4	2-4	Intermittent	Yakima River
S5	2-5	Ephemeral	Yakima River
S6	1-2	Ephemeral	Yakima River

The biologists presume that all of the investigated wetlands and waterbodies are potentially jurisdictional under federal regulations for wetlands and waters of the United States. A final determination will be made by USACE.

The *Wetland Delineation Report* (Attachment B) provides additional discussion of wetlands and drainages within the project corridor.

2. *Will the project require any work within 200 feet of the described waters? If yes, please describe and attach available plans.*
3. The Applicant will work within 200 feet of described waters but will avoid siting solar modules directly within potentially jurisdictional waters (Attachment D, Figure 5). Impacts to potentially jurisdictional wetlands and waters were avoided where possible during project conceptual design. Where impacts could not be avoided, the design was tailored to minimize impacts (Attachment D, Figure 5).
4. *Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of the fill material.*

Road widening associated with construction activities may affect four wetlands (W8-W11) and one waterbody (S4). The expected impact to wetlands and waterbodies as a result of road widening will be less than 0.1 acre. Total fill could be up to 59 cy of road material.

A USACE Section 404 Wetland Permit Application will be submitted using the Joint Aquatic Resources Permit Application (JARPA) as part of this project proposal.

5. *Will the proposal require surface water withdrawals or diversions? Please provide description, purpose, and approximate quantities:*

The proposed project will not require new surface water withdrawals or diversions.

6. *Does the proposal lie within a 100-year floodplain? If so, please note the location on the site plan.*

The proposed project does not lie within a 100-year floodplain (Attachment D, Figure 8).

7. *Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.*

The proposed project does not involve any discharge of waste materials to surface waters.

b. Ground

1. *Will ground water be withdrawn, or will water be discharged to ground water? Please give description, purpose, and approximate quantities.*

The construction contractor will neither withdraw groundwater nor discharge water to groundwater during project construction. Construction of the project may involve water use for dust control. If so, the construction contractor would arrange for delivery of water to the active construction site using water trucks from a source with an existing water right. The Applicant will neither withdraw groundwater nor discharge to groundwater during project operations.

2. *Describe waste material that will be discharged into the ground from septic tanks or other sources (e.g., domestic sewage; industrial, containing the following chemicals...; agricultural; etc.). Describe the size and number of the systems, houses to be served; or, the number of animals or humans the systems are expected to serve.*

The Applicant does not anticipate discharge of waste materials into the ground during construction or operation. The construction contractor will use onsite portable toilets during construction.

c. Water Runoff (Including Stormwater):

1. *Describe the source of runoff (including storm water) and method of collection and disposal. Include quantities, if known. Describe where the water will flow, and whether it will flow into other water.*

The proposed project will maintain the local surface drainage system and patterns. The Applicant will not collect or treat stormwater runoff.

Construction of the access roads, staging areas, and installed solar modules could result in stormwater runoff into surrounding soils. No additional stormwater will run off into waterbodies.

2. *Could waste materials enter ground or surface waters? If so, please describe.*

Waste materials will not enter ground or surface waters. Waste materials stored at the staging areas will have secondary containment to prevent entrance into ground or surface waters. The construction contractor will establish buffers to prevent waste materials from entering surface waters. The construction contractor will also remove waste materials from the project area upon completion of construction activities. The construction contractor will implement the following BMPs to minimize the release of waste materials into ground or surface waters:

- During project construction, vehicle servicing and refueling will occur offsite in a temporary staging area equipped for fuel or oil spills.
- Onsite vehicles will be monitored for petroleum leaks. Spills will be cleaned up immediately upon recovery and reported to the appropriate agency.

- Few hazardous materials will be used during project construction or operation – primarily small amounts of lubricants and cleaning solutions. Any hazardous waste material generated by project construction or operation will be disposed of in a manner specified by local and state regulations or by the manufacturer.
- Cleanup materials will be kept readily available onsite, either at the equipment storage area, O&M building or on the construction contractor’s trucks.

d. Proposed Measures to Reduce or Control Surface, Ground, and Runoff Water Impacts, If Any:

In Washington, a Washington Construction Stormwater General Permit (1200-C) administered by Ecology will regulate construction activities. This permit requires BMPs to minimize possible impacts from erosion or other impacts to soil and waterways. As required by the conditions outlined in the permit authorization, any permanent erosion-control measures will be implemented with final design of the project.

Plants

a. Check or circle types of vegetation found on the site:

The following sections describe the vegetation categories found in the survey area. Detailed plant descriptions are included in Attachment A.

Results indicated a total of five natural habitat types within the survey area. Most of these can be named by using the Chappel et al. (2001) system of vegetation classification. Project area natural vegetation types are as follows:

- Ponderosa Pine Forest and Woodlands
- Open Water – Lakes, Rivers, and Streams
- Herbaceous Wetlands
- Riparian
- Upland Aspen Forest

These habitat types are described below.

Ponderosa Pine Forest and Woodlands

The Ponderosa Pine Forest and Woodlands habitat type has the greatest coverage of the five habitat types in the survey area. The survey area has been actively managed as commercial timberlands for the past 100 years. The area was last logged in 2001-2002, leaving relatively few trees per acre and open stands of predominantly ponderosa pine (see Attachment A, *Sensitive Species Surveys* report). The ponderosa pine stands located at the proposed project site are dominated by an overstory of 50-year-old ponderosa pine (*Pinus ponderosa*) trees with a subcomponent of Douglas-fir (*Pseudotsuga menziesii*) trees. Saplings of both species are present in the understory. The herbaceous understory is composed of mixed co-dominants, including arrowleaf balsamroot (*Balsamorhiza sagittata*), yarrow (*Achillea millefolium*), bulbous bluegrass (*Poa bulbosa*), ventenata (*Ventenata dubia*), and several species of fescue (*Festuca* spp.), wheatgrass (*Agropyron* spp.), and lupine (*Lupinus* spp.). Several populations of Oregon check-mallow (*Sidalcea oregana* var. *procera*) and sticky purple geranium (*Geranium viscosissimum*) are present.

Open Water—Lakes, Rivers, and Streams

Several intermittent streams and one artificially ponded area are found within or crossing the survey area. All of the streams were dry at the time of the field visits and all were vegetated to varying extents. Typical vegetation within most channels includes herbaceous grass and forb species, including Brewer's navarretia (*Navarretia brewerii*), poverty oatgrass (*Danthoia spicata*), and small tarweed (*Madia exigua*). Other channels were dominated by dense shrub and herb species including wild rose (*Rosa woodsii*), snowberry (*Symphoricarpos albus*), cinquefoil (*Potentilla* spp.), and Oregon checkermallow (*Sidalcea oregana* var. *procera*).

Herbaceous Wetlands

Herbaceous Wetland habitats within the survey area consist of depressional wetlands dominated by herbaceous vegetation (see Attachment A for *Sensitive Species Surveys* report). Exposed soils were cracked, evidence of altering drying and wetting periods. These systems are not hydrologically connected to any stream or drainage ditch. Water arrives as either snowmelt or precipitation. These wetlands support hydrophytic herbaceous vegetation, and met the criteria for hydric soils and wetland hydrology. Common plant species within these wetlands were creeping spikerush (*Eleocharis palustris*) and ventenata.

Riparian

The Riparian habitat is found adjacent to some of the intermittent stream channels in the survey area. It generally consists of a dense shrub layer immediately adjacent to the stream gradually transitioning to ponderosa pine forest. Typical species include oceanspray (*Holodiscus discolor*), mountain spiraea (*Spiraea betulifolia*), Oregon checkermallow (*Sidalcea oregana* var. *procera*), Wood's rose (*Rosa woodsii*), and ponderosa pine.

Upland Aspen Forest

A small patch of aspen (*Populus tremuloides*) forest occurs along a drainage and around an artificially impounded pond in the southwestern portion of the survey area. Associated species include ponderosa pine, snowberry, and wild rose.

b. What kind and amount of vegetation will be removed or altered?

The project site will require clearing to address the potential for damage to the project from blown down trees, decreased power efficiency of the solar modules, the risk of fire from fuel buildup within the project area, and the need to create a 100-foot firebreak along the project's perimeters as provided below. To clear the site for installing the project, trees will be harvested within the project area on an as-needed basis for facilitating the next construction phase of the project. Trees will generally be harvested to a stump level of 6 to 12 inches above ground level. The Applicant will obtain a permit from WDNR and contract with a professional forester to harvest these trees in accordance with the permit. Because the bottoms of the solar modules will be approximately 3 feet above grade, any vegetation taller than 3 feet or expected to exceed 3 feet in height will be removed. Shrubs, grass, and groundcover will, to the maximum extent practicable, remain between rows and under the solar modules.

The project will not affect any listed Washington Department of Fish and Wildlife (WDFW) Priority Habitat or habitats listed under the WDNR Natural Heritage Program (NHP)

database. No high-value or Category I or II habitats will be affected (Attachment A). Any impacts to Category III habitats will be mitigated and minimized and described below.

c. *List threatened or endangered species known to be on or near the site.*

No threatened or endangered plant species were identified within the survey area.

d. *Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:*

The following measures are proposed:

- Vegetation removal and disturbance during construction will be restricted to the area designated for solar modules and related facilities, and vegetation adjacent to the access roads. Areas for assembly of the solar modules (structure laydown areas) will also be required at each module location. Soil disturbances will be reduced by seeding with an approved native seed mix once project construction is complete.
- Vegetation clearing will occur along some existing ROWs for road widening and improvement. Vegetation along existing ROWs is primarily herbaceous plant species. Some shrubs and trees may be removed for the widening of access roads; however, the Applicant proposes to minimize the removal of these species when possible.
- Herbaceous vegetation taller than 3 feet will be temporarily cleared for the placement of the solar modules. After construction, vegetation inspections will be performed and herbaceous vegetation growth will be allowed up to a height of 3 feet, at which time the vegetation will be trimmed. Noxious weeds such as spotted knapweed (*Centaurea stoebe*) will be controlled within the project area.
- The solar modules will contain nonvegetated buffers. These buffers will be maintained as a firebreak and wind break. To prevent shading, soiling, and damage from windthrow, no trees will be permitted within the buffer. The site will be maintained to prevent the regrowth and reestablishment of saplings or trees.
- The proposed project is designed to avoid impacts to wetlands and streams. Thus, no wetland or stream vegetation will be cleared during project development or maintenance.
- Vehicles will avoid riparian areas, areas within wetlands, or areas within wetland buffers by driving only on access roads. Some access road improvements may affect wetlands; these impacts will be mitigated. Sediment will be prevented from entering streams and wetlands through the use of BMPs. For further discussion of the BMPs that will be implemented to prevent soil erosion and stream sedimentation, please see the Earth section of this SEPA.
- It is expected that staging areas will be existing yard areas that have fencing, lighting, and security. The construction contractor will make these arrangements. No permanent impacts to vegetation are expected from this use. These areas will be seeded with an approved native seed mix once construction is complete.

- Vegetation will be cleared for the proposed powerline route to grid interconnection. Areas cleared of vegetation will be reseeded with an approved native seed mix, and maintained for noxious weed control and to prevent woody seedling growth.
- Where appropriate, development will be located in already disturbed areas, including previously logged lands, existing transmission corridors, and ROWs. However, when impacts are unavoidable, alternative means of compensation mitigation will be considered.

WDFW Wind Power Guidelines

In 2003 and 2009, WDFW adopted guidelines to address fish and wildlife habitat protection, conservation and mitigation related to the development of wind energy facilities. The purpose of the WDFW Wind Power Guidelines is to provide consistent statewide guidance for the development of land-based wind energy projects that avoid, minimize and mitigate impacts to fish and wildlife habitats in Washington State. Specifically, the guidelines were largely designed to address concerns due to the unique nature of wind turbines and wind power projects, including avian and bat strikes, liability under the Migratory Bird Treaty Act, avian behavioral modification and migration displacement through the installation of tall wind turbines, and lack of research regarding avian migration and response to FAA-approved lighting configurations. Because the concerns over high wind turbines largely do not apply to solar farms, the Guidelines are not applicable to the Teanaway Solar Reserve project. Nonetheless, the Applicant has used the same approach to species and habitat identification, and will implement the following additional measures to minimize and mitigate any impacts that may occur.

Best Management Practices

BMPs will be implemented during construction to avoid and reduce temporary and permanent impacts to the extent practicable. In the event that a state or federally listed threatened or endangered plant or wildlife species is observed during project development, work will be halted immediately and a qualified biologist notified.

BMPs will be implemented wherever surface disturbances occur. These measures include, but are not limited to, the following:

- Protect all trees, shrubbery, and other vegetation not designated for removal will from damage caused by the project construction.
- Seed areas of temporary soil disturbance with the specified temporary seed mix.
- Install filter bags, sediment fences, sediment filter fabric traps, graveled construction accesses as necessary for erosion control.
- Cover stockpiles with impervious materials when unattended or during rainfall.
- Locate construction staging areas for storage, maintenance, and fueling of construction equipment minimum of 150 feet from creeks or wetlands. Show staging areas on the construction plans.
- Take care to prevent petroleum products and other harmful material from entering wetland or waterways.

- Upon completion of construction, seed or plant all areas of disturbance with native plants.

Mitigation

In the course of preparing this checklist and accompanying technical reports, all recommended surveys have been completed. It is still possible, however, that individuals or populations of rare plant species may be encountered during project construction. In the event of such a discovery, a qualified botanist will be retained to verify identity of the plant(s) and make recommendations for addressing the situation. All efforts will be made to avoid disturbance to such species. If disturbance cannot be avoided, efforts will be employed to minimize disturbance to the maximum extent practicable. If such efforts are not possible, mitigation for impacts to the plant(s) will be required. Mitigation measures will be specific to each plant species.

Possible avoidance and mitigation measures may include the following:

- Implement micro-siting: slight relocations of project facilities to avoid rare plant populations.
- Remove and conserve plants; replant following construction.
- Replant disturbed area with seed obtained from a qualified cultivator of rare plants.
- Mitigate by seeding an approved offsite area with the same species.

Mitigation will require approval of the agencies, as well as monitoring for a defined period of time.

Animals

No federal- or state-listed threatened or endangered species were found during field surveys. CH2M HILL biologists conducted reconnaissance-level field surveys on June 16 through 19 and July 9, 2009. Surveys were conducted by walking transects spaced 30 meters apart. Both audible and visual observations of avian and mammal species were recorded. Attachment A, *Sensitive Species Surveys* report, further discusses the results of the wildlife field survey. Measures designed to avoid, minimize, or mitigate impacts to wildlife are as provided above.

- a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

Birds – hawks, heron, eagle, songbirds, other

The Priority Habitat and Species (PHS) database identifies three species that are *candidates* for federal or state listing with some, however unlikely, potential to occur within the proposed project area (see *Sensitive Species Technical Report*, Tables 3 and 4). The database includes potential occurrences of both black-backed woodpecker and mountain quail approximately 1.0 mile from the project area. In addition, several occurrences of northern goshawk are documented approximately 1.5 to 1.8 miles from the northern edge of the proposed project area. The black-backed woodpecker occurrence is approximately 1 mile from the project area's southernmost boundary.

Field biologists did not observe any federal- or state-listed threatened or endangered wildlife species within the survey area. A state candidate species, the white-headed woodpecker (*Picoides albolarvatus*), was observed in the northwest portion of the survey area. Biologists observed both male and female woodpeckers close to the main access road. The male was observed foraging in a stand of adult ponderosa pine, while the female was located excavating a nest in a snag approximately 10 feet from the road.

It is unlikely that any black-backed woodpeckers will be affected by project development because activities relating to this project will not involve the documented area. Black-backed woodpeckers require habitat with stands of mature conifers that have experienced a burn event within the last 5 years. No stands of burned, mature conifer trees exist in the project area. In addition, the proposed project is unlikely to affect any mountain quail or northern goshawk habitat, as no activities related to this project will occur near the PHS listing.

Mammals – deer, bear, elk, beaver, other

The PHS database was queried for elk and mule deer habitat regions. Priority habitats for these large mammals do not occur within the proposed project area. According to the PHS database, the closest elk wintering habitat is along the Teanaway River, approximately 0.8 to 1.5 miles from the proposed project area. These areas provide winter forage habitat for elk and mule deer and will not be disturbed during construction because they are outside the proposed project boundary.

During the course of field surveys, a small herd of roughly six elk cows and two mule deer with fawns was identified in the northwest portion of the proposed project area. This area is used as a calving and fawning area during spring and summer. During fall, the herds travel east to the PHS regions located along the Teanaway River.

In order to avoid disturbances to elk and mule deer, the Applicant will coordinate with WDFW and the U.S. Fish and Wildlife Service (USFWS) on construction timing and activities to avoid impacts to elk and deer during calving season. BMPs will be developed to avoid and minimize impacts to these species during the calving and fawning season. Perimeter and access roads will be wide enough to allow for migration. In addition, the PV solar modules will be securely constructed with concrete foundations. The height of the modules is approximately 12 feet, which will allow several feet of clearance for elk and mule deer. The Applicant will coordinate with WDFW and USFWS on construction timing and activities to avoid impacts to elk and deer during calving season.

A study of cougars conducted by WDFW biologists from 2001 to 2007 estimates the total population density at 4.97 cougars per 100 square kilometers in the area surrounding the Teanaway River, with 1.50 adult males and 1.15 adult females per 100 square kilometers respectively (Cooley et al., 2009a). The remaining estimate consists of juveniles (younger than 24 months) and kittens. The population is composed primarily of older animals, indicating the population is stable. Cooley et al. (2009a) determined the mean age of adult cougars in the area surrounding the Teanaway River based on 65 known specimens. The mean age of males was 60 months (5 years), while the mean age of females was 69 months (5.4 years). A separate study found the average annual survival rate was 0.71 percent for adults (Cooley et al., 2009b), with approximately 1.12 kittens maturing per female each year (Cooley et al., 2009b).

Based on the available data, it is unlikely that any grizzly bears occur within the proposed project area. Currently, bears are only known to occur in one 100-mile area in the Okanogan Highlands. No evidence of the sight being used by grizzly bear was observed during 2009 field surveys. In addition, there are no occurrences listed in the WDFW or USFWS databases, verified or unverified, of bears in the surrounding region.

Fish – bass, salmon, trout, herring, shellfish, other

The project area contains several intermittent rivers and streams. Project construction will not disturb vegetation within these waterbodies. Although the project area contains no fish-bearing streams, the construction contractor will implement BMPs adequate to protect fish habitat. Because no in-water work is anticipated as a project activity, the Applicant did not conduct any fish field surveys.

b. List any threatened or endangered species known to be on or near the site.

The survey team did not find any threatened or endangered species in or near the survey area.

Prior to field surveys, biologists searched the WDFW PHS and WDNR NHP databases for any documented occurrences of listed species within 3 miles of the project area. Agency data did not show any threatened or endangered species occurring within the project area. The PHS database documented occurrences of northern goshawk, black-backed woodpecker, northern spotted owl, and mountain quail occurring within 3 miles of the project area. Because of a lack of suitable habitat, it is unlikely that any of these species occur within the project area. Moreover, the survey team did not observe these species in the survey area. The Migratory Bird Treaty Act protects all of these species from “take” (see Attachment A).

c. Is the site part of a migration route? If so, explain.

Because of this seasonal migration, portions of the project area may be used as a migratory corridor for large, migrating ungulates. However, this route was not identified during the 2009 field survey effort. Portions of the project area include an upland ponderosa pine forest stand, which may provide habitat for several species of wildlife. During spring, elk and mule deer typically use this type of habitat as a calving and fawning ground.

The PHS data identified regions of elk and mule deer habitat along the Teanaway River, east of the project area. The nearest known PHS regions occur between 0.8 and 1.5 miles from the project area. Elk and mule deer species will migrate from western locations to the PHS regions along the Teanaway River in the fall and winter, potentially crossing the project area.

The Applicant has considered these migration pathways during the design of the proposed project layout. The proposed PV arrays will be spaced approximately 10 feet apart and will be 12 feet in height, allowing for the movement of wildlife between sections. No fencing will occur along the property boundary. Such fencing is not required to be installed, per the National Electrical Code (NEC).

Energy and Natural Resources

- a. *What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.*

Minimal amounts of energy will be used to meet the completed project's energy needs; the completed project will produce electricity. A minimal amount of energy will be used to heat and light the O&M facility.

- b. *Would your project affect the potential use of solar energy by adjacent properties?*

The project will not affect the potential use of solar energy by adjacent properties. Any shadows from transmission line-pole structures would have minimal, if any, effect on adjacent properties. The shadows from the solar facility components and other related appurtenant improvements will not interfere with the potential use of solar energy by adjacent properties.

- c. *What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts:*

Minimal amounts of energy will be used to meet the completed project's energy needs. No energy conservation features are included in the plans of this proposal.

Environmental Health

- a. *Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal?*

Once the project is completed, there will be minimal exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste. While some solar modules being considered for installation do contain toxic substances, such as cadmium telluride, there is very little chance of exposure because modules are laminated in a glass structure that is designed to last for 25 years. At the end of this 25-year life cycle, the solar modules will be recycled by the manufacturer.

During construction, the construction contractor may use small amounts of lubricants and solvents and will follow appropriate measures to prevent spills and contamination. Except for fuel and oil used in construction equipment, the construction contractor will use no combustible materials. During construction activities, the potential for fires and accidents may exist. However, the construction contractor will construct the project in accordance with applicable federal, state, and County regulations that pertain to fire prevention, presuppression, and suppression.

- 1) *Describe special emergency services that might be required.*

This project does not require any special emergency services related to environmental health.

- 2) *Proposed measures to reduce or control environmental health hazards, if any:*

The Applicant will construct the project to comply with applicable federal, state, and industry standards that address environmental health standards, such as clearances, grounding, lightning protection, and fire protection.

During construction, the construction contractor will implement standard safety measures to reduce or control environmental health hazards. The construction contractor will employ the following BMPs to reduce or control the potential for environmental health hazards:

- Monitoring onsite vehicles for petroleum leaks. The construction contractor will clean up spills immediately upon recovery and report such spills to the appropriate agency.
- Disposing of hazardous waste material generated by project construction and operation in a manner specified by local and state regulations or by the manufacturer.
- Keeping cleanup materials readily available onsite, either at the equipment storage area or on the construction contractor's trucks.

PV arrays will be set back 100 feet from the perimeter of the property to allow for proper firebreaks. In addition, spacing between PV arrays will be 10 feet, to provide for adequate maintenance and fire prevention space.

During operation, the Applicant will continue to implement applicable BMPs to reduce or control environmental health hazards.

b. Noise

1) *What types of noise exist in the area which may affect your project (e.g., traffic, equipment, operation, other)?*

The nature of the project is such that it is unaffected by noise.

2) *What types and levels of noise are associated with the project on a short-term or a long-term basis (e.g., traffic, equipment, operation, other)? Indicate what hours the noise would come from the site.*

During construction, the project will expose nearby residences to increased noise from construction equipment. Typical equipment the construction contractor is likely to use during construction includes pickup trucks, line trucks, graders and bulldozers, backhoes, boring equipment, tractor-trailers, cranes, drum pullers and tensioners, harrows, and broadcast seeders. Construction equipment typically produces noise levels of 75 to 90 decibels on an A-weighted scale (dBA) at a distance of 50 feet from the construction activity. Noise levels from construction equipment will vary and will be temporary in nature. Construction will occur during daylight hours (7 a.m. to 7 p.m.) and is anticipated to last for several weeks at a given location for up to 9 months over a period of 2 to 3 years.

3) *Proposed measures to reduce or control noise impacts:*

Noise levels during construction of the solar facility components and other related appurtenant improvements will depend on the specific construction methods used. Construction noise will be localized and temporary.

To minimize noise impacts, the construction contractor will limit construction activities to daylight hours (7 a.m. to 7 p.m.), and all equipment will have sound-control devices.

Land and Shoreline Use

a. *What is the current use of the site and adjacent properties?*

The site is currently zoned Forest and Range (F&R) (Figure 5). The site was most recently selectively logged in 2001–2002, and existing site vegetation consists of low grasses, shrubs, and plants with scattered 50- to 60-foot, 6- to 18-inch-diameter ponderosa pine (*Pinus ponderosa*) trees. The adjacent properties are zoned as Commercial Forest (CF), Rural 3, and F&R (Figure 6).

b. *Has the site been used for agriculture? If so, please describe.*

No, the proposed project site has not been used for agriculture. The site is currently zoned F&R and was most recently logged in 2001–2002.

c. *Describe any structures on the site.*

No structures are currently present on the proposed project site. The Applicant selected the proposed project site to maximize significant insulation capacities and sunlight, optimize slopes for year-round energy production, provide adequate site accessibility, avoid environmentally sensitive areas, and minimize visibility from offsite locations.

d. *Will any structures be demolished? If so, please describe.*

The Applicant is not proposing to demolish any structures as part of this project.

d. *What is the current zoning classification of the site?*

The proposed project site is located within the F&R zone in Kittitas County.

e. *What is the current comprehensive plan designation of the site?*

The current comprehensive plan designation of the proposed project site is Rural.

f. *What is the current shoreline master program designation of the site?*

The proposed project will not be located within 200 feet of any rivers designated under the shoreline master program. The closest river with such a designation under Washington Administrative Code (WAC) 173-18-230 is the Teanaway River, which is located approximately 1.0 mile from the proposed project site (Attachment D, Figure 8).

g. *Has any part of the site been classified as an “environmentally sensitive” area? If so, please specify.*

Section 17A.02.060 of the Kittitas County Code (KCC) designates the following habitats and ecosystems as critical areas consistent with state statute (RCW 36.70A.030[5]):

1. *Wetlands;*
2. *Areas with a critical recharging effect on aquifers used for potable water;*
3. *Fish and wildlife habitat conservation areas;*
4. *Frequently flooded areas; and*
5. *Geologically hazardous areas.*

The following subsections further define these designated “critical areas.” However, only wetlands and frequently flooded areas apply to the project because the proposed project

does not affect the other critical areas. The Applicant will mitigate the critical areas that the project affects in accordance with the KCC, Critical Areas Ordinance (CAO), and federal and state requirements. The Critical Areas permit application is included as part of the Kittitas County conditional use permit.

Wetlands

CH2M HILL conducted a wetlands and other waters delineation in June and July 2009 for the proposed project.

The proposed project is located in the Teanaway River and Yakima River watersheds within the Yakima River basin and Upper Yakima subbasin. Tributaries within the project site flow into ponds, ditches, and vegetated swales. Water from these tributaries not used for irrigation practices eventually flows into the Yakima River with the exception of one unnamed tributary (S6), which flows directly into the Teanaway River. Wetlands within the project site are hydrologically connected to these tributaries.

Twelve wetlands were delineated (see Table 4). They total 0.97 acre within the survey area (Attachment D, Figure 8). All of the wetlands were determined to be PEM (Cowardin) depressional (HGM) wetlands. Table 4 lists the separate wetlands within the proposed project area. (See *Environmental Elements: Water a. Surface* in this checklist for more details.)

TABLE 4
Wetlands Summary Table

Wetland ID	Wetland Acreage	Cowardin Type	HGM Type	Wetland Adjacent to RPW	Wetland Adjacent to Non-RPW	USACE Jurisdiction	State Jurisdiction
W1	0.010	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W2	0.004	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W3	0.030	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W4	0.067	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W5	0.004	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W6	0.253	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W7	0.231	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W8	0.027	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W9	0.013	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W10	0.019	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES

TABLE 4
Wetlands Summary Table

Wetland ID	Wetland Acreage	Cowardin Type	HGM Type	Wetland Adjacent to RPW	Wetland Adjacent to Non-RPW	USACE Jurisdiction	State Jurisdiction
W11	0.006	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W12	0.312	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES

The survey team delineated wetlands within the proposed project area in accordance with *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE, 2006), and distinguished buffers based on 17A.04.020 of the KCC. The *Wetland Delineation Report* (Attachment B) provides a detailed analysis of the stream classifications for the streams/jurisdictional waters in the project area.

There will be no permanent impacts to wetlands or waters in Washington from the construction of solar PV arrays, transformers, the O&M building, switchgear structures, or the powerline route to the grid. The Applicant will restore temporarily disturbed areas by returning the surface to preconstruction contours and planting with a specified native seed mix immediately following construction.

The Applicant recognizes that there are three Category III wetlands greater than 10,000 square feet within the proposed project area. These wetlands will contain a buffer of 80 feet, which will not be impacted by any permanent or temporary structure (Attachment D, Figure 5). All other wetlands will have a 25-foot buffer pursuant to 17A.04.020 of the KCC.

It is anticipated that the improvements associated with access roads will result in minimal impacts to wetlands and waters. As stated in the Plants section of this checklist, impacts to wetlands and waters will be avoided wherever practicable. For a more detailed analysis of wetland impacts and mitigation measures, please see Attachment B, *Wetland Delineation Report*.

The Applicant will revegetate temporarily disturbed areas with an appropriate seed mix consisting of native shrubs, forbs, and grasses developed in consultation with the Kittitas County Noxious Weed Control Board or landowner and using other applicable state and federal guidelines and plant lists. Permanently disturbed areas will be maintained to prevent the occurrence of noxious weeds.

Critical Aquifer Recharge Areas

Section 17A.02.020 of the KCC defines areas with a critical recharging effect on aquifers used for potable water as “areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water (WAC 365-190-030[2]).”

This project will not have an impact on critical aquifer recharge areas (see Attachment D, Figure 8). Per Section 17A.08.010 of the KCC, no critical aquifer recharge areas have been identified by the County. All nearby wells have been identified (see Attachment D, Figure 8) and will be avoided. No hazardous materials which may contaminate the ground or surface

water will be utilized or stored on site. While some solar modules being considered for installation do contain toxic substances, such as cadmium telluride, there is very little chance of groundwater contamination because modules are laminated in a glass structure that is designed to last for 25 years. At the end of this 25-year life cycle, the solar modules will be recycled by the manufacturer.

During construction, the construction contractor may use small amounts of lubricants and solvents and will follow appropriate measures to prevent spills and contamination.

Fish and Wildlife Habitat Conservation Areas

Section 17A.02.090 of the KCC defines fish and wildlife habitat conservation areas as follows:

1. *Those lands in Kittitas County owned or leased by the Washington State Department of Fish and Wildlife;*
2. *Those lands donated to or purchased by Kittitas County for corridors pursuant to RCW 36.07A.160;*
3. *Wetlands;*
4. *Big game winter range;*
5. *Riparian habitat;*
6. *Habitats for species of local importance.*

There are no lands owned or leased by WDFW within the project area. Also, there are no lands purchased by Kittitas County pursuant to RCW 36.017A.160, which requires the County to designate “open space corridors within and between urban growth areas.” Because no such corridors are located in the project area, they are not affected by the proposed project.

The project area contains wetlands; however, any impacts to wetlands will be minimal. All category-specific buffers will be observed and BMPs will be in place to avoid impacts to wetlands and riparian habitat, where practicable. Please see the Wetlands section directly above for a more detailed discussion of these areas.

There are no areas of important wildlife habitat within the project area. This includes big game winter habitat and habitats for species of local importance. The project will not affect any listed WDFW Priority Habitat or habitats listed under the WDNR NHP database. The nearest PHS habitat is between 0.8 and 1.5 miles from the site.

The Animals section of this checklist discusses detailed wildlife, habitat, and proposed mitigation measures.

Frequently Flooded Areas

Section 17A.02.140 of the KCC defines areas of special flood hazard as “*the one-hundred year floodplain, which are lands subject to a one percent or greater chance of flooding in any given year as designated by the Federal Emergency Management Federal Insurance Rate Map for Kittitas County.*”

The project area does not contain or affect any 100-year floodplains, according to the Federal Emergency Management Agency floodplain areas (Figure 9). The nearest 100-year floodplain is adjacent to the Teanaway River and is approximately 450 feet from the project area.

Geologically Hazardous Areas

Section 17A.02.150 of the KCC defines geologically hazardous areas as “*areas that because of their susceptibility to erosion, sliding, earthquake, or other geological events, are not suitable to the siting of major commercial, residential or industrial development consistent with public health or safety concerns without proper engineering consideration and design. The term commercial shall not be construed to include natural resource activities.*”

The proposed project is not “commercial, residential, or industrial development” as defined by the KCC. The Applicant will select the placement and locations of the facility components to minimize susceptibility to erosion, sliding, earthquakes, and other geological events, consistent with proper engineering consideration and design.

Geological hazards are discussed in further detail in the Earth section of this checklist and are presented on Attachment D, Figure 10, Designated Critical Areas: Erosion-Prone Soils and Geologic Hazards.

h. How many people would reside or work in the completed project?

The project will not result directly in any people residing in the project area.

i. How many people would the completed project displace?

The project will not result in the displacement of any people.

j. Please list proposed measures to avoid or reduce displacement impacts:

The project will not create displacement impacts.

k. List proposed measures to ensure the proposal is compatible with existing and projected land uses and plans:

The proposed project is compatible with the existing and projected land uses and plans with the approvals and permits described in the following subsections. This includes compatibility with the *Kittitas County Comprehensive Plan* (Kittitas County, 2006), and the Kittitas County Code.

The Applicant will submit all necessary applications for local land use approvals and permits in Washington to ensure that the project is compatible with existing and projected land uses and plans. These land use approvals and permits include those described below.

Forest Practices Act Permit

The FPA permit will be obtained through WDNR. Trees will be removed from the site only as necessary to install facilities. Trees will be left onsite wherever practicable.

Conditional Use Permits

The Applicant will submit a conditional use permit (CUP) application to Kittitas County consistent with the comprehensive plans and zoning ordinances for both jurisdictions.

The project is defined as a “*Major alternative energy facility*” in KCC Section 17.61.010(9) and may be authorized in the F-R zoning district through approval of a CUP per KCC Section 17.61.020(4).

Kittitas County has indicated that the size and complexity of the project generate the need for a Development Agreement (DA) between the Applicant and the County. A DA will be submitted at the same time as the other application material described above, under separate cover. The DA will condition and govern the CUP.

Critical Areas Permit

The proposed project site includes wetlands, which are critical areas as defined in Section 17A.02.060 of KCC and are described in more detail in item (g). Therefore, the Applicant has applied for a Critical Areas Permit as part of the Kittitas County CUP.

Housing

- a. *Approximately how many units would be provided? Indicate whether it is high, middle, or low-income housing.*

The proposed project involves the construction and operation of the Teanaway Solar Reserve on private land in an unincorporated area of Kittitas County, and does not include the development of any new housing units.

The direct average employment in Kittitas County during each of the 7- to 9-month construction periods is estimated at 225 workers (see *Economic Impact Analysis for the Teanaway Solar Reserve, Kittitas County, Washington*). The number of construction workers expected to be transient to Kittitas County will be small enough that adequate temporary housing provided by hotels and motels is available to meet project needs. No housing units will be developed as part of the proposed project.

According to the 2005–2007 American Community Survey 3-Year Estimates, Kittitas County has 9,180 estimated housing units, including 5,464 owner-occupied units and 2,729 renter-occupied units (U.S. Census Bureau, 2009). The vacancy rate is estimated to be 8.8 percent.

According to the Cle Elum Roslyn Chamber of Commerce (2009), approximately 20 hotels and motels are available in the Cle Elum Roslyn area.

- b. *Approximately how many units, if any, would be eliminated? Indicate whether it is high, middle, or low-income housing.*

The proposed project will not eliminate any housing units in Washington.

- c. *List proposed measures to reduce or control housing impacts.*

No housing impacts will occur as a result of the proposed project.

Aesthetics

a. *What is the tallest height of any proposed structure(s), not including antennas? What is proposed as the principal exterior building materials?*

The tallest structures associated with the proposed project will be poles associated with the proposed powerline route to interconnect with the grid. The construction could be similar to the existing lattice towers for the BPA line, and could require a height of approximately 150 feet. However, this transmission line will need to be only 3,000 feet long, with a total of five towers. In addition, this line will be constructed at the lowest elevation on the site, helping to minimize its visibility.

Within the project area, the tallest structures will be components associated with the O&M building. The O&M building will be approximately 24 feet in height.

b. *What views in the immediate vicinity would be altered or obstructed?*

A geographic information system (GIS)-based visibility assessment was conducted to determine areas from which solar modules will be potentially visible. Please see Attachment F, *Zone of Visual Influence Technical Memorandum*. Attachment F was developed to provide background documentation for these conclusions. It was also developed to assist the County in evaluating potential visual impacts associated with the proposed project.

The visibility assessment illustrates that because the proposed site is located on a sloping “bench,” it is above and not visible from many important nearby viewing areas. These include most of the Teanaway Valley to the north, east, and west; US 97 (a state-designated Scenic and Recreational Highway); and the City of Cle Elum. The site is visible from some residences on hillsides southeast of the site that are located on the northwest-facing slope of Lookout Mountain. The distances between these residences and the project site range from approximately 0.5 to 3 miles. Based on several site visits and discussions with one resident in the area (personal communication between M. Greenig [CH2M HILL] and Tom Lambert, property owner, July 26, 2009), many, if not most, of the residences on the northwest-facing slopes of Lookout Mountain have views toward the project site that are obscured, or at least partially screened, by trees.

Conceptual depictions of how the project will change existing views toward the project site from two areas on the slopes of Lookout Mountain (from which the project site is most visible) are contained in Attachment F. The project will alter the view from at least one residence and a public road (Ridgewater Drive, see Attachment F) in that many solar modules will be visible in an area that now has the appearance of an area that was harvested for timber. Although views of Mt. Stewart and other peaks will not be blocked or obscured, the presence of the solar modules will alter views of the harvested area seen from these locations. Most of the trees in the harvested area will be removed and replaced with a series of parallel solar module rows that will have an almost agricultural-orchard appearance.

The project site is also visible from some residential areas on the hillsides south of I-90 (although these are not in the “immediate vicinity”). The distance between these residences and the closest part of the project site varies from approximately 3.5 to 7 miles. Conceptual depictions of how the project will change existing views toward the project site from these areas are contained in Attachment F. The closest part of I-90 (a National Scenic Byway) to the project site is approximately 3 miles away. Because the part of I-90 from which the project will be visible is laid out in a generally southeast-to-northwest direction, motorists likely will not notice the project in their peripheral vision as they drive I-90 with their attention on the freeway ahead of them. The project will likely be noticed from some of these areas, but because of its distance and the flatness of the terrain on which much of it will be located, the project will not block or obscure views of mountains to the north and will cause little alteration to landscape viewed from these areas.

c. Proposed measures to reduce or control aesthetic impacts:

The tallest and potentially most visible project components (the transmission structures) will be galvanized and treated at the factory to create a dulled finish that will reduce light reflection from the structures. In addition, nonspecular (nonreflecting) material will be used for the conductors. Nonspecular conductors and insulators made of materials that do not reflect light will also be used for the proposed substation. As with the transmission structures, the metal frames for the solar modules will be galvanized and treated at the factory to create a dull finish that will reduce reflection. The solar modules themselves require no measures to reduce or control light or glare impacts. Lighting specified for the substation and inverted buildings will be the minimum required to meet safety and security standards. Light fixtures will be hooded to eliminate any potential for glare effects and to prevent light from spilling off the site or up into the sky. In addition, the fixtures will have sensors and switches to permit the lighting to be turned off at times when it is not required. The finish of the inverter buildings’ walls and roofs will be dull so as not to reflect glare.

These measures will limit the reflectivity of the project components and greatly reduce or eliminate the potential for the proposed project to be a source of daytime glare or create nighttime lighting impacts.

Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

The proposed solar modules are monochromatic with a dull finish, which minimizes the production of glare. Additionally, the photovoltaic modules proposed are designed (and have antireflective coatings) to absorb and capture sunlight rather than reflect it. Design features such as textured glass further reduce reflectivity. Other project components such as the substation, transmission line, and inverter buildings could potentially create glare, but the measures described in item (d) below explain how that potential has been addressed. Lights associated with the substation and inverter buildings will potentially be seen from some areas for irregular periods of time. Item (d) below explains how that potential has been addressed.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No. See previous item (a).

c. What existing off-site sources of light or glare may affect your proposal?

None. There are very few residences and buildings near the project site and none within the site. Some lighting from residences may be seen below the project site, and some light or glare from vehicles traveling on roads near the project site (but rarely through the project site due to locked gates blocking public access) may be seen from some viewing areas. These offsite sources of light or glare will not affect the proposed project.

d. Proposed measures to reduce or control light and glare impacts:

The tallest and potentially most visible project components (the transmission structures) will be galvanized and treated at the factory to create a dulled finish that will reduce light reflection from the structures. In addition, nonspecular (nonreflecting) material will be used for the conductors. Nonspecular conductors and insulators made of materials that do not reflect light will also be used for the proposed substation. As with the transmission structures, the metal frames for the solar modules will be galvanized and treated at the factory to create a dull finish that will reduce reflection. The solar modules themselves require no measures to reduce or control light or glare impacts. Lighting specified for the substation and inverted buildings will be the minimum required to meet safety and security standards. All light fixtures will be hooded to eliminate any potential for glare effects and to prevent light from spilling off the site or up into the sky. In addition, the fixtures will have sensors and switches to permit the lighting to be turned off at times when it is not required. The finish of the inverter buildings' walls and roofs will be dull so as not to reflect glare.

These measures will limit the reflectivity of the project components and greatly reduce or eliminate the potential for the proposed project to be a source of daytime glare or create nighttime lighting impacts.

Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

The proposed project site and immediate vicinity do not contain any designated or informal recreational opportunities. The proposed project site traditionally has been used as commercial forest, and public access has been prohibited.

Although some hunting or hiking occurs on private land near the proposed project site, there are no designated parks, wildlife refuges, or recreational areas in the immediate vicinity, according to data provided by *National Atlas of the United States* (U.S. Department of the Interior, 2007). The proposed project is not visible from the Indian John Hill rest stop and may be minimally visible from the summit. Three lakes occur approximately 2 miles from the proposed project area (Table 5). No impacts to the lakes are anticipated.

TABLE 5
Potential Locations for Recreational Opportunities Near the Proposed Project Area

Name	Distance to Proposed Project Area
Big Lake	1.95
Cabin Lake	2.16
Little Lake	2.42

Source: U.S. Department of the Interior, 2007.

The majority of the land near the proposed project area is privately owned. Bird watching and hunting are the only types of recreational opportunity to exist on these private lands. There are no known planned future recreational sites or opportunities in or near the proposed project area.

b. Would the project displace any existing recreational uses? If so, please describe.

The project may minimally affect the existing hunting uses. Public access of the primary access point is already restricted by the subject landowners and will continue to be restricted in accordance with easement agreements. The Applicant does not have the authority to grant permission to third party recreationists, including hunters and campers, to access the project, but may grant permission to such parties on a case-by-case basis provided such parties secure written permission from all of the applicable landowners along Loping Lane.

c. Proposed measures to reduce or control impacts on recreation, including recreational opportunities to be provided by the project or applicant, if any:

Because no significant impacts on important recreational opportunities will occur, the Applicant does not propose any measures to avoid, reduce, or otherwise mitigate project impacts. The Applicant will reduce potential impacts on unimportant recreational opportunities through measures already in use to reduce other project impacts. These measures may include the use of existing roads. Also, because there will be no significant impacts on important recreational resources, no monitoring program is proposed.

Historic and Cultural Resources

a. Are there any places or objects on or near the site which are listed or proposed for national, state, or local preservation registers? If so, please describe.

No places, objects, or sites located in the project area are listed or proposed for listing in the national, state, or local preservation registers. See Attachment C, *Cultural Resources Report* (restricted distribution), for a more complete analysis and field methodology.

b. Please describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

The project site is located on privately owned industrial forest lands. No landmarks or other evidence of historic, archaeological, scientific, or cultural importance are known to be on or adjacent to the site.

c. *Proposed measures to reduce or control impacts, if any:*

Archaeological surveys did not identify any cultural sites in the project area. Should previously unidentified sites be discovered during the course of construction, the Applicant will halt work in that area until a qualified archaeologist can assess the site and determine whether protective measures should be implemented. See Attachment C, *Cultural Resources Report* (restricted distribution), for a more detailed description of measures to reduce or control impacts.

Transportation

a. *Identify the public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.*

Figure 3, *Site Access Map*, shows the local streets and major state highways serving the proposed project. The construction contractor will access the project site primarily from I-90 eastbound to State Route (SR) 970 northbound to Red Bridge Road, which is a local County roadway. From Red Bridge Road, project traffic likely will take Weihl Road northbound for approximately 0.2 mile to Loping Lane, where traffic will turn left and continue westbound on Loping Lane to the project site, as shown in Attachment D, Figure 3. Weihl Road and Loping Lane are private roadways and are not maintained by Kittitas County.

From the main proposed project access off of Loping Lane, proposed project traffic may use private and County roads to access the project site. Use of these roads will depend on weather conditions and on load and size restrictions. Most of these other access routes are privately owned. Table 6 describes the roads that will directly access the project corridor or provide a critical regional transportation link to the project corridor.

TABLE 6
 Key Roads Providing Access to the Proposed Project Area

Facility	Description
I-90	Interstate 90 within the vicinity of the project is classified as a rural interstate roadway with rolling terrain, according to the Washington State Department of Transportation (WSDOT) road classification system. This roadway has two lanes in each direction, and has a posted speed limit of 70 miles per hour (mph) outside city limits. Interstate 90 is anticipated to be the major haul route from Seattle, Washington.
US 970	US 970 begins in Cle Elum, Washington, where the speed limit is posted at 55 mph inside city limits. It continues eastbound and then northbound as a two-lane road with a posted speed limit of 60 mph. This facility is classified as a rural principal arterial with level terrain, according to the WSDOT road classification system. This rural principal arterial would provide the main access between the Interstate and local county roadways serving the proposed project area.
Red Bridge Road	Red Bridge Road is a paved two-lane road with a posted speed limit of 25 mph. It is classified as a rural local access road by Kittitas County. This roadway will serve as the main connection between state highway facilities and private access roads.
Weihl Road	Weihl Road is an unpaved, two-lane, privately maintained road without a posted speed limit. It is within a public right-of-way but is not maintained by Kittitas County. This rural privately maintained roadway likely experiences very little daily traffic, and likely will be able to provide access to the project site without affecting existing traffic operations.

TABLE 6
Key Roads Providing Access to the Proposed Project Area

Facility	Description
Loping Lane	Loping Lane is an unpaved, two-lane private road without a posted speed limit. It is a private roadway, and is not maintained by Kittitas County. This rural private roadway likely experiences very little daily traffic, and likely will be able to provide access to the project site without affecting existing traffic operations.

To evaluate the possible impacts resulting from construction traffic associated with the proposed powerline route to the grid, the analysts obtained traffic volumes for state highways that are part of the expected construction transportation routes. The study team consulted the Washington State Department of Transportation (WSDOT) and Kittitas County for traffic volumes and roadway characteristics.

Table 7 shows the average daily traffic (ADT) volumes between 2005 and 2008, the roadway functional classifications, the jurisdiction, and estimated truck percentages on state-maintained roadways in the project area. These volumes are based on available traffic data in *Annual Traffic Report*, published by WSDOT in 2008; the report provides annual traffic volumes for at least the last 4 years.

TABLE 7
Average Daily Traffic (ADT) Volumes, Roadway Functional Classification, and Estimated Percentage of Trucks

Roadway	State/ Jurisdiction	Functional Classification	2005 ADT	2006 ADT	2007 ADT	2008 ADT	Estimated Truck %
I-90 (MP 82.70) ^a	Washington State Dept of Transportation	Rural Interstate	27,000	27,000	28,000	27,000	23
I-90 (MP 84.61) ^a	Washington State Dept of Transportation	Rural Interstate	24,000	25,000	27,000	25,000	N/A
SR 970 (MP 2.69 west of SR 10)	Washington State Dept of Transportation	Rural Principal Arterial	5,600	5,800	5,800	5,400	N/A
SR 970 (MP 2.69 east of SR 10)	Washington State Dept of Transportation	Rural Principal Arterial	4,700	4,900	4,800	4,500	N/A
Red Bridge Road ^b	Kittitas County	Rural Local Access	260	230	250	200	N/A
Weihl Road	Private	N/A	N/A	N/A	N/A	N/A	N/A
Loping Lane	Private	N/A	N/A	N/A	N/A	N/A	N/A

^a WSDOT, 2008.

^b Wollman, 2009.

N/A = Information not available.

Traffic data along Red Bridge Road were provided by Kittitas County. No traffic data are available on Weihl Road or Loping Lane because they are privately owned, and they are not monitored or maintained by the County.

The project will be served internally by a network of existing and new maintenance roads. The existing maintenance roads, along with Weihl Road and Loping Lane, generally consist of gravel and dirt and will be improved pursuant to County requirements. Loping Lane is subject to several road use and cost-sharing agreements, and the Applicant will be subject to those agreements. Additionally, the Applicant is responsible for any improvements to these roads, and will first submit a plan detailing any such improvement for review and approval by the Kittitas County Public Works Department. These roads typically do not have posted speed limits, and ADT volumes are likely not available for these locations.

Transport of major equipment and materials to the site for construction likely will span 7 to 9 months for each of the two or three construction seasons (between April and October or April and December over 2 or 3 consecutive years). Truck deliveries are anticipated to occur between 7 a.m. and 7 p.m. on weekdays. The average daily truck volume will be approximately 15 vehicles, with no more than 10 vehicles (5 light-duty trucks and 5 heavy-duty trucks) expected to either enter or leave the site during the peak hour of construction.

Construction worker traffic is also expected during the three construction seasons. The expected workforce could include 500 construction workers and 50 other personnel during the peak 5 months of construction each year. Assuming that half of the construction workers carpool to the site each day, approximately 300 worker trips can be expected to enter the project site in the morning and leave the site during the evening peak hour.

There is one permanent load restriction on I-90 between Seattle and the project site. This restriction prohibits loads taller than 16 feet 2 inches high from entering the snow shed near Hyak (MP 54-62 on westbound I-90). This restriction is not anticipated to affect truck- and construction-related traffic because any project-related trucks will be empty (no loads) heading westbound. Construction vehicles are expected to be of legal size and legal weight for Washington highways; therefore, no special permitting for transport of materials and equipment will be necessary.

There are no permanent restrictions on SR 970 in the vicinity of the project site.

b. Is the site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

The project site is not currently served by public transit.

The nearest public transportation system is in Ellensburg, Washington. Central Transit is a general public transportation system that operates a fixed route serving mainly Central Washington University. It includes bus stops, operates on a schedule, and does not require advance reservations. It is operated by HopeSource. (Source: *Kittitas County Long Range Transportation Plan, 2008*)

c. How many parking spaces would the completed project have?

The Applicant anticipates 20 permanent parking stalls with the completion of this project. These parking stalls will be reserved for vehicles related to project maintenance.

- d. *Will the proposal require new roads or streets, or improvements to existing roads or streets, not including driveways? If so, please describe and indicate whether they are public or private.*

The Applicant and the construction contractor will use existing roads as much as possible. Because project-generated and local traffic volumes are fairly low, the Applicant does not anticipate requiring any improvements to existing paved roads or streets accessing the project.

The Applicant and the construction contractor will also use unimproved, nonpaved, private roadways to access the project site. Based on current conditions, these roadways will need improvements (such as gravel surfacing or widening) to transport large or heavy equipment and materials to the site during construction. As previously discussed, the Applicant will coordinate any improvements to these roads with the Kittitas County Public Works Department to ensure compliance with County requirements.

The number of new access roads will be kept to a minimum to avoid disrupting existing land use. If new construction access roads are necessary on private property, they will be created for temporary access only, and the land will be returned to its natural state after construction.

- e. *Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, please describe.*

The Applicant does not anticipate that the proposed project will use rail, water, or air transportation.

- f. *How many vehicular trips per day would be generated by the completed project? Indicate when peak traffic volumes would occur.*

Once the project has been completed, there will be virtually no traffic (less than five trips per day) for operations and maintenance. Given the low traffic volumes within the project area, these minor added trips will not cause traffic impacts during project operations.

- g. *Proposed measures to reduce or control transportation impacts, if any:*

Because project transportation impacts are limited, the Applicant will not pursue specific measures to reduce traffic impacts on local residents during the construction process.

Public Services

- a. *Would the project result in an increased need for public services (e.g., fire protection, police protection, health care, schools, other)? If so, please describe.*

The proposed project area is currently subject to the fire suppression protection services of WDNR. Should the construction of the project require additional or different fire protection services, the Applicant will work with Kittitas County Fire Protection District #7 to ensure that suitable fire suppression protection services are in place during the construction and ongoing operations of the project. The Applicant will create and maintain a firebreak of no less than 100 feet between all outer edges of the project site and adjacent property lines

Police protection of the proposed project area is provided by the County's Sheriff's Office. The construction contractor will notify the fire protection and police services of staging and

active construction locations so these services can respond efficiently to emergencies, should any arise. During the operational phase, the Applicant will contact fire protection and police services in the event of an emergency.

The Applicant does not anticipate that health care and school needs will increase during construction or operation of the proposed project.

b. *Proposed measures to reduce or control direct impacts on public services, if any.*

The Applicant does not propose any measures to reduce or control direct impacts on public services.

Utilities

a. *Circle the utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.*

The proposed project will not require utilities.

b. *Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.*

The Applicant does not anticipate any utility use during construction. The construction contractor will provide mobile utilities such as portable toilets, cellular telephones, and water trucks.

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Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____



Date Submitted: _____

ATTACHMENT A
Sensitive Species Report

Report

Sensitive Species Surveys for the Teanaway Solar Reserve Kittitas County, Washington

Prepared for
Teanaway Solar Reserve, LLC

August 2009

Prepared by
CH2MHILL



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1.0 Introduction

CH2M HILL conducted rare plant and wildlife surveys in June and July 2009 for the proposed Teanaway Solar Reserve (project). The proposed project is located on private land in an unincorporated area of Kittitas County, Washington. The purpose of the surveys was to identify potential populations of special status species and to determine whether proposed project activities will affect these populations.

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

2.0 Project Description

2.1 Site Location

The proposed project site is located approximately 4 miles northeast of Cle Elum, Washington, in Township 20N, Range 16E, within Sections 22, 23, and 27 (see Figure 1 in Appendix A for map of site location). The site is located on the eastern slopes of the Cascade Mountains on Cle Elum Ridge, which runs generally from east to west at elevations ranging from approximately 2,200 to 2,600 feet. The Teanaway River is approximately 1 mile to the northeast of Cle Elum Ridge. The site is accessed from Highway 970 by way of County roads such as Red Bridge Road, and private roads such as Loping Lane and Wehl Road.

The proposed project area consists of 982 acres. Based on site surveys, the project will utilize approximately 580 acres within the proposed project area. The remaining acres are currently undeveloped open space, but may accommodate some future expansion of the project after appropriate surveys are conducted to address any environmental concerns and compliance with any underlying federal, state, or local permitting requirements.

2.2 Purpose and Need

The purpose of the proposed project is to generate up to 75 direct current megawatts (MWdc) of photovoltaic (PV) solar energy for distribution to utilities and communities seeking to optimize their renewable and sustainable energy sources. The project was conceived by Teanaway Solar Reserve, LLC (Applicant) in response to the growing need for sustainable energy sources and the State of Washington's Renewable Electricity Standard, Revised Code of Washington (RCW) Title 19, mandate that by the year 2020, the state's largest electric utilities meet 15 percent of their retail electric load with renewable electricity (for example, wind and solar energy). The standard first takes effect in 2012 with a requirement of 3 percent through 2015, then 9 percent from 2016 through 2019 and 15 percent thereafter.

2.3 Key Components

The proposed project will consist of the following key components:

- Solar modules
- Inverter Buildings

- Underground Electrical Conductors
- Substation
- Transmission Line
- Access Roads
- Operations and Maintenance (O&M) Building

Key components are summarized below.

2.4 Solar Modules

Solar modules in a metal frame on supporting mounting structures will be used. The solar modules are manufactured offsite and will be delivered to the site by truck in wooden crates or cardboard boxes. The solar modules are mounted in a fashion that orients the modules toward the sun.

2.5 Inverter Buildings

Up to 40 inverter buildings will be needed. The inverters can be placed outdoors. An example inverter building includes a concrete pad, and prefabricated facilities are available such as the 2-MW enclosed system offered by Xantrex.

2.6 Underground Electrical Conductors

Underground electrical conductors will be installed in trenches at a depth in compliance with the Kittitas County code (36 inches or greater). Conductors will be buried directly or placed in a polyvinylchloride (PVC) conduit.

2.7 Substation

The Applicant proposes to construct an electrical substation that will interconnect with the 345-kV BPA transmission line. The substation will require a level, fenced area of approximately 10 acres. The 10-acre area will be graveled with no vegetation. The substation will contain a small control house, transformer(s), circuit breakers and switches, steel support structures, and overhead electrical bus work. Its appearance will be similar to that of many other substations throughout the Pacific Northwest.

2.8 Transmission Line

A new 345-kV transmission line will be needed to connect the new substation to the existing BPA line. If the substation is located at the BPA right-of-way, this line would be very short. The line would have two circuits, one into the substation and one out of the substation. The construction could be similar to the existing lattice towers, and require a right-of-way of up to 300 feet in width.

2.9 Access Roads

The site will be accessed via Kittitas County and private roads that interconnect with Highway 970. The major County access road is Red Bridge Road. Loping Lane and Weihl Road are private roads over which the Applicant has easement rights.

3.0 Sensitive Species Surveys

CH2M HILL biologists conducted surveys of the 580-acre survey area for rare plant and wildlife species in June and early July of 2009. Figure 2 (Appendix A) shows the sensitive species survey area within the 982-acre proposed project area.

A species was considered to be rare if it met one or more of the following listing criteria:

- Federally listed as threatened or endangered (*Endangered Species Act of 1973* (16 U.S.C. 1531-1544, 87 Stat. 884))
- State listed as threatened or endangered (State of Washington *Endangered, Threatened, and Candidate Species Classification WAC 232-12-297*)

Target species included all plant and wildlife taxa listed by the U.S. Fish and Wildlife Service (USFWS) or the state of Washington as *Endangered* or *Threatened* and potentially occurring in Kittitas County, Washington. A species was determined to have potential to occur in the survey area if its known or expected geographic range includes the survey area or the vicinity of the survey area, and if its known or expected habitat is represented within or adjacent to the survey area.

3.1 Rare Plant Survey

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

3.1.1 Methods

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

Sources consulted included the following:

- *List of Known Occurrences of Rare Plants in Washington: Kittitas County.* Washington Natural Heritage Information System (WNHIS). February 2009.
- *State of Washington Priority Habitats and Species (PHS) List.* Washington Department of Fish and Wildlife (WDFW), 2008.
- *Federally Listed, Proposed, Candidate Species and Species of Concern Under the Jurisdiction of the Fish and Wildlife Service Which May Occur Within Kittitas County, Washington.* United States Fish and Wildlife Service (USFWS), July 24, 2008 (Appendix B).
- *Topographic Map of the Teanaway, Washington Quadrangle.* United States Geological Service (USGS), 1985 Provisional Edition.
- *Soil Survey, Kittitas County Area, Washington.* NRCS Soils Survey, 2009.

- *Field Guide to Selected Rare Plants of Washington* (Washington Natural Heritage Program, 2009) (Appendix C).

Field Investigation. Surveys were floristic in nature and were conducted according to the U.S. Bureau of Land Management Survey Protocols for Survey and Manage Strategy 2 Vascular Plants (Whiteaker et al., 1998).

Two survey methods were used. An Intuitive Controlled Survey was conducted throughout the survey area, and a Complete Survey was conducted in areas of high potential habitat within the survey area. Protocol for these methods is described below.

Intuitive Controlled Survey

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

Complete Survey

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

Lists of all vascular plant taxa encountered within each survey area were recorded in the field. Nearly all plant species found in the survey areas were identified to the level needed to determine whether they qualify as special status plants. Collections were made of specimens that could not be identified readily in the field. Final determinations were made by keying specimens using standard references such as *Vascular Plants of the Pacific Northwest: Parts 1 through 5* (Hitchcock et al., 1955–1969). Plant identification was also aided by current taxonomic guides and other standard references, including the following:

- *Flora of the Pacific Northwest* (Hitchcock and Cronquist, 1973)
- *Manual of Grasses of the United States* (Hitchcock, 1971)
- *Field Guide to Selected Rare Plants of Washington* (Washington Natural Heritage Program, 2008)
- *WTU Image Collection: Plants of Washington, Lichens of Washington*. University of Washington Herbarium, Burke Museum of Natural History and Culture, 2009.

3.1.2 Results

Office Review. Twelve plant species listed by federal or state agencies as threatened or endangered were identified as potentially occurring in the vicinity of the survey area. Of those species, six were determined to potentially occur within the survey area based on evaluation of habitat requirements, elevation, and records of known occurrence. A complete list of potentially occurring plant species, including habitat requirements and bloom times, is presented in Table 1.

TABLE 1
Threatened or Endangered Plant Species That May Occur in the Vicinity of the Proposed Project Area

Scientific Name	Common Name	Federal Status*	State Status*	Habitat Preference	Potential to Occur
Plants					
<i>Astragalus arrectus</i>	Palouse milk-vetch	--	LT	Open ponderosa pine/Douglas fir forests in grassy or shrub dominated openings	May occur. Historical in Kittitas County. Several species of <i>Astragalus</i> identified during site visit.
<i>Carex macrochaeta</i>	Large-awn sedge	--	LT	Moist or wet, open places, frequently found near the coast, but occurs inland as well. Grows in seepage areas, around waterfalls, in wet meadows, and along streams and lakes.	May occur. Only five known extant populations, but like many sedges, it may be underreported.
<i>Delphinium viridescens</i>	Wenatchee larkspur	SoC	LT	Seasonally wet openings, moist meadows, moist microsites in open coniferous forests springs, seeps, riparian areas.	May occur. Known range is very small, but southern extent of know range is less than 15 miles north of proposed project area.
<i>Ophioglossum pusillum</i>	Adder's-tongue	--	LT	Wet meadows, grassy swales, moist woods, mud creeks.	May occur. Historical in Kittitas County. Few extant populations left in range, however potential habitat is present.
<i>Sidalcea oregana var. calva</i>	Wenatchee Mountain checker-mallow	LE	LE	Moist meadows that have surface water or are saturated in the upper portions of the soil profile into early summer. Taxon also occurs in open ponderosa pine/Douglas fir forests and along edges of shrub thickets.	May occur. Range covers roughly 30 square miles of habitat S/SE of Leavenworth, Washington.
<i>Spirathes diuvialis</i>	Ute's ladies tresses	LE	LE	Broad low-elevation intermontane valley plains, with deltaic meandered wetland complexes; restricted to calcareous, temporarily inundated wet meadow zones and segments of channels and swales where there is stable subsurface moisture and relatively low vegetation cover. There are 4 know sites in WA. One is in a periodically flooded alkaline flat (moist meadow) adjacent to a ponderosa pine/Douglas-fir woodlands and sagebrush steppe with big sagebrush, bitterbrush, and rabbitbrush. The other three sites are adjacent to the Columbia River on stabilized gravel bars that are moist throughout the growing season.	Not likely to occur. Occurs between 720 and 1,500 feet elevation. Project area is between 2,100 and 2,800 feet elevation.

* Status Codes:

LE = Listed Endangered (Federal or State)
 LT = Listed Threatened (Federal or State)
 SoC = Species of Concern (Federal)
 FC = Federal Candidate for Listing (Federal)
 SC = Washington State Candidate for Listing (State)
 Sources: USFWS, 2009; WDFW, 2009; WDNR, 2009.

Field Investigation. CH2M HILL botanists conducted field surveys for rare plant species and potential rare plant habitat on June 16 through 19 and July 9, 2009. This range of survey dates was selected to encompass all or a portion of the blooming times of the special status plants potentially occurring within the project area. Approximately 580 acres were evaluated for the potential presence of rare plant species.

Plant Species Observed

The field survey identified a total of 81 species: 3 trees, 7 shrubs, 12 graminoids, and 56 forbs, and 3 herbaceous species. No special status plant species were found within the survey area. Table 2 presents a complete list of all plant species identified during the course of the field surveys. Appendix D contains photos of typical habitat types that occur in the survey area.

TABLE 2

Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
Alismataceae					
	<i>Alisma plantago-aquatica</i>	European water plantain		X	forb
Apiaceae					
	<i>Ligusticum grayii</i>	Gray's lovage	X		forb
	<i>Lomatium nudicaule</i>	bare-stem desert parsley	X		forb
	<i>Lomatium triternatum</i>	nine-leaf desert parsley	X		forb
	<i>Oenanthe sarmentosa</i>	Pacific water -parsley	X		forb
Asteraceae					
	<i>Achillea millefolium</i>	wooly yarrow	X		forb
	<i>Anaphalis margaritacea</i>	pearly-everlasting	X		forb
	<i>Arnica sororia</i>	foothills arnica	X		forb
	<i>Balsamorhiza sagittata</i>	arrow-leaf balsamroot	X		forb
	<i>Chondrilla juncea</i>	rush skeletonweed		X	forb
	<i>Chrysanthemum leucanthemum</i>	ox-eye daisy		X	forb
	<i>Cirsium vulgare</i>	bull thistle		X	forb

TABLE 2

Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
	<i>Crepis occidentalis</i>	western hawksbeard	X		forb
	<i>Crepis setosa</i>	rough hawksbeard		X	forb
	<i>Eriophyllum lanatum</i>	wooly sunflower	X		forb
	<i>Gnaphalium palustre</i>	marsh cudweed	X		forb
	<i>Hieracium scouleri</i>	wooly-weed	X		forb
	<i>Madia glomerata</i>	mountain tarweed	X		forb
	<i>Madia gracilis</i>	slender tarweed	X		forb
	<i>Madia minima</i>	small-headed tarweed	X		forb
	<i>Senecio sylvaticus</i>	wood groundsel	X		forb
	<i>Symphotrichum spathulatum</i>	western mountain aster	X		forb
	<i>Tragopogon dubius</i>	yellow salsify		X	forb
	<i>Wyethia amplexifolia</i>	narrow-leaf wyethia	X		forb
Berberidaceae					
	<i>Berberis repens</i>	creeping Oregongrape	X		shrub
Boraginaceae					
	<i>Lithospermum ruderale</i>	Columbia puccoon	X		forb
	<i>Myosotis laxa</i>	small-flowered forget-me-not	X		forb
	<i>Plagiobothrys scouleri</i>	Scouler's popcorn-flower	X		forb
Caprifoliaceae					
	<i>Symphoricarpos albus</i>	snowberry	X		shrub
Caryophyllaceae					
	<i>Agrostemma githago</i>	common corncockle		X	forb
	<i>Symphoricarpos oreophilis</i>	mountain snowberry	X		shrub
Convolvulaceae					
	<i>Convolvulus arvensis</i>	field Morning-glory		X	forb
Cyperaceae					
	<i>Carex hoodii</i>	Hood's sedge	X		graminoid
	<i>Carex pachystachya</i>	thick-headed sedge	X		graminoid
	<i>Carex utriculata</i>	inflated sedge	X		graminoid

TABLE 2

Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
	<i>Scirpus microcarpus</i>	small-fruited bulrush	X		forb
Fabaceae					
	<i>Cytisus scoparius</i>	Scotch broom		X	shrub
	<i>Lathyrus japonicus</i>	pinewoods peavine	X		forb
	<i>Lupinus polyphyllus</i>	large-leaf lupine	X		forb
	<i>Lupinus sericeus</i>	silky lupine	X		forb
	<i>Vicia americana</i>	American purple vetch	X		forb
Gentianaceae					
	<i>Centaurium erythraea</i>	centaury		X	forb
Juncaceae					
	<i>Juncus parryi</i>	Parry's rush	X		graminoid
Lamiaceae					
	<i>Prunella vulgaris</i>	self-heal		X	forb
Liliaceae					
	<i>Camassia quamash</i>	common camas	X		forb
	<i>Veratrum insolitum</i>	Siskiyou false-hellebore	X		forb
	<i>Zigadenus venenosus</i>	death camas	X		forb
Malvaceae					
	<i>Sidalcea oregana var. procera</i>	Oregon checkmallow	X		forb
Pinaceae					
	<i>Pinus ponderosa</i>	ponderosa pine	X		tree
	<i>Pseudotsuga menziesii</i>	Douglas-fir	X		tree
Plantaginaceae					
	<i>Plantago major</i>	common plantain	X		forb
Poaceae					
	<i>Agropyron smithii</i>	western wheatgrass	X		graminoid
	<i>Agropyron spicatum</i>	bluebunch wheatgrass	X		forb
	<i>Agrostis longiligula</i>	Pacific bentgrass	X		graminoid
	<i>Agrostis scabra</i>	rough bentgrass	X		graminoid
	<i>Danthonia spicata</i>	poverty oatgrass	X		graminoid

TABLE 2

Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
	<i>Elymus elymoides</i>	squirreltail			graminoid
	<i>Elymus glaucus</i>	blue wild-rye	X		graminoid
	<i>Festuca idahoensis</i>	Idaho fescue	X		graminoid
	<i>Phleum pratense</i>	common timothy		X	graminoid
	<i>Poa bulbosa</i>	bulbous bluegrass		X	graminoid
Polemoniaceae					
	<i>Collomia grandiflora</i>	large flowered collomia	X		forb
	<i>Navarretai breweri</i>	Brewer's navarretia	X		forb
	<i>Navarretia intertexta</i>	needle-leaf navarretia	X		forb
Polygonaceae					
	<i>Eriogonum umbellatum</i>	sulfur buckwheat	X		forb
	<i>Polygonum polygaloides</i> <i>spp.confertiti</i>	close-flowered knotweed	X		forb
	<i>Rumex acetosella</i>	sheep sorrel		X	forb
Ranunculaceae					
	<i>Ranunculus acris</i>	tall ranunculus		X	forb
Rosaceae					
	<i>Fragaria virginiana</i>	wild strawberry	X		forb
	<i>Potentill drummondii</i>	Drummonds cinquefoil	X		forb
	<i>Rosa woodsii</i>	Wood's rose	X		shrub
	<i>Spiraea betulifolia</i>	white spiraea	X		shrub
Rubiaceae					
	<i>Galium boreale</i>	northern bedstraw	X		forb
Salicaceae					
	<i>Populus tremuloides</i>	quaking aspen	X		tree
	<i>Salix scouleriana</i>	Scouler's willow	X		shrub
Scrophulariaceae					
	<i>Castilleja hispida</i>	harsh paintbrush	X		forb
	<i>Castilleja tenuis</i>	hairy Indian paintbrush	X		forb
	<i>Delphinium nuttallianum</i>	upland larkspur	X		forb
	<i>Penstemon procerus</i>	small flowered penstemon			forb
	<i>Verbascum thapsus</i>	wooly mullein	X		forb

TABLE 2

Plant Species Observed During Field Surveys

Family	Scientific Name	Common Name	Native	Non-native	Form
Valerianaceae	<i>Plectritis macrocera</i>	white plectritis	X		forb

3.2 Wildlife Survey

3.2.1 Methods

Office Review. The office review consisted of compiling a list of special status wildlife species potentially occurring within the proposed survey area. The office review included review of state and federal rare species lists, recent aerial photography, and information on habitat requirements for any of the potentially occurring species.

Sources consulted included the following:

- *Species of Concern in Washington State.* Washington Department of Fish & Wildlife (WDFW), June 2009.
- *State of Washington Priority Habitats and Species (PHS) List.* WDFW, 2008.
- *Federally Listed, Proposed, Candidate Species and Species of Concern Under the Jurisdiction of the Fish and Wildlife Service Which May Occur Within Kittitas County, Washington.* United States Fish and Wildlife Service (USFWS), July 24, 2008 (Appendix B).

Field Investigation. CH2M HILL biologists conducted reconnaissance-level field surveys on June 16 through 19 and July 9, 2009. A reconnaissance-level survey identifies all habitats within the survey area to determine whether there is onsite habitat with the potential to support a listed species. Recommendations are made for further protocol-level surveys for individual species if suitable habitat has been identified. Protocol-level surveys are intensive surveys with specific requirements according to the particular individual wildlife species.

Approximately 580 acres were evaluated for the potential presence of wildlife species.

3.2.2 Results

Office Review. A review of the *Species of Concern in Washington State* and the *State of Washington Priority Habitats and Species (PHS) List* resulted in four wildlife species which have the potential to occur in the vicinity of the proposed survey area. Table 3 summarizes WDFW PHS species, their habitat requirements, and likelihood of occurring in the survey area.

The database includes occurrences of both black-backed woodpecker and mountain quail approximately 1.0 mile from the project boundary. In addition, several occurrences of northern goshawk are documented approximately 1.5 to 1.8 miles from the northern edge of the survey area. The PHS database also includes elk and mule deer habitat regions

approximately 0.8 to 1.5 miles from the proposed project area. While neither species is listed, these habitats likely provide important winter habitat for elk and mule deer.

TABLE 3
Species Listed in the WDFW PHS Database That May Occur in the Vicinity of the Proposed Project Area

Scientific Name	Common Name	Federal Status	State Status	Preferred Habitat	Potential to Occur	Notes
Birds						
<i>Picoides arcticus</i>	Black-backed woodpecker	--	SC	Mature coniferous forests that have been burned within 5 years	Unlikely	
<i>Accipiter gentilis</i>	Northern goshawk	SoC	SC	Mature coniferous forests. Often found on moderate slopes at mid to high elevations. Also found along forest edges and occasionally in mixed coniferous/deciduous forests.	May Occur	
<i>Oreortyx pictus</i>	Mountain quail	--	--	Requires dense thicket cover with accessible openings on slopes on mountains and foothills. Often associated with thickets in burned or cut areas. Require a reliable source of water during the summer.	Unlikely	Species of Local Significance
Mammals						
<i>Cervus Canadensis nelsoni</i>	Elk	--	--	Productive grasslands, meadows, or clear cuts, interspersed with closed-canopy forests. Year round range varies from 2,500 to 10,000 acres, and usually includes distinct summering and wintering grounds.	Documented	

Source: WDFW, 2009.

A review of Appendix B resulted in two wildlife species which have the potential to occur in the vicinity of the survey area. Table 4 summarizes the species, their habitat requirements, and the likelihood of occurrence in the survey area.

TABLE 4
 USFWS Listed Threatened or Endangered Wildlife Species That May Occur in the Vicinity of the Proposed Project Area

Scientific Name	Common Name	Federal Status*	State Status*	Habitat Preference	Potential to Occur
<i>Martes pennanti</i>	Fisher	C	LE	Mature, closed-canopy coniferous forests with some deciduous trees present, primarily along riparian corridors.	Unlikely. Rare in Washington State.
<i>Canis lupus</i>	Gray wolf	LE	LE	Dense, unfragmented coniferous forests.	Unlikely. Only one wolf known to occur in Washington State, in southeast Washington.

* Status Codes:

LE = Listed Endangered (Federal or Washington status)

LT = Listed Threatened (Federal or Washington status)

SoC = USFWS Species of Concern

C = Federal Candidate for Listing

SC = Washington State Candidate for Listing

Source: USFWS, 2009.

Field Investigation. Results indicated a total of five natural habitat types within the survey area. Most of these can be named by using the Chappel et al. (2001) system of vegetation classification. Survey area natural vegetation types are as follows:

- Ponderosa Pine Forest and Woodlands
- Open Water – Lakes, Rivers, and Streams
- Herbaceous Wetlands
- Riparian
- Upland Aspen Forest

These habitat types are illustrated on Figure 3 (Appendix A) and described below. Appendix D contains photos of typical habitat types that occur in the survey area.

Ponderosa Pine Forest and Woodlands

The Ponderosa Pine Forest and Woodland habitat (Appendix D: Photo 1) within the survey area is the most abundant of the five habitat types. The survey area has been actively managed as commercial timberlands for the past 100 years. The area was last logged in 2001-2002, leaving relatively few trees per acre and open stands of predominantly ponderosa pine (*Pinus ponderosa*) trees with Douglas-fir (*Pseudotsuga menzeisii*) present as a subdominant species. Stands typically consist of an overstory of 50-year-old ponderosa pine trees with an understory of mid-successional trees and saplings. There is a mixed herbaceous understory comprised of several co-dominants. Species include arrowleaf balsamroot (*Balsamorhiza sagittata*), yarrow (*Achillea millefolium*), bulbous bluegrass (*Poa bulbosa*), ventenata (*Ventenata dubia*), and several species of fescue (*Festuca* spp.), wheatgrass (*Agropyron* spp.), and lupine (*Lupinus* spp.). Populations of Oregon checker-mallow (*Sidalcea oregana* var. *procera*) and sticky purple geranium (*Geranium viscosissimum*) were also observed.

Open Water—Lakes, Rivers, and Streams

Several intermittent streams and one artificially ponded area (Appendix D: Photo 2) are found within or crossing the survey area. All of the streams were dry at the time of the field

visits and all were vegetated to varying extents. Typical vegetation within most channels includes herbaceous grass and forb species, including Brewer's navarretia (*Navarretia brewerii*), poverty oatgrass (*Danthoia spicata*), and small tarweed (*Madia exigua*). Other channels were dominated by dense shrub and herb species including wild rose (*Rosa woodsii*), snowberry (*Symphoricarpos albus*), cinquefoil (*Potentilla* spp.), and Oregon checkermallow (*Sidalcea oregana* var. *procera*).

Herbaceous Wetlands

Herbaceous Wetland habitats within the survey area consist of depressional wetlands dominated by herbaceous vegetation (Appendix D: Photo 3). Exposed soils were cracked, evidence of altering drying and wetting periods (Appendix D: Photo 3). These systems are not hydrologically connected to any stream or drainage ditch. Water arrives as either snowmelt or precipitation. These wetlands support hydrophytic herbaceous vegetation, and met the criteria for hydric soils and wetland hydrology. Common plant species within these wetlands were creeping spikerush and ventenata.

Riparian

The Riparian habitat (Appendix D: Photo 4) is found adjacent to some of the intermittent stream channels in the survey area. It generally consists of a dense shrub layer immediately adjacent to the stream gradually transitioning to ponderosa pine forest. Typical species include oceanspray (*Holodiscus discolor*), mountain spiraea (*Spiraea betulifolia*), Oregon checkermallow (*Sidalcea oregana* var. *procera*), Wood's rose (*Rosa woodsii*), and ponderosa pine.

Upland Aspen Forest

A small patch of aspen (*Populus tremuloides*) forest occurs along a drainage and around an artificially impounded pond in the southwestern portion of the survey area (Appendix D: Photo 5). Associated species include ponderosa pine, snowberry, and wild rose.

Species Observed. Wildlife observed during the field survey consisted of 10 bird and 2 mammal species. Evidence of wildlife (e.g., scat, burrows) observed in the survey area indicate the presence of rodents and coyote (*Canis latrans*).

Table 5 presents the list of all wildlife species observed during the field surveys.

TABLE 5
Wildlife Species Observed, June-July 2009 Field Investigation

Common Name	Scientific Name
Red-tailed hawk	<i>Buteo jamaicensis</i>
Stellar's jay	<i>Cyanocitta stelleri</i>
Common raven	<i>Corvus corax</i>
White-headed woodpecker	<i>Picoides albolarvatus</i>
Hairy woodpecker	<i>Picoides villosus</i>
Northern flicker	<i>Colaptes auratus</i>
White-crowned sparrow	<i>Zonotrichia albicollis</i>
Chipping sparrow	<i>Spizella passerina</i>
Western tanager	<i>Piranga ludoviciana</i>
Western wood peewee	<i>Contopus sordidulus</i>
Mule deer	<i>Odocoileus hemionus</i>
Rocky Mountain Elk	<i>Cervus canadensis nelsoni</i>

No state or federally listed threatened or endangered wildlife species were observed within the survey area. A state candidate species, the white-headed woodpecker, was observed in the northwest portion of the survey area. Both male and female woodpeckers were observed close to the main access road. The male was observed foraging in a stand of adult ponderosa pine, while the female was located excavating a nest in a snag approximately 10 feet from the road.

4.0 Conclusions and Recommendations

CH2M HILL biologists conducted surveys for rare plant and wildlife species throughout the survey area. The purpose of the surveys was to identify potential populations of special status species and to determine whether proposed project activities will affect these populations.

4.1 Conclusions

The surveys identified 81 plant species, 12 wildlife species, and 5 habitat types. No state or federally listed endangered or threatened species were observed in the survey area during field surveys. The following conclusions were derived:

- Three habitat types in the survey area, Upland Aspen, Riparian, and Herbaceous Wetlands, are considered Washington Priority Habitats (Aspen Stands, Riparian, and Freshwater Wetlands). Because these habitats comprise only a small portion of the

survey area, impacts to these habitats from construction and operation of the project can likely be avoided.

- Back-backed woodpeckers are unlikely to be impacted by the development of this project, as activities relating to this project will not involve the documented area. Black-backed woodpeckers require habitat that includes stands of mature conifers that have experienced a burn event within the last 5 years. No stands of burned, mature conifer trees exist in the survey area. In addition, the proposed project is unlikely to impact any mountain quail or northern goshawk habitat, as no activities related to this project will occur near the PHS listing.
- Both the mule deer and elk PHS regions are located outside the proposed project area, and will not be impacted by project activities
- Potential suitable habitat for several listed species does occur within the Ponderosa Pine Forest and Woodland habitat. However, habitats within the survey area have been disturbed and fragmented by commercial forest practices and by residential development in the surrounding area. State or federal resource agencies may require additional surveys to determine if any rare plants or listed wildlife species occur in the survey area.
- The proposed project is not expected to result in any significant impacts to special status species. However, potentially suitable habitat may be temporarily and permanently impacted. Temporary impacts may occur in conjunction with the placement and use of heavy equipment during project construction. Permanent impacts will occur due to habitat alteration and tree removal. Removal of trees for project placement will disturb and fragment the existing forested habitat.

4.2 Recommendations

4.2.1 Best Management Practices (BMPs)

Best management practices (BMPs) will be implemented during construction to avoid and reduce temporary and permanent impacts to the extent practicable. In the event that a state or federally listed threatened or endangered plant or wildlife species is observed during project development, work will be halted immediately and a qualified biologist notified.

BMPs will be implemented wherever surface disturbances occur. These measures include, but are not limited to, the following:

- Protect trees, shrubbery, and other vegetation not designated for removal from damage caused by the project construction.
- Seed areas of temporary soil disturbance with the specified temporary seed mix.
- Install filter bags, sediment fences, sediment filter fabric traps, and graveled construction accesses as necessary for erosion control.
- Cover stockpiles with impervious materials when unattended or during rainfall.

- Locate construction staging areas for storage, maintenance, and fueling of construction equipment minimum of 150 feet from creeks or wetlands. Show staging areas on the construction plans.
- Take care to prevent petroleum products and other harmful material from entering wetland or waterways.
- Upon completion of construction, seed or plant all areas of disturbance with native plants.

4.2.2 Mitigation

All recommended surveys have been completed. It is still possible that individuals or populations of rare plant species may be encountered in the course of project construction. In the event of such a discovery, a qualified botanist will be retained to verify identity of the plant(s) and make recommendations for addressing the situation. All efforts will be made to avoid disturbance to such species. If disturbance cannot be avoided, efforts will be employed to minimize disturbance to the maximum extent practicable. If such efforts are not possible, mitigation for impacts to the plant(s) will be required. Mitigation measures will be specific to each plant species.

Possible avoidance and mitigation measures may include the following:

- Implement micrositeing: slight relocations of project facilities to avoid rare plant populations.
- Remove and conserve plants; replant following construction.
- Replant disturbed area with seed obtained from a qualified cultivator of rare plants.
- Mitigate by seeding an approved offsite area with the same species.
 - Mitigation will require approval of the agencies, as well as monitoring for a defined period of time.

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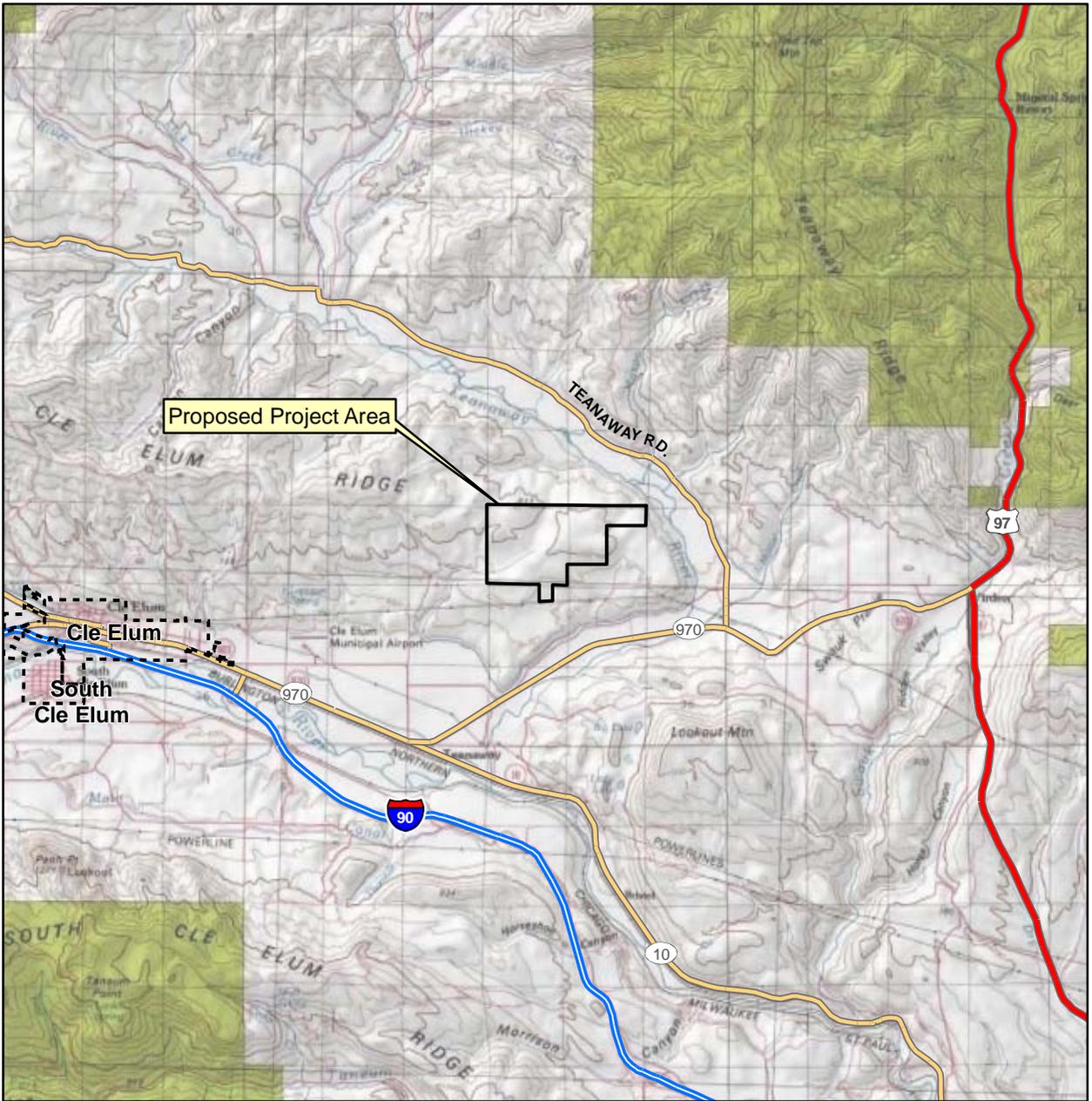
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APPENDIX A
Figures



VICINITY MAP

LEGEND

-  Proposed Project Area
-  City Boundary
-  Interstate
-  Highway
-  Major Road

Note:

1. USGS 100K Quadrangle: Wenatchee.

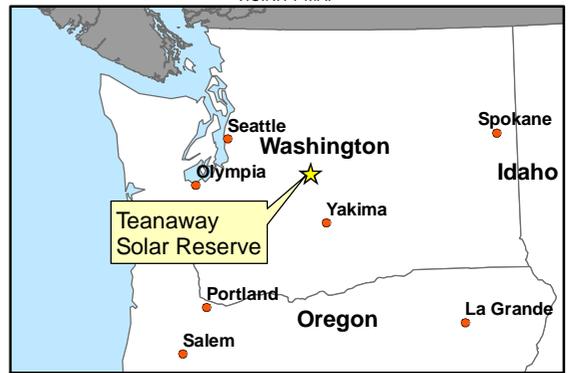
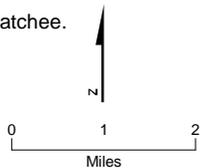
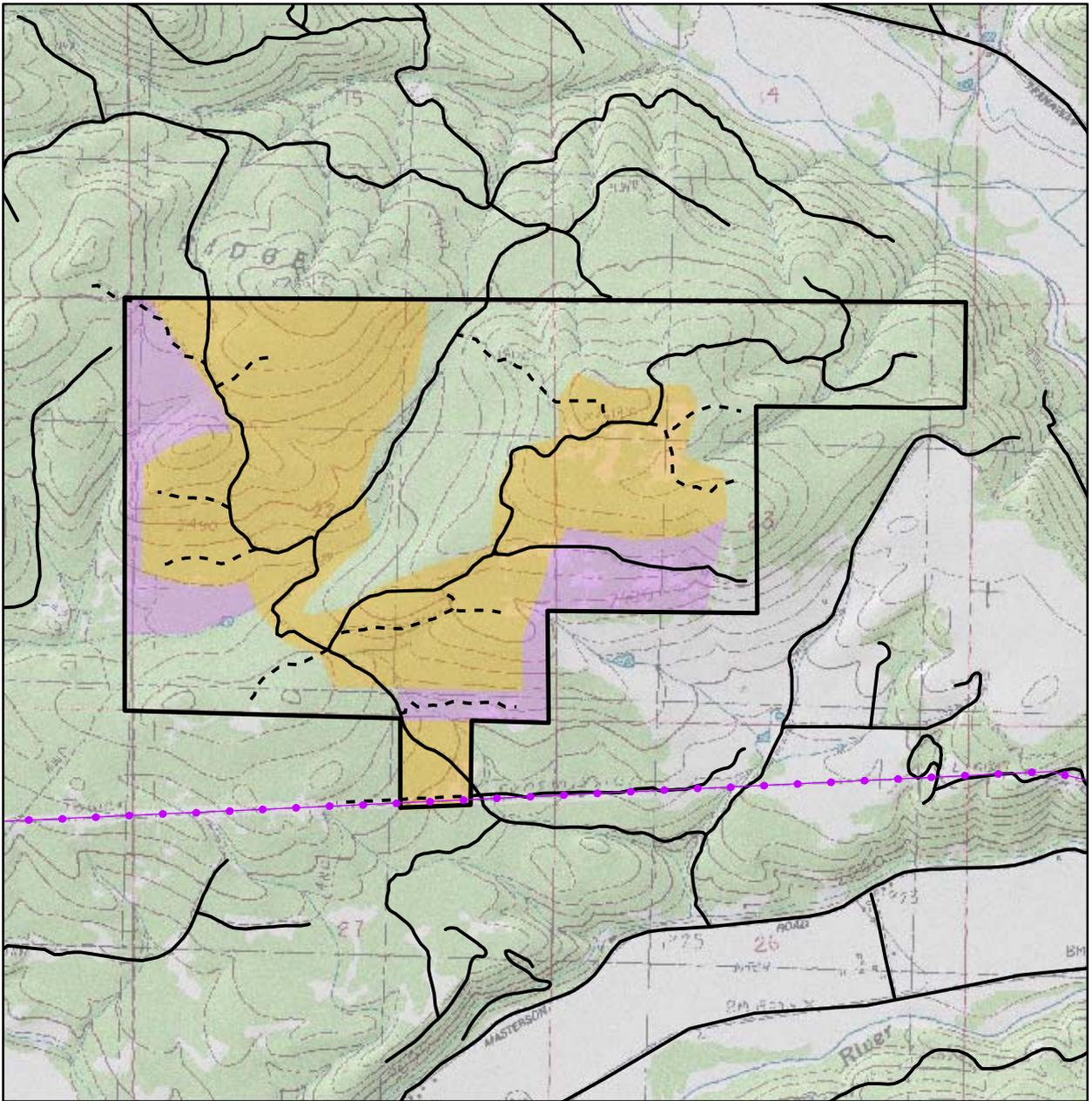


FIGURE 1
Vicinity Map

Sensitive Species Surveys Report
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

-  Proposed Project Area
-  July 2009 Survey Area
-  June 2009 Survey Area
-  Existing BPA Transmission Line
-  Road
-  Minor Dirt Road

Note:
1. USGS 24K Quadrangle: Teanaway.

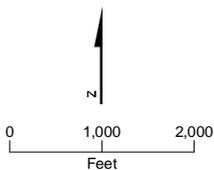
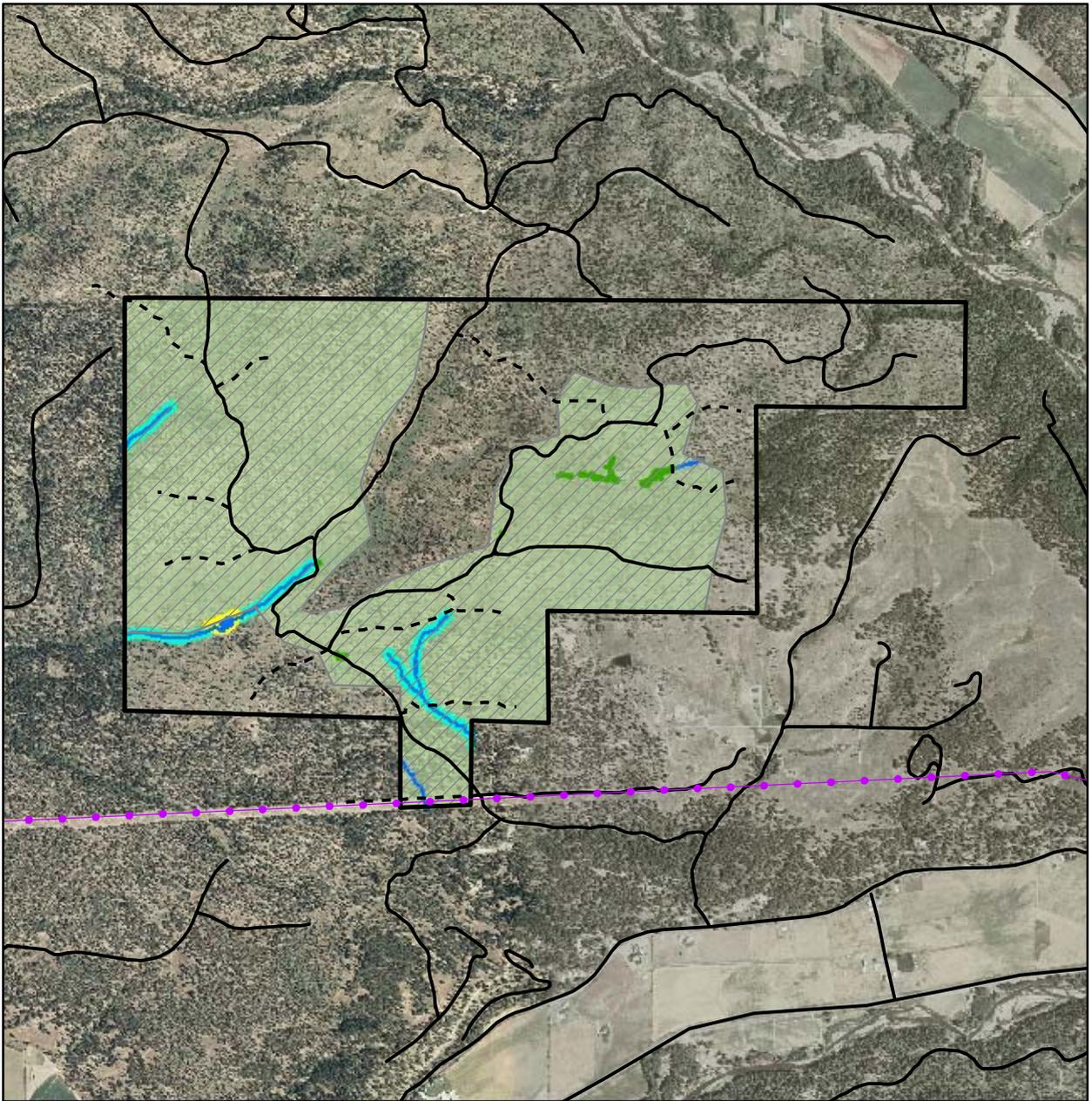


FIGURE 2
Survey Area Map
Sensitive Species Surveys Report
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

- | | | | |
|--|--------------------------------|--|-------------------------------------|
| | Proposed Project Area | | Habitat |
| | Biological Survey Area | | Open Water |
| | Existing BPA Transmission Line | | Ponderosa Pine Forest and Woodlands |
| | Road | | Riparian |
| | Minor Dirt Road | | Upland Aspen |

Note:
1. Aerial Imagery: 2006 1m NAIP.

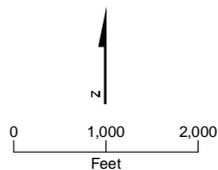


FIGURE 3
Habitat Types
Sensitive Species Surveys Report
Teanaway Solar Reserve
Kittitas County, Washington

APPENDIX B
U.S. Fish and Wildlife Service Species
List

KITTITAS COUNTY
Updated 7/24/2008

LISTED

Endangered

Gray wolf (*Canis lupus*)

Threatened

Bull trout (*Salvelinus confluentus*) – Columbia River distinct population segment

Grizzly bear (*Ursus arctos horribilis*)

Canada lynx (*Lynx canadensis*)

Marbled murrelet (*Brachyramphus marmoratus*)

Northern spotted owl (*Strix occidentalis caurina*)

Spiranthes diluvialis (Ute ladies'-tresses), plant

Designated

Critical habitat for the northern spotted owl

Critical habitat for the Columbia River distinct population segment of the bull trout

CANDIDATE

Fisher (*Martes pennanti*) - West Coast distinct population segment

Greater sage grouse (*Centrocercus urophasianus*) – Columbia Basin distinct population segment

Yellow-billed cuckoo (*Coccyzus americanus*)

SPECIES OF CONCERN

Animals

Bald eagle (*Haliaeetus leucocephalus*) (delisted, monitor status)

Black swift (*Cypseloides niger*)

Burrowing owl (*Athene cunicularia*)

Ferruginous hawk (*Buteo regalis*)

Larch Mountain salamander (*Plethodon larselli*)

Loggerhead shrike (*Lanius ludovicianus*)

Long-eared myotis (*Myotis evotis*)

Northern goshawk (*Accipiter gentilis*)

Olive-sided flycatcher (*Contopus cooperi*)

Pacific lamprey (*Lampetra tridentata*)

Pallid Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)

Peregrine falcon (*Falco peregrinus*) (Delisted, monitor status)

Pygmy whitefish (*Prosopium coulteri*)
Redband trout (*Oncorhynchus mykiss*)
River lamprey (*Lampetra ayresi*)
Sagebrush lizard (*Sceloporus graciosus*)
Sharptail snake (*Contia tenuis*)
Townsend's ground squirrel (*Spermophilus townsendii*)
Western brook lamprey (*Lampetra richardsoni*)
Western gray squirrel (*Sciurus griseus griseus*)
Westslope cutthroat trout (*Oncorhynchus clarki lewisi*)
Wolverine (*Gulo gulo*)

Vascular Plants

Astragalus columbianus (Columbia milk-vetch)
Cypripedium fasciculatum (Clustered lady's-slipper)
Delphinium viridescens (Wenatchee larkspur)
Lomatium tuberosum (Hoover's desert-parsley)
Phacelia minutissima (Least phacelia)
Pinus albicaulis (Whitebark pine)
Silene seelyi (Seely's silene)
Tauschia hooveri (Hoover's tauschia)

Mosses

Orthotrichum praemorsum

APPENDIX C

Washington Natural Heritage Program Species List



[Return to Washington
Natural Heritage Program](#)

**Washington
Natural
Heritage
Program**

Reference Desk

Reference Desk	Location Search	Rare Plants	Rare Animals	Communities
GIS	Field Guides	Publications	Natural Heritage Plan	

**Washington Natural Heritage Information System
List of Known Occurrences of Rare Plants in Washington
February 2009
Kittitas County**

A key to status fields appears below. If a scientific name is underlined you may click on it to go to a field guide page (pdf format, average size 300 kb) for that taxon.

Scientific Name	Common Name	State Status	Federal Status	Historic Record
<u>Agoseris elata</u>	tall agoseris	S		
<u>Anemone patens var. multifida</u>	pasqueflower	T		
<u>Anthoxanthum hirtum</u>	common northern sweet grass	R1		H
<u>Astragalus arrectus</u>	Palouse milk-vetch	T		H
<u>Astragalus columbianus</u>	Columbia milk-vetch	S	SC	
<u>Astragalus misellus var. pauper</u>	Pauper milk-vetch	S		
<u>Camissonia pygmaea</u>	dwarf evening-primrose	S		
<u>Camissonia scapoidea ssp. scapoidea</u>	naked-stemmed evening-primrose	S		
<u>Carex comosa</u>	bristly sedge	S		H
<u>Carex macrochaeta</u>	large-awn sedge	T		H
<u>Carex pauciflora</u>	few-flowered sedge	S		
<u>Carex scirpoidea ssp. scirpoidea</u>	Canadian single-spike sedge	S		
<u>Chaenactis thompsonii</u>	Thompson's chaenactis	S		
<u>Collomia macrocalyx</u>	bristle-flowered collomia	S		
<u>Cryptantha gracilis</u>	narrow-stem cryptantha	S		
<u>Cryptantha leucophaea</u>	gray cryptantha	S	SC	
<u>Cryptantha rostellata</u>	beaked cryptantha	T		
<u>Cryptantha scoparia</u>	miner's candle	S		
<u>Cypripedium fasciculatum</u>	clustered lady's-slipper	S	SC	
<u>Delphinium viridescens</u>	Wenatchee larkspur	T	SC	
<u>Eatonella nivea</u>	white eatonella	T		
<u>Erigeron basalticus</u>	basalt daisy	T	SC	
<u>Erigeron piperianus</u>	Piper's daisy	S		H
<u>Erigeron salishii</u>	Salish fleabane	S		H
<u>Gentiana douglasiana</u>	swamp gentian	S		
<u>Hackelia hispida var. disjuncta</u>	sagebrush stickseed	S		H
<u>Iliamna longisepala</u>	longsepal globemallow	S		
<u>Juncus howellii</u>	Howell's rush	T		
<u>Lomatium tuberosum</u>	Hoover's desert-parsley	S	SC	

<u>Mimulus suksdorfii</u>	Suksdorf's monkey-flower	S	
<u>Minuartia nuttallii ssp. fragilis</u>	Nuttall's sandwort	T	
<u>Montia diffusa</u>	branching montia	S	H
<u>Nicotiana attenuata</u>	coyote tobacco	S	
<u>Oenothera caespitosa ssp. caespitosa</u>	caespitose evening-primrose	S	
<u>Ophioglossum pusillum</u>	Adder's-tongue	T	H
<u>Oxytropis campestris var. gracilis</u>	slender crazyweed	S	H
<u>Pediocactus nigrispinus</u>	snowball cactus	R1	
<u>Pellaea breweri</u>	Brewer's cliff-brake	S	
<u>Penstemon eriantherus var. whitedii</u>	fuzzytongue penstemon	S	
<u>Phacelia minutissima</u>	least phacelia	E	SC
<u>Pyrrocoma hirta var. sonchifolia</u>	sticky goldenweed	S	
<u>Sidalcea oregana var. calva</u>	Wenatchee Mountain checker-mallow	E	LE
<u>Silene seelyi</u>	Seely's silene	S	SC
<u>Spiranthes porrifolia</u>	western ladies-tresses	S	
<u>Subularia aquatica var. americana</u>	water awlwort	R1	
<u>Tauschia hooveri</u>	Hoover's tauschia	T	SC

Description of Codes

Historic Record:

H indicates most recent sighting in the county is before 1977.

State Status

State Status of plant species is determined by the Washington Natural Heritage Program. Factors considered include abundance, occurrence patterns, vulnerability, threats, existing protection, and taxonomic distinctness.

Values include:

E = Endangered. In danger of becoming extinct or extirpated from Washington.

T = Threatened. Likely to become Endangered in Washington.

S = Sensitive. Vulnerable or declining and could become Endangered or Threatened in the state.

X = Possibly extinct or Extirpated from Washington.

R1 = Review group 1. Of potential concern but needs more field work to assign another rank.

R2 = Review group 2. Of potential concern but with unresolved taxonomic questions.

Federal Status

Federal Status under the U.S. Endangered Species Act(USESA) as published in the Federal Register:

LE = Listed Endangered. In danger of extinction.

LT = Listed Threatened. Likely to become endangered.

PE = Proposed Endangered.

PT = Proposed Threatened.

C = Candidate species. Sufficient information exists to support listing as Endangered or Threatened.

SC = Species of Concern. An unofficial status, the species appears to be in jeopardy, but insufficient information to support listing.

APPENDIX D
Site Photographs



Photo 1: View of ponderosa pine forest and woodland in project area.



Photo 2: View of open water habitat in project area. Several intermittent streams present, as well.



Photo 3: View of herbaceous wetland in project area.



Photo 4: View of riparian habitat overhanging intermittent stream channel.



Photo 5: Upland aspen habitat south of artificially impounded pond. Aspen rings the pond in association with ponderosa pine and Douglas fir and continues for a short distance up the drainage.

ATTACHMENT B

Wetland Delineation Report

Report

Teaway Solar Reserve Wetland Delineation Report Kittitas County, Washington

Prepared for
Teaway Solar Reserve, LLC

August 2009

Prepared by
CH2MHILL



**Printed on
Recycled and
Recyclable
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1.0 Introduction

CH2M HILL conducted a wetlands and other waters delineation in June and July 2009 for the proposed Teanaway Solar Reserve project (project), a solar facility on private land in an unincorporated area of Kittitas County, Washington. Twelve wetlands and six ephemeral streams were delineated.

The 982-acre proposed project area is located on the eastern slopes of the Cascade Mountains on Cle Elum Ridge (see Figure 1 in Appendix A). The solar facility and associated components will include solar panels, a substation on approximately 10 acres, and potentially a transmission line (up to 300 feet wide of right-of-way required) to connect the substation to the existing Bonneville Power Administration (BPA) 345-kilovolt (kV) Rocky Reach-Maple Valley transmission line.

Subsequent sections of this report are organized as follows:

- 2.0—Landscape Setting and Land Use (Historical and Current)
- 3.0—Site Alterations
- 4.0—Precipitation Data and Analysis
- 5.0—Methods
- 6.0—Description of Wetlands and Other Waters
- 7.0—Mapping Method
- 8.0—Results and Conclusions
- 9.0—References

Report figures are presented in Appendix A. U.S. Army Corps of Engineers (USACE) wetland data forms are included in Appendix B. Site photographs are in Appendix C. Washington wetland rating forms and maps are in Appendix D. Washington State Department of Ecology function assessment forms are in Appendix E. Background information supporting these forms is available upon request.

2.0 Landscape Setting and Land Use (Historical and Current)

The proposed project site is located approximately 4 miles northeast of Cle Elum, Washington, in Township 20N, Range 16E, within Sections 22, 23, and 27 (see Figure 1 in Appendix A for map of site location). The site is located on the eastern slopes of the Cascade Mountains on Cle Elum Ridge, which runs generally from east to west at elevations ranging from approximately 2,200 to 2,600 feet. The Teanaway River is approximately 1 mile to the northeast of Cle Elum Ridge. The site is accessed from Highway 970 by way of County roads such as Red Bridge Road, and private roads such as Loping Lane and Wehl Road.

The proposed project area consists of 982 acres. Based on site surveys, the project will utilize approximately 580 acres within the proposed project area. The remaining acres are currently undeveloped open space, but may accommodate some future expansion of the project after appropriate surveys are conducted to address any environmental concerns and compliance with any underlying federal, state, or local permitting requirements.

Vegetation communities within the proposed project area are early to mid-successional ponderosa pine (*Pinus ponderosa*) forests and sloped hillside meadows where logging has occurred more recently. Current and historical land uses in the vicinity of the project site are ranching and commercial tree farming.

The proposed project is located in the Teanaway River and Yakima River watersheds within the Yakima River basin and Upper Yakima subbasin. Tributaries within the project site flow into ponds, ditches, and vegetated swales. Water from these tributaries not used for irrigation practices may eventually flow into the Yakima River several miles to the south with the exception of one unnamed tributary (S6), which flows directly into the Teanaway River. Wetlands within the project site are hydrologically connected to these tributaries.

3.0 Site Alterations

Trees within the project site have been selectively harvested. The most recent harvest was in 2001 and 2002. An old earthen berm crosses stream S4 and has created or enlarged wetland W12 (see Section 6.0 for description of wetlands and other waters).

4.0 Precipitation Data and Analysis

Annual precipitation in the region averages approximately 23.07 inches of rain and 86.5 inches of snow for the water year (NRCS, 2002). Precipitation data were reviewed for the nearest weather station located approximately 5 miles west of the project site in Cle Elum, Washington. This weather station is approximately 400 feet lower in elevation than the project site. Precipitation for the water year beginning October 2008 through June 2009 was 18.35 inches (Table 1).

TABLE 1
 Monthly Precipitation Data (NRCS, 2002; KWACLEEL Weather Station, 2009)

	Actual Precipitation (in inches)	Normal Range* (in inches)	Outside Normal Range (in inches)
October 2008	1.36	0.72 - 2.14	
November 2008	5.96	2.61 - 4.61	+1.35
December 2008	1.48	3.05 - 5.27	-1.70
January 2009	4.36	2.31 - 4.60	
February 2009	0.52	1.52 - 3.04	-1.00
March 2009	2.48	1.12 - 1.99	+0.49
April 2009	0.83	0.79 - 1.38	
May 2009	1.08	0.57 - 1.12	
June 2009	0.28	0.57 - 1.16	-0.29
Total	18.35	13.26 – 25.31	

*"Normal Range" is the range within which precipitation for the given period has a 70 percent chance of occurring.

Table 2 presents the precipitation data for the 2-week period preceding the field investigation dates of June 9, 10, 16, and 17, 2009. Precipitation totaled 0.28 inch.

TABLE 2
 Daily Precipitation Data (KWACLEEL3 Weather Station, 2009)

Date	Precipitation (in inches)
May 27, 2009	0.0
May 28, 2009	0.0
May 29, 2009	0.0
May 30, 2009	0.0
May 31, 2009	0.0
June 1, 2009	0.0
June 2, 2009	0.0
June 3, 2009	0.0
June 4, 2009	0.12
June 5, 2009	0.0
June 6, 2009	0.0
June 7, 2009	0.0
June 8, 2009	0.0
June 9, 2009	0.16
June 10, 2009	0.0
June 11, 2009	0.0
June 12, 2009	0.0
June 13, 2009	0.0
June 14, 2009	0.0
June 15, 2009	0.0
June 16, 2009	0.0
Total:	0.28

Table 3 presents the precipitation data for the 2-week period preceding the field investigation date of July 9, 2009. Precipitation totaled 0.0 inch.

TABLE 3
Daily Precipitation Data (KWACLEEL3 Weather Station, 2009)

Date	Precipitation (in inches)
June 27, 2009	0.0
June 27, 2009	0.0
June 28, 2009	0.0
June 29, 2009	0.0
June 30, 2009	0.0
July 1, 2009	0.0
July 2, 2009	0.0
July 3, 2009	0.0
July 4, 2009	0.0
July 5, 2009	0.0
July 6, 2009	0.0
July 7, 2009	0.0
July 8, 2009	0.0
July 9, 2009	0.0
Total:	0.0

Based on the above precipitation data, precipitation for the water year prior to the fieldwork was within the normal range. June precipitation was 0.29 inch below the normal range and there was no precipitation in July. However, the actual precipitation amounts were only slightly below the normal range and were unlikely to be significant enough to affect the observation and interpretation of wetland hydrological indicators or stream flow duration indicators at that time of year.

5.0 Methods

Before the field investigation began, the following information was reviewed:

- Watercourses mapped by the Washington State Department of Natural Resources (WADNR) (2006)
- U.S. Geological Survey (USGS) 24K topographic maps: Teanaway quadrangle
- National Wetland Inventory (NWI) 24K maps: Teanaway quadrangle
- Soil Survey Geographic Database of Kittitas County, Washington (2002) (see Figure 4 in Appendix A)
- Hydric Soils List of Kittitas County, Washington
- True color aerial photographs flown in various years

One NWI-mapped wetland is in the southwest corner of section 22. It is labeled as *palustrine emergent, semi-permanently flooded*. Five streams were mapped by WADNR. All five are classified as *non-fish, seasonal*. There are no mapped hydric soil units within the project site.

Fieldwork was conducted on June 9, 10, 16, and 17, and July 9, 2009. Potential waters and wetlands identified in the office review were field verified. Additional potential waters and wetlands were observed during fieldwork and were delineated.

Data collection and analysis followed procedures in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valley and Coast* (USACE, 2008). The routine onsite wetland determination method was used to observe vegetation, soils, and hydrological conditions at representative locations. Paired sample plots were used to document wetland and upland areas adjacent to wetland boundaries. The *National List of Plant Species that Occur in Wetlands: Northwest (Region 9)* (USFWS, 1988) and the 1993 supplement (USACE, 1993) were used to determine hydrophytic status of vegetation.

The widths of stream channels were estimated in the field [Ordinary High Water Mark to Ordinary High Water Mark (OHWM to OHWM)].

Wetlands were rated using the Department of Ecology's *Wetland Rating System for Eastern Washington* (Hruby, 2004).

6.0 Description of Wetlands and Other Waters

Twelve wetlands and six ephemeral streams were delineated (see Figure 5 in Appendix A).

6.1 Wetlands

Twelve wetlands were delineated (see Table 4, located on page 11). They total 0.97 acre within the project site. All of the wetlands were determined to be palustrine emergent (PEM) (Cowardin). Eleven wetlands were depressional (HGM) wetlands. Wetland W12 was riverine (HGM).

Wetlands W1, W3, and W6 and wetlands W4, W5, and W7 formed two complexes in the northeast portion of the survey area. Wetlands W8, W9, and W11 were adjacent to road fill and were probably created or enlarged by the fill backing up water. W11 appeared to be an excavated roadside ditch and W8 was at the outlet of a culvert that carried water under the road from W11. Wetland W10 was created or enlarged by road fill across the headwaters of stream S4 that backs up water due to a perched culvert. Wetland W12, which corresponded to the NWI-mapped wetland, was created or enlarged by an old earthen berm across stream S4.

The hydrologic source of all wetlands within the project site is precipitation and snowmelt. No springs or seeps were observed. Inundation and saturation were only observed at wetland W12. Primary hydrologic indicators observed were predominantly surface soil cracks (B6); however, some wetlands had sparsely vegetated concave surface (B8), and algal mat or crust (B4) indicators. The secondary indicator of geomorphic position (D2) was observed for all the wetlands. These indicators suggest that precipitation and snowmelt pond in depressional areas during the wet season and dry out during the summer.

Hydric soil indicators observed in soil pits included Depleted Matrix (F3) and Redox Dark Surface (F7). Soils were predominantly silt loams with some clay soils occurring below 6 inches. Most of the wetlands had a restrictive layer of rock and gravel, usually at about 12 inches.

Dominant wetland plants included *Ventenata dubia* (NOL), *Juncus parryi* (FAC), *Gnaphalium palustre* (FAC), and *Eleocharis palustris* (OBL). Other wetland plants included *Plagiobotrys scouleri* (FACW), *Carex feta* (FACW), *Potentilla gracilis* (FAC), *Camassia quamash* (FACW), and *Ranunculus acris* (FACW). Some wetlands were sparsely vegetated and contained little or no vegetation. The hydrophytic vegetation criterion was met for many of the wetlands through problematic vegetation procedures, because they were dominated by *Ventenata dubia*, an invasive annual species that presumably dominates depressional areas in dryer years or as the depressions dry out.

6.2 Other Waters

Six ephemeral streams were delineated within the project site (see Table 5, located on page 12). Indicators observed during site visits that suggest ephemeral water flow included moderately apparent bed and banks, scour marks, and cobble, gravel, and sand stream substrate. Abrupt headcuts and defined and continuous bed and banks were used to determine the extent of streams. No springs, seeps, or evidence of groundwater was observed along stream corridors indicating the source of hydrology is solely precipitation and snow melt. Lack of water-dependant organisms (fish, amphibians, macro invertebrates, streamer mosses) within stream corridors suggests that water does not persist in streams longer than the wet season.

7.0 Mapping Method

Wetland sample plot locations and wetland other waters boundaries were mapped within the project site using a hand-held Trimble GeoXT geographical positioning system (GPS) unit with sub-meter accuracy capability. Acreages of wetlands within the project site boundaries were calculated using geographical information system (GIS) software.

Estimated accuracy of mapped wetland boundaries and sample plot locations is +/- 3 feet.

8.0 Wetland Ratings

All of the wetlands rated as Category 3. Wetland rating forms and associated figures are in Appendix D.

9.0 Results and Conclusions

Twelve wetlands totaling 0.97 acre and six ephemeral streams were delineated in the project site. All of the waters and wetlands identified in this report are potentially subject to federal or state jurisdiction. Jurisdictional determinations, including the applicability of exemptions, are made on a case-by-case basis by the Washington State Department of Ecology (Ecology) and the USACE.

9.1 Waters of the State

"Surface waters of the state" include lakes, rivers, ponds, streams, inland waters, saltwaters, wetlands, and all other surface waters and water courses within the jurisdiction of the state of Washington (Washington Administrative Code 173-201A-020). All of the delineated streams and wetlands at the project site are naturally occurring features of the landscape and are likely waters of the state.

9.2 Waters of the United States

USACE asserts jurisdiction over the following waters:

- Traditional navigable waters (TNWs)
- Wetlands adjacent to TNWs
- Non-navigable tributaries of TNWs that are relatively permanent waters (RPWs) where the tributaries typically flow year-round or have continuous flow at least seasonally (i.e., typically 3 months)
- Wetlands that directly abut (i.e., have a continuous surface connection to) such tributaries (U.S. Environmental Protection Agency [EPA] and USACE, 2008)

USACE will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a TNW:

- Non-navigable tributaries that are not relatively permanent
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent
- Wetlands adjacent to but that do not directly abut a relatively permanent nonnavigable tributary (EPA and USACE, 2008)

A “significant nexus” is determined through analysis of “the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream TNWs” (EPA and USACE, 2008).

USACE will decide jurisdiction over isolated (i.e., nonadjacent) wetlands and waters based on a fact-specific analysis to determine whether impacts to those wetlands or waters could affect interstate commerce.

9.2.1 Traditional Navigable Waters

There are no traditional navigable waters in the project site. The nearest TNW is the Yakima River (USACE Seattle District, 2008b, 2008c).

9.2.2 Relatively Permanent Waters and Abutting Wetlands

There are no RPWs in the project site.

9.2.3 Non-RPWs and Adjacent Wetlands

All of the non-RPWs (i.e., ephemeral streams) are natural tributaries to the Teanaway and Yakima rivers. The Teanaway River flows into the Yakima River, a TNW. These streams and their adjacent wetlands in the proposed project area potentially have a significant nexus to the Yakima River, which is the nearest downstream TNW, based on their contributions of water supply, nutrients, and flood flow attenuation to the Yakima. They are all presumed to be jurisdictional until a final determination has been made by USACE.

Tables 4 and 5 provide a summary of potentially jurisdictional wetlands and waters within the project site boundaries.

TABLE 4
 Wetlands Summary Table

Wetland ID	Wetland Acreage	Cowardin Type	HGM Type	Wetland Adjacent to RPW	Wetland Adjacent to Non-RPW	USACE Jurisdiction	State Jurisdiction
W1	0.010	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W2	0.004	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W3	0.030	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W4	0.067	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W5	0.004	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W6	0.253	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W7	0.231	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W8	0.027	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W9	0.013	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W10	0.019	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W11	0.006	PEM	Depressional	NO	YES	Potentially – if significant nexus to TNW	YES
W12	0.312	PEM	Riverine	NO	YES	Potentially – if significant nexus to TNW	YES

TABLE 5
Other Waters Summary Table

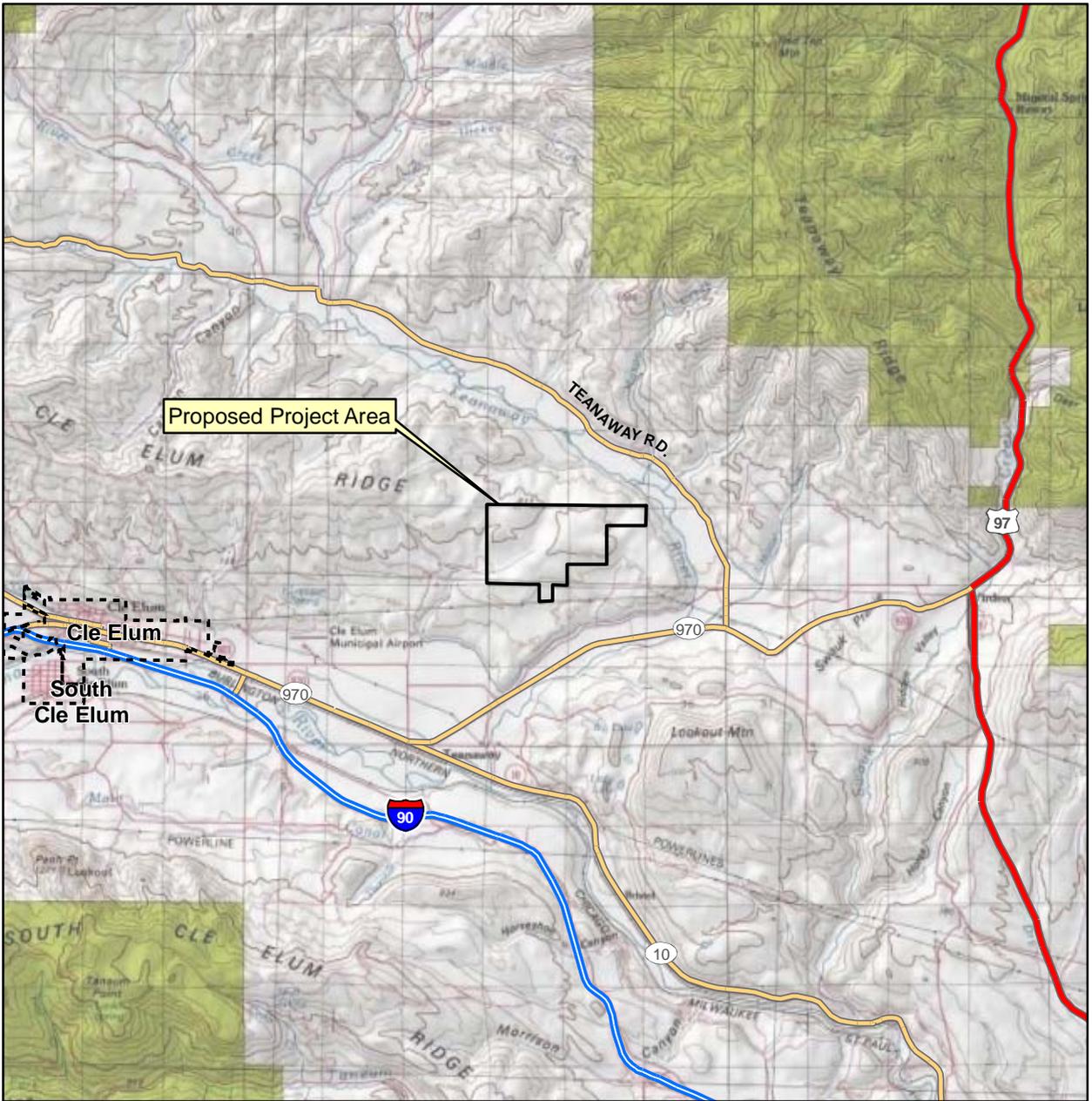
Water ID	Width (feet)	Flow Regime	Nearest TNW	Non RPW	RPW	USACE Jurisdiction	State Jurisdiction
S1	2-5	Ephemeral	Yakima River	YES	NO	Potentially – if has significant nexus to TNW	YES
S2	2-6	Ephemeral	Yakima River	YES	NO	Potentially – if has significant nexus to TNW	YES
S3	2-5	Ephemeral	Yakima River	YES	NO	Potentially – if has significant nexus to TNW	YES
S4	2-4	Ephemeral	Yakima River	YES	NO	Potentially – if has significant nexus to TNW	YES
S5	2-5	Ephemeral	Yakima River	YES	NO	Potentially – if has significant nexus to TNW	YES
S6	1-2	Ephemeral	Yakima River	YES	NO	Potentially – if has significant nexus to TNW	YES

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APPENDIX A
Figures



VICINITY MAP

LEGEND

-  Proposed Project Area
-  City Boundary
-  Interstate
-  Highway
-  Major Road

Note:

1. USGS 100K Quadrangle: Wenatchee.

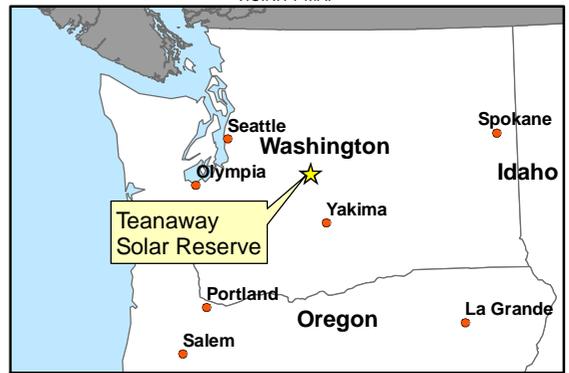
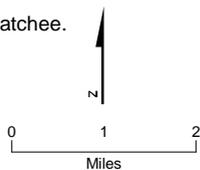
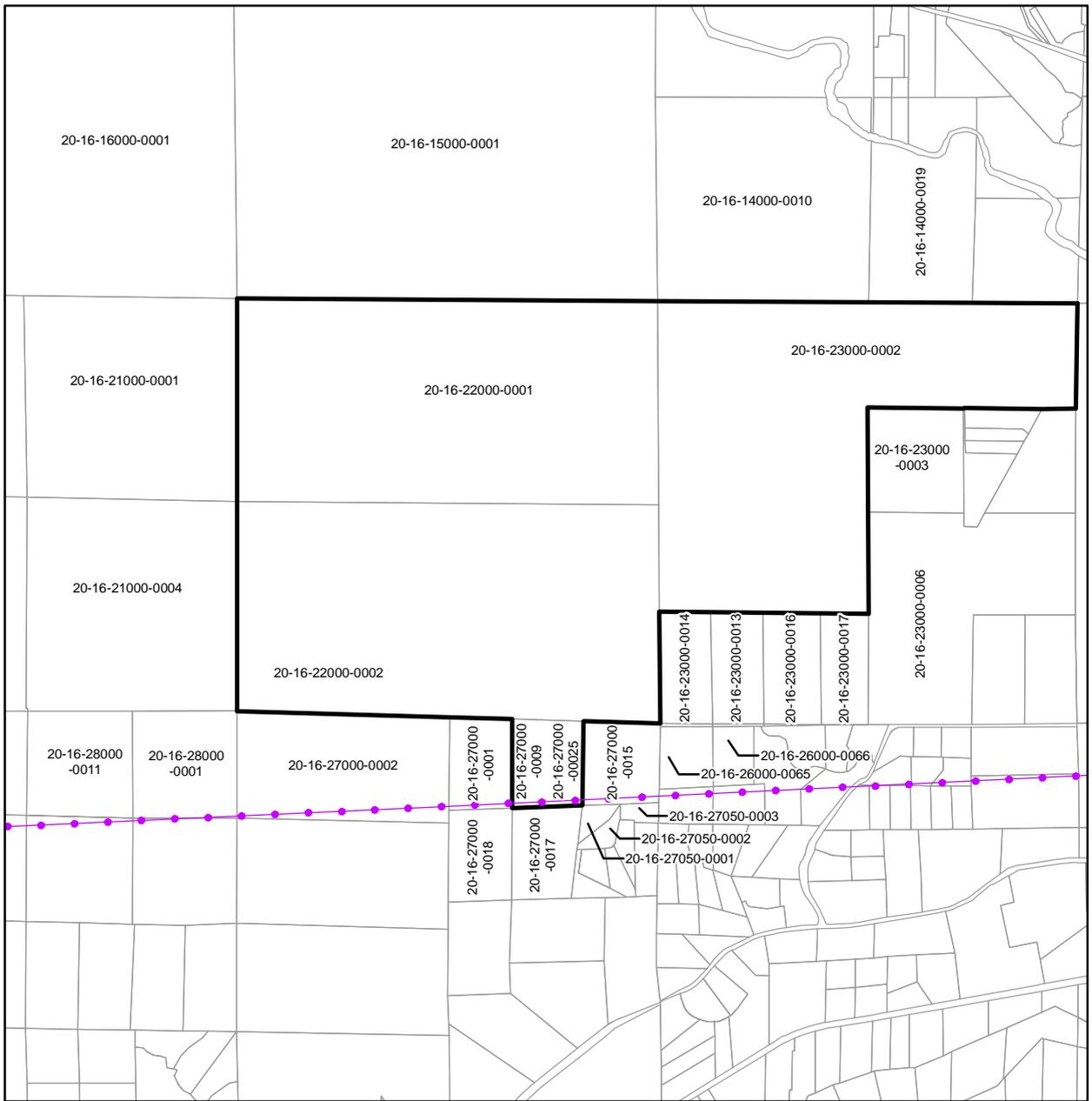


FIGURE 1
Vicinity Map

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

-  Proposed Project Area
-  Existing BPA Transmission Line
-  Tax Lot Boundary

Note:
1. USGS 24K Quadrangle: Teanaway.

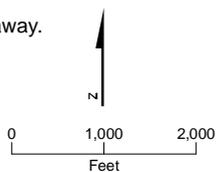
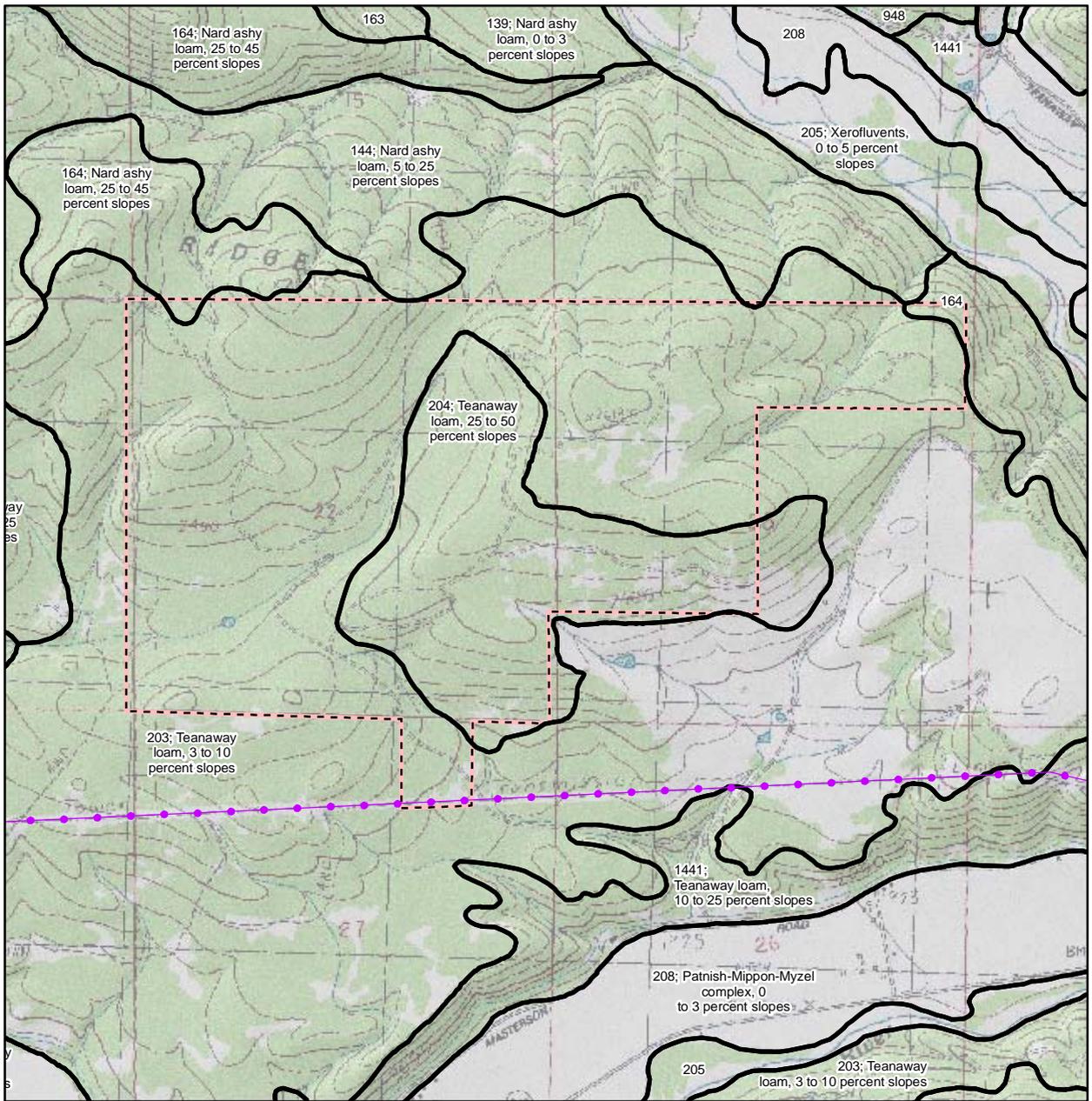


FIGURE 2
Tax Lot Map

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



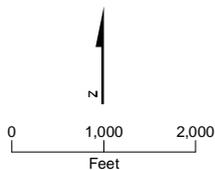
VICINITY MAP

LEGEND

-  Proposed Project Area
-  Existing BPA Transmission Line
-  Soil Unit

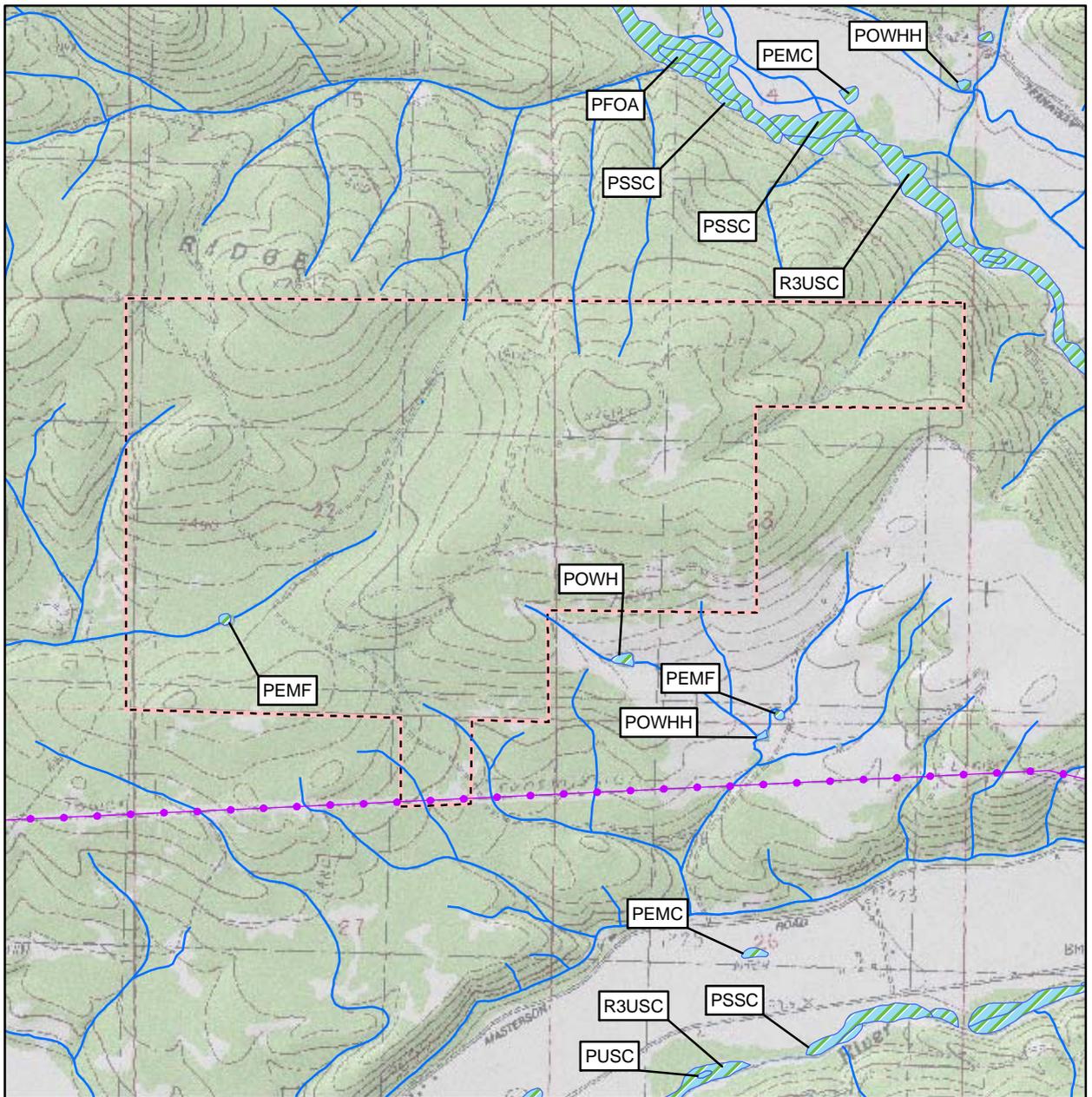
Notes:

1. USGS 24K Quadrangle: Teanaway.
2. Soils Data: Soil Survey Geographic (SSURGO) Database. MUSYM; MUNAME labeled.



**FIGURE 3
Soils Map**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

-  Proposed Project Area
-  Existing BPA Transmission Line
-  Stream
-  NWI Wetland

Notes:

1. USGS 24K Quadrangle: Teanaway.
2. National Wetlands Inventory (NWI) Wetlands Data: United States Fish and Wildlife Service.
3. Stream Data: Washington Department of Natural Resources.

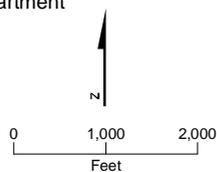
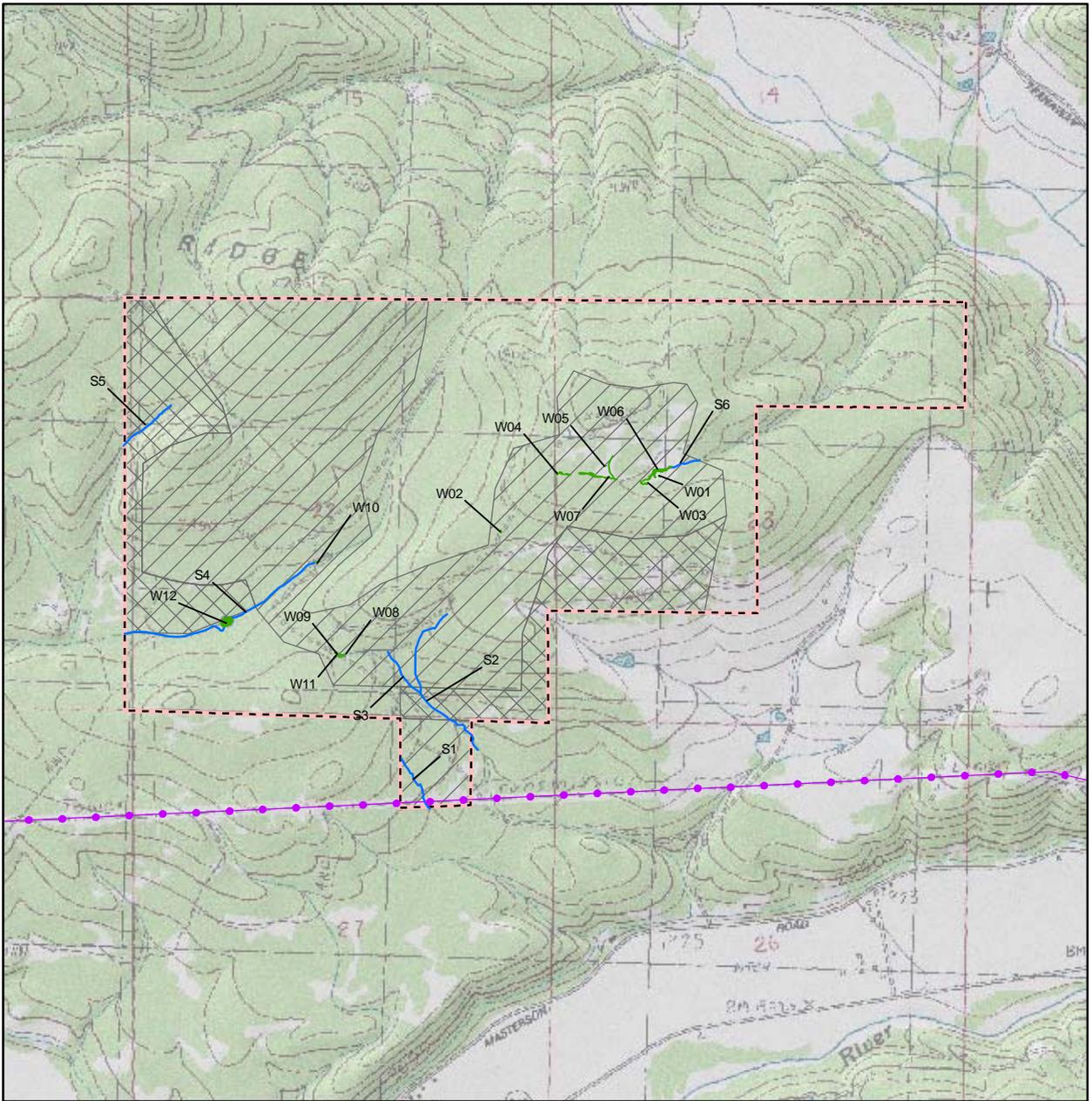


FIGURE 4
National Wetlands Inventory Map

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



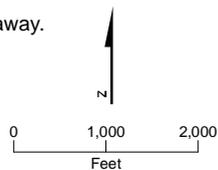
VICINITY MAP

LEGEND

-  Proposed Project Area
-  June 2009 Survey Area
-  July 2009 Survey Area
-  Existing BPA Transmission Line
-  Wetland
-  Stream

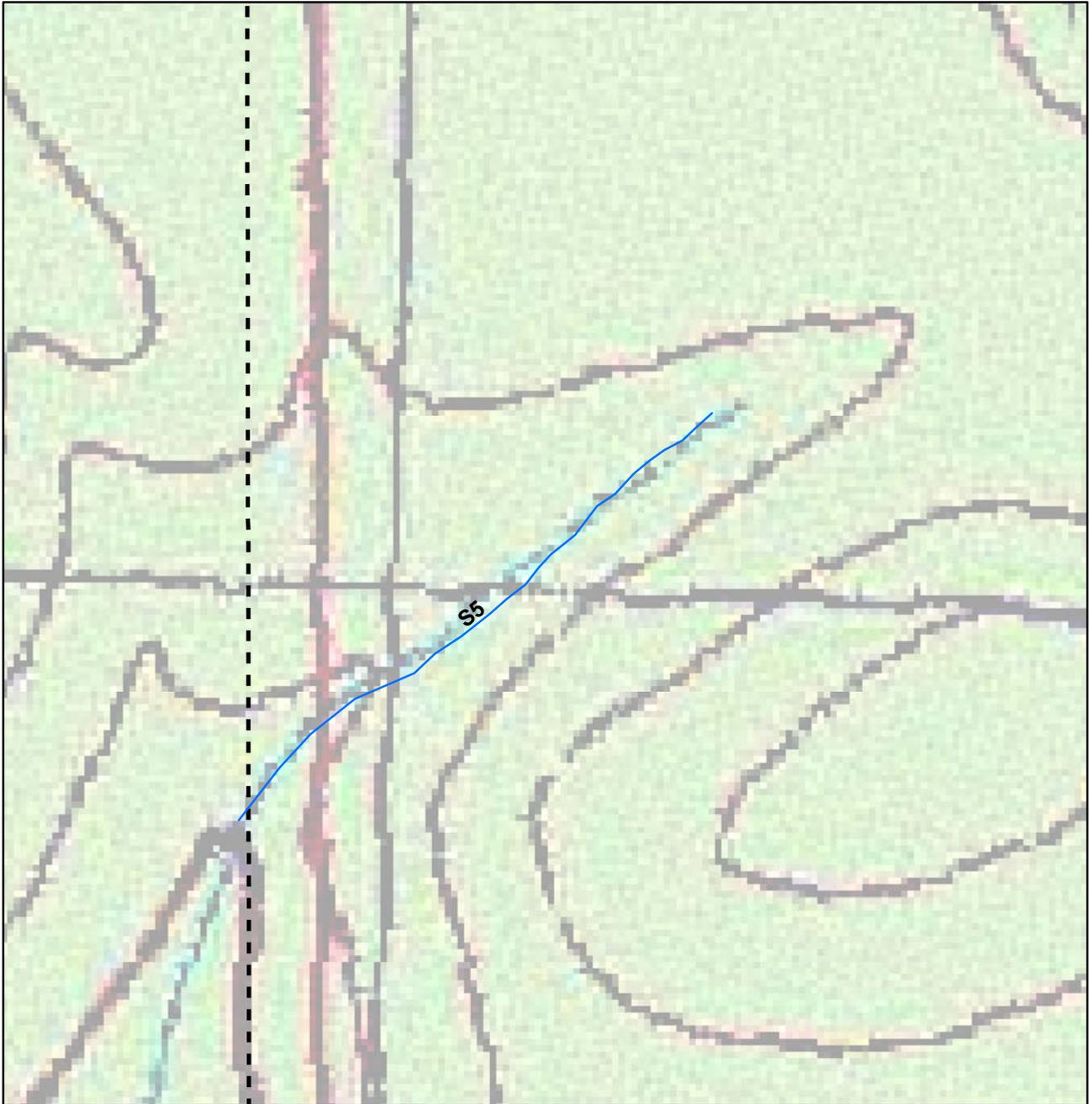
Note:

1. USGS 24K Quadrangle: Teanaway.



**FIGURE 5
Delineation Map-Overview**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

- Wetland Plot
- ~ Stream
- Wetland
- Wetland Survey Area

Note:

1. USGS 24K Quadrangle: Teanaway.

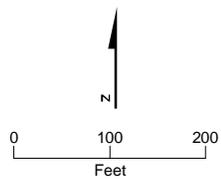
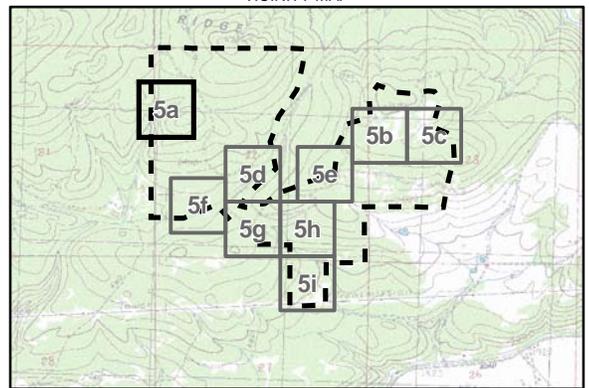
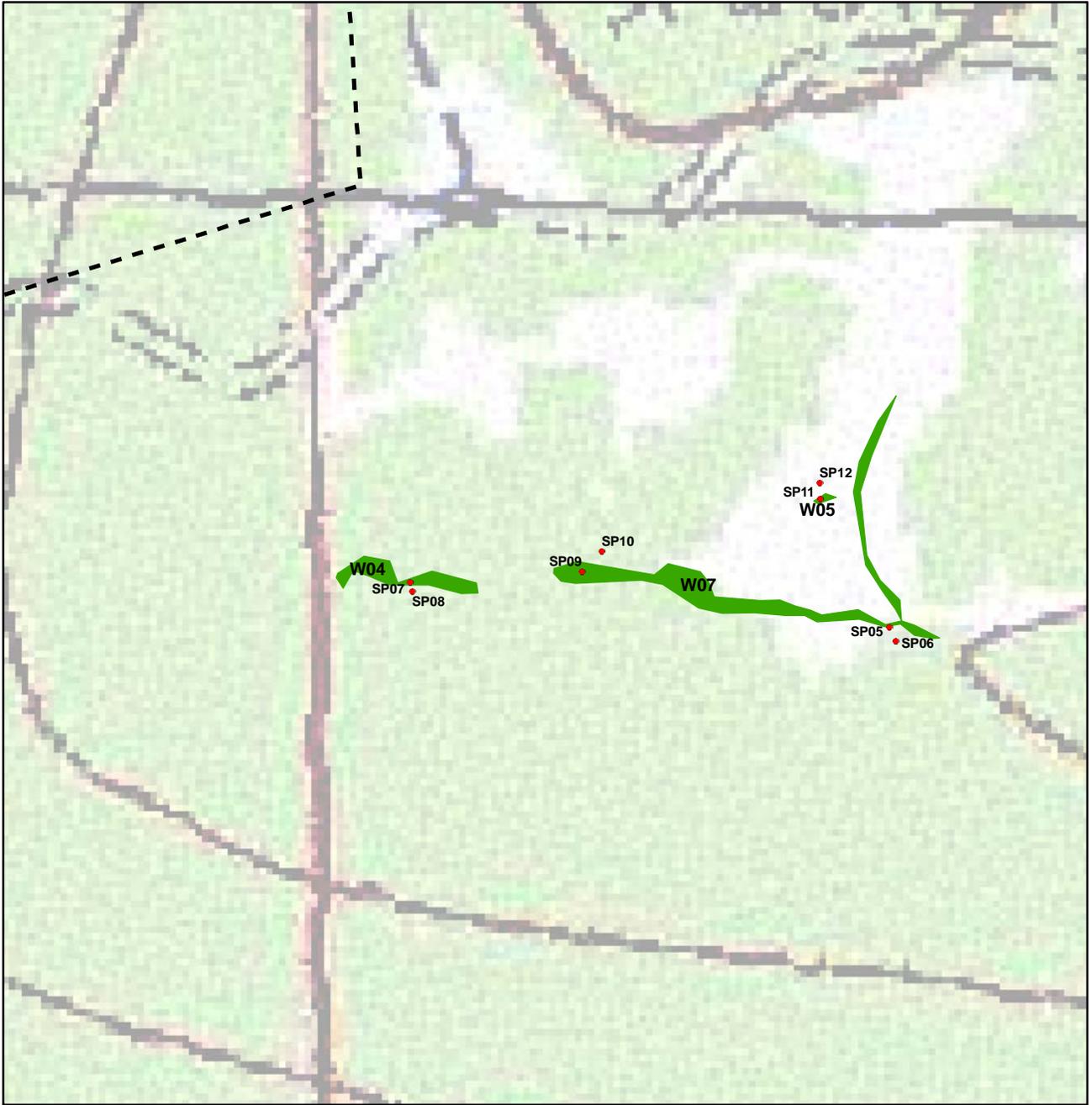


Figure 5a
Delineation Map-Detail

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington

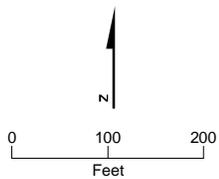


LEGEND

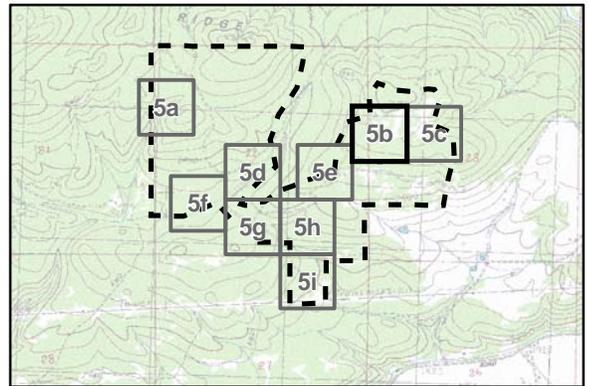
- Wetland Plot
- Stream
- Wetland
- Wetland Survey Area

Note:

1. USGS 24K Quadrangle: Teanaway.

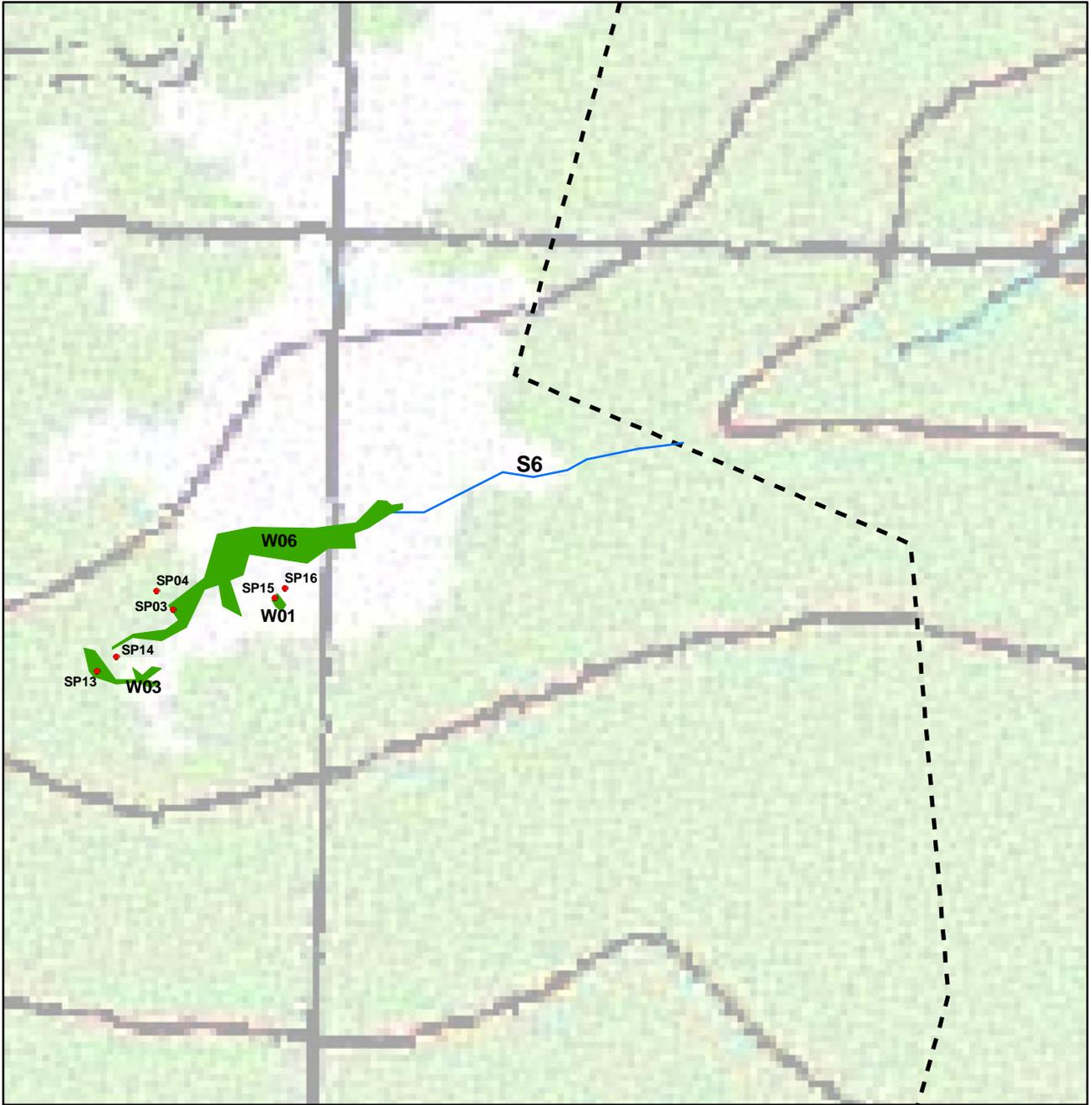


VICINITY MAP



**Figure 5b
Delineation Map-Detail**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

- Wetland Plot
- ~ Stream
- Wetland
- Wetland Survey Area

Note:

1. USGS 24K Quadrangle: Teanaway.

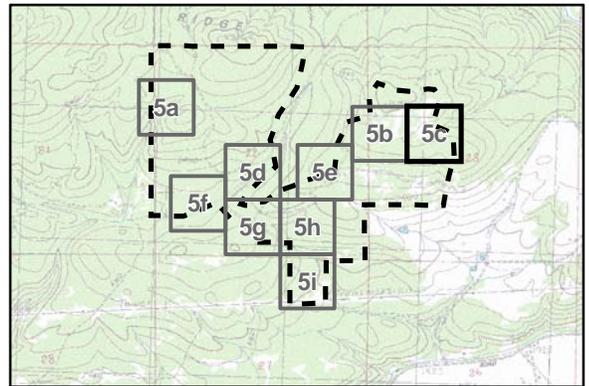
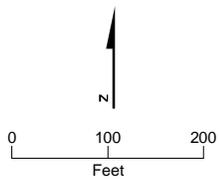
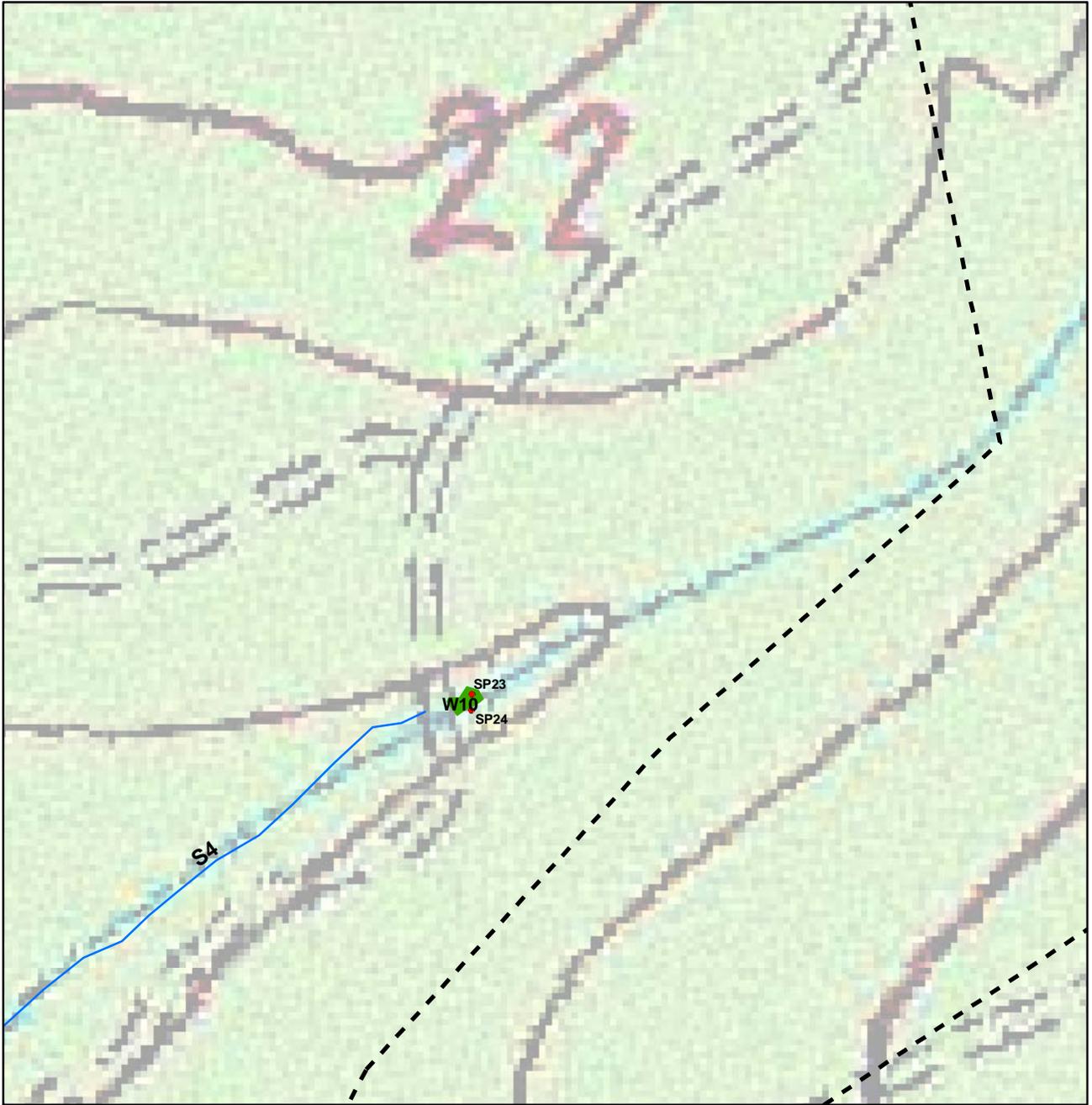


Figure 5c
Delineation Map-Detail

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

- Wetland Plot
- ~ Stream
- Wetland
- Wetland Survey Area

Note:

1. USGS 24K Quadrangle: Teanaway.

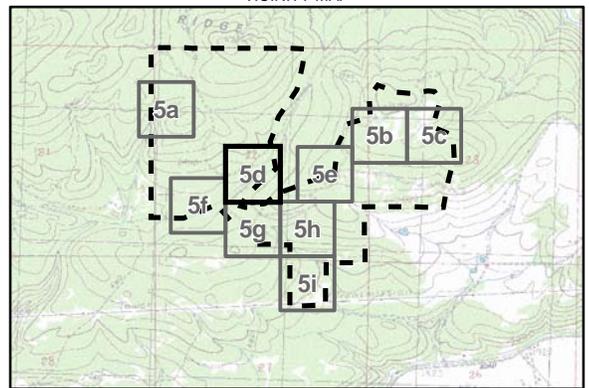
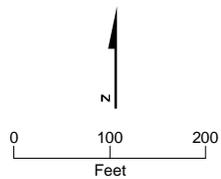
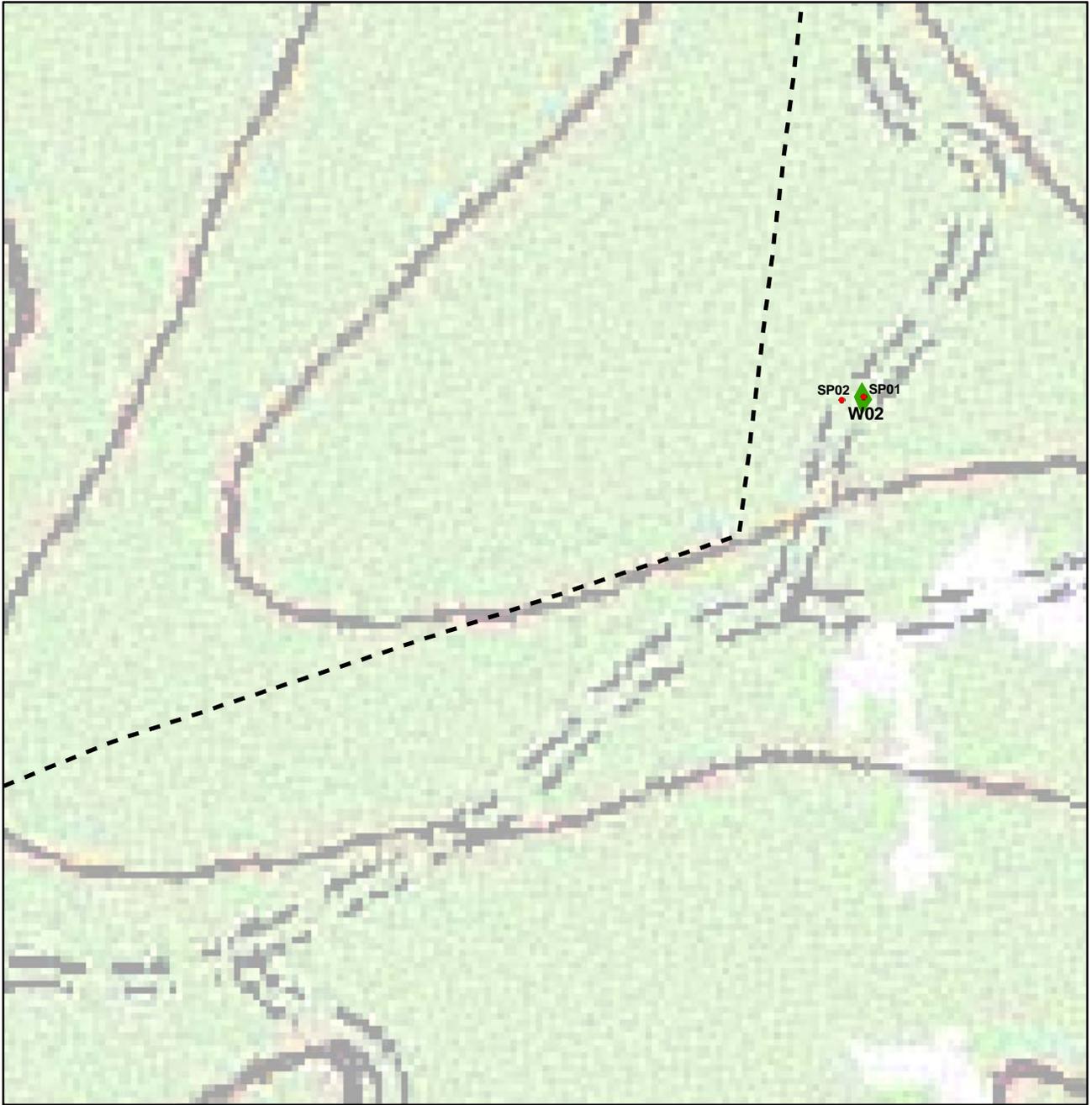


Figure 5d
Delineation Map-Detail

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



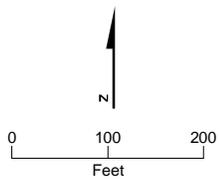
SP02 SP01
W02

LEGEND

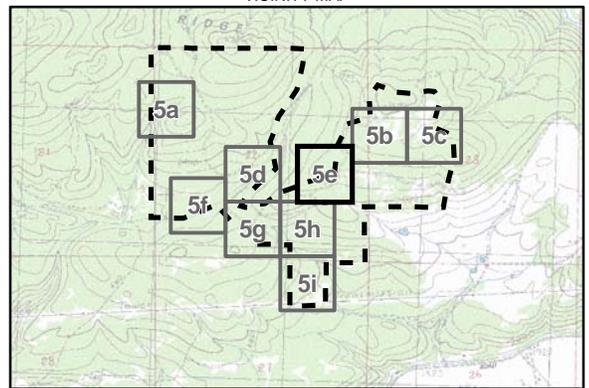
- Wetland Plot
- ~ Stream
- Wetland
- Wetland Survey Area

Note:

1. USGS 24K Quadrangle: Teanaway.

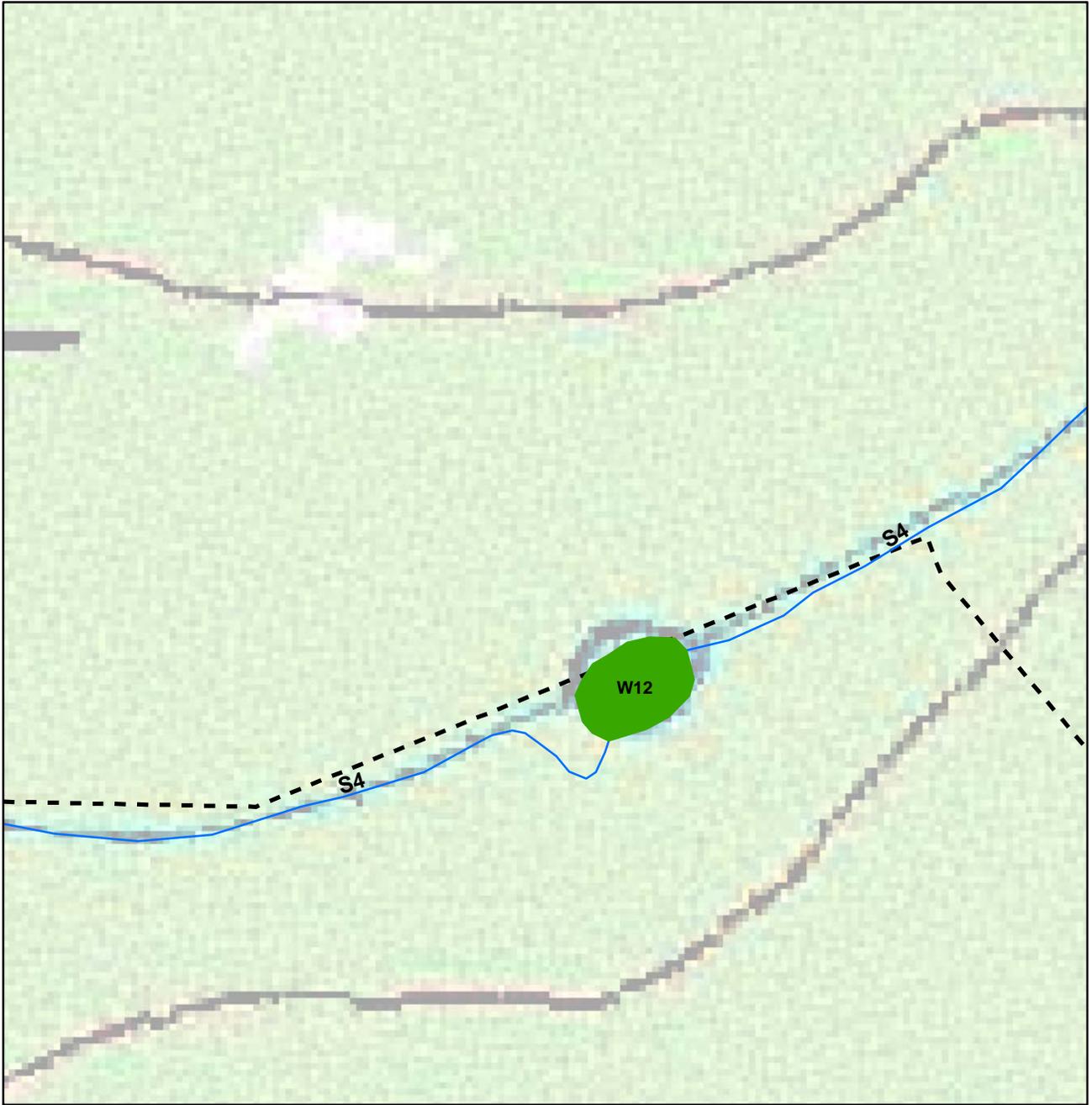


VICINITY MAP



**Figure 5e
Delineation Map-Detail**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

- Wetland Plot
- ~ Stream
- Wetland
- Wetland Survey Area

Note:

1. USGS 24K Quadrangle: Teanaway.

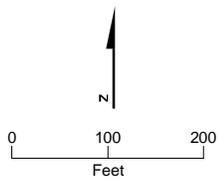
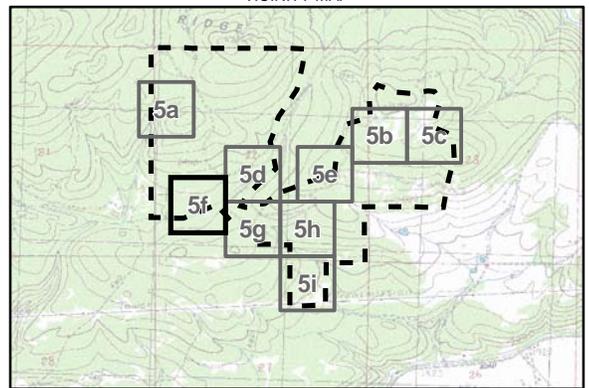
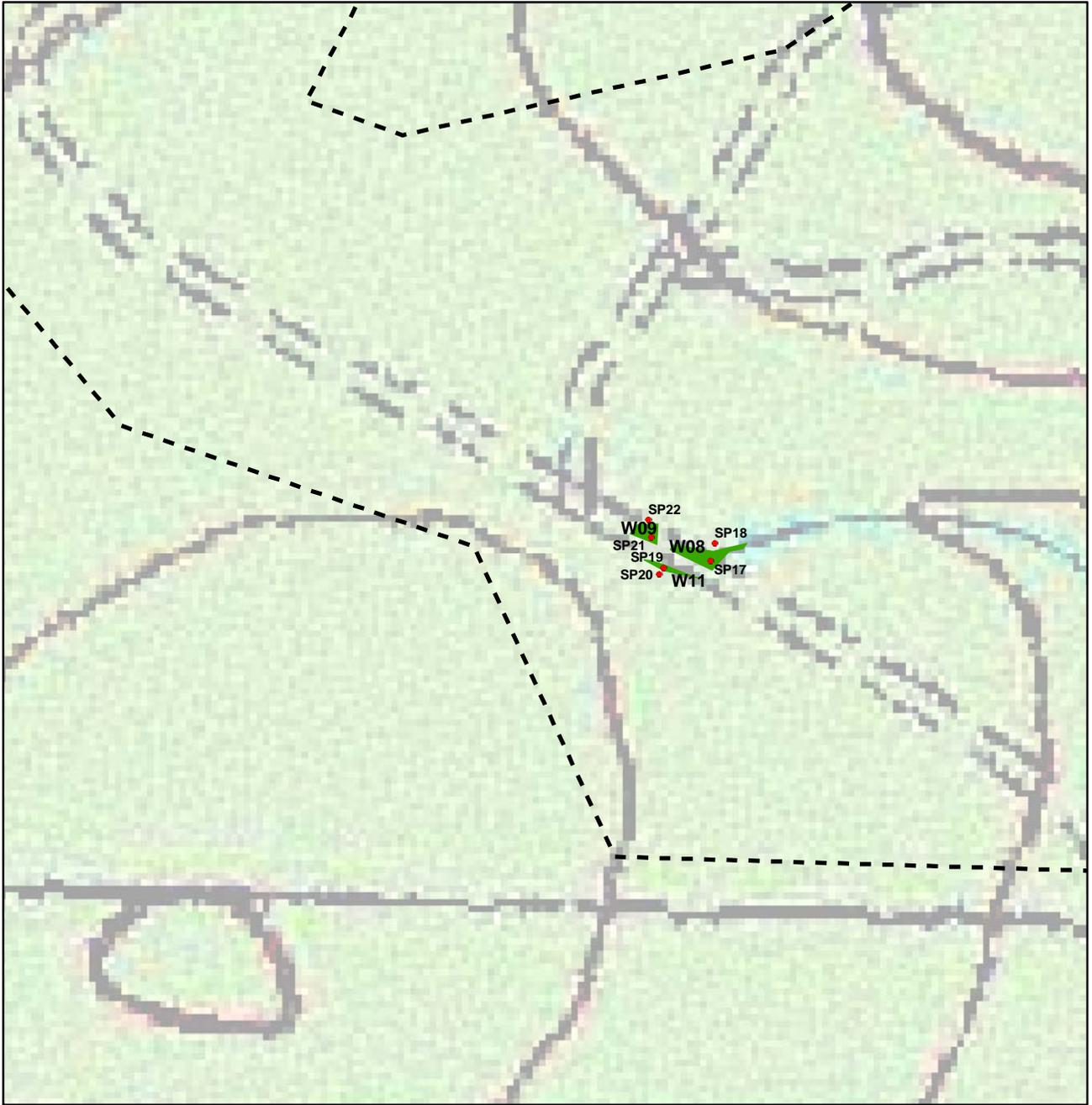


Figure 5f
Delineation Map-Detail

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

- Wetland Plot
- Stream
- Wetland
- Wetland Survey Area

Note:

1. USGS 24K Quadrangle: Teanaway.

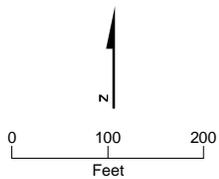
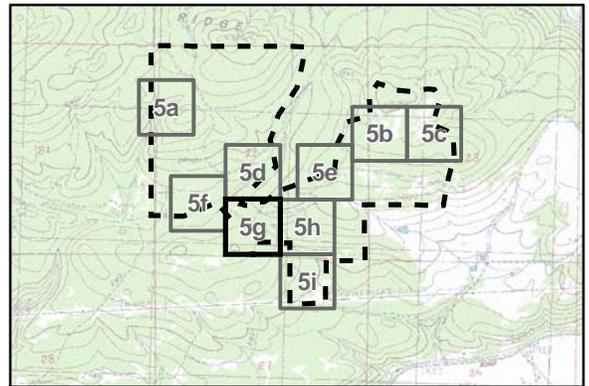
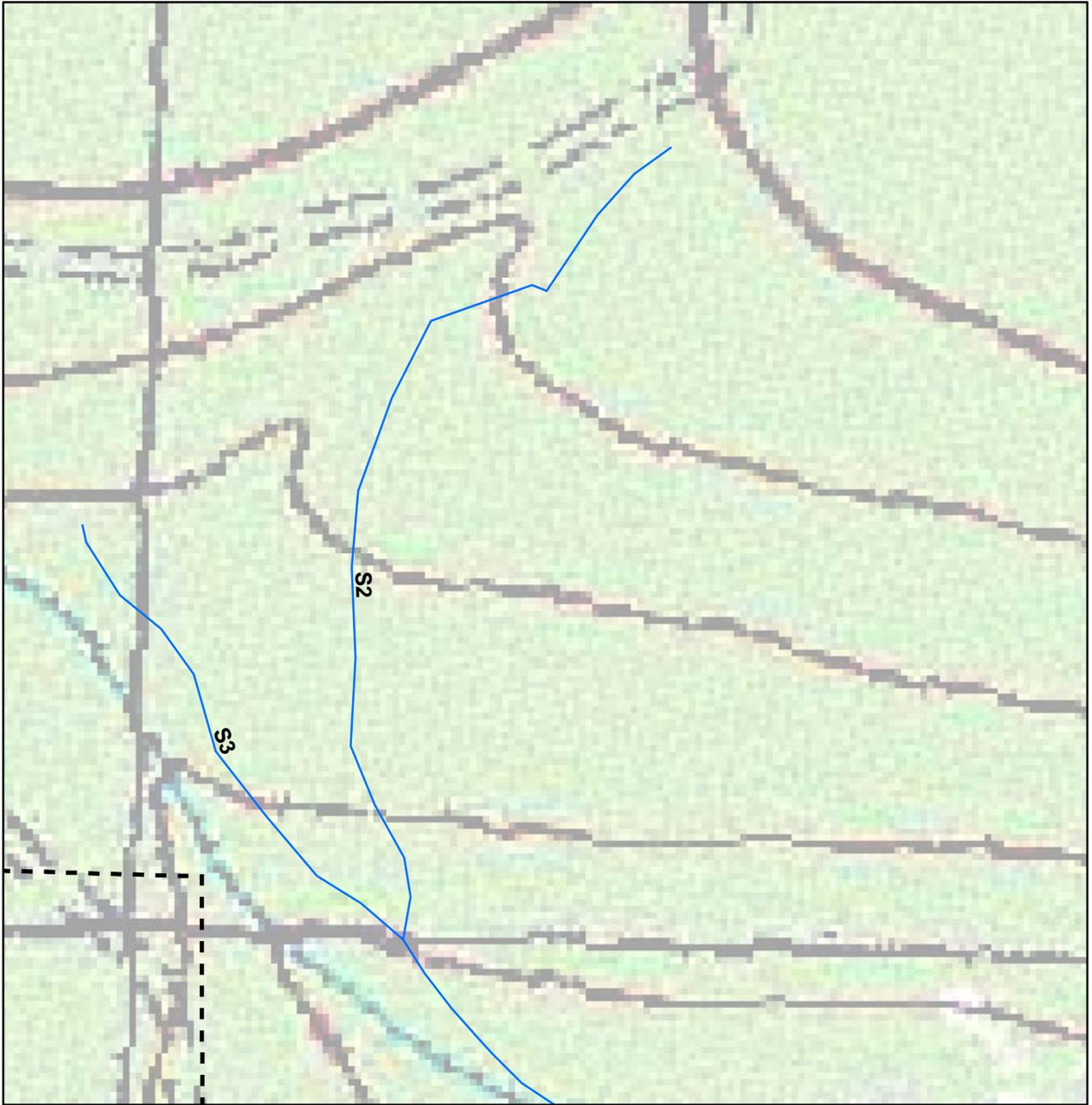


Figure 5g
Delineation Map-Detail

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington

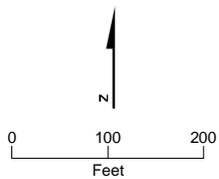


LEGEND

- Wetland Plot
- ~ Stream
- Wetland
- Wetland Survey Area

Note:

1. USGS 24K Quadrangle: Teanaway.



VICINITY MAP

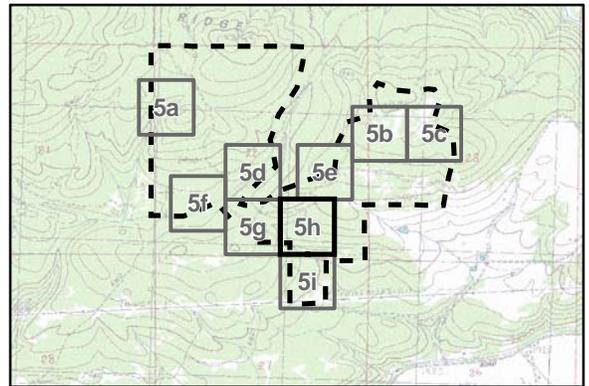


Figure 5h
Delineation Map-Detail

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

- Wetland Plot
- Stream
- Wetland
- Wetland Survey Area

Note:

1. USGS 24K Quadrangle: Teanaway.

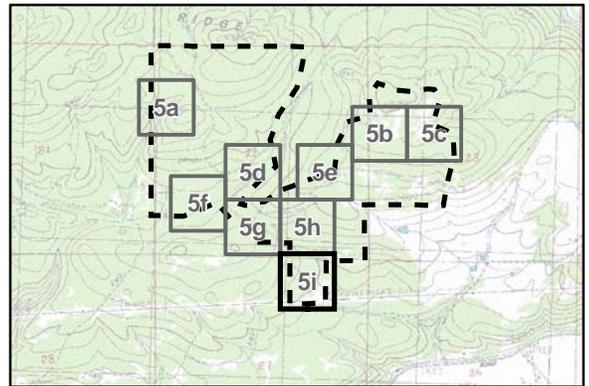
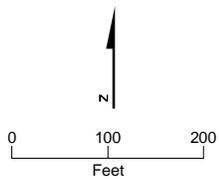


Figure 5i
Delineation Map-Detail

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington

APPENDIX B

**U.S. Army Corps of Engineers Wetland
Determination Data Forms**

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/09/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP1
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21212769 Long: -120.8140945 Datum: NAD 83
 Soil Map Unit Name: 204-Teanaway loam, 25-50 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland W2 is a PEM (Cowardin), depressional (HGM). Wetland boundaries determined by the toe of slope of a distinct depressional area and a change from wetland vegetation <i>Juncus parryi</i> to dominant upland vegetation <i>Balsamorhiza sagittata</i> .	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet:
1. _____	_____	_____	_____	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x 1 = _____
3. _____	_____	_____	_____	FACW species _____ x 2 = _____
4. _____	_____	_____	_____	FAC species <u>13</u> x 3 = <u>39</u>
5. _____	_____	_____	_____	FACU species _____ x 4 = _____
<u>0</u> = Total Cover				UPL species <u>83</u> x 5 = <u>415</u>
				Column Totals: <u>96</u> (A) <u>454</u> (B)
				Prevalence Index = B/A = <u>4.73</u>
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators:
1. <u>Ventenata dubia</u>	<u>80</u>	<u>Y</u>	<u>NOL</u>	<input type="checkbox"/> Dominance Test is >50%
2. <u>Juncus parryi</u>	<u>10</u>	<u>N</u>	<u>FAC</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 ¹
3. <u>Wyethia amplexicaulis</u>	<u>3</u>	<u>N</u>	<u>FAC</u>	<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. <u>Poa bulbosa</u>	<u>3</u>	<u>N</u>	<u>NOL</u>	<input type="checkbox"/> Wetland Non-Vascular Plants ¹
5. <u>Unknown grasses</u>	<u>4</u>	<u>N</u>	<u>unk.</u>	<input checked="" type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)				Hydrophytic Vegetation Present?
1. _____	_____	_____	_____	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks: Vegetation meets problematic hydrophytic vegetation criteria based on positive hydric soil indicators, algal crust and concave topography that indicate that area ponds water. Vegetation may be more hydrophytic in wetter years – annual invasive <i>Ventenata dubia</i> may dominate in dryer years				

SOIL

Sampling Point: SP1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/2	85	10YR 4/6	15	C	PL	silt loam	
6-18	10YR 4/2	95	10YR 5/8	5	C	PL	silty clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- 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) (**except MLRA 1**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (**LRR A**)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) (**LRR A**)
- Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? Yes No Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

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

Remarks: Only apparent source of hydrology is precipitation and snow melt.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/09/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP2
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21014404 Long: 120.8173599 Datum: NAD 83
 Soil Map Unit Name: 204-Teaaway loam, 25-50 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point taken above depressional area.	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Pinus ponderosa</u>	10	Y	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____				
3. _____				
4. _____				
	10	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____				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 = _____
2. _____				
3. _____				
4. _____				
5. _____				
	0	= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Balsamorhiza sagittata</u>	25	Y	NOL	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Lupinus sericeus</u>	20	Y	NOL	
3. <u>Achillea millefolium</u>	15	Y	FACU	
4. <u>Lomatium nudicaule</u>	15	Y	NOL	
5. <u>Poa bulbosa</u>	15	Y	NOL	
6. <u>Unknown grass</u>	5	N	unk.	
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
	95	= Total Cover		
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. _____				
	0	= Total Cover		
% Bare Ground in Herb Stratum <u>5</u>				
Remarks:				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/10/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP3
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21204758 Long: -120.8098526 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland W6 is a PEM (Cowardin), depressionnal (HGM). Wetland boundaries determined by the toe of slope of a distinct depressionnal area containing cracked soils and a change from wetland vegetation <i>Juncus parryi</i> to dominant upland vegetation <i>Balsamorhiza sagittata</i> .	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet:
1. _____	_____	_____	_____	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x 1 = _____
3. _____	_____	_____	_____	FACW species _____ x 2 = _____
4. _____	_____	_____	_____	FAC species <u>30</u> x 3 = <u>90</u>
5. _____	_____	_____	_____	FACU species _____ x 4 = _____
<u>0</u> = Total Cover				UPL species <u>70</u> x 5 = <u>350</u>
				Column Totals: <u>100</u> (A) <u>440</u> (B)
				Prevalence Index = B/A = <u>4.4</u>
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators:
1. <u>Ventenata dubia</u>	<u>70</u>	<u>Y</u>	<u>NOL</u>	<input type="checkbox"/> Dominance Test is >50%
2. <u>Juncus parryi</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 ¹
3. _____	_____	_____	_____	<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. _____	_____	_____	_____	<input type="checkbox"/> Wetland Non-Vascular Plants ¹
5. _____	_____	_____	_____	<input checked="" type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)				Hydrophytic Vegetation Present?
1. _____	_____	_____	_____	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks: Vegetation meets problematic hydrophytic vegetation criteria based on positive hydric soil indicators, surface cracks and concave topography that indicate that area ponds water. Vegetation may be more hydrophytic in wetter years – annual invasive <i>Ventenata dubia</i> may dominate in dryer years				

SOIL

Sampling Point: SP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-9	10YR 4/1	92	7.5YR 4/6	8	C	PL	silt loam	
9-17	10YR 5/2	95	10YR 5/8	5	C	PL	silty clay	
17-20	10YR 3/1	70	10YR 5/8	30	C	PL	clay	Soil contains 40% gravel below 17"
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix.								
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)						Indicators for Problematic Hydric Soils³:		
<input type="checkbox"/> Histosol (A1)		<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> 2 cm Muck (A10)				
<input type="checkbox"/> Histic Epipedon (A2)		<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Red Parent Material (TF2)				
<input type="checkbox"/> Black Histic (A3)		<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)		<input type="checkbox"/> Other (Explain in Remarks)				
<input type="checkbox"/> Hydrogen Sulfide (A4)		<input type="checkbox"/> Loamy Gleyed Matrix (F2)						
<input type="checkbox"/> Depleted Below Dark Surface (A11)		<input checked="" type="checkbox"/> Depleted Matrix (F3)						
<input type="checkbox"/> Thick Dark Surface (A12)		<input type="checkbox"/> Redox Dark Surface (F6)					³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.	
<input type="checkbox"/> Sandy Mucky Mineral (S1)		<input type="checkbox"/> Depleted Dark Surface (F7)						
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Redox Depressions (F8)						
Restrictive Layer (if present):								
Type: _____								
Depth (inches): _____						Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks:								

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input checked="" type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		
Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
(includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: Only apparent source of hydrology is precipitation and snow melt.		

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/10/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP4
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 5
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21211243 Long: -120.8099365 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point taken above depressional area.	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Pinus ponderosa</u>	10	Y	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____				
3. _____				
4. _____				
	10	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____				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 = _____
2. _____				
3. _____				
4. _____				
5. _____				
	0	= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Balsamorhiza sagittata</u>	70	Y	NOL	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Lupinus sericeus</u>	10	N	NOL	
3. <u>Achillea millefolium</u>	3	N	FACU	
4. <u>Lomatium nudicaule</u>	3	N	NOL	
5. <u>Poa bulbosa</u>	7	N	NOL	
6. <u>Bromus sp.</u>	7	N	unk.	
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
	100	= Total Cover		
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. _____				
	0	= Total Cover		
% Bare Ground in Herb Stratum <u>0</u>				
Remarks:				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/10/2009

Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP5

Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21197891 Long: -120.8116913 Datum: NAD 83
 Soil Map Unit Name: 203-Teaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland W7 is a PEM (Cowardin), depressional (HGM). Wetland boundaries determined by the toe of slope of a distinct depressional area containing cracked soils and a change from dominant wetland vegetation <i>Juncus parryi</i> to dominant upland vegetation <i>Balsamorhiza sagittata</i> .	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>70</u> x 3 = <u>210</u> FACU species _____ x 4 = _____ UPL species <u>30</u> x 5 = <u>150</u> Column Totals: <u>100</u> (A) <u>360</u> (B) Prevalence Index = B/A = <u>3.6</u>
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Ventenata dubia</u>	<u>30</u>	<u>Y</u>	<u>NOL</u>	
2. <u>Juncus parryi</u>	<u>60</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Wyethia amplexicaulis</u>	<u>7</u>	<u>N</u>	<u>FAC</u>	
4. <u>Allium douglasii</u>	<u>3</u>	<u>N</u>	<u>FAC</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				

Hydrophytic Vegetation Indicators:

Dominance Test is >50%

Prevalence Index is ≤3.0¹

Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Wetland Non-Vascular Plants¹

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: Vegetation meets problematic hydrophytic vegetation criteria based on positive hydric soil indicators, a restrictive layer at 4", surface cracks and concave topography that indicate that area ponds water. Vegetation may be more hydrophytic in wetter years – annual invasive *Ventenata dubia* may dominate in dryer years

SOIL

Sampling Point: SP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4+	10YR 3/2	90	7.5YR 4/6	10	C	PL	silt loam	rocks present in soils

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Hydrogen Sulfide (A4)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input checked="" type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): Type: <u>Rocks and gravel</u> Depth (inches): <u>>4"</u>	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input checked="" type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Only apparent source of hydrology is precipitation and snow melt.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/10/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP6
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 5
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21193314 Long: -120.8116608 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point taken above depressional area.	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
<u>0</u> = Total Cover				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 = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
<u>0</u> = Total Cover					
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Balsamorhiza sagittata</u>	<u>30</u>	<u>Y</u>	<u>NOL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
2. <u>Lupinus sericeus</u>	<u>30</u>	<u>Y</u>	<u>NOL</u>		
3. <u>Achillea millefolium</u>	<u>8</u>	<u>N</u>	<u>FACU</u>		
4. <u>Lomatium nudicaule</u>	<u>7</u>	<u>N</u>	<u>UPL</u>		
5. <u>Poa bulbosa</u>	<u>7</u>	<u>N</u>	<u>NOL</u>		
6. <u>Agrostis sp.</u>	<u>7</u>	<u>N</u>	<u>unk.</u>		
7. <u>Vicia americana</u>	<u>5</u>	<u>N</u>	<u>FAC</u>		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
<u>100</u> = Total Cover					
Woody Vine Stratum (Plot size: <u>15'</u>)					
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
2. _____	_____	_____	_____		
<u>0</u> = Total Cover					
% Bare Ground in Herb Stratum <u>~6</u>					
Remarks:					

SOIL

Sampling Point: SP6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-13	7.5YR 3/2	100					silt loam	
0-13	7.5YR 3/2	100					silt clay loam	
			</					

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teaway Solar Reserve City/County: Kittitas Sampling Date: 06/16/2009
 Applicant/Owner: Teaway Solar Reserve, LLC State: WA Sampling Point: SP7
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21212769 Long: -120.8140945 Datum: NAD 83
 Soil Map Unit Name: 203-Teaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland W4 is a PEM (Cowardin), depression (HGM). Wetland boundaries determined by the toe of slope of a distinct depression area containing cracked soils.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Ventenata dubia</u>	<u>95</u>	<u>Y</u>	<u>NOL</u>	
2. <u>Castilleja tenuis</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 1 (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 _____ x 3 = _____
 FACU species 5 x 4 = 20
 UPL species 95 x 5 = 475
 Column Totals: 100 (A) 495 (B)
 Prevalence Index = B/A = 4.95

Hydrophytic Vegetation Indicators:
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: Vegetation meets problematic hydrophytic vegetation criteria based on positive hydric soil indicators, a restrictive layer at 12", surface cracks and concave topography that indicate that area ponds water. Vegetation may be more hydrophytic in wetter years – annual invasive *Ventenata dubia* may dominate in dryer years

SOIL

Sampling Point: SP7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 4/1	95	2.5YR 4/6	5	C	PL	silt loam	
12-								rock/gravel refusal

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)			
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)			
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)				
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)				
<input type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.			
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)				
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)				

Restrictive Layer (if present): Type: <u>Rocks and gravel</u> Depth (inches): <u>>12"</u>	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input checked="" type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Only apparent source of hydrology is precipitation and snow melt.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/16/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP8
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21209717 Long: -120.8140869 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point taken above depressional area.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Ventenata dubia</u>	<u>95</u>	<u>Y</u>	<u>NOL</u>	
2. <u>Potentilla drummondii</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum _____				
Remarks:				
				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teaway Solar Reserve City/County: Kittitas Sampling Date: 06/16/2009

Applicant/Owner: Teaway Solar Reserve, LLC State: WA Sampling Point: SP9

Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21216965 Long: -120.8132324 Datum: NAD 83
 Soil Map Unit Name: 203-Teaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No

Are Vegetation , Soil , or Hydrology naturally problematic? Y (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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland W7 is a PEM (Cowardin), depression (HGM). Wetland boundaries determined by the toe of slope of a distinct depression area containing cracked soils.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																																																																		
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WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/16/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP10
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21223831 Long: 120.8131332 Datum: NAD 83
 Soil Map Unit Name: 203-Teaaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point taken above depressional area.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
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Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Ventenata dubia</u>	<u>80</u>	<u>Y</u>	<u>NOL</u>	
2. <u>Castilleja tenuis</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
3. <u>Potentilla gracilis</u>	<u>trace</u>	<u>N</u>	<u>FAC</u>	
4. <u>Juncus parryi</u>	<u>trace</u>	<u>N</u>	<u>FAC</u>	
5. <u>Zigadenus venenosus</u>	<u>trace</u>	<u>N</u>	<u>FACU</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>85</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>15</u>				
Remarks:				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/16/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP11
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.2124176 Long: -120.8120422 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? Y (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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland W5 is a PEM (Cowardin), depressional (HGM). Wetland boundaries determined by the toe of slope of a distinct depressional area containing cracked soils.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species <u>5</u> x 4 = <u>20</u> UPL species <u>95</u> x 5 = <u>475</u> Column Totals: <u>100</u> (A) <u>495</u> (B) Prevalence Index = B/A = <u>4.95</u>
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Ventenata dubia</u>	<u>95</u>	<u>Y</u>	<u>NOL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input checked="" type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Castilleja tenuis</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
3. <u>Juncus parryi</u>	<u>trace</u>	<u>N</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks: Vegetation meets problematic hydrophytic vegetation criteria based on positive hydric soil indicators, a restrictive layer at 12", surface cracks and concave topography that indicate that area ponds water. Vegetation may be more hydrophytic in wetter years – annual invasive <i>Ventenata dubia</i> may dominate in dryer years				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/16/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP12
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21247482 Long: -120.8120422 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point taken above depressional area.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Poa bulbosa</u>	25	Y	NOL	
2. <u>Castilleja tenuis</u>	15	Y	FACU	
3. <u>Potentilla gracilis</u>	5	N	FAC	
4. <u>Agrostis scabra</u>	20	Y	FAC	
5. <u>Zigadenus venenosus</u>	5	N	FACU	
6. <u>Achillea millefolium</u>	10	N	FACU	
7. <u>Lomatium simplex</u>	5	N	NOL	
8. <u>Lupinus sericeus</u>	5	N	NOL	
9. <u>Balsamorhiza sagittata</u>	10	N	NOL	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks:				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/16/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP13
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21183395 Long: -120.8102341 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? Y (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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland W3 is a PEM (Cowardin), depressional (HGM). Wetland boundaries determined by the toe of slope of a distinct depressional area containing cracked soils.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Dominance Test worksheet:				
Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)				
Total Number of Dominant Species Across All Strata: <u>1</u> (B)				
Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)				
Prevalence Index worksheet:				
Total % Cover of: _____ Multiply by: _____				
OBL species _____ x 1 = _____				
FACW species _____ x 2 = _____				
FAC species <u>5</u> x 3 = <u>15</u>				
FACU species <u>5</u> x 4 = <u>20</u>				
UPL species <u>90</u> x 5 = <u>450</u>				
Column Totals: <u>100</u> (A) <u>485</u> (B)				
Prevalence Index = B/A = <u>4.85</u>				
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)				
___ Wetland Non-Vascular Plants ¹				
<input checked="" type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Ventenata dubia</u>	<u>90</u>	<u>Y</u>	<u>NOL</u>	
2. <u>Castilleja tenuis</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
3. <u>Juncus parryi</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				

Remarks: Vegetation meets problematic hydrophytic vegetation criteria based on positive hydric soil indicators, a restrictive layer at 12", surface cracks and concave topography that indicate that area ponds water. Vegetation may be more hydrophytic in wetter years – annual invasive *Ventenata dubia* may dominate in dryer years

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/16/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP14
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21188354 Long: -120.8101349 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point taken above depressional area.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Poa bulbosa</u>	<u>25</u>	<u>Y</u>	<u>NOL</u>	
2. <u>Castilleja tenuis</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Potentilla drummondii</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
4. <u>Agrostis scabra</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
5. <u>Zigadenus venenosus</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
6. <u>Achillea millefolium</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
7. <u>Lomatium simplex</u>	<u>5</u>	<u>N</u>	<u>NOL</u>	
8. <u>Lupinus sericeus</u>	<u>5</u>	<u>N</u>	<u>NOL</u>	
9. <u>Balsamorhiza sagittata</u>	<u>10</u>	<u>N</u>	<u>NOL</u>	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks:				

SOIL

Sampling Point: SP14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 3/2	100					silt loam	
12-								gravel/rock refusal
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.					² Location: PL=Pore Lining, M=Matrix.			
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)						Indicators for Problematic Hydric Soils³:		
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Sandy Redox (S5)			<input type="checkbox"/> 2 cm Muck (A10)		
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Stripped Matrix (S6)			<input type="checkbox"/> Red Parent Material (TF2)		
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)			³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
<input type="checkbox"/> Depleted Below Dark Surface (A11)			<input type="checkbox"/> Depleted Matrix (F3)					
<input type="checkbox"/> Thick Dark Surface (A12)			<input type="checkbox"/> Redox Dark Surface (F6)					
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input type="checkbox"/> Depleted Dark Surface (F7)					
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<input type="checkbox"/> Redox Depressions (F8)					
Restrictive Layer (if present):								
Type: <u>Gravel/rock</u>								
Depth (inches): <u>12"+</u>						Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Remarks:								

HYDROLOGY

Wetland Hydrology Indicators:					
<u>Primary Indicators (minimum of one required; check all that apply)</u>			<u>Secondary Indicators (2 or more required)</u>		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)			
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)			
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)			
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)			
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)			
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)			
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)			
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)			
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)			
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)					
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)					
Field Observations:					
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____			
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:					
Remarks:					

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/16/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP15
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21208572 Long: -120.8093414 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland W1 is a PEM (Cowardin), depression (HGM). Wetland boundaries determined by the toe of slope of a distinct depression area containing cracked soils.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
<u>0</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Gnaphalium palustre</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Polygonum polygaloides</u>	<u>trace</u>	<u>N</u>	<u>FACW</u>	
3. <u>Navarretia brewerii</u>	<u>trace</u>	<u>N</u>	<u>NOL</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>5</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>95</u>				
Remarks:				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/16/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP16
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.21212006 Long: -120.809288 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point taken above depressional area.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Poa bulbosa</u>	10	N	NOL	
2. <u>Castilleja tenuis</u>	12	Y	FACU	
3. <u>Potentilla gracilis</u>	5	N	FAC	
4. <u>Agrostis scabra</u>	20	Y	FAC	
5. <u>Agrostemma githago</u>	20	Y	NOL	
6. <u>Lomatium simplex</u>	10	N	NOL	
7. <u>Juncus parryi</u>	10	N	FAC	
8. <u>Balsamorhiza sagittata</u>	8	N	NOL	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks:				

SOIL

Sampling Point: SP16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 3/2	100					silt loam	
12-								gravel/rock refusal
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.			² Location: PL=Pore Lining, M=Matrix.					
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)					Indicators for Problematic Hydric Soils³:			
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Sandy Redox (S5)			<input type="checkbox"/> 2 cm Muck (A10)		
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Stripped Matrix (S6)			<input type="checkbox"/> Red Parent Material (TF2)		
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)			³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
<input type="checkbox"/> Depleted Below Dark Surface (A11)			<input type="checkbox"/> Depleted Matrix (F3)					
<input type="checkbox"/> Thick Dark Surface (A12)			<input type="checkbox"/> Redox Dark Surface (F6)					
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input type="checkbox"/> Depleted Dark Surface (F7)					
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<input type="checkbox"/> Redox Depressions (F8)					
Restrictive Layer (if present):								
Type: <u>Gravel/rock</u>								
Depth (inches): <u>12"+</u>							Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks:								

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		
Field Observations:		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/17/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP17
 Investigator(s): Renee Storey/Katina Kapantais Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.20587158 Long: 120.8251495 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland W8 is a PEM (Cowardin), depressional (HGM). Wetland boundaries determined by the toe of slope of a distinct depressional area containing cracked soils and a change from dominant wetland vegetation <i>Eleocharis palustris</i> to dominant upland vegetation <i>Achillea millefolium</i> .	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Eleocharis palustris</u>	<u>70</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Juncus parryi</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>75</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>25</u>				
Remarks:				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teaway Solar Reserve City/County: Kittitas Sampling Date: 06/17/2009
 Applicant/Owner: Teaway Solar Reserve, LLC State: WA Sampling Point: SP18
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 5
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.20593262 Long: -120.8251266 Datum: NAD 83
 Soil Map Unit Name: 203-Teaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point taken above depressional area.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>10</u> = Total Cover				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 = _____
<u>0</u> = Total Cover				
<u>0</u> = Total Cover				
<u>90</u> = Total Cover				
<u>0</u> = Total Cover				
<u>10</u> = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
<u>0</u> = Total Cover				
<u>0</u> = Total Cover				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<u>0</u> = Total Cover				
Remarks:				

SOIL

Sampling Point: SP18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 4/2	100					silt loam	
3-12	10YR 4/2	90	7.5YR 4/6	10	C	PL	silt loam	
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix.								
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)						Indicators for Problematic Hydric Soils³:		
<input type="checkbox"/> Histosol (A1)		<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> 2 cm Muck (A10)				
<input type="checkbox"/> Histic Epipedon (A2)		<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Red Parent Material (TF2)				
<input type="checkbox"/> Black Histic (A3)		<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)				<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Hydrogen Sulfide (A4)		<input type="checkbox"/> Loamy Gleyed Matrix (F2)						
<input type="checkbox"/> Depleted Below Dark Surface (A11)		<input checked="" type="checkbox"/> Depleted Matrix (F3)						
<input type="checkbox"/> Thick Dark Surface (A12)		<input type="checkbox"/> Redox Dark Surface (F6)		³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.				
<input type="checkbox"/> Sandy Mucky Mineral (S1)		<input type="checkbox"/> Depleted Dark Surface (F7)						
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Redox Depressions (F8)						
Restrictive Layer (if present):								
Type: _____								
Depth (inches): _____						Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks:								

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		
Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____		
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/17/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP19
 Investigator(s): Renee Storey/Katina Kapantais Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.20584869 Long: -120.825386 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland W11 is a PEM (Cowardin), depressional (HGM). Wetland boundaries determined by the toe of slope of a distinct depressional area containing cracked soils and a change from dominant wetland vegetation <i>Eleocharis palustris</i> to dominant upland vegetation <i>Achillea millefolium</i> . Wetland appears to be a created roadside ditch.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet:
1. _____	_____	_____	_____	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x 1 = _____
3. _____	_____	_____	_____	FACW species _____ x 2 = _____
4. _____	_____	_____	_____	FAC species _____ x 3 = _____
5. _____	_____	_____	_____	FACU species _____ x 4 = _____
<u>0</u> = Total Cover				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators:
1. <u>Eleocharis palustris</u>	<u>70</u>	<u>Y</u>	<u>OBL</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
2. <u>Juncus parryi</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 ¹
3. _____	_____	_____	_____	<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. _____	_____	_____	_____	<input type="checkbox"/> Wetland Non-Vascular Plants ¹
5. _____	_____	_____	_____	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)				Hydrophytic Vegetation Present?
1. _____	_____	_____	_____	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>25</u>				
Remarks:				

SOIL

Sampling Point: SP19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 4/2	95	7.5YR 5/8	5	C	PL	silt loam	

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teaway Solar Reserve City/County: Kittitas Sampling Date: 06/17/2009
 Applicant/Owner: Teaway Solar Reserve, LLC State: WA Sampling Point: SP20
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 5
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.20582581 Long: -120.8254089 Datum: NAD 83
 Soil Map Unit Name: 203-Teaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point taken above depressional area.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>10</u> = Total Cover				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 = _____
<u>0</u> = Total Cover				
<u>0</u> = Total Cover				
<u>90</u> = Total Cover				
<u>0</u> = Total Cover				
<u>10</u> = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
<u>0</u> = Total Cover				
<u>0</u> = Total Cover				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<u>0</u> = Total Cover				
Remarks:				

SOIL

Sampling Point: SP20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 4/2	100					silt loam	
3-12	10YR 4/2	90	7.5YR 4/6	10	C	PL	silt loam	
		</						

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/17/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP21
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.20595169 Long: -120.8254471 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? Y (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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland W9 is a PEM (Cowardin), depressional (HGM). Wetland boundaries determined by the toe of slope of a distinct depressional area containing cracked soils.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				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 <u>50</u> x 5 = <u>250</u> Column Totals: <u>50</u> (A) <u>250</u> (B) Prevalence Index = B/A = <u>5</u>
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input checked="" type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Ventenata dubia</u>	<u>50</u>	<u>Y</u>	<u>NOL</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>50</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>50</u>				
Remarks: Vegetation meets problematic hydrophytic vegetation criteria based on positive hydric soil indicators, a restrictive layer at 12", surface cracks and concave topography that indicate that area ponds water. Vegetation may be more hydrophytic in wetter years – annual invasive <i>Ventenata dubia</i> may dominate in dryer years.				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/17/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP22
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.20600891 Long: -120.8254623 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point taken above depressional area.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Agropyron spicatum</u>	<u>35</u>	<u>Y</u>	<u>UPL</u>	
2. <u>Lupinus sericeus</u>	<u>25</u>	<u>Y</u>	<u>NOL</u>	
3. <u>Agropyron smithii</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	
4. <u>Lomatium nudicaule</u>	<u>10</u>	<u>N</u>	<u>NOL</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks:				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teanaway Solar Reserve City/County: Kittitas Sampling Date: 06/17/2009
 Applicant/Owner: Teanaway Solar Reserve, LLC State: WA Sampling Point: SP23
 Investigator(s): Renee Storey/Katina Kapantais Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.20911407 Long: -120.8263702 Datum: NAD 83
 Soil Map Unit Name: 203-Teanaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland W10 is a PEM (Cowardin), depressional (HGM). Wetland boundaries determined by the toe of slope of a distinct depressional area containing cracked soils.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species <u>10</u> x 2 = <u>20</u> FAC species <u>30</u> x 3 = <u>90</u> FACU species _____ x 4 = _____ UPL species <u>30</u> x 5 = <u>150</u> Column Totals: <u>70</u> (A) <u>260</u> (B) Prevalence Index = B/A = <u>3.7</u>
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Ventenata dubia</u>	<u>30</u>	<u>Y</u>	<u>NOL</u>	
2. <u>Juncus parryi</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Scirpus sp.</u>	<u>10</u>	<u>N</u>	<u>FACW/OBL</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>70</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>30</u>				
Remarks: Vegetation meets problematic hydrophytic vegetation criteria based on positive hydric soil indicators, surface cracks and concave topography that indicate that area ponds water. Vegetation may be more hydrophytic in wetter years – annual invasive Ventenata dubia may dominate in dryer years.				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

SOIL

Sampling Point: SP23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16+	10YR 4/1	50	5YR 4/6	10	C	PL	silt loam	Mixed matrix
0-16+	10YR 4/2	40						Mixed matrix

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Teaway Solar Reserve City/County: Kittitas Sampling Date: 06/17/2009
 Applicant/Owner: Teaway Solar Reserve, LLC State: WA Sampling Point: SP24
 Investigator(s): Forrest Parsons/Joel Shaich Section, Township, Range: T20N R16E S23
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
 Subregion (LRR): A - Northwest Forests and Coast Lat: 47.20905685 Long: -120.8263702 Datum: NAD 83
 Soil Map Unit Name: 203-Teaway loam, 3-10 percent slopes NWI classification: none

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? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point taken above depressional area.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Pinus ponderosa</u>	30	Y	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____				
3. _____				
4. _____				
<u>30</u> = Total Cover				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 = _____
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Syphoricarpos albus</u>	40	Y	FACU	
2. _____				
3. _____				
4. _____				
5. _____				
<u>40</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Achillea millefolium</u>	20	Y	FACU	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Penstemon procerus</u>	trace	N	NI	
3. _____				
4. _____				
5. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
<u>20</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. _____				
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>20</u>				
Remarks: 10% ground cover and pine needles				

APPENDIX C
Site Photographs

APPENDIX C

Site Photographs



Photo 1: Wetland W1 facing north from SP15.



Photo 2: Wetland W2 facing northeast toward SP1.



Photo 3: Wetland W3 facing southwest from SP14.



Photo 4: Wetland W3 facing north from SP13.

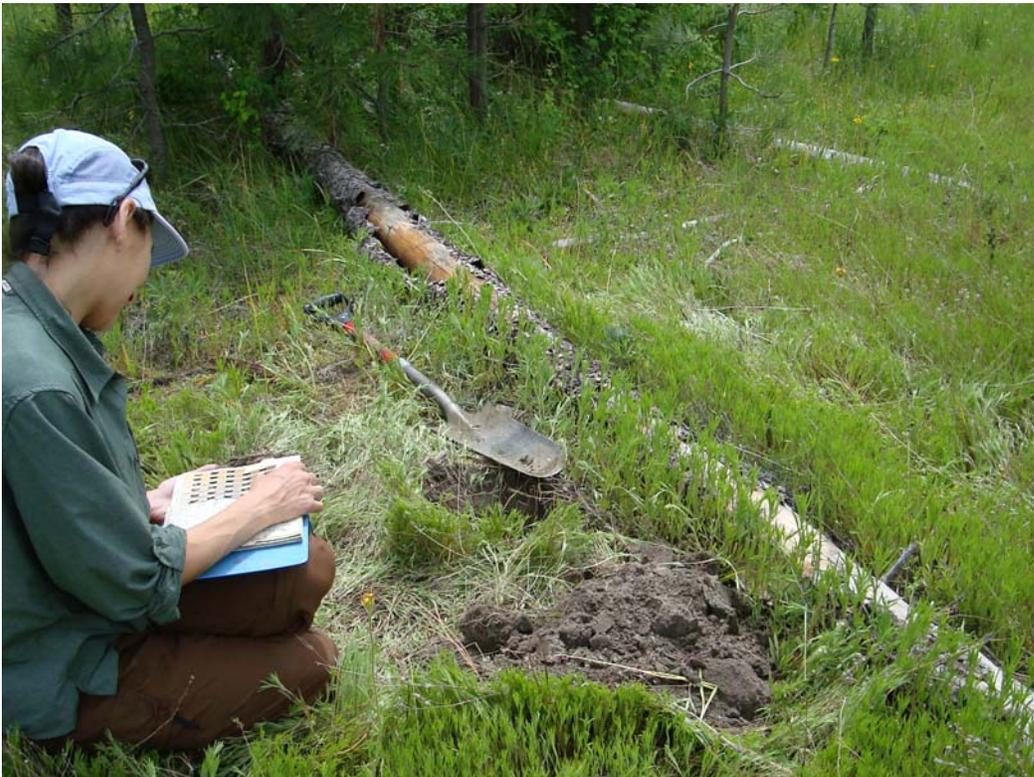


Photo 5: SP8 facing southwest.



Photo 6: Wetland W4 facing northeast from SP7.



Photo 7: SP12 facing east. Wetland W7 is in the background.



Photo 8: Wetland W5 facing northeast from SP11.



Photo 9: Wetland W6 facing northwest toward SP4.



Photo 10: Wetland W6 facing northeast from the eastern half of the wetland.



Photo 11: Wetland W7 facing south from transitional area at north end of the wetland.



Photo 12: Wetland W7 facing west between SP5 and SP6.



Photo 13: SP10 facing west.



Photo 14: Wetland W7 facing east from SP9.



Photo 15: SP18 facing northeast.



Photo 16: Wetland W8 facing northwest from SP17.



Photo 17: SP22 facing northwest.



Photo 18: Wetland W9 facing west toward SP21.



Photo 19: SP24 facing east.



Photo 10: Wetland W10 facing southeast toward SP23.



Photo 21: Wetland W11 facing east from SP19.



Photo 22: Wetland W12 facing west.



Photo 23: Wetland W12 facing northwest.



Photo 24: Stream S1 facing south (downstream) at transmission line corridor.



Photo 25: Stream S1 facing north (upstream) at transmission line corridor.



Photo 26: Stream S2 facing south (downstream) at the southern portion of project area.



Photo 27: Stream S2 facing north (upstream) in southern portion of project area.



Photo 28: Stream S2 facing south (downstream) upstream from the confluence with S3.



Photo 29: Stream S2 facing north (upstream) upstream from the confluence with S3.



Photo 30: Stream S2 facing south near a road crossing and downstream from the confluence with S3.



Photo 31: Stream S3 facing south (downstream).



Photo 32: Stream S3 facing north (upstream).



Photo 33: Stream S4 facing west (downstream) toward road culvert.



Photo 34: Stream S4 facing northeast (upstream).



Photo 35: Stream S5 facing southwest from headwater.



Photo 36: S5 facing southwest near west edge of project area.

APPENDIX D

Washington Wetland Rating Forms and Associated Figures

Wetland name or number W1

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): W1 Date of site visit: 6/9/09

Rated by Forrest Parsons/Joel Shaich Trained by Ecology? Yes ___ No X Date of training _____

SEC: 23 TOWNSHIP: 20N RANGE: 16E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure 2 Estimated size 0.01 acre

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

9

Score for Hydrologic Functions

20

Score for Habitat Functions

15

TOTAL score for functions

44

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

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

3

Summary of basic information about the wetland unit

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

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>		X
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>		X
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		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.

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**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 W1

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.

D Depressional Wetlands		Points
WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality		(only 1 score per box)
D	D 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	D 1.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet - points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing surface outlet points = 1	5
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (<i>use NRCS definitions of soil types</i>) YES points = 3 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure 2 1
D	D 1.4 Characteristics of seasonal ponding or inundation. <i>This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.</i> Area seasonally ponded is > 1/2 total area of wetland points = 3 Area seasonally ponded is 1/4 - 1/2 total area of wetland points = 1 Area seasonally ponded is < 1/4 total area of wetland points = 0 NOTE: See text for indicators of seasonal and permanent inundation/flooding. Map of Hydroperiods	Figure 8 3
D	Total for D 1 <i>Add the points in the boxes above</i>	9
D	D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality? Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. <i>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.</i> — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ YES multiplier is 2 NO multiplier is 1	multiplier <u>1</u>
D	TOTAL - Water Quality Functions Multiply the score from D1 by the multiplier in D2 <i>Record score on p. 1 of field form</i>	9

D Depressional Wetlands HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion		Points (only 1 score per box)
D	D 3.0 Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?	(see p. 39)
D	D 3.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet points = 8 Wetland has an intermittently flowing outlet points = 4 Wetland has a highly constricted permanently flowing outlet points = 4 Wetland has a permanently flowing surface outlet points = 0	8
D	D 3.2 Depth of storage during wet periods: <i>Estimate the height of ponding above the surface of the wetland (see text for description of measuring height). In wetlands with permanent ponding, the surface is the lowest elevation of "permanent" water)</i> Marks of ponding are at least 3 ft above the surface points = 8 The wetland is a "headwater" wetland" (see p. 39) points = 6 Marks are 2 ft to < 3 ft from surface points = 6 Marks are 1 ft to < 2 ft from surface points = 4 Marks are 6 in to < 1 ft from surface points = 2 No marks above 6 in. or wetland has only saturated soils points = 0	2
D	Total for D 3 <i>Add the points in the boxes above</i>	10
D	D 4.0 Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion? <i>Answer NO if the major source of water is groundwater, irrigation return flow, or water levels in the wetland are controlled by a reservoir.</i> <i>Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Note which of the following conditions apply.</i> — Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems <input checked="" type="checkbox"/> Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other _____ YES multiplier is 2 NO multiplier is 1	(see p. 42) multiplier <u>2</u>
D	TOTAL - Hydrologic Functions Multiply the score from D3 by the multiplier in D4 <i>Record score on p. 1 of field form</i>	20

Comments

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

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points Moderate = 2 points</p> <p>High = 3 points High = 3 points [Riparian braided channel]</p> <p>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</p>	<p>Figure 2</p> <p style="text-align: center; font-size: 2em;">1</p>
<p>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.</p> <p><input type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. <i>The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.</i></p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)</p> <p style="text-align: right;">Maximum score possible = 6</p>	<p style="text-align: center; font-size: 2em;">0</p>
<p style="text-align: right;">TOTAL Potential to provide habitat Add the scores in the column above</p>	<p style="text-align: center; font-size: 2em; border: 2px dashed black;">4</p>

Comments

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p>	
<p>H 2.1 Buffers (<i>see p. 71</i>) <i>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.</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 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 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — 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 <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure 14</p> <p style="text-align: center; font-size: 2em;">5</p>
<p>H 2.2 Wet Corridors (<i>see p. 72</i>)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) <input checked="" type="radio"/> NO = go to H 2.2.2</p> <p>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?</p> <p>YES = 2 points (go to H 2.3) <input checked="" type="radio"/> NO go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p><input checked="" type="radio"/> YES = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">1</p>

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.*

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report p. 152).
- Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora (full description of herbaceous species found here are in WDFW PHS report p. 153).
- Old-growth/Mature forests (east of Cascade crest):** (full descriptions in WDFW PHS report p. 157). Old-growth: Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. Mature: Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.
- Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (full descriptions in WDFW PHS report p. 158).
- Juniper Savannah:** All juniper woodlands (SE part of state only; check map)
- Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Inland Dunes** This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. (check WDFW web site)
- Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

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

0

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)

<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <p>— 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 x means outside boundaries of reclamation areas, irrigation district, or reservoirs) points = 5</p> <p>— 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</p> <p>— There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed? points = 2</p> <p>— There is at least 1 wetland within ½ mile. points = 1</p> <p>— Does not meet any of the four criteria above points = 0</p>	5
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	11
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>	
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (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)</p> <p style="text-align: center;">YES = - 5 points <u>NO</u> = 0 points</p>	<p>Points will be subtracted</p> <p>0</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>	15

Comments

Wetland name or number W2

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): W2 Date of site visit: 6/9/09

Rated by Forrest Parsons/Joel Shaich Trained by Ecology? Yes ___ No X Date of training _____

SEC: 22 TOWNSHIP: 20N RANGE: 16E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure _____ Estimated size 0.004

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

11

Score for Hydrologic Functions

20

Score for Habitat Functions

12

TOTAL score for functions

43

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

Final Category (choose the “highest” category from above)

3

Summary of basic information about the wetland unit

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

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>		X
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>		X
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		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.

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**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 W2

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.

D Depressional Wetlands		Points
WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality		(only 1 score per box)
D	D 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	D 1.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet - points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing surface outlet points = 1	3
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions of soil types) YES points = 3 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure 4 5
D	D 1.4 Characteristics of seasonal ponding or inundation. <i>This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.</i> Area seasonally ponded is > 1/2 total area of wetland points = 3 Area seasonally ponded is 1/4 - 1/2 total area of wetland points = 1 Area seasonally ponded is < 1/4 total area of wetland points = 0 NOTE: See text for indicators of seasonal and permanent inundation/flooding. Map of Hydroperiods	Figure 10 3
D	Total for D 1 Add the points in the boxes above	11
D	D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality? Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. 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. — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ YES multiplier is 2 NO multiplier is 1	multiplier <u>1</u>
D	TOTAL - Water Quality Functions Multiply the score from D1 by the multiplier in D2 <i>Record score on p. 1 of field form</i>	11

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)								
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat										
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?										
<p>H 1.1 <u>Categories of vegetation structure</u> (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.</p> <p> <input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover <input type="checkbox"/> Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >30% cover) </p> <p>Add the number of vegetation types that qualify. If you have:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>4-6 types</td> <td>points = 3</td> </tr> <tr> <td>3 types</td> <td>points = 2</td> </tr> <tr> <td>2 types</td> <td>points = 1</td> </tr> <tr> <td>1 type</td> <td>points = 0</td> </tr> </table> <p>Map of Cowardin vegetation classes and areas with different heights of emergents</p>		4-6 types	points = 3	3 types	points = 2	2 types	points = 1	1 type	points = 0	<p>Figure 4</p> <p style="text-align: center; font-size: 2em;">0</p>
4-6 types	points = 3									
3 types	points = 2									
2 types	points = 1									
1 type	points = 0									
<p>H 1.2. Is one of the vegetation types “aquatic bed?” (see p .64) YES = 1 point NO = 0 points</p>		0								
<p>H 1.3. <u>Surface Water</u> (see p.65)</p> <p>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)? <i>Note: answer YES for Lake-fringe wetlands</i> YES = 3 points & go to H 1.4 NO = go to H 1.3.2</p> <p>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</p>		<p>Figure 10</p> <p style="text-align: center; font-size: 2em;">0</p>								
<p>H 1.4. <u>Richness of Plant Species</u> (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)</p> <p>If you counted: > 9 species points = 2 4-9 species points = 1 # of species <u>5</u> < 4 species points = 0 points</p> <p>List species below if you wish</p>		1								

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points</p> <p>High = 3 points [Riparian braided channel]</p> <p>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</p>	<p>Figure 4</p> <p style="text-align: center;">0</p>
<p>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.</p> <p><input type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. <i>The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.</i></p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)</p> <p style="text-align: right;"><i>Maximum score possible = 6</i></p>	<p style="text-align: center;">0</p>
<p style="text-align: right;">TOTAL Potential to provide habitat <i>Add the scores in the column above</i></p>	<p style="text-align: center;">1</p>

Comments

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p>	
<p>H 2.1 Buffers (<i>see p. 71</i>) <i>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.</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 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 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — 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 <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure 16.</p> <p style="text-align: center; font-size: 2em;">5</p>
<p>H 2.2 Wet Corridors (<i>see p. 72</i>)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) <input checked="" type="radio"/> NO = go to H 2.2.2</p> <p>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?</p> <p>YES = 2 points (go to H 2.3) <input checked="" type="radio"/> NO go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p><input checked="" type="radio"/> YES = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">1</p>

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.*

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report p. 152).
- Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora (full description of herbaceous species found here are in WDFW PHS report p. 153).
- Old-growth/Mature forests (east of Cascade crest):** (full descriptions in WDFW PHS report p. 157). **Old-growth:** Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. **Mature:** Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.
- Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (full descriptions in WDFW PHS report p. 158).
- Juniper Savannah:** All juniper woodlands (SE part of state only; check map)
- Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Inland Dunes** This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. (check WDFW web site)
- Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

If wetland has **2 or more** Priority Habitats = **4 points**

If wetland has **1** Priority Habitat = **2 points**

No Priority habitats = **0 points**

0

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)

<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <p>— 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</p> <p>x — 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</p> <p>— There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed? points = 2</p> <p>— There is at least 1 wetland within ½ mile. points = 1</p> <p>— Does not meet any of the four criteria above points = 0</p>	<p>5</p>
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	<p>11</p>
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>	
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (see p. 75)</p> <p>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)</p> <p style="text-align: center;">YES = - 5 points <u>NO</u> = 0 points</p>	<p>Points will be subtracted</p> <p>0</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>	<p>12</p>

Comments

<p>SC 5.0 Forested Wetlands (see p. 85)</p> <p>Does the wetland unit have an area of forest (<i>you should have identified a forested class, if present, in question H 1.1</i>) rooted within its boundary that meet at least one of the following three criteria?</p> <ul style="list-style-type: none"> — The wetland is within the “100 year” floodplain of a river or stream — aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant of the “woody” vegetation. (<i>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</i>) — 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 (<i>see p. 83</i>) <p>YES = go to SC 5.1 NO <i>not a forested wetland with special characteristics</i></p>	
<p>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</p> <p>Slow growing trees are: western red cedar (<i>Thuja plicata</i>), Alaska yellow cedar (<i>Chamaecyparis nootkatensis</i>), pine spp. mostly “white” pine (<i>Pinus monticola</i>), western hemlock (<i>Tsuga heterophylla</i>), Englemann spruce (<i>Picea engelmannii</i>).</p> <p>YES = Category I NO = go to SC 5.2</p>	<p>Cat. I</p>
<p>SC 5.2 Does the unit have areas where aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant species?</p> <p>YES = Category I NO = go to SC 5.3</p>	<p>Cat. I</p>
<p>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.</p> <p>Fast growing species are:</p> <p>Alders – red (<i>Alnus rubra</i>), thin-leaf (<i>A. tenuifolia</i>)</p> <p>Cottonwoods – narrow-leaf (<i>Populus angustifolia</i>), black (<i>P. balsamifera</i>)</p> <p>Willows- peach-leaf (<i>Salix amygdaloides</i>), Sitka (<i>S. sitchensis</i>), Pacific (<i>S. lasiandra</i>), Aspen - (<i>Populus tremuloides</i>), Water Birch (<i>Betula occidentalis</i>)</p> <p>YES = Category II NO = go to SC 5.5</p>	<p>Cat. II</p>
<p>SC 5.5 Is the forested component of the wetland within the “100 year floodplain” of a river or stream?</p> <p>YES = Category II</p>	<p>Cat. II</p>
<p>Category of wetland based on Special Characteristics</p> <p><i>Choose the “highest” rating if wetland falls into several categories.</i></p> <p>If you answered NO for all types enter “Not Applicable” on p.1</p>	<p>NA</p>

Wetland name or number W3

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): W3 Date of site visit: 6/10/09

Rated by Forrest Parsons/Joel Shaich Trained by Ecology? Yes ___ No X Date of training _____

SEC: 23 TOWNSHIP: 20N RANGE: 16E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure _____ Estimated size 0.03 acre

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

11

Score for Hydrologic Functions

20

Score for Habitat Functions

11

TOTAL score for functions

42

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

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

3

Summary of basic information about the wetland unit

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

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>		X
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>		X
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		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.

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**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 W3

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.

D Depressional Wetlands		Points
WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality		(only 1 score per box)
D	D 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	D 1.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet - points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing surface outlet points = 1	3
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions of soil types) YES points = 3 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure 2 5
D	D 1.4 Characteristics of seasonal ponding or inundation. <i>This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.</i> Area seasonally ponded is > 1/2 total area of wetland points = 3 Area seasonally ponded is 1/4 - 1/2 total area of wetland points = 1 Area seasonally ponded is < 1/4 total area of wetland points = 0 NOTE: See text for indicators of seasonal and permanent inundation/flooding. Map of Hydroperiods	Figure 8 3
D	Total for D 1 Add the points in the boxes above	11
D	D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality? Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. 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. — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ YES multiplier is 2 NO multiplier is 1	multiplier <u>1</u>
D	TOTAL - Water Quality Functions Multiply the score from D1 by the multiplier in D2 <i>Record score on p. 1 of field form</i>	11

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)								
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat										
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?										
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<p>H 1.3. <u>Surface Water</u> (see p.65)</p> <p>H 1.3.1 Does the unit have areas of “open” water (without herbaceous or shrub plants) over at least 1/4 acre or 10% of its area during the spring (March – early June) OR in early fall (August – end of September)? <i>Note: answer YES for Lake-fringe wetlands</i> YES = 3 points & go to H 1.4 NO = go to H 1.3.2</p> <p>H 1.3.2 Does the unit have an intermittent or permanent stream within its boundaries, or along one side, over at least 1/4 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</p> <p style="text-align: center;">Map showing areas of open water</p>		<p>Figure 8</p> <p style="text-align: center; font-size: 2em;">0</p>								
<p>H 1.4. <u>Richness of Plant Species</u> (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) <i>You do not have to name the species.</i> Do not include Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites ,Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)</p> <p>If you counted: > 9 species points = 2 4-9 species points = 1 # of species <u>3</u> < 4 species points = 0 points</p> <p><i>List species below if you wish</i></p>		0								

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points Moderate = 2 points</p> <p>High = 3 points High = 3 points [Riparian braided channel]</p> <p>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</p>	<p>Figure 2</p> <p style="text-align: center; font-size: 2em;">0</p>
<p>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.</p> <p><input type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. <i>The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.</i></p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)</p> <p style="text-align: right;"><i>Maximum score possible = 6</i></p>	<p style="text-align: center; font-size: 2em;">0</p>
<p>TOTAL Potential to provide habitat Add the scores in the column above</p>	<p>0</p>

Comments

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p>	
<p>H 2.1 Buffers (<i>see p. 71</i>) <i>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.</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 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 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — 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 <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure 14</p> <p style="text-align: center; font-size: 2em;">5</p>
<p>H 2.2 Wet Corridors (<i>see p. 72</i>)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) <input checked="" type="radio"/> NO = go to H 2.2.2</p> <p>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?</p> <p>YES = 2 points (go to H 2.3) <input checked="" type="radio"/> NO go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p><input checked="" type="radio"/> YES = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">1</p>

<p>H 2.3 <u>Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)</u></p> <p>Which of the following priority habitats are within 330ft (100m) of the wetland unit? <i>NOTE: the connections to the habitats can be disturbed.</i></p> <p><input type="checkbox"/> Aspen Stands: Pure or mixed stands of aspen greater than 0.4 ha (1 acre).</p> <p><input type="checkbox"/> Biodiversity Areas and Corridors: Areas of habitat that are relatively important to various species of native fish and wildlife (<i>full descriptions in WDFW PHS report p. 152</i>).</p> <p><input type="checkbox"/> Eastside Steppe: Non-forested vegetation type dominated by broadleaf herbaceous flora (<i>full description of herbaceous species found here are in WDFW PHS report p. 153</i>).</p> <p><input type="checkbox"/> Old-growth/Mature forests (east of Cascade crest): (<i>full descriptions in WDFW PHS report p. 157</i>). Old-growth: Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. Mature: Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.</p> <p><input type="checkbox"/> Oregon white Oak: Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (<i>full descriptions in WDFW PHS report p. 158</i>).</p> <p><input type="checkbox"/> Juniper Savannah: All juniper woodlands (<i>SE part of state only; check map</i>)</p> <p><input type="checkbox"/> Shrub-steppe: A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).</p> <p><input type="checkbox"/> Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.</p> <p><input type="checkbox"/> Inland Dunes This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. (<i>check WDFW web site</i>)</p> <p><input type="checkbox"/> Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.</p> <p><input type="checkbox"/> Caves: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.</p> <p><input type="checkbox"/> Cliffs: Greater than 7.6 m (25 ft) high and occurring below 5000 ft.</p> <p><input type="checkbox"/> Talus: Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.</p> <p><input type="checkbox"/> Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.</p> <p style="text-align: right;">If wetland has 2 or more Priority Habitats = 4 points If wetland has 1 Priority Habitat = 2 points No Priority habitats = 0 points</p> <p><i>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)</i></p>	<p>0</p>
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<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <p>— 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 x means outside boundaries of reclamation areas, irrigation district, or reservoirs) points = 5</p> <p>— 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</p> <p>— There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed? points = 2</p> <p>— There is at least 1 wetland within ½ mile. points = 1</p> <p>— Does not meet any of the four criteria above points = 0</p>	<p>5</p>
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	<p>11</p>
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>	
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (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)</p> <p style="text-align: center;">YES = - 5 points <u>NO</u> = 0 points</p>	<p>Points will be subtracted</p> <p>0</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>	<p>11</p>

Comments

Wetland name or number W4

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): W4 Date of site visit: 6/10/09

Rated by Forrest Parsons/Joel Shaich Trained by Ecology? Yes ___ No X Date of training _____

SEC: 23 TOWNSHIP: 20N RANGE: 16E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure _____ Estimated size 0.067 acre

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	11
Score for Hydrologic Functions	20
Score for Habitat Functions	11
TOTAL score for functions	42

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

3

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

Summary of basic information about the wetland unit

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

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>		X
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>		X
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		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.

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**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 W4

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.

D Depressional Wetlands		Points
WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality		(only 1 score per box)
D	D 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	D 1.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet - points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing surface outlet points = 1	3
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions of soil types) YES points = 3 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure 1 5
D	D 1.4 Characteristics of seasonal ponding or inundation. <i>This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.</i> Area seasonally ponded is > 1/2 total area of wetland points = 3 Area seasonally ponded is 1/4 - 1/2 total area of wetland points = 1 Area seasonally ponded is < 1/4 total area of wetland points = 0 NOTE: See text for indicators of seasonal and permanent inundation/flooding. Map of Hydroperiods	Figure 7 3
D	Total for D 1 Add the points in the boxes above	11
D	D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality? Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. 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. — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ YES multiplier is 2 NO multiplier is 1	multiplier <u>1</u>
D	TOTAL - Water Quality Functions Multiply the score from D1 by the multiplier in D2 <i>Record score on p. 1 of field form</i>	11

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)								
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat										
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?										
<p>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.</p> <p> <input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover <input type="checkbox"/> Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >30% cover) </p> <p>Add the number of vegetation types that qualify. If you have:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>4-6 types</td> <td>points = 3</td> </tr> <tr> <td>3 types</td> <td>points = 2</td> </tr> <tr> <td>2 types</td> <td>points = 1</td> </tr> <tr> <td>1 type</td> <td>points = 0</td> </tr> </table> <p>Map of Cowardin vegetation classes and areas with different heights of emergents</p>		4-6 types	points = 3	3 types	points = 2	2 types	points = 1	1 type	points = 0	Figure 1 0
4-6 types	points = 3									
3 types	points = 2									
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<p>H 1.2. Is one of the vegetation types “aquatic bed?” (see p .64) YES = 1 point NO = 0 points</p>		0								
<p>H 1.3. Surface Water (see p.65)</p> <p>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)? <i>Note: answer YES for Lake-fringe wetlands</i> YES = 3 points & go to H 1.4 NO = go to H 1.3.2</p> <p>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 (<i>answer yes only if H 1.3.1 is NO</i>)? YES = 3 points NO = 0 points Map showing areas of open water</p>		Figure 7 0								
<p>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. (<i>different patches of the same species can be combined to meet the size threshold</i>) <i>You do not have to name the species.</i> <i>Do not include Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites ,Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)</i></p> <p>If you counted: > 9 species points = 2 4-9 species points = 1 # of species <u>2</u> < 4 species points = 0 points</p> <p>List species below if you wish</p>		 0								

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points Moderate = 2 points</p> <p>High = 3 points High = 3 points [Riparian braided channel]</p> <p>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</p>	<p>Figure 4</p> <p style="text-align: center;">0</p>
<p>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.</p> <p><input type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. <i>The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.</i></p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)</p> <p style="text-align: right;"><i>Maximum score possible = 6</i></p>	<p style="text-align: center;">0</p>
<p style="text-align: right;">TOTAL Potential to provide habitat <i>Add the scores in the column above</i></p>	<p style="text-align: center;">0</p>

Comments

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p>	
<p>H 2.1 Buffers (<i>see p. 71</i>) <i>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.</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 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 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — 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 <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure 13</p> <p style="text-align: center; font-size: 2em;">5</p>
<p>H 2.2 Wet Corridors (<i>see p. 72</i>)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) <input checked="" type="radio"/> NO = go to H 2.2.2</p> <p>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?</p> <p>YES = 2 points (go to H 2.3) <input checked="" type="radio"/> NO go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p><input checked="" type="radio"/> YES = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">1</p>

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.*

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*).
- Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora (*full description of herbaceous species found here are in WDFW PHS report p. 153*).
- Old-growth/Mature forests (east of Cascade crest):** (*full descriptions in WDFW PHS report p. 157*). **Old-growth:** Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. **Mature:** Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.
- Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).
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- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

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

0

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)

<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <p>— 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</p> <p>x — 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</p> <p>— There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed? points = 2</p> <p>— There is at least 1 wetland within ½ mile. points = 1</p> <p>— Does not meet any of the four criteria above points = 0</p>	5
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	11
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>	
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (see p. 75)</p> <p>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)</p> <p style="text-align: center;">YES = - 5 points <u>NO</u> = 0 points</p>	<p>Points will be subtracted</p> <p>0</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>	11

Comments

Wetland name or number W5

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): W5 Date of site visit: 6/10/09

Rated by Forrest Parsons/Joel Shaich Trained by Ecology? Yes ___ No X Date of training _____

SEC: 23 TOWNSHIP: 20N RANGE: 16E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure _____ Estimated size 0.004 acre

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

11

Score for Hydrologic Functions

20

Score for Habitat Functions

11

TOTAL score for functions

42

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

Final Category (choose the “highest” category from above)

3

Summary of basic information about the wetland unit

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

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>		X
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>		X
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		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.

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**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 W5

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.

D Depressional Wetlands		Points
WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality		(only 1 score per box)
D	D 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	D 1.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet - points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing surface outlet points = 1	3
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions of soil types) YES points = 3 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure 1 5
D	D 1.4 Characteristics of seasonal ponding or inundation. <i>This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.</i> Area seasonally ponded is > 1/2 total area of wetland points = 3 Area seasonally ponded is 1/4 - 1/2 total area of wetland points = 1 Area seasonally ponded is < 1/4 total area of wetland points = 0 NOTE: See text for indicators of seasonal and permanent inundation/flooding. Map of Hydroperiods	Figure 7 3
D	Total for D 1 Add the points in the boxes above	11
D	D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality? Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. 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. — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ YES multiplier is 2 NO multiplier is 1	multiplier <u>1</u>
D	TOTAL - Water Quality Functions Multiply the score from D1 by the multiplier in D2 <i>Record score on p. 1 of field form</i>	11

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)								
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat										
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?										
<p>H 1.1 <u>Categories of vegetation structure</u> (see p.62) <i>Check the vegetation classes (as defined by Cowardin) and heights of emergents present. Size threshold for each class or height category is 1/4 acre or more than 10% of the area if unit is < 2.5 acres.</i></p> <p><input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover <input type="checkbox"/> Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >30% cover)</p> <p><i>Add the number of vegetation types that qualify. If you have:</i></p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>4-6 types</td> <td>points = 3</td> </tr> <tr> <td>3 types</td> <td>points = 2</td> </tr> <tr> <td>2 types</td> <td>points = 1</td> </tr> <tr> <td>1 type</td> <td>points = 0</td> </tr> </table> <p>Map of Cowardin vegetation classes and areas with different heights of emergents</p>		4-6 types	points = 3	3 types	points = 2	2 types	points = 1	1 type	points = 0	Figure 1 0
4-6 types	points = 3									
3 types	points = 2									
2 types	points = 1									
1 type	points = 0									
<p>H 1.2. Is one of the vegetation types “aquatic bed?” (see p .64) YES = 1 point NO = 0 points</p>		0								
<p>H 1.3. <u>Surface Water</u> (see p.65) H 1.3.1 Does the unit have areas of “open” water (without herbaceous or shrub plants) over at least 1/4 acre or 10% of its area during the spring (March – early June) OR in early fall (August – end of September)? <i>Note: answer YES for Lake-fringe wetlands</i> 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 1/4 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</p>		Figure 7 0								
<p>H 1.4. <u>Richness of Plant Species</u> (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)</p> <p>If you counted: > 9 species points = 2 4-9 species points = 1 # of species <u>3</u> < 4 species points = 0 points</p> <p><i>List species below if you wish</i></p>		0								

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points Moderate = 2 points</p> <p>High = 3 points High = 3 points [Riparian braided channel]</p> <p>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</p>	<p>Figure 1</p> <p style="text-align: center; font-size: 2em;">0</p>
<p>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.</p> <p><input type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. <i>The presence of “yellow flag” Iris is a good indicator of vegetation in areas permanently ponded.</i></p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)</p> <p style="text-align: right;"><i>Maximum score possible = 6</i></p>	<p style="text-align: center; font-size: 2em;">0</p>
<p style="text-align: right;">TOTAL Potential to provide habitat <i>Add the scores in the column above</i></p>	<p style="text-align: center; font-size: 2em; border: 2px dashed black;">0</p>

Comments

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p>	
<p>H 2.1 Buffers (<i>see p. 71</i>) <i>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.</i></p> <p><input checked="" type="checkbox"/> 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference Points = 5</p> <p>— 330 ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. Points = 4</p> <p>— 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. Points = 4</p> <p>— 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . Points = 3</p> <p>— 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. Points = 3</p> <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <p>— 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</p> <p>— No paved areas or buildings within 170ft (50m) of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. Points = 2</p> <p>— Heavy grazing in buffer. Points = 1</p> <p>— 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</p> <p>— Buffer does not meet any of the criteria above. Points = 1</p> <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure 13</p> <p style="text-align: center; font-size: 2em;">5</p>
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0

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)

<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <ul style="list-style-type: none"> — 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 x 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 — 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 	<p>5</p>
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	<p>11</p>
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>	
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (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)</p> <p style="text-align: center;">YES = - 5 points <u>NO</u> = 0 points</p>	<p>Points will be subtracted</p> <p>0</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>	<p>11</p>

Comments

<p>SC 5.0 Forested Wetlands (see p. 85)</p> <p>Does the wetland unit have an area of forest (<i>you should have identified a forested class, if present, in question H 1.1</i>) rooted within its boundary that meet at least one of the following three criteria?</p> <ul style="list-style-type: none"> — The wetland is within the “100 year” floodplain of a river or stream — aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant of the “woody” vegetation. (<i>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</i>) — 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 (<i>see p. 83</i>) <p>YES = go to SC 5.1 NO – <i>not a forested wetland with special characteristics</i></p>	
<p>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</p> <p>Slow growing trees are: western red cedar (<i>Thuja plicata</i>), Alaska yellow cedar (<i>Chamaecyparis nootkatensis</i>), pine spp. mostly “white” pine (<i>Pinus monticola</i>), western hemlock (<i>Tsuga heterophylla</i>), Englemann spruce (<i>Picea engelmannii</i>).</p> <p>YES = Category I NO = go to SC 5.2</p>	<p>Cat. I</p>
<p>SC 5.2 Does the unit have areas where aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant species?</p> <p>YES = Category I NO = go to SC 5.3</p>	<p>Cat. I</p>
<p>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.</p> <p>Fast growing species are:</p> <p>Alders – red (<i>Alnus rubra</i>), thin-leaf (<i>A. tenuifolia</i>)</p> <p>Cottonwoods – narrow-leaf (<i>Populus angustifolia</i>), black (<i>P. balsamifera</i>)</p> <p>Willows- peach-leaf (<i>Salix amygdaloides</i>), Sitka (<i>S. sitchensis</i>), Pacific (<i>S. lasiandra</i>), Aspen - (<i>Populus tremuloides</i>), Water Birch (<i>Betula occidentalis</i>)</p> <p>YES = Category II NO = go to SC 5.5</p>	<p>Cat. II</p>
<p>SC 5.5 Is the forested component of the wetland within the “100 year floodplain” of a river or stream?</p> <p>YES = Category II</p>	<p>Cat. II</p>
<p>Category of wetland based on Special Characteristics</p> <p><i>Choose the “highest” rating if wetland falls into several categories.</i></p> <p>If you answered NO for all types enter “Not Applicable” on p.1</p>	<p>NA</p>

Wetland name or number W6

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): W6 Date of site visit: 6/10/09

Rated by Forrest Parsons/Joel Shaich Trained by Ecology? Yes ___ No X Date of training _____

SEC: 23 TOWNSHIP: 20N RANGE: 16E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure _____ Estimated size 0.253 acre

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	11
Score for Hydrologic Functions	20
Score for Habitat Functions	11
TOTAL score for functions	42

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

3

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

Summary of basic information about the wetland unit

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

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>		X
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>		X
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		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.

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**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 W6

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.

D Depressional Wetlands		Points
WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality		(only 1 score per box)
D	D 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	D 1.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet - points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing surface outlet points = 1	3
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (<i>use NRCS definitions of soil types</i>) YES points = 3 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure 2 5
D	D 1.4 Characteristics of seasonal ponding or inundation. <i>This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.</i> Area seasonally ponded is > 1/2 total area of wetland points = 3 Area seasonally ponded is 1/4 - 1/2 total area of wetland points = 1 Area seasonally ponded is < 1/4 total area of wetland points = 0 NOTE: See text for indicators of seasonal and permanent inundation/flooding. Map of Hydroperiods	Figure 8 3
D	Total for D 1 <i>Add the points in the boxes above</i>	11
D	D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality? Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. <i>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.</i> — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ YES multiplier is 2 NO multiplier is 1	multiplier <u>1</u>
D	TOTAL - Water Quality Functions Multiply the score from D1 by the multiplier in D2 <i>Record score on p. 1 of field form</i>	11

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)								
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat										
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?										
<p>H 1.1 <u>Categories of vegetation structure (see p.62)</u> <i>Check the vegetation classes (as defined by Cowardin) and heights of emergents present. Size threshold for each class or height category is 1/4 acre or more than 10% of the area if unit is < 2.5 acres.</i></p> <p><input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover <input type="checkbox"/> Emergent plants >12 – 40 in. (>30 – 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Emergent plants > 40 in. (> 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >30% cover)</p> <p><i>Add the number of vegetation types that qualify. If you have:</i></p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>4-6 types</td> <td>points = 3</td> </tr> <tr> <td>3 types</td> <td>points = 2</td> </tr> <tr> <td>2 types</td> <td>points = 1</td> </tr> <tr> <td>1 type</td> <td>points = 0</td> </tr> </table> <p>Map of Cowardin vegetation classes and areas with different heights of emergents</p>		4-6 types	points = 3	3 types	points = 2	2 types	points = 1	1 type	points = 0	<p>Figure 2</p> <p style="text-align: center; font-size: 2em;">0</p>
4-6 types	points = 3									
3 types	points = 2									
2 types	points = 1									
1 type	points = 0									
<p>H 1.2. Is one of the vegetation types “aquatic bed?” (see p .64) YES = 1 point NO = 0 points</p>		<p style="font-size: 2em;">0</p>								
<p>H 1.3. <u>Surface Water (see p.65)</u> H 1.3.1 Does the unit have areas of “open” water (without herbaceous or shrub plants) over at least 1/4 acre or 10% of its area during the spring (March – early June) OR in early fall (August – end of September)? <i>Note: answer YES for Lake-fringe wetlands</i> 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 1/4 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</p>		<p>Figure 8</p> <p style="text-align: center; font-size: 2em;">0</p>								
<p>H 1.4. <u>Richness of Plant Species (see p. 66)</u> 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)</p> <p>If you counted: > 9 species points = 2 4-9 species points = 1 # of species <u>2</u> < 4 species points = 0 points</p> <p><i>List species below if you wish</i></p>		<p style="font-size: 2em;">0</p>								

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points Moderate = 2 points</p> <p>High = 3 points High = 3 points [Riparian braided channel]</p> <p>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</p>	<p>Figure 2</p> <p style="text-align: center;">0</p>
<p>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.</p> <p><input type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. <i>The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.</i></p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)</p> <p style="text-align: right;"><i>Maximum score possible = 6</i></p>	<p style="text-align: center;">0</p>
<p style="text-align: right;">TOTAL Potential to provide habitat <i>Add the scores in the column above</i></p>	<p style="text-align: center;">0</p>

Comments

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p>	
<p>H 2.1 Buffers (<i>see p. 71</i>) <i>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.</i></p> <p><input checked="" type="checkbox"/> 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference Points = 5</p> <p>— 330 ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. Points = 4</p> <p>— 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. Points = 4</p> <p>— 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . Points = 3</p> <p>— 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. Points = 3</p> <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <p>— 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</p> <p>— No paved areas or buildings within 170ft (50m) of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. Points = 2</p> <p>— Heavy grazing in buffer. Points = 1</p> <p>— 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</p> <p>— Buffer does not meet any of the criteria above. Points = 1</p> <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure 14</p> <p style="text-align: center; font-size: 2em;">5</p>
<p>H 2.2 Wet Corridors (<i>see p. 72</i>)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) <input checked="" type="radio"/> NO = go to H 2.2.2</p> <p>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?</p> <p>YES = 2 points (go to H 2.3) <input checked="" type="radio"/> NO go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p><input checked="" type="radio"/> YES = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">1</p>

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.*

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report p. 152).
- Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora (full description of herbaceous species found here are in WDFW PHS report p. 153).
- Old-growth/Mature forests (east of Cascade crest):** (full descriptions in WDFW PHS report p. 157). **Old-growth:** Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. **Mature:** Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.
- Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (full descriptions in WDFW PHS report p. 158).
- Juniper Savannah:** All juniper woodlands (SE part of state only; check map)
- Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Inland Dunes** This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. (check WDFW web site)
- Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

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

0

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)

<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <p>— 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 x means outside boundaries of reclamation areas, irrigation district, or reservoirs) points = 5</p> <p>— 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</p> <p>— There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed? points = 2</p> <p>— There is at least 1 wetland within ½ mile. points = 1</p> <p>— Does not meet any of the four criteria above points = 0</p>	<p>5</p>
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	<p>11</p>
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>	
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (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)</p> <p style="text-align: center;">YES = - 5 points <u>NO</u> = 0 points</p>	<p>Points will be subtracted</p> <p>0</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>	<p>11</p>

Comments

<p>SC 5.0 Forested Wetlands (see p. 85)</p> <p>Does the wetland unit have an area of forest (<i>you should have identified a forested class, if present, in question H 1.1</i>) rooted within its boundary that meet at least one of the following three criteria?</p> <ul style="list-style-type: none"> — The wetland is within the “100 year” floodplain of a river or stream — aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant of the “woody” vegetation. (<i>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</i>) — 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 (<i>see p. 83</i>) <p>YES = go to SC 5.1 NO – <i>not a forested wetland with special characteristics</i></p>	
<p>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</p> <p>Slow growing trees are: western red cedar (<i>Thuja plicata</i>), Alaska yellow cedar (<i>Chamaecyparis nootkatensis</i>), pine spp. mostly “white” pine (<i>Pinus monticola</i>), western hemlock (<i>Tsuga heterophylla</i>), Englemann spruce (<i>Picea engelmannii</i>).</p> <p>YES = Category I NO = go to SC 5.2</p>	<p>Cat. I</p>
<p>SC 5.2 Does the unit have areas where aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant species?</p> <p>YES = Category I NO = go to SC 5.3</p>	<p>Cat. I</p>
<p>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.</p> <p>Fast growing species are:</p> <p>Alders – red (<i>Alnus rubra</i>), thin-leaf (<i>A. tenuifolia</i>)</p> <p>Cottonwoods – narrow-leaf (<i>Populus angustifolia</i>), black (<i>P. balsamifera</i>)</p> <p>Willows- peach-leaf (<i>Salix amygdaloides</i>), Sitka (<i>S. sitchensis</i>), Pacific (<i>S. lasiandra</i>), Aspen - (<i>Populus tremuloides</i>), Water Birch (<i>Betula occidentalis</i>)</p> <p>YES = Category II NO = go to SC 5.5</p>	<p>Cat. II</p>
<p>SC 5.5 Is the forested component of the wetland within the “100 year floodplain” of a river or stream?</p> <p>YES = Category II</p>	<p>Cat. II</p>
<p>Category of wetland based on Special Characteristics</p> <p><i>Choose the “highest” rating if wetland falls into several categories.</i></p> <p>If you answered NO for all types enter “Not Applicable” on p.1</p>	<p>NA</p>

Wetland name or number W7

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): W7 Date of site visit: 6/10/09

Rated by Forrest Parsons/Joel Shaich Trained by Ecology? Yes ___ No X Date of training _____

SEC: 23 TOWNSHIP: 20N RANGE: 16E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure _____ Estimated size 0.231 acre

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

11

Score for Hydrologic Functions

20

Score for Habitat Functions

13

TOTAL score for functions

44

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

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

3

Summary of basic information about the wetland unit

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

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>		X
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>		X
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		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.

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**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 W7

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.

D Depressional Wetlands		Points
WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality		(only 1 score per box)
D	D 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	D 1.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet - points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing surface outlet points = 1	3
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions of soil types) YES points = 3 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure 1 5
D	D 1.4 Characteristics of seasonal ponding or inundation. <i>This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.</i> Area seasonally ponded is > 1/2 total area of wetland points = 3 Area seasonally ponded is 1/4 - 1/2 total area of wetland points = 1 Area seasonally ponded is < 1/4 total area of wetland points = 0 NOTE: See text for indicators of seasonal and permanent inundation/flooding. Map of Hydroperiods	Figure 7 3
D	Total for D 1 Add the points in the boxes above	11
D	D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality? Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. 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. — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ YES multiplier is 2 NO multiplier is 1	multiplier <u>1</u>
D	TOTAL - Water Quality Functions Multiply the score from D1 by the multiplier in D2 <i>Record score on p. 1 of field form</i>	11

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)								
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat										
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?										
<p>H 1.1 <u>Categories of vegetation structure</u> (see p.62) <i>Check the vegetation classes (as defined by Cowardin) and heights of emergents present. Size threshold for each class or height category is 1/4 acre or more than 10% of the area if unit is < 2.5 acres.</i></p> <p><input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover <input type="checkbox"/> Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >30% cover)</p> <p><i>Add the number of vegetation types that qualify. If you have:</i></p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>4-6 types</td> <td>points = 3</td> </tr> <tr> <td>3 types</td> <td>points = 2</td> </tr> <tr> <td>2 types</td> <td>points = 1</td> </tr> <tr> <td>1 type</td> <td>points = 0</td> </tr> </table> <p>Map of Cowardin vegetation classes and areas with different heights of emergents</p>		4-6 types	points = 3	3 types	points = 2	2 types	points = 1	1 type	points = 0	Figure 1 0
4-6 types	points = 3									
3 types	points = 2									
2 types	points = 1									
1 type	points = 0									
<p>H 1.2. Is one of the vegetation types “aquatic bed?” (see p .64) YES = 1 point NO = 0 points</p>		0								
<p>H 1.3. <u>Surface Water</u> (see p.65)</p> <p>H 1.3.1 Does the unit have areas of “open” water (without herbaceous or shrub plants) over at least 1/4 acre or 10% of its area during the spring (March – early June) OR in early fall (August – end of September)? <i>Note: answer YES for Lake-fringe wetlands</i> YES = 3 points & go to H 1.4 <input checked="" type="radio"/> NO = go to H 1.3.2</p> <p>H 1.3.2 Does the unit have an intermittent or permanent stream within its boundaries, or along one side, over at least 1/4 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 <input checked="" type="radio"/> NO = 0 points</p> <p style="text-align: center;">Map showing areas of open water</p>		Figure 7 0								
<p>H 1.4. <u>Richness of Plant Species</u> (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)</p> <p>If you counted: > 9 species points = 2 4-9 species points = 1 # of species <u>5</u> < 4 species points = 0 points</p> <p><i>List species below if you wish</i></p>		 1								

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points</p> <p>High = 3 points [Riparian braided channel]</p> <p>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</p>	<p>Figure 1</p> <p style="text-align: center;">1</p>
<p>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.</p> <p><input type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. <i>The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.</i></p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)</p> <p style="text-align: right;"><i>Maximum score possible = 6</i></p>	<p style="text-align: center;">0</p>
<p style="text-align: right;">TOTAL Potential to provide habitat <i>Add the scores in the column above</i></p>	<p style="text-align: center;">2</p>

Comments

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p>	
<p>H 2.1 Buffers (<i>see p. 71</i>) <i>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.</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 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 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — 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 <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure 13</p> <p style="text-align: center; font-size: 2em;">5</p>
<p>H 2.2 Wet Corridors (<i>see p. 72</i>)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) <input checked="" type="radio"/> NO = go to H 2.2.2</p> <p>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?</p> <p>YES = 2 points (go to H 2.3) <input checked="" type="radio"/> NO go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p><input checked="" type="radio"/> YES = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">1</p>

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.*

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*).
- Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora (*full description of herbaceous species found here are in WDFW PHS report p. 153*).
- Old-growth/Mature forests (east of Cascade crest):** (*full descriptions in WDFW PHS report p. 157*). **Old-growth:** Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. **Mature:** Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.
- Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).
- Juniper Savannah:** All juniper woodlands (*SE part of state only; check map*)
- Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Inland Dunes** This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. (*check WDFW web site*)
- Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

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

0

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)

<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <p>— 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 x means outside boundaries of reclamation areas, irrigation district, or reservoirs) points = 5</p> <p>— 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</p> <p>— There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed? points = 2</p> <p>— There is at least 1 wetland within ½ mile. points = 1</p> <p>— Does not meet any of the four criteria above points = 0</p>	<p>5</p>	
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	<p>11</p>	
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>		
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (see p. 75)</p> <p>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)</p> <p style="text-align: center;">YES = - 5 points <u>NO</u> = 0 points</p>	<p>Points will be subtracted</p> <p>0</p>	
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>		<p>13</p>

Comments

Wetland name or number W8

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): W8 Date of site visit: 6/10/09

Rated by Forrest Parsons/Joel Shaich Trained by Ecology? Yes ___ No X Date of training _____

SEC: 22 TOWNSHIP: 20N RANGE: 16E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure _____ Estimated size 0.027 acre

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	14
Score for Hydrologic Functions	20
Score for Habitat Functions	12
TOTAL score for functions	46

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

3

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

Summary of basic information about the wetland unit

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

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>		X
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>		X
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		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.

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**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 W8

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.

D Depressional Wetlands		Points
WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality		(only 1 score per box)
D	D 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	D 1.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet - points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing surface outlet points = 1	3
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions of soil types) YES points = 3 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure 6 1
D	D 1.4 Characteristics of seasonal ponding or inundation. <i>This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.</i> Area seasonally ponded is > 1/2 total area of wetland points = 3 Area seasonally ponded is 1/4 - 1/2 total area of wetland points = 1 Area seasonally ponded is < 1/4 total area of wetland points = 0 NOTE: See text for indicators of seasonal and permanent inundation/flooding. Map of Hydroperiods	Figure 12 3
D	Total for D 1 Add the points in the boxes above	7
D	D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality? Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. 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. — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland <input checked="" type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ YES multiplier is 2 NO multiplier is 1	multiplier <u>2</u>
D	TOTAL - Water Quality Functions Multiply the score from D1 by the multiplier in D2 <i>Record score on p. 1 of field form</i>	14

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)								
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat										
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?										
<p>H 1.1 <u>Categories of vegetation structure</u> (see p.62) <i>Check the vegetation classes (as defined by Cowardin) and heights of emergents present. Size threshold for each class or height category is 1/4 acre or more than 10% of the area if unit is < 2.5 acres.</i></p> <p><input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover <input type="checkbox"/> Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >30% cover)</p> <p><i>Add the number of vegetation types that qualify. If you have:</i></p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>4-6 types</td> <td>points = 3</td> </tr> <tr> <td>3 types</td> <td>points = 2</td> </tr> <tr> <td>2 types</td> <td>points = 1</td> </tr> <tr> <td>1 type</td> <td>points = 0</td> </tr> </table> <p>Map of Cowardin vegetation classes and areas with different heights of emergents</p>		4-6 types	points = 3	3 types	points = 2	2 types	points = 1	1 type	points = 0	<p>Figure 6</p> <p style="text-align: center; font-size: 2em;">0</p>
4-6 types	points = 3									
3 types	points = 2									
2 types	points = 1									
1 type	points = 0									
<p>H 1.2. Is one of the vegetation types “aquatic bed?” (see p .64) YES = 1 point NO = 0 points</p>		<p style="font-size: 2em;">0</p>								
<p>H 1.3. <u>Surface Water</u> (see p.65)</p> <p>H 1.3.1 Does the unit have areas of “open” water (without herbaceous or shrub plants) over at least 1/4 acre or 10% of its area during the spring (March – early June) OR in early fall (August – end of September)? <i>Note: answer YES for Lake-fringe wetlands</i></p> <p>YES = 3 points & go to H 1.4 NO = go to H 1.3.2</p> <p>H 1.3.2 Does the unit have an intermittent or permanent stream within its boundaries, or along one side, over at least 1/4 acre or 10% of its area, AND that has an unvegetated bottom (answer yes only if H 1.3.1 is NO)?</p> <p>YES = 3 points NO = 0 points</p> <p style="text-align: center;">Map showing areas of open water</p>		<p>Figure 12</p> <p style="text-align: center; font-size: 2em;">3</p>								
<p>H 1.4. <u>Richness of Plant Species</u> (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)</p> <p>If you counted: > 9 species points = 2 4-9 species points = 1 # of species <u>2</u> < 4 species points = 0 points</p> <p><i>List species below if you wish</i></p>		<p style="font-size: 2em;">0</p>								

<p>H 1.5. Interspersion of habitats (<i>see p. 67</i>) 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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points Moderate = 2 points</p> <p>High = 3 points High = 3 points [Riparian braided channel]</p> <p>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</p>	<p>Figure 6</p> <p style="text-align: center;">1</p>
<p>H 1.6. Special Habitat Features: (<i>see p. 68</i>) 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.</p> <p><input type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. <i>The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.</i></p> <p><input type="checkbox"/> 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</p> <p><input checked="" type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)</p> <p style="text-align: right;"><i>Maximum score possible = 6</i></p>	<p style="text-align: center;">1</p>
<p style="text-align: right;">TOTAL Potential to provide habitat <i>Add the scores in the column above</i></p>	<p style="text-align: center; border: 2px dashed black;">5</p>

Comments

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p>	
<p>H 2.1 <u>Buffers</u> (see p. 71) <i>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.</i></p> <ul style="list-style-type: none"> — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference Points = 5 X 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 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — 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 <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure 18</p> <p style="text-align: center; font-size: 2em;">4</p>
<p>H 2.2 <u>Wet Corridors</u> (see p. 72)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) (NO) = go to H 2.2.2</p> <p>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?</p> <p>YES = 2 points (go to H 2.3) (NO) go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p>(YES) = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">1</p>

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.*

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report p. 152).
- Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora (full description of herbaceous species found here are in WDFW PHS report p. 153).
- Old-growth/Mature forests (east of Cascade crest):** (full descriptions in WDFW PHS report p. 157). **Old-growth:** Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. **Mature:** Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.
- Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (full descriptions in WDFW PHS report p. 158).
- Juniper Savannah:** All juniper woodlands (SE part of state only; check map)
- Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Inland Dunes** This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. (check WDFW web site)
- Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

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

0

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)

<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <ul style="list-style-type: none"> — 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 <input checked="" type="checkbox"/> 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 	2
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	7
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>	
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (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)</p> <p style="text-align: center;">YES = - 5 points <input checked="" type="radio"/> NO = 0 points</p>	<p>Points will be subtracted</p> <p>0</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>	
<p>12</p>	

Comments

<p>SC 5.0 Forested Wetlands (see p. 85)</p> <p>Does the wetland unit have an area of forest (<i>you should have identified a forested class, if present, in question H 1.1</i>) rooted within its boundary that meet at least one of the following three criteria?</p> <ul style="list-style-type: none"> — The wetland is within the “100 year” floodplain of a river or stream — aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant of the “woody” vegetation. (<i>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</i>) — 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 (<i>see p. 83</i>) <p>YES = go to SC 5.1 NO <i>not a forested wetland with special characteristics</i></p>	
<p>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</p> <p>Slow growing trees are: western red cedar (<i>Thuja plicata</i>), Alaska yellow cedar (<i>Chamaecyparis nootkatensis</i>), pine spp. mostly “white” pine (<i>Pinus monticola</i>), western hemlock (<i>Tsuga heterophylla</i>), Englemann spruce (<i>Picea engelmannii</i>).</p> <p>YES = Category I NO = go to SC 5.2</p>	<p>Cat. I</p>
<p>SC 5.2 Does the unit have areas where aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant species?</p> <p>YES = Category I NO = go to SC 5.3</p>	<p>Cat. I</p>
<p>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.</p> <p>Fast growing species are:</p> <p>Alders – red (<i>Alnus rubra</i>), thin-leaf (<i>A. tenuifolia</i>)</p> <p>Cottonwoods – narrow-leaf (<i>Populus angustifolia</i>), black (<i>P. balsamifera</i>)</p> <p>Willows- peach-leaf (<i>Salix amygdaloides</i>), Sitka (<i>S. sitchensis</i>), Pacific (<i>S. lasiandra</i>), Aspen - (<i>Populus tremuloides</i>), Water Birch (<i>Betula occidentalis</i>)</p> <p>YES = Category II NO = go to SC 5.5</p>	<p>Cat. II</p>
<p>SC 5.5 Is the forested component of the wetland within the “100 year floodplain” of a river or stream?</p> <p>YES = Category II</p>	<p>Cat. II</p>
<p>Category of wetland based on Special Characteristics</p> <p><i>Choose the “highest” rating if wetland falls into several categories.</i></p> <p>If you answered NO for all types enter “Not Applicable” on p.1</p>	<p>NA</p>

Wetland name or number W9

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): W9 Date of site visit: 6/10/09

Rated by Forrest Parsons/Joel Shaich Trained by Ecology? Yes ___ No X Date of training _____

SEC: 22 TOWNSHIP: 20N RANGE: 16E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure _____ Estimated size 0.013 acre

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	9
Score for Hydrologic Functions	20
Score for Habitat Functions	11
TOTAL score for functions	40

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

3

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

Summary of basic information about the wetland unit

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

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>		X
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>		X
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		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.

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**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 W9

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.

D Depressional Wetlands		Points
WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality		(only 1 score per box)
D	D 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	D 1.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet - points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing surface outlet points = 1	3
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions of soil types) YES points = 3 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure 6 3
D	D 1.4 Characteristics of seasonal ponding or inundation. <i>This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.</i> Area seasonally ponded is > 1/2 total area of wetland points = 3 Area seasonally ponded is 1/4 - 1/2 total area of wetland points = 1 Area seasonally ponded is < 1/4 total area of wetland points = 0 NOTE: See text for indicators of seasonal and permanent inundation/flooding. Map of Hydroperiods	Figure 12 3
D	Total for D 1 Add the points in the boxes above	9
D	D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality? Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. 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. — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ YES multiplier is 2 NO multiplier is 1	multiplier <u>1</u>
D	TOTAL - Water Quality Functions Multiply the score from D1 by the multiplier in D2 <i>Record score on p. 1 of field form</i>	9

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)								
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat										
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?										
<p>H 1.1 <u>Categories of vegetation structure</u> (see p.62) <i>Check the vegetation classes (as defined by Cowardin) and heights of emergents present. Size threshold for each class or height category is 1/4 acre or more than 10% of the area if unit is < 2.5 acres.</i></p> <p><input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover <input type="checkbox"/> Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >30% cover)</p> <p><i>Add the number of vegetation types that qualify. If you have:</i></p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>4-6 types</td> <td>points = 3</td> </tr> <tr> <td>3 types</td> <td>points = 2</td> </tr> <tr> <td>2 types</td> <td>points = 1</td> </tr> <tr> <td>1 type</td> <td>points = 0</td> </tr> </table> <p>Map of Cowardin vegetation classes and areas with different heights of emergents</p>		4-6 types	points = 3	3 types	points = 2	2 types	points = 1	1 type	points = 0	Figure 6 0
4-6 types	points = 3									
3 types	points = 2									
2 types	points = 1									
1 type	points = 0									
<p>H 1.2. Is one of the vegetation types “aquatic bed?” (see p .64) YES = 1 point NO = 0 points</p>		0								
<p>H 1.3. <u>Surface Water</u> (see p.65) H 1.3.1 Does the unit have areas of “open” water (without herbaceous or shrub plants) over at least 1/4 acre or 10% of its area during the spring (March – early June) OR in early fall (August – end of September)? <i>Note: answer YES for Lake-fringe wetlands</i> <input checked="" type="checkbox"/> 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 1/4 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</p>		Figure 12 3								
<p>H 1.4. <u>Richness of Plant Species</u> (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)</p> <p>If you counted: > 9 species points = 2 4-9 species points = 1 # of species <u>1</u> < 4 species points = 0 points List species below if you wish</p>		 0								

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points Moderate = 2 points</p> <p>High = 3 points High = 3 points [Riparian braided channel]</p> <p>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</p>	<p>Figure 6</p> <p style="text-align: center; font-size: 2em;">1</p>
<p>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.</p> <p><input type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. <i>The presence of “yellow flag” Iris is a good indicator of vegetation in areas permanently ponded.</i></p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)</p> <p style="text-align: right;"><i>Maximum score possible = 6</i></p>	<p style="text-align: center; font-size: 2em;">0</p>
<p style="text-align: right;">TOTAL Potential to provide habitat <i>Add the scores in the column above</i></p>	<p style="text-align: center; font-size: 2em; border: 2px dashed black;">4</p>

Comments

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p>	
<p>H 2.1 Buffers (<i>see p. 71</i>) <i>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.</i></p> <ul style="list-style-type: none"> — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference Points = 5 X 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 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — 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 <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure 18</p> <p style="text-align: center; font-size: 2em;">4</p>
<p>H 2.2 Wet Corridors (<i>see p. 72</i>)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) (NO) = go to H 2.2.2</p> <p>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?</p> <p>YES = 2 points (go to H 2.3) (NO) go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p>(YES) = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">1</p>

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.*

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*).
- Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora (*full description of herbaceous species found here are in WDFW PHS report p. 153*).
- Old-growth/Mature forests (east of Cascade crest):** (*full descriptions in WDFW PHS report p. 157*). **Old-growth:** Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. **Mature:** Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.
- Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).
- Juniper Savannah:** All juniper woodlands (*SE part of state only; check map*)
- Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Inland Dunes** This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. (*check WDFW web site*)
- Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

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

0

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)

<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <ul style="list-style-type: none"> — 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 <input checked="" type="checkbox"/> 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 	2	
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	7	
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>		
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (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)</p> <p style="text-align: center;">YES = - 5 points <input checked="" type="radio"/> NO = 0 points</p>	<p>Points will be subtracted</p> <p>0</p>	
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>		11

Comments

<p>SC 3.0 Natural Heritage Wetlands (<i>see p. 81</i>) 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.</p> <p>SC 3.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (<i>this question is used to screen out most sites before you need to contact WNHP/DNR</i>) S/T/R information from Appendix D <input checked="" type="checkbox"/> or accessed from WNHP/DNR database ___</p> <p>YES ___ – contact WNHP/DNR (see p. 79) and go to SC 3.2 NO <input checked="" type="checkbox"/></p> <p>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? YES = Category I NO –not a natural heritage wetland</p>	Cat. I
<p>SC 4.0 Bogs (<i>see p. 82</i>) Does the wetland unit (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs. <i>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.</i></p> <p>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</p> <p>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 - <i>Is not a bog for rating</i></p> <p>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)? Yes – Category I bog No - go to Q. 4.4</p> <p><i>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.</i></p> <p>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)? Yes – Category I bog NO</p>	Cat. I Cat. I

Wetland name or number W10

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): W10 Date of site visit: 6/10/09

Rated by Forrest Parsons/Joel Shaich Trained by Ecology? Yes ___ No X Date of training _____

SEC: 22 TOWNSHIP: 20N RANGE: 16E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure _____ Estimated size 0.019 acre

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	11
Score for Hydrologic Functions	20
Score for Habitat Functions	11
TOTAL score for functions	42

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

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

3

Summary of basic information about the wetland unit

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

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>		X
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>		X
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		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.

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**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 W10

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.

D Depressional Wetlands		Points
WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality		(only 1 score per box)
D	D 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	D 1.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet - points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing surface outlet points = 1	3
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions of soil types) YES points = 3 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure 3 5
D	D 1.4 Characteristics of seasonal ponding or inundation. <i>This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.</i> Area seasonally ponded is > 1/2 total area of wetland points = 3 Area seasonally ponded is 1/4 - 1/2 total area of wetland points = 1 Area seasonally ponded is < 1/4 total area of wetland points = 0 NOTE: See text for indicators of seasonal and permanent inundation/flooding. Map of Hydroperiods	Figure 9 3
D	Total for D 1 Add the points in the boxes above	11
D	D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality? Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. 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. — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ YES multiplier is 2 NO multiplier is 1	multiplier <u>1</u>
D	TOTAL - Water Quality Functions Multiply the score from D1 by the multiplier in D2 <i>Record score on p. 1 of field form</i>	11

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

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points Moderate = 2 points</p> <p>High = 3 points High = 3 points [Riparian braided channel]</p> <p>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</p>	<p>Figure 3</p> <p style="text-align: center; font-size: 2em;">0</p>
<p>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.</p> <p><input type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. <i>The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.</i></p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)</p> <p style="text-align: right;"><i>Maximum score possible = 6</i></p>	<p style="text-align: center; font-size: 2em;">0</p>
<p style="text-align: right;">TOTAL Potential to provide habitat <i>Add the scores in the column above</i></p>	<p style="text-align: center; font-size: 2em; border: 2px dashed black;">0</p>

Comments

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p>	
<p>H 2.1 <u>Buffers</u> (see p. 71) <i>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.</i></p> <ul style="list-style-type: none"> — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference Points = 5 X 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 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — 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 <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure 15</p> <p style="text-align: center; font-size: 2em;">4</p>
<p>H 2.2 <u>Wet Corridors</u> (see p. 72)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) (NO) = go to H 2.2.2</p> <p>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?</p> <p>YES = 2 points (go to H 2.3) (NO) go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p>(YES) = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">1</p>

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.*

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*).
- Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora (*full description of herbaceous species found here are in WDFW PHS report p. 153*).
- Old-growth/Mature forests (east of Cascade crest):** (*full descriptions in WDFW PHS report p. 157*). **Old-growth:** Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. **Mature:** Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.
- Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).
- Juniper Savannah:** All juniper woodlands (*SE part of state only; check map*)
- Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Inland Dunes** This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. (*check WDFW web site*)
- Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

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

4

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)

<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <ul style="list-style-type: none"> — 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 <input checked="" type="checkbox"/> 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 	2	
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	11	
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>		
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (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)</p> <p style="text-align: center;">YES = - 5 points <input checked="" type="radio"/> NO = 0 points</p>	<p>Points will be subtracted</p> <p>0</p>	
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>		11

Comments

<p>SC 5.0 Forested Wetlands (see p. 85)</p> <p>Does the wetland unit have an area of forest (<i>you should have identified a forested class, if present, in question H 1.1</i>) rooted within its boundary that meet at least one of the following three criteria?</p> <ul style="list-style-type: none"> — The wetland is within the “100 year” floodplain of a river or stream — aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant of the “woody” vegetation. (<i>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</i>) — 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 (<i>see p. 83</i>) <p>YES = go to SC 5.1 NO <i>not a forested wetland with special characteristics</i></p>	
<p>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</p> <p>Slow growing trees are: western red cedar (<i>Thuja plicata</i>), Alaska yellow cedar (<i>Chamaecyparis nootkatensis</i>), pine spp. mostly “white” pine (<i>Pinus monticola</i>), western hemlock (<i>Tsuga heterophylla</i>), Englemann spruce (<i>Picea engelmannii</i>).</p> <p>YES = Category I NO = go to SC 5.2</p>	<p>Cat. I</p>
<p>SC 5.2 Does the unit have areas where aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant species?</p> <p>YES = Category I NO = go to SC 5.3</p>	<p>Cat. I</p>
<p>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.</p> <p>Fast growing species are:</p> <p>Alders – red (<i>Alnus rubra</i>), thin-leaf (<i>A. tenuifolia</i>)</p> <p>Cottonwoods – narrow-leaf (<i>Populus angustifolia</i>), black (<i>P. balsamifera</i>)</p> <p>Willows- peach-leaf (<i>Salix amygdaloides</i>), Sitka (<i>S. sitchensis</i>), Pacific (<i>S. lasiandra</i>), Aspen - (<i>Populus tremuloides</i>), Water Birch (<i>Betula occidentalis</i>)</p> <p>YES = Category II NO = go to SC 5.5</p>	<p>Cat. II</p>
<p>SC 5.5 Is the forested component of the wetland within the “100 year floodplain” of a river or stream?</p> <p>YES = Category II</p>	<p>Cat. II</p>
<p>Category of wetland based on Special Characteristics</p> <p><i>Choose the “highest” rating if wetland falls into several categories.</i></p> <p>If you answered NO for all types enter “Not Applicable” on p.1</p>	<p>NA</p>

Wetland name or number W11

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): W11 Date of site visit: 6/10/09

Rated by Forrest Parsons/Joel Shaich Trained by Ecology? Yes ___ No X Date of training _____

SEC: 22 TOWNSHIP: 20N RANGE: 16E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure _____ Estimated size 0.006 acre

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

11

Score for Hydrologic Functions

20

Score for Habitat Functions

8

TOTAL score for functions

39

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

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

3

Summary of basic information about the wetland unit

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

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>		X
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>		X
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		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.

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**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 W11

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.

D Depressional Wetlands		Points
WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality		(only 1 score per box)
D	D 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	D 1.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet - points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing surface outlet points = 1	3
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions of soil types) YES points = 3 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure 6 5
D	D 1.4 Characteristics of seasonal ponding or inundation. <i>This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.</i> Area seasonally ponded is > 1/2 total area of wetland points = 3 Area seasonally ponded is 1/4 - 1/2 total area of wetland points = 1 Area seasonally ponded is < 1/4 total area of wetland points = 0 NOTE: See text for indicators of seasonal and permanent inundation/flooding. Map of Hydroperiods	Figure 12 3
D	Total for D 1 Add the points in the boxes above	11
D	D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality? Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. 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. — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ YES multiplier is 2 NO multiplier is 1	multiplier <u>1</u>
D	TOTAL - Water Quality Functions Multiply the score from D1 by the multiplier in D2 <i>Record score on p. 1 of field form</i>	11

D Depressional Wetlands HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion		Points (only 1 score per box)
D	D 3.0 Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?	(see p. 39)
D	D 3.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet points = 8 Wetland has an intermittently flowing outlet points = 4 Wetland has a highly constricted permanently flowing outlet points = 4 Wetland has a permanently flowing surface outlet points = 0	4
D	D 3.2 Depth of storage during wet periods: <i>Estimate the height of ponding above the surface of the wetland (see text for description of measuring height). In wetlands with permanent ponding, the surface is the lowest elevation of "permanent" water)</i> Marks of ponding are at least 3 ft above the surface points = 8 The wetland is a "headwater" wetland" (see p. 39) points = 6 Marks are 2 ft to < 3 ft from surface points = 6 Marks are 1 ft to < 2 ft from surface points = 4 Marks are 6 in to < 1 ft from surface points = 2 No marks above 6 in. or wetland has only saturated soils points = 0	6
D	Total for D 3 <i>Add the points in the boxes above</i>	10
D	D 4.0 Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion? <i>Answer NO if the major source of water is groundwater, irrigation return flow, or water levels in the wetland are controlled by a reservoir.</i> <i>Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Note which of the following conditions apply.</i> <input checked="" type="checkbox"/> Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other _____ YES multiplier is 2 NO multiplier is 1	(see p. 42) multiplier <u>2</u>
D	TOTAL - Hydrologic Functions Multiply the score from D3 by the multiplier in D4 <i>Record score on p. 1 of field form</i>	20

Comments

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)								
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat										
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?										
<p>H 1.1 <u>Categories of vegetation structure</u> (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.</p> <p> <input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover <input type="checkbox"/> Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover <input type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >30% cover) </p> <p>Add the number of vegetation types that qualify. If you have:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>4-6 types</td> <td>points = 3</td> </tr> <tr> <td>3 types</td> <td>points = 2</td> </tr> <tr> <td>2 types</td> <td>points = 1</td> </tr> <tr> <td>1 type</td> <td>points = 0</td> </tr> </table> <p>Map of Cowardin vegetation classes and areas with different heights of emergents</p>		4-6 types	points = 3	3 types	points = 2	2 types	points = 1	1 type	points = 0	<p>Figure 6</p> <p style="text-align: center; font-size: 2em;">0</p>
4-6 types	points = 3									
3 types	points = 2									
2 types	points = 1									
1 type	points = 0									
<p>H 1.2. Is one of the vegetation types “aquatic bed?” (see p .64) YES = 1 point NO = 0 points</p>		<p style="font-size: 2em;">0</p>								
<p>H 1.3. <u>Surface Water</u> (see p.65)</p> <p>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)? <i>Note: answer YES for Lake-fringe wetlands</i> YES = 3 points & go to H 1.4 NO = go to H 1.3.2</p> <p>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</p> <p style="text-align: center;">Map showing areas of open water</p>		<p>Figure 12</p> <p style="text-align: center; font-size: 2em;">0</p>								
<p>H 1.4. <u>Richness of Plant Species</u> (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)</p> <p>If you counted: > 9 species points = 2 4-9 species points = 1 # of species <u>2</u> < 4 species points = 0 points</p> <p>List species below if you wish</p>		<p style="font-size: 2em;">0</p>								

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points</p> <p>High = 3 points</p> <p>[Riparian braided channel]</p> <p>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</p>	<p>Figure 6</p> <p style="text-align: center; font-size: 2em;">0</p>
<p>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.</p> <p><input type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. <i>The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.</i></p> <p><input type="checkbox"/> 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</p> <p><input checked="" type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)</p> <p style="text-align: right;">Maximum score possible = 6</p>	<p style="text-align: center; font-size: 2em;">1</p>
<p style="text-align: right;">TOTAL Potential to provide habitat Add the scores in the column above</p>	<p style="text-align: center; font-size: 2em; border: 2px dashed black;">1</p>

Comments

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p>	
<p>H 2.1 Buffers (<i>see p. 71</i>) <i>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.</i></p> <ul style="list-style-type: none"> — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference Points = 5 X 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 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — 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 <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure 18</p> <p style="text-align: center; font-size: 2em;">4</p>
<p>H 2.2 Wet Corridors (<i>see p. 72</i>)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) (NO) = go to H 2.2.2</p> <p>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?</p> <p>YES = 2 points (go to H 2.3) (NO) go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p>(YES) = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">1</p>

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.*

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*).
- Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora (*full description of herbaceous species found here are in WDFW PHS report p. 153*).
- Old-growth/Mature forests (east of Cascade crest):** (*full descriptions in WDFW PHS report p. 157*). **Old-growth:** Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. **Mature:** Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.
- Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).
- Juniper Savannah:** All juniper woodlands (*SE part of state only; check map*)
- Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Inland Dunes** This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. (*check WDFW web site*)
- Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

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

0

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)

<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <ul style="list-style-type: none"> — 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 <input checked="" type="checkbox"/> 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 	2
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	7
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>	
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (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)</p> <p style="text-align: center;">YES = - 5 points <input checked="" type="radio"/> NO = 0 points</p>	<p>Points will be subtracted</p> <p>0</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>	8

Comments

Wetland name or number W12

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): W12 Date of site visit: 6/10/09

Rated by Forrest Parsons/Joel Shaich Trained by Ecology? Yes ___ No X Date of training _____

SEC: 22 TOWNSHIP: 20N RANGE: 16E Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure _____ Estimated size 0.312 acre

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	12
Score for Hydrologic Functions	20
Score for Habitat Functions	15
TOTAL score for functions	47

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply X

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

3

Summary of basic information about the wetland unit

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

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
<p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p>		X
<p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).</p>		X
<p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p>		X
<p>SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.</p>		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.

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**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 W12

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.

<p>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.</p> <p>None = 0 points Low = 1 point Moderate = 2 points Moderate = 2 points</p> <p>High = 3 points High = 3 points [Riparian braided channel]</p> <p>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</p>	<p>Figure 5</p> <p style="text-align: center; font-size: 2em;">1</p>
<p>H 1.6. Special Habitat Features: (see p. 68) <i>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.</i></p> <p><input type="checkbox"/> Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.</p> <p><input type="checkbox"/> Cattails or bulrushes are present within the unit.</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.</p> <p><input type="checkbox"/> Emergent or shrub vegetation in areas that are permanently inundated/ponded. <i>The presence of “yellow flag” Iris is a good indicator of vegetation in areas permanently ponded.</i></p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> Invasive species cover less than 20% in each stratum of vegetation (<i>canopy, sub-canopy, shrubs, herbaceous, moss/ground cover</i>)</p> <p style="text-align: right;"><i>Maximum score possible = 6</i></p>	<p style="text-align: center; font-size: 2em;">0</p>
<p style="text-align: right;">TOTAL Potential to provide habitat <i>Add the scores in the column above</i></p>	<p style="text-align: center; font-size: 2em; border: 2px dashed black;">4</p>

Comments

<p>H 2.0 Does the wetland have the opportunity to provide habitat for many species?</p>	
<p>H 2.1 <u>Buffers</u> (see p. 71) <i>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.</i></p> <p>X 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference Points = 5</p> <p>— 330 ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. Points = 4</p> <p>— 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. Points = 4</p> <p>— 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . Points = 3</p> <p>— 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. Points = 3</p> <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <p>— 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</p> <p>— No paved areas or buildings within 170ft (50m) of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. Points = 2</p> <p>— Heavy grazing in buffer. Points = 1</p> <p>— 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</p> <p>— Buffer does not meet any of the criteria above. Points = 1</p> <p style="text-align: center;">Aerial photo showing buffers</p>	<p>Figure 17</p> <p style="text-align: center; font-size: 2em;">5</p>
<p>H 2.2 <u>Wet Corridors</u> (see p. 72)</p> <p>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)? (<i>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</i>).</p> <p>YES = 4 points (go to H 2.3) NO = go to H 2.2.2</p> <p>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?</p> <p>YES = 2 points (go to H 2.3) NO go to H 2.2.3</p> <p>H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (<i>do not include man-made ditches</i>)?</p> <p>YES = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">2</p>

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.*

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- Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
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If wetland has **2 or more** Priority Habitats = **4 points**

If wetland has **1** Priority Habitat = **2 points**

No Priority habitats = **0 points**

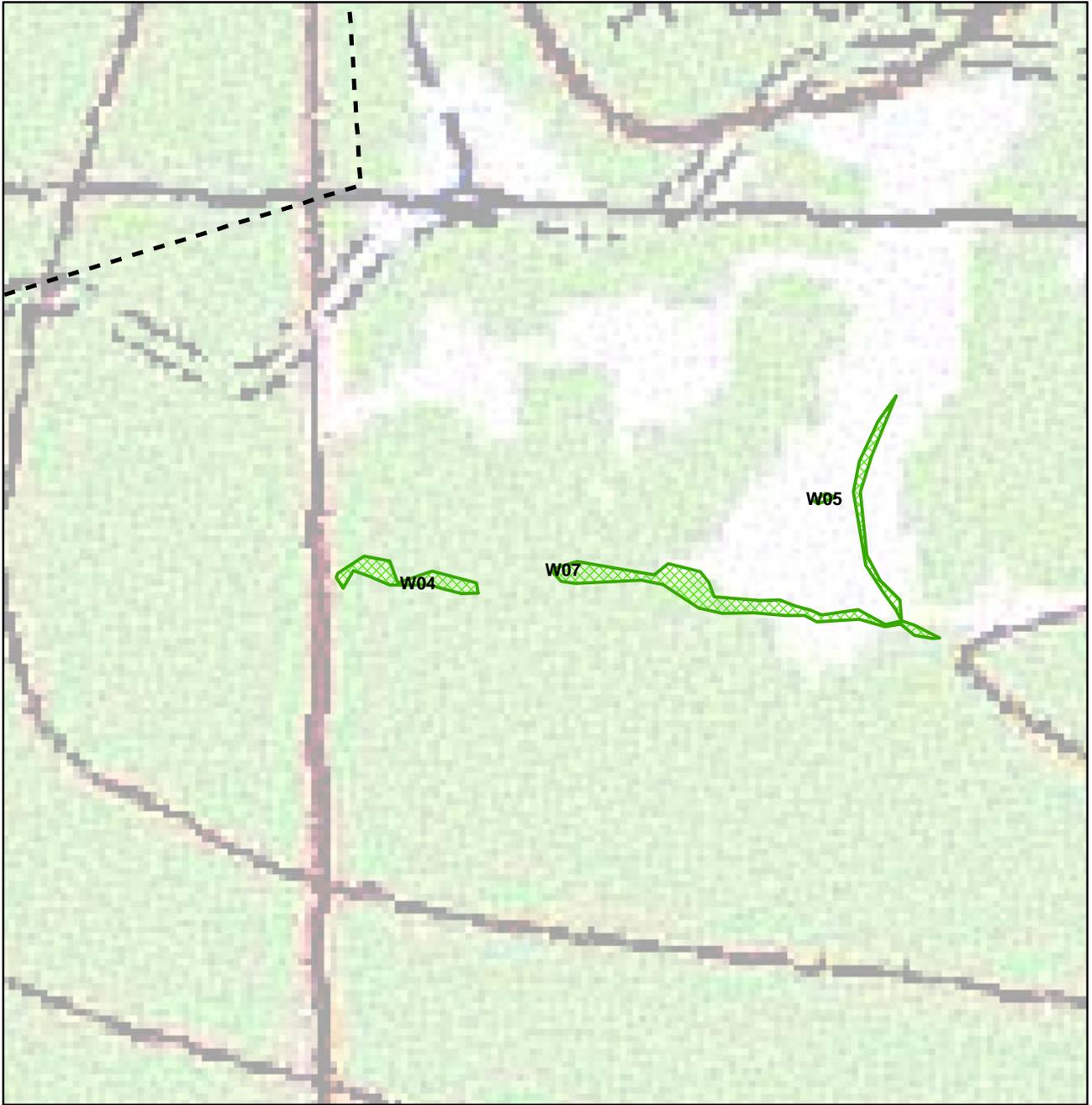
Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)

2

<p>H 2.4 <u>Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 76)</p> <ul style="list-style-type: none"> — 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 <input checked="" type="checkbox"/> 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 	2
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores in the column above</p>	11
<p>H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?</p>	
<p>H 3.1 <u>Indicator of reduced habitat functions</u> (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)</p> <p style="text-align: center;">YES = - 5 points NO = 0 points</p>	<p>Points will be subtracted</p> <p>0</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2, and H 3 and record the result on p. 1</p>	15

Comments

<p>SC 5.0 Forested Wetlands (see p. 85)</p> <p>Does the wetland unit have an area of forest (<i>you should have identified a forested class, if present, in question H 1.1</i>) rooted within its boundary that meet at least one of the following three criteria?</p> <ul style="list-style-type: none"> — The wetland is within the “100 year” floodplain of a river or stream — aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant of the “woody” vegetation. (<i>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</i>) — 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 (<i>see p. 83</i>) <p>YES = go to SC 5.1 NO <i>not a forested wetland with special characteristics</i></p>	
<p>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</p> <p>Slow growing trees are: western red cedar (<i>Thuja plicata</i>), Alaska yellow cedar (<i>Chamaecyparis nootkatensis</i>), pine spp. mostly “white” pine (<i>Pinus monticola</i>), western hemlock (<i>Tsuga heterophylla</i>), Englemann spruce (<i>Picea engelmannii</i>).</p> <p>YES = Category I NO = go to SC 5.2</p>	<p>Cat. I</p>
<p>SC 5.2 Does the unit have areas where aspen (<i>Populus tremuloides</i>) are a dominant or co-dominant species?</p> <p>YES = Category I NO = go to SC 5.3</p>	<p>Cat. I</p>
<p>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.</p> <p>Fast growing species are:</p> <p>Alders – red (<i>Alnus rubra</i>), thin-leaf (<i>A. tenuifolia</i>)</p> <p>Cottonwoods – narrow-leaf (<i>Populus angustifolia</i>), black (<i>P. balsamifera</i>)</p> <p>Willows- peach-leaf (<i>Salix amygdaloides</i>), Sitka (<i>S. sitchensis</i>), Pacific (<i>S. lasiandra</i>), Aspen - (<i>Populus tremuloides</i>), Water Birch (<i>Betula occidentalis</i>)</p> <p>YES = Category II NO = go to SC 5.5</p>	<p>Cat. II</p>
<p>SC 5.5 Is the forested component of the wetland within the “100 year floodplain” of a river or stream?</p> <p>YES = Category II</p>	<p>Cat. II</p>
<p>Category of wetland based on Special Characteristics</p> <p><i>Choose the “highest” rating if wetland falls into several categories.</i></p> <p>If you answered NO for all types enter “Not Applicable” on p.1</p>	<p>NA</p>

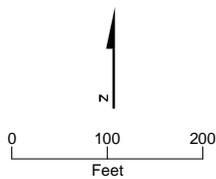


LEGEND

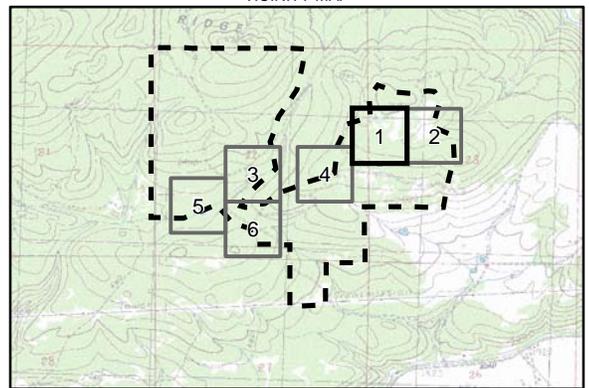
-  Stream
-  Wetland Boundary
-  Emergent Wetland
-  Wetland Survey Area

Note:

1. USGS 24K Quadrangle: Teanaway.

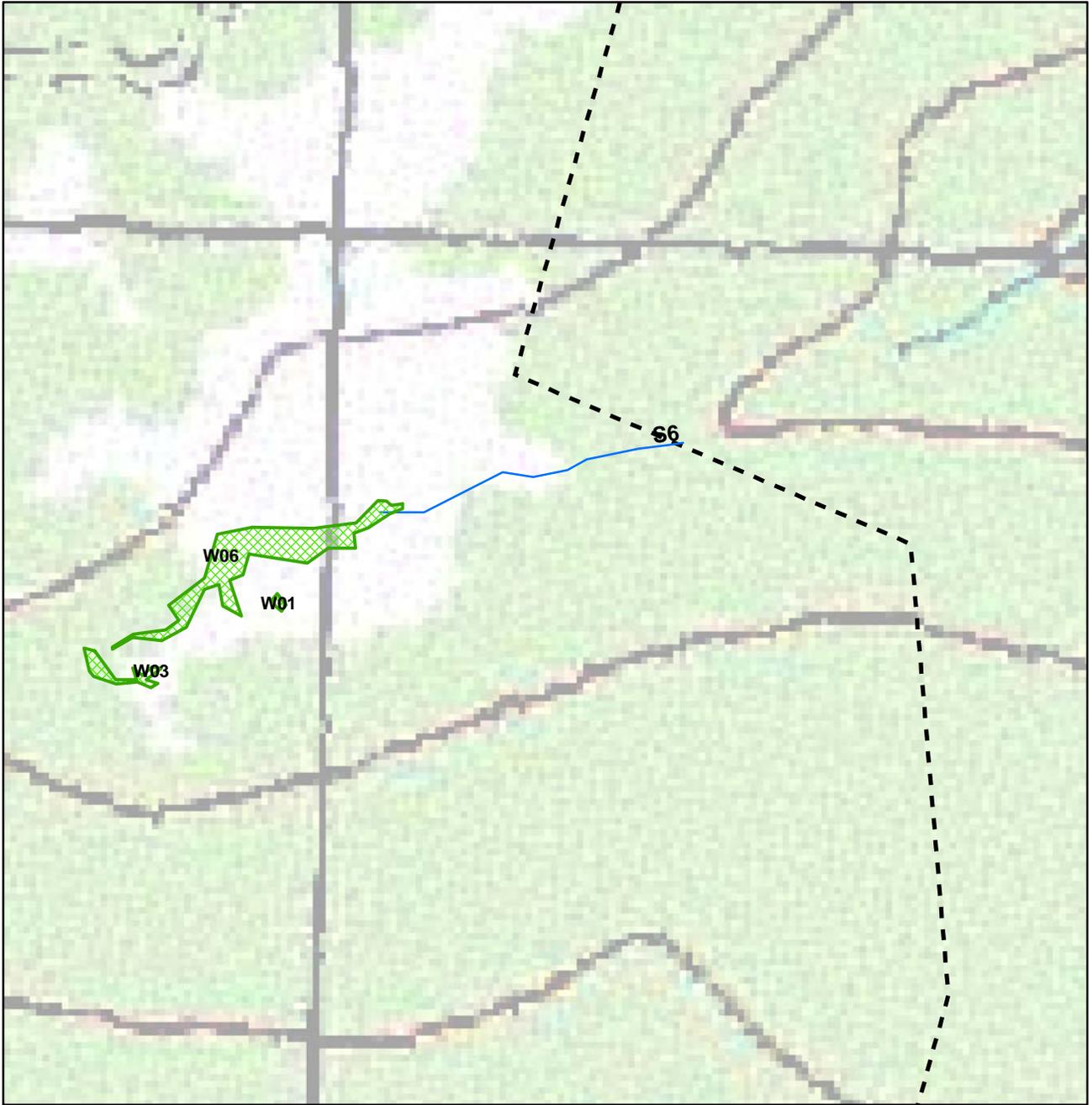


VICINITY MAP



**Appendix D Figure 1
Cowardin Vegetation Classes**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



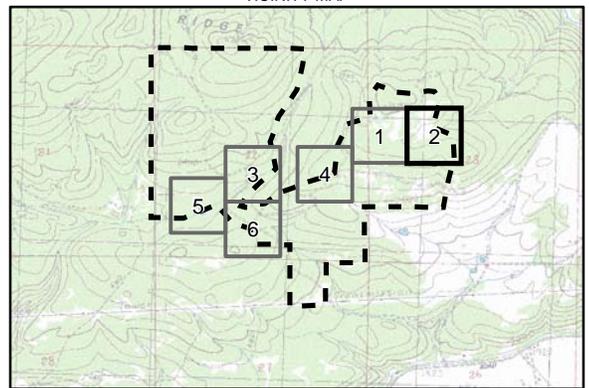
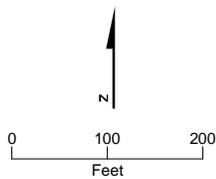
VICINITY MAP

LEGEND

-  Stream
-  Wetland Boundary
-  Emergent Wetland
-  Wetland Survey Area

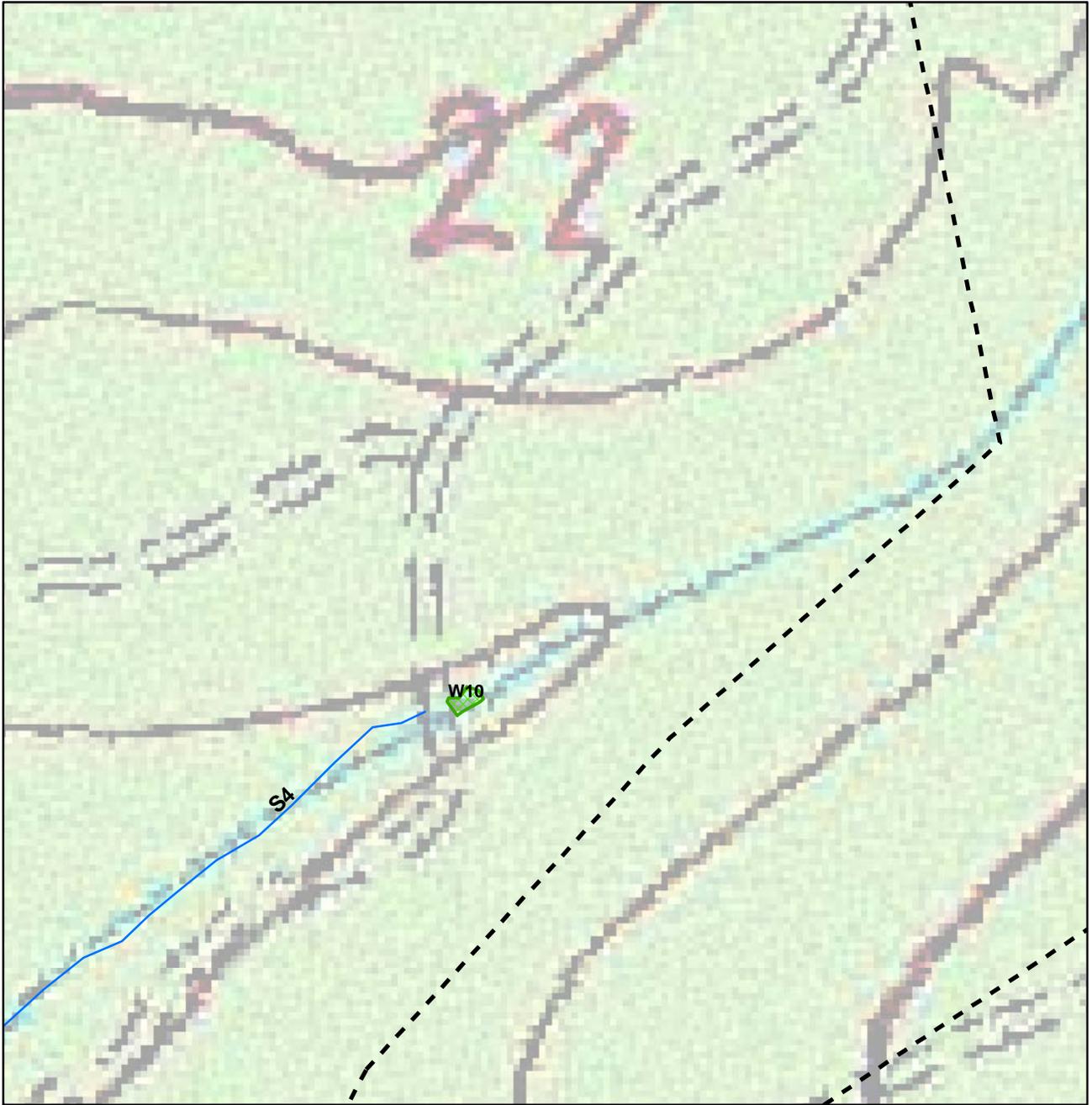
Note:

1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 2
Cowardin Vegetation Classes**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



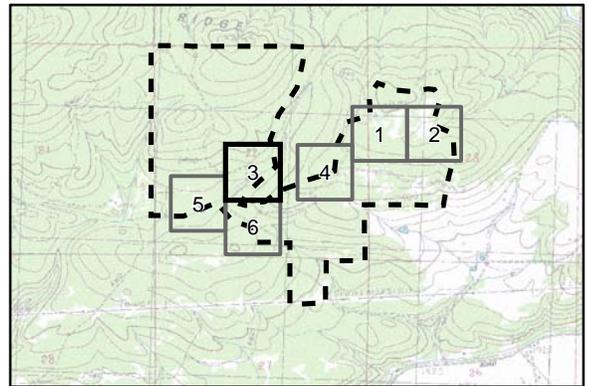
VICINITY MAP

LEGEND

-  Stream
-  Wetland Boundary
-  Emergent Wetland
-  Wetland Survey Area

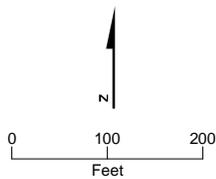
Note:

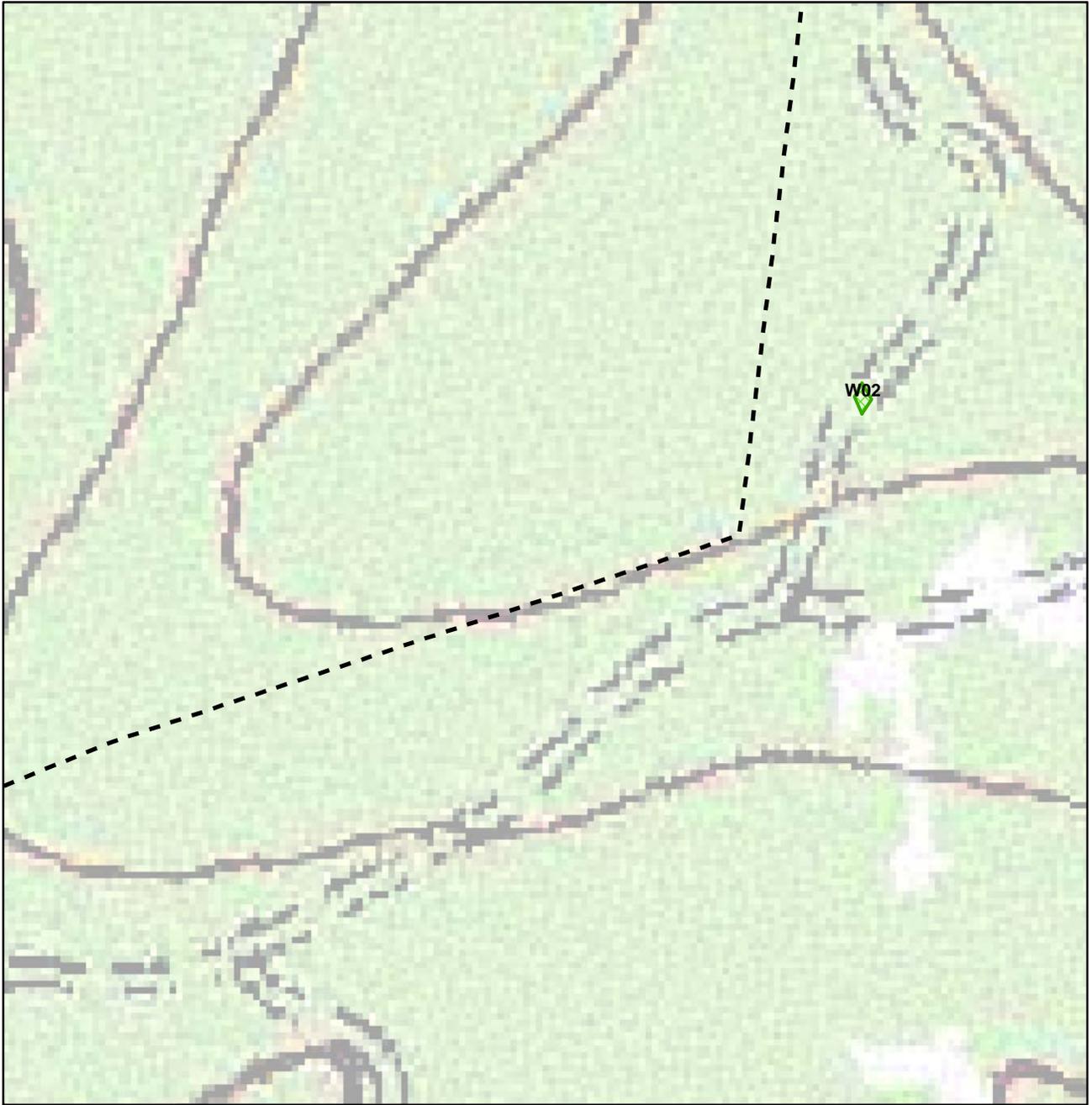
- 1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 3
Cowardin Vegetation Classes**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington





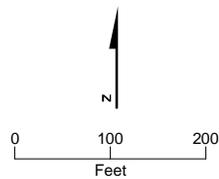
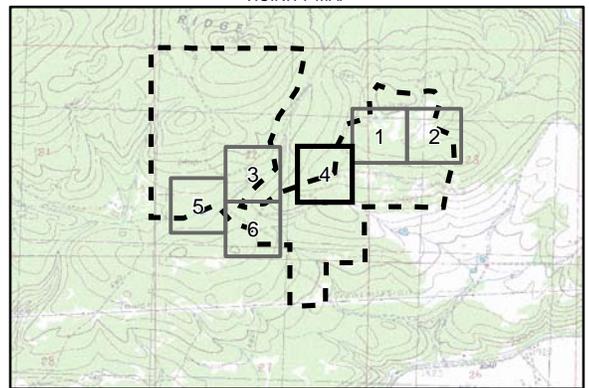
VICINITY MAP

LEGEND

-  Stream
-  Wetland Boundary
-  Emergent Wetland
-  Wetland Survey Area

Note:

- 1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 4
Cowardin Vegetation Classes**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



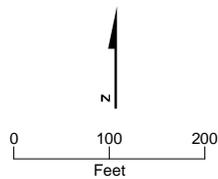
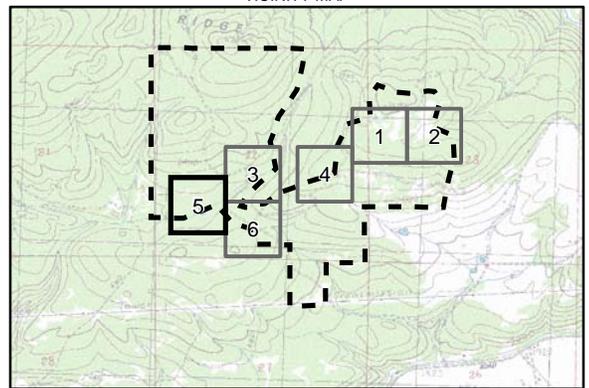
VICINITY MAP

LEGEND

-  Stream
-  Wetland Boundary
-  Emergent Wetland
-  Wetland Survey Area

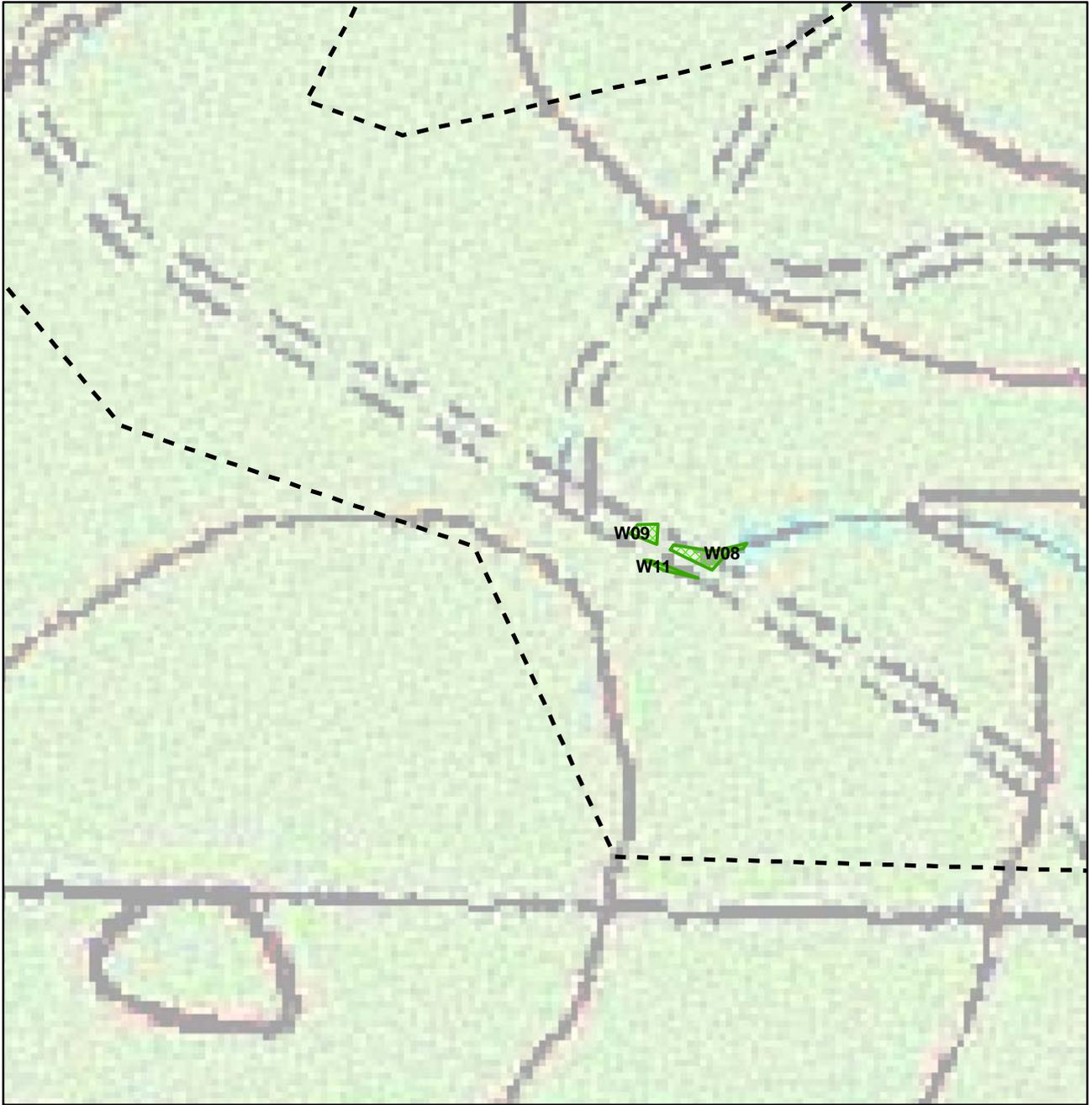
Note:

1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 5
Cowardin Vegetation Classes**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



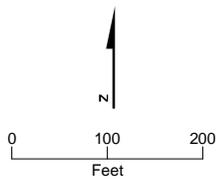
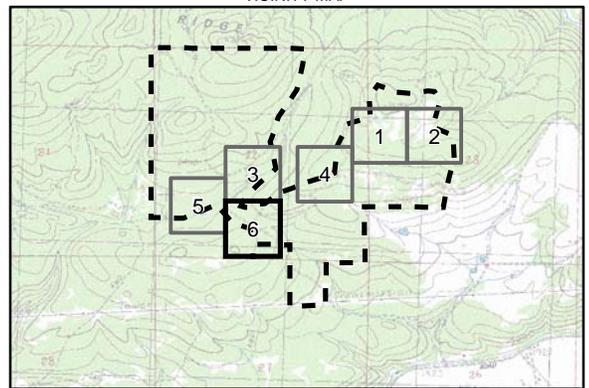
VICINITY MAP

LEGEND

-  Stream
-  Wetland Boundary
-  Emergent Wetland
-  Wetland Survey Area

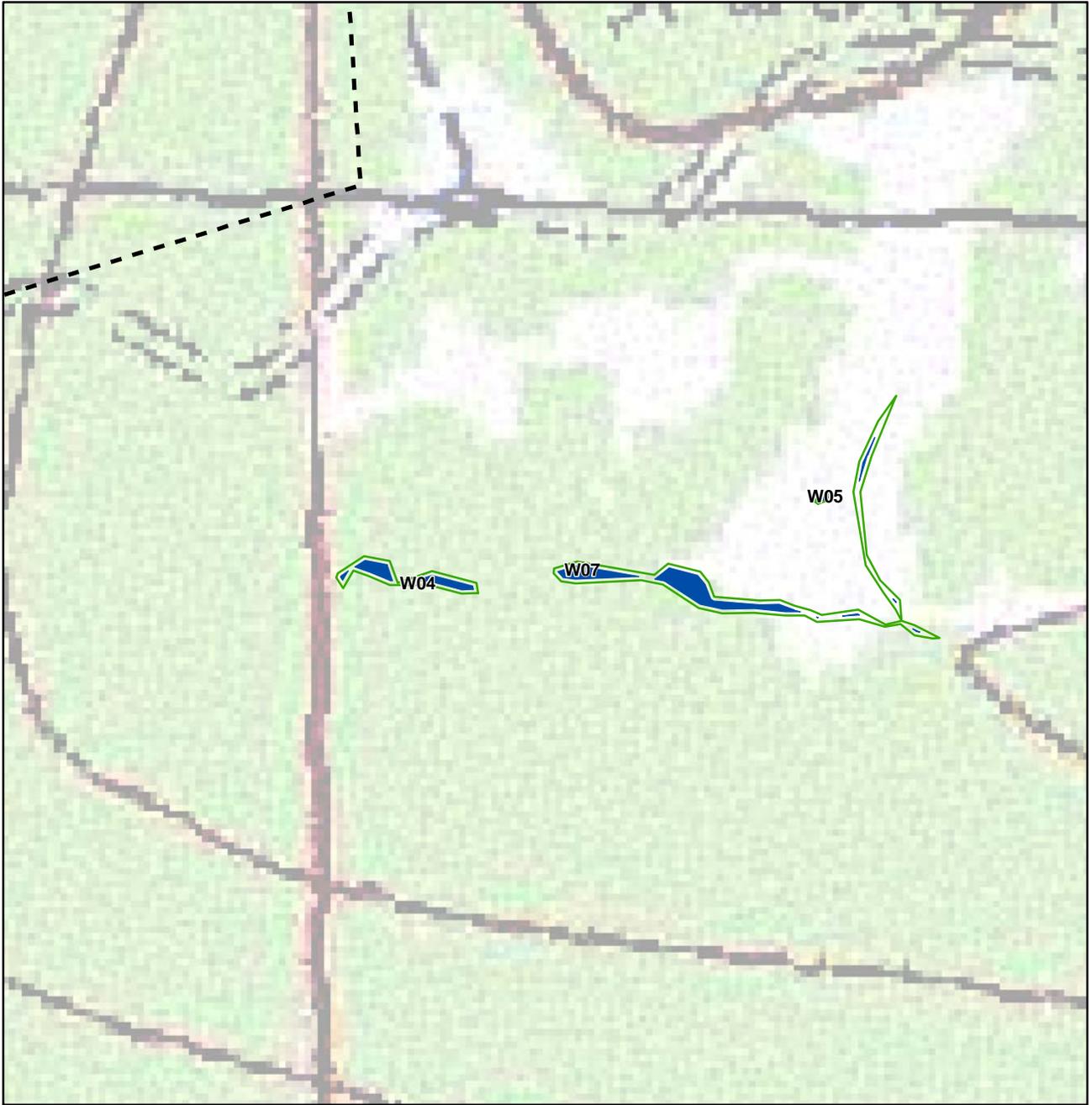
Note:

1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 6
Cowardin Vegetation Classes**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington

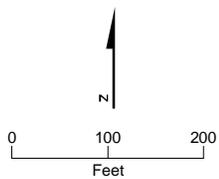


LEGEND

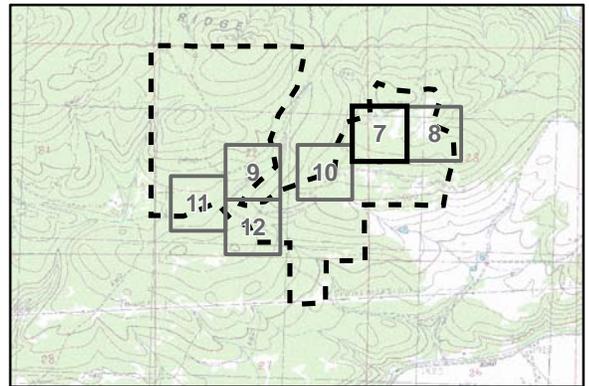
-  Stream
-  Wetland Boundary
-  Seasonally Flooded or Inundated
-  Wetland Survey Area

Note:

1. USGS 24K Quadrangle: Teanaway.

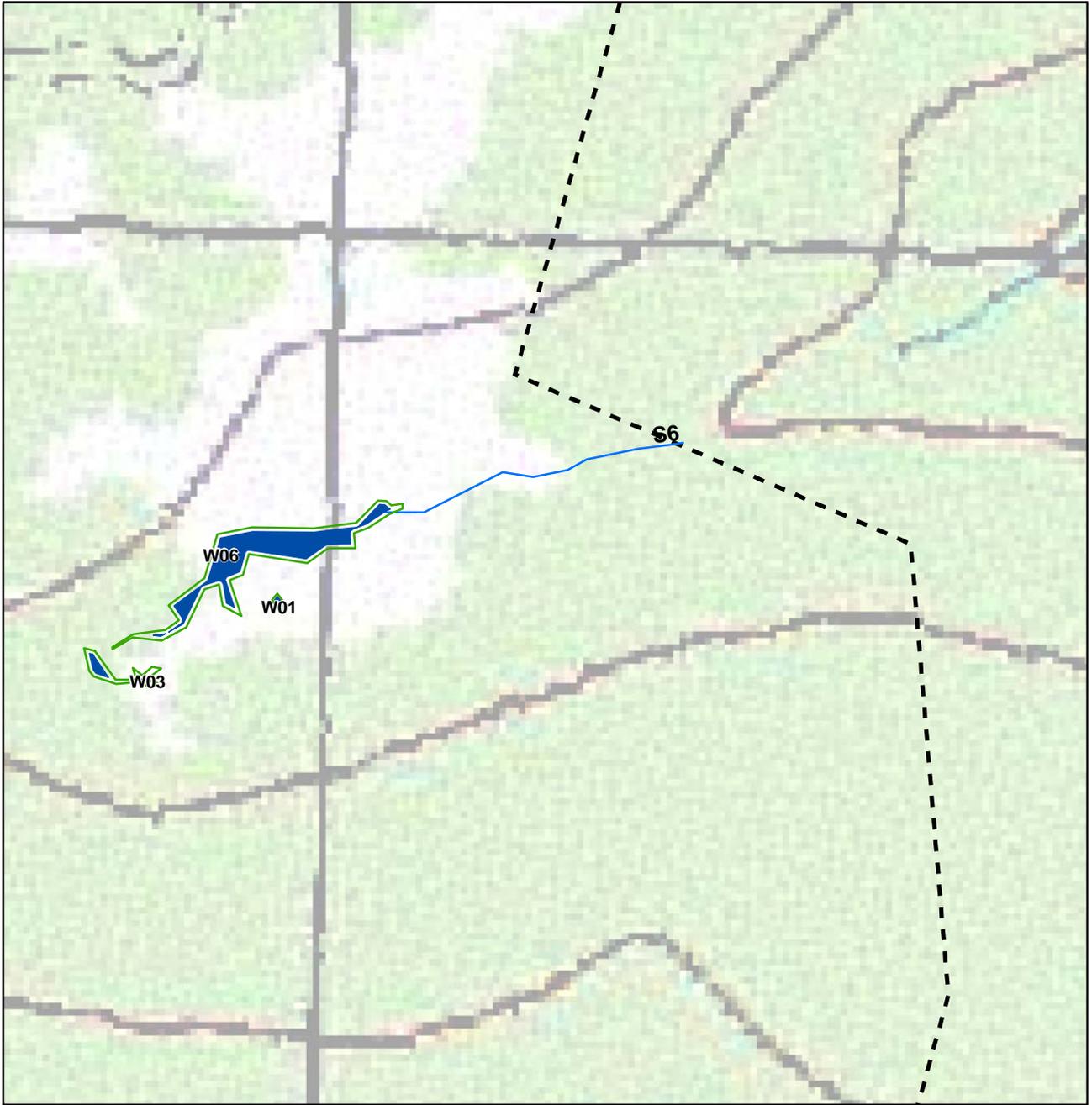


VICINITY MAP



**Appendix D Figure 7
Hydroperiods**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



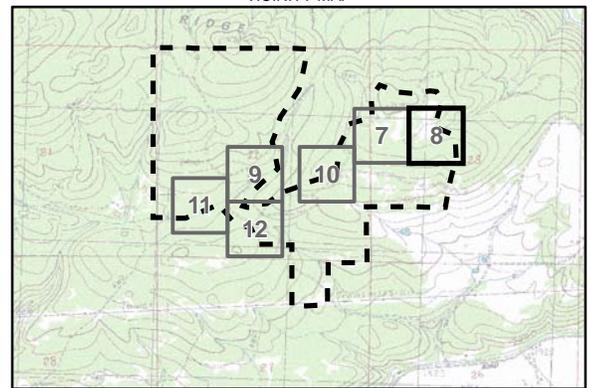
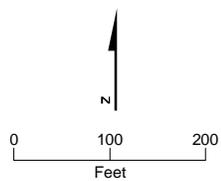
VICINITY MAP

LEGEND

-  Stream
-  Wetland Boundary
-  Seasonally Flooded or Inundated
-  Wetland Survey Area

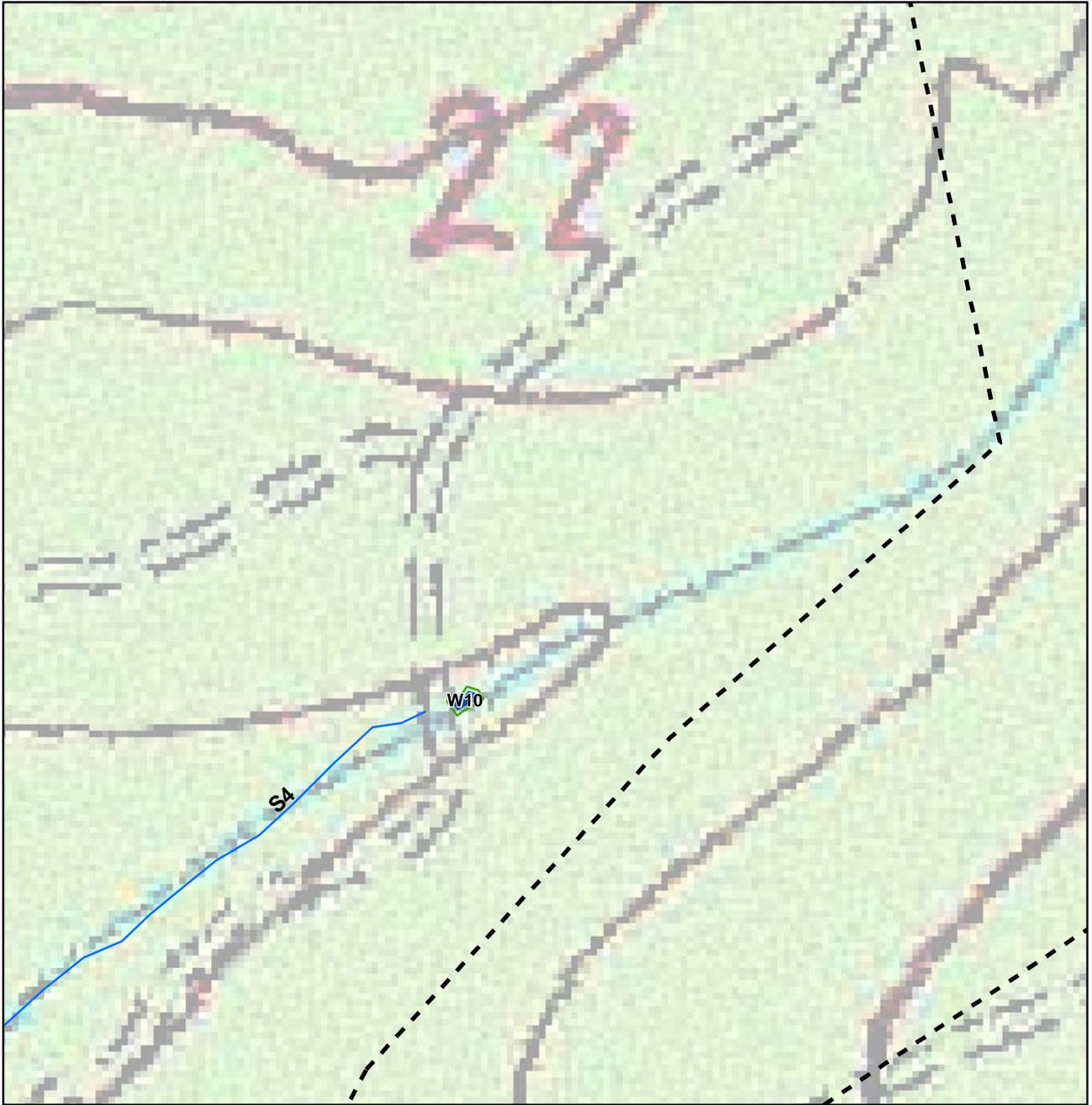
Note:

1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 8
Hydroperiods**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



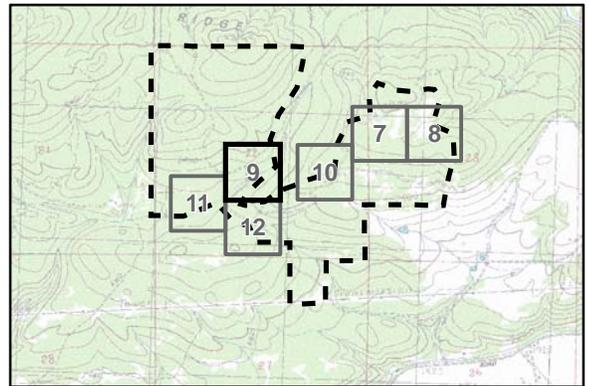
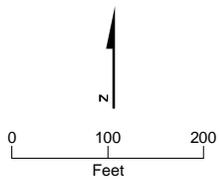
VICINITY MAP

LEGEND

-  Stream
-  Wetland Boundary
-  Seasonally Flooded or Inundated
-  Wetland Survey Area

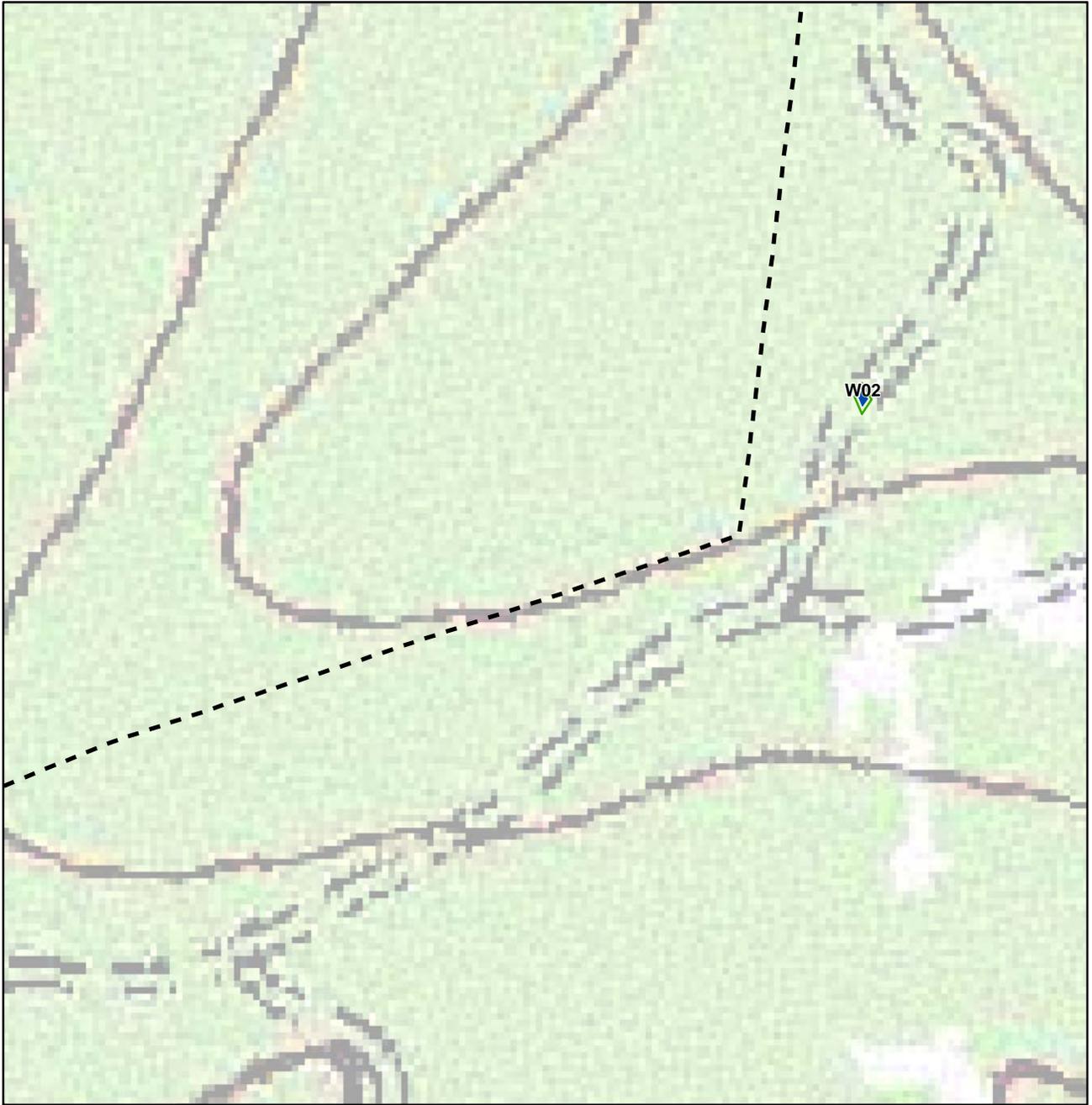
Note:

1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 9
Hydroperiods**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



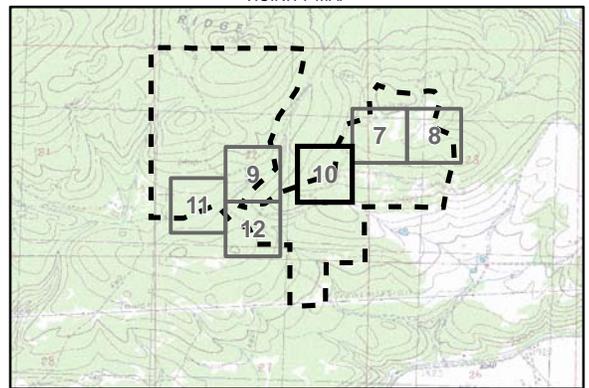
VICINITY MAP

LEGEND

-  Stream
-  Wetland Boundary
-  Seasonally Flooded or Inundated
-  Wetland Survey Area

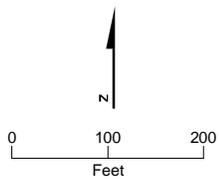
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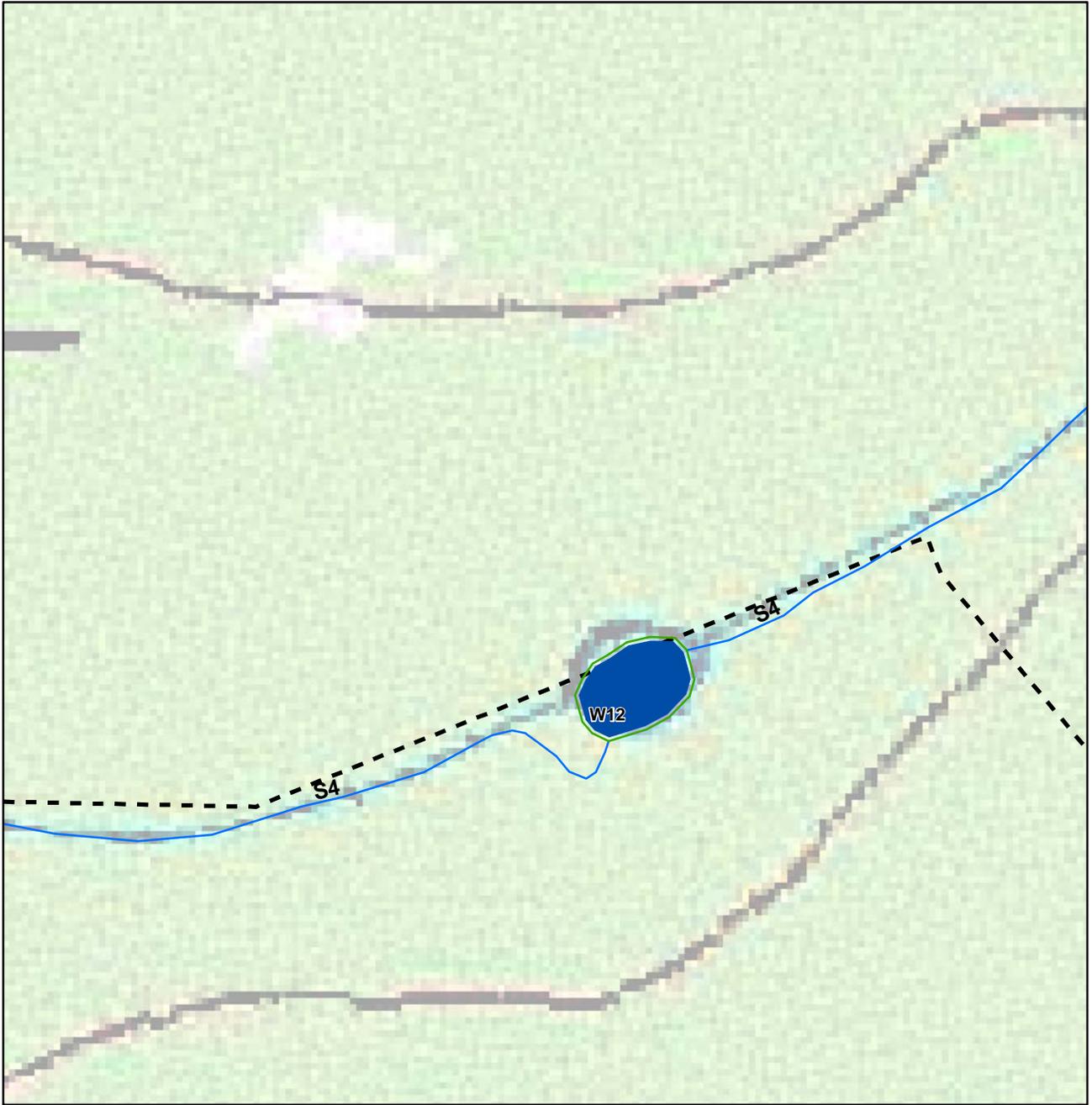
1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 10
Hydroperiods**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington





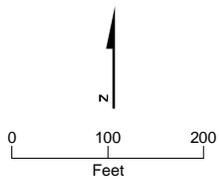
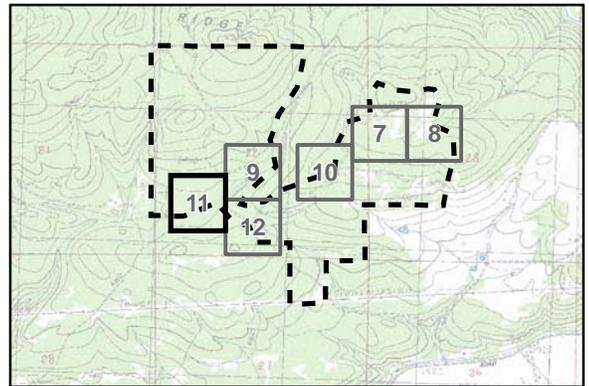
VICINITY MAP

LEGEND

-  Stream
-  Wetland Boundary
-  Seasonally Flooded or Inundated
-  Wetland Survey Area

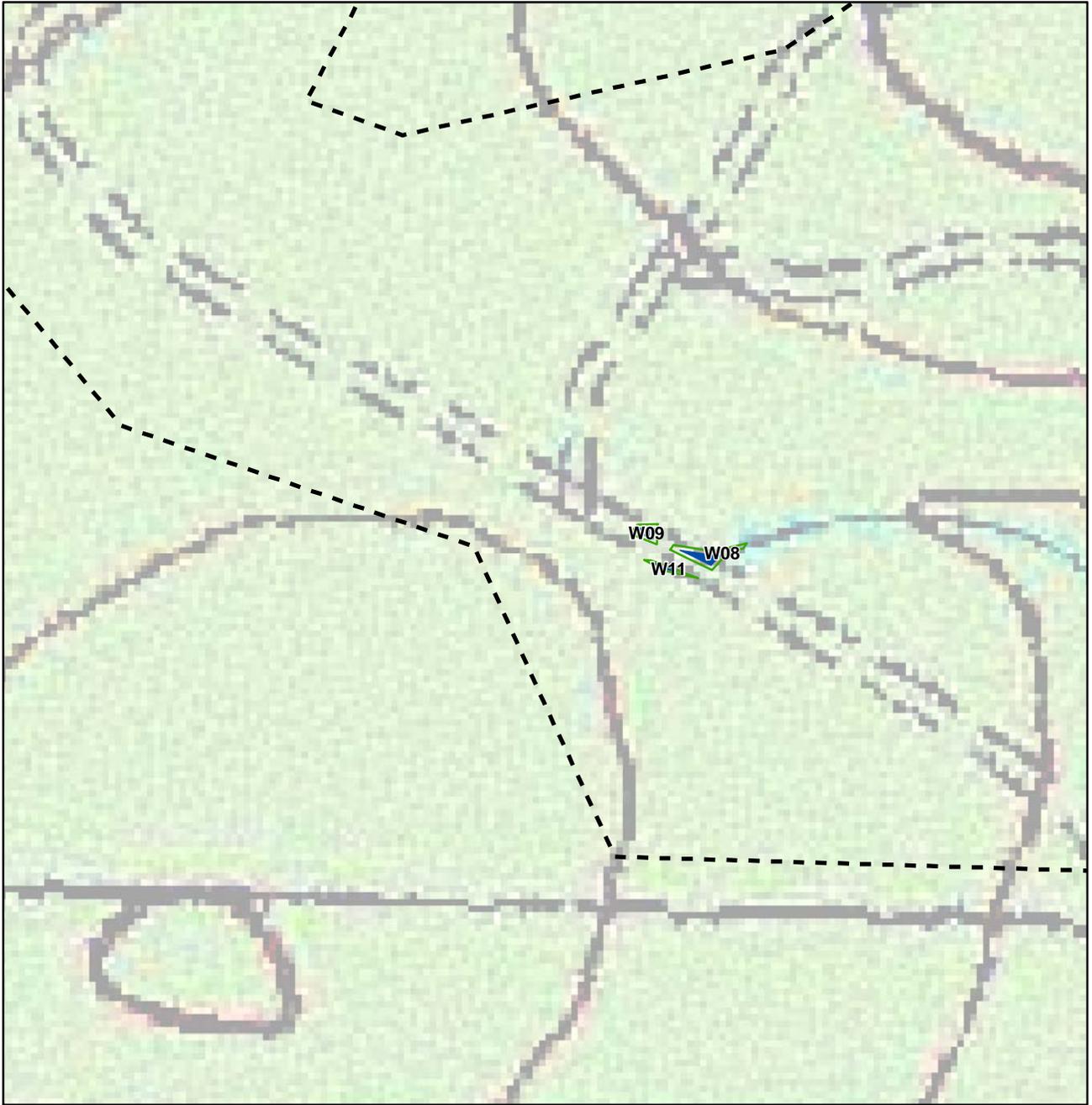
Note:

1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 11
Hydroperiods**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



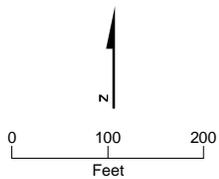
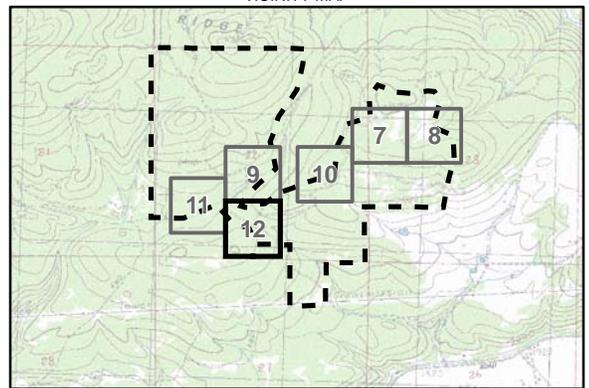
VICINITY MAP

LEGEND

-  Stream
-  Wetland Boundary
-  Seasonally Flooded or Inundated
-  Wetland Survey Area

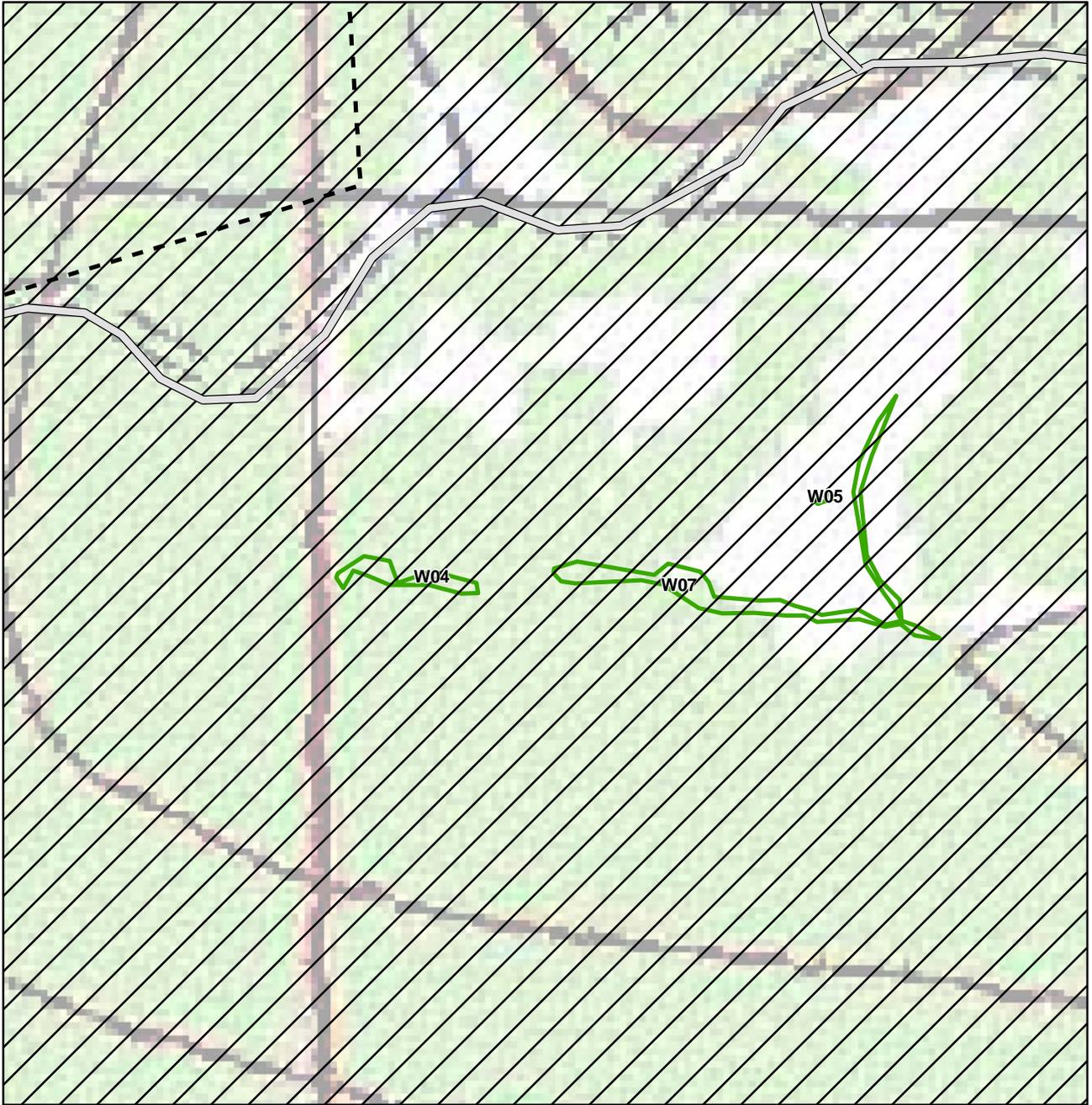
Note:

1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 12
Hydroperiods**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



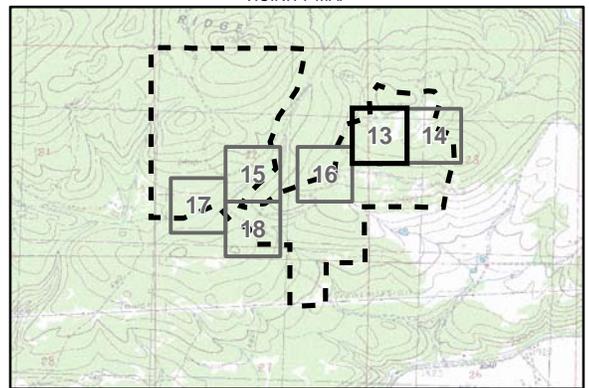
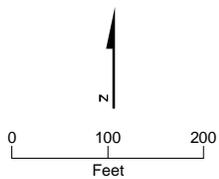
VICINITY MAP

LEGEND

-  Stream
-  Road
-  Relatively Undisturbed Buffer
-  Wetland Boundary
-  Wetland Survey Area

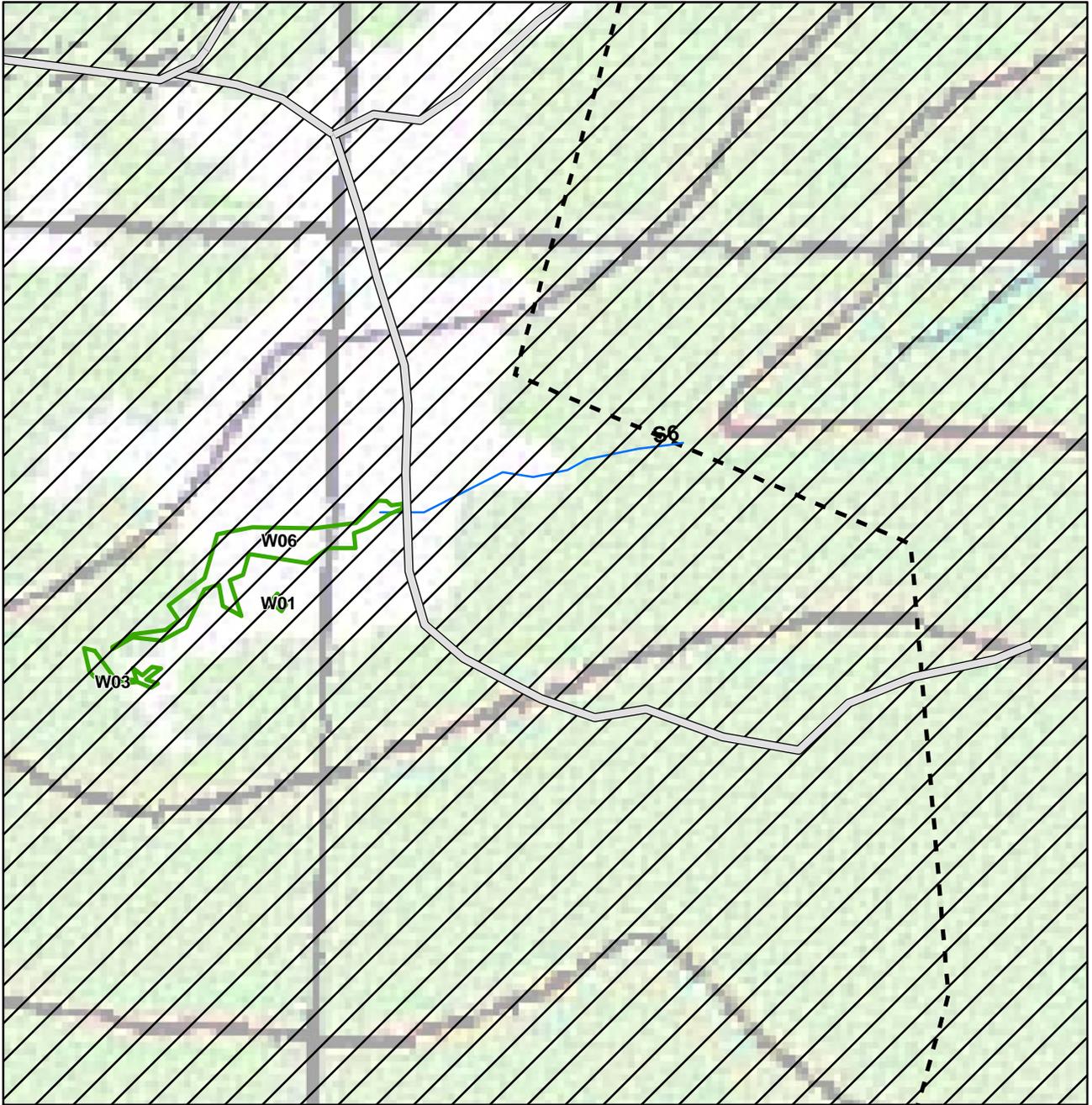
Note:

1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 13
Wetland Buffers**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



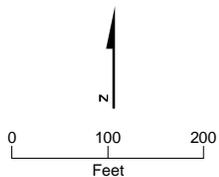
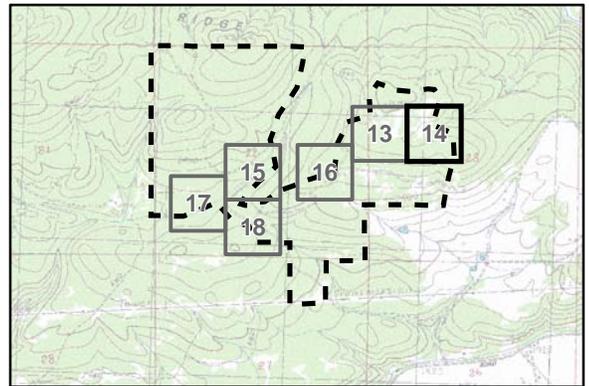
VICINITY MAP

LEGEND

-  Stream
-  Road
-  Relatively Undisturbed Buffer
-  Wetland Boundary
-  Wetland Survey Area

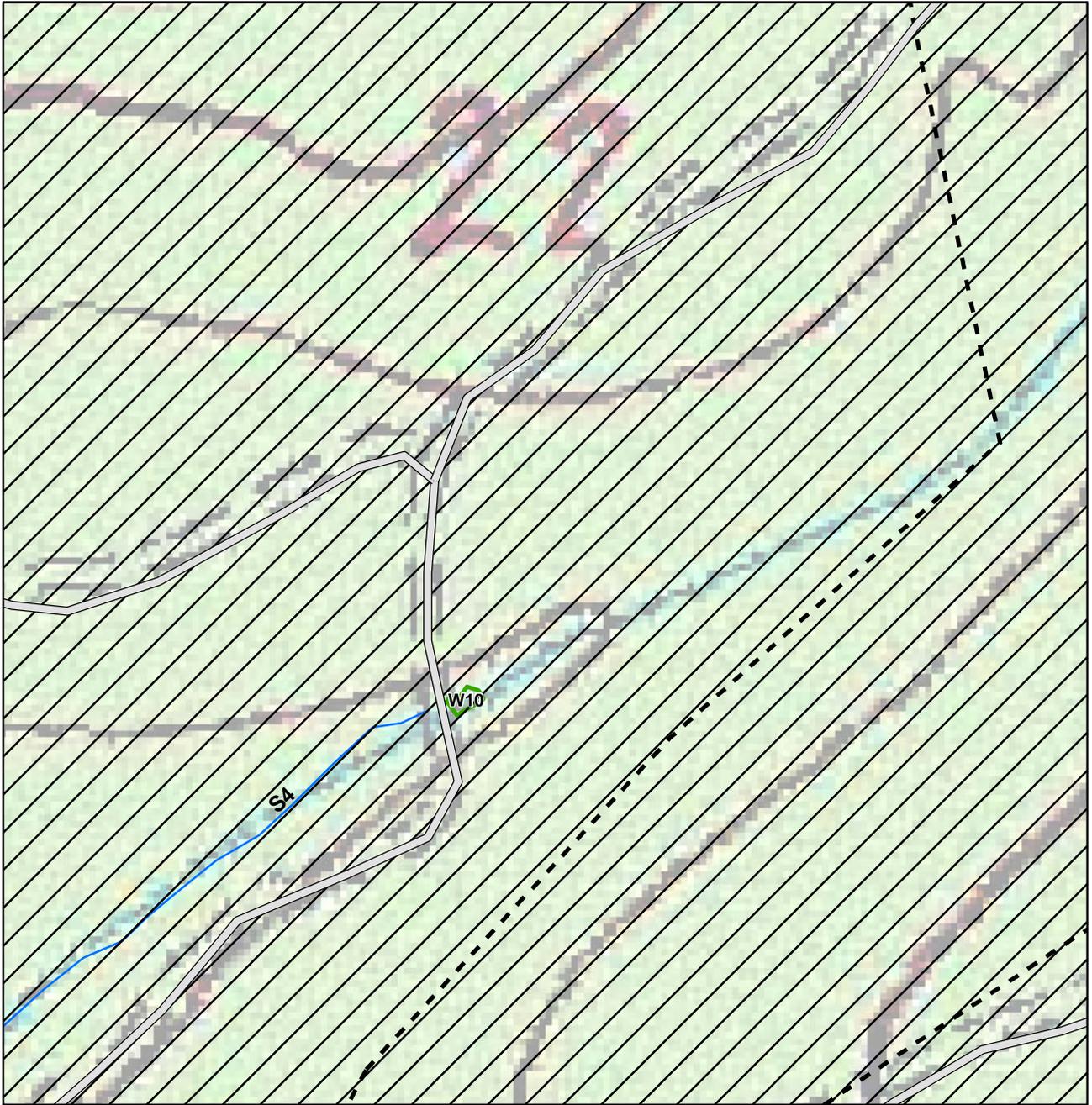
Note:

1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 14
Wetland Buffers**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



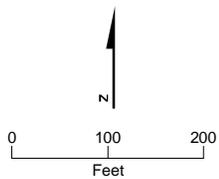
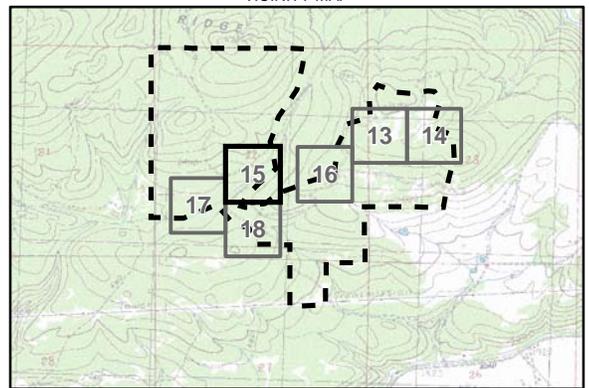
VICINITY MAP

LEGEND

-  Stream
-  Road
-  Relatively Undisturbed Buffer
-  Wetland Boundary
-  Wetland Survey Area

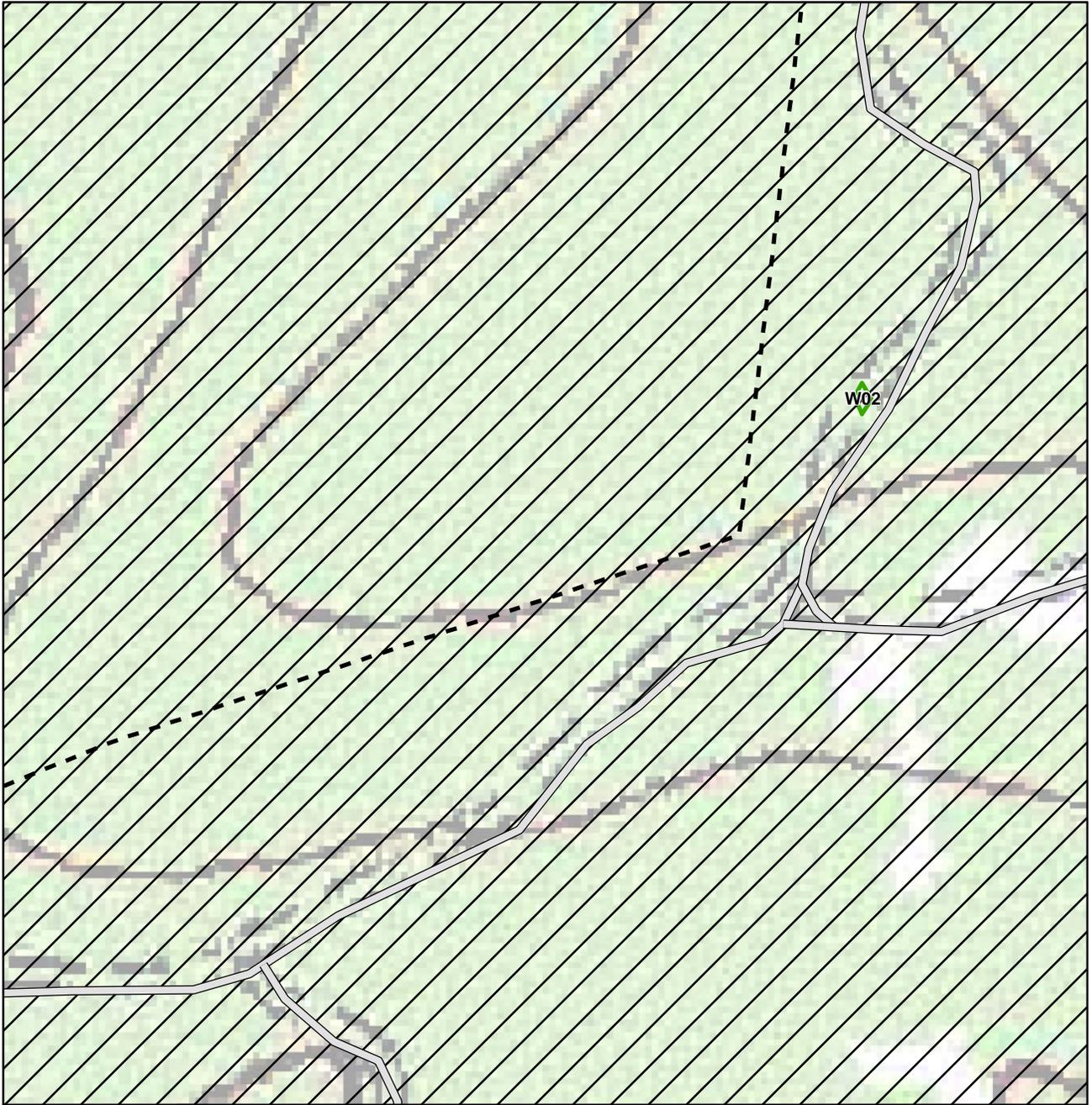
Note:

1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 15
Wetland Buffers**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



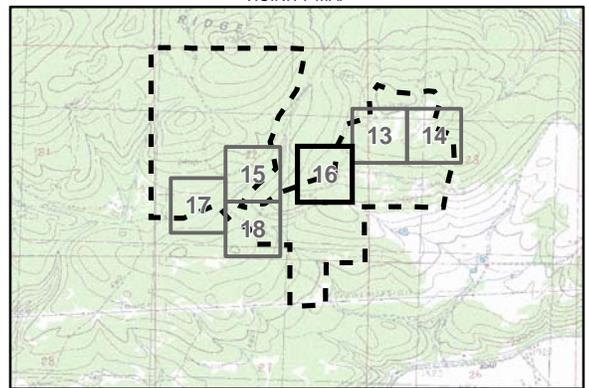
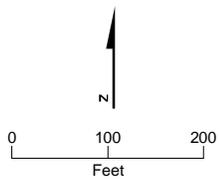
VICINITY MAP

LEGEND

-  Stream
-  Road
-  Relatively Undisturbed Buffer
-  Wetland Boundary
-  Wetland Survey Area

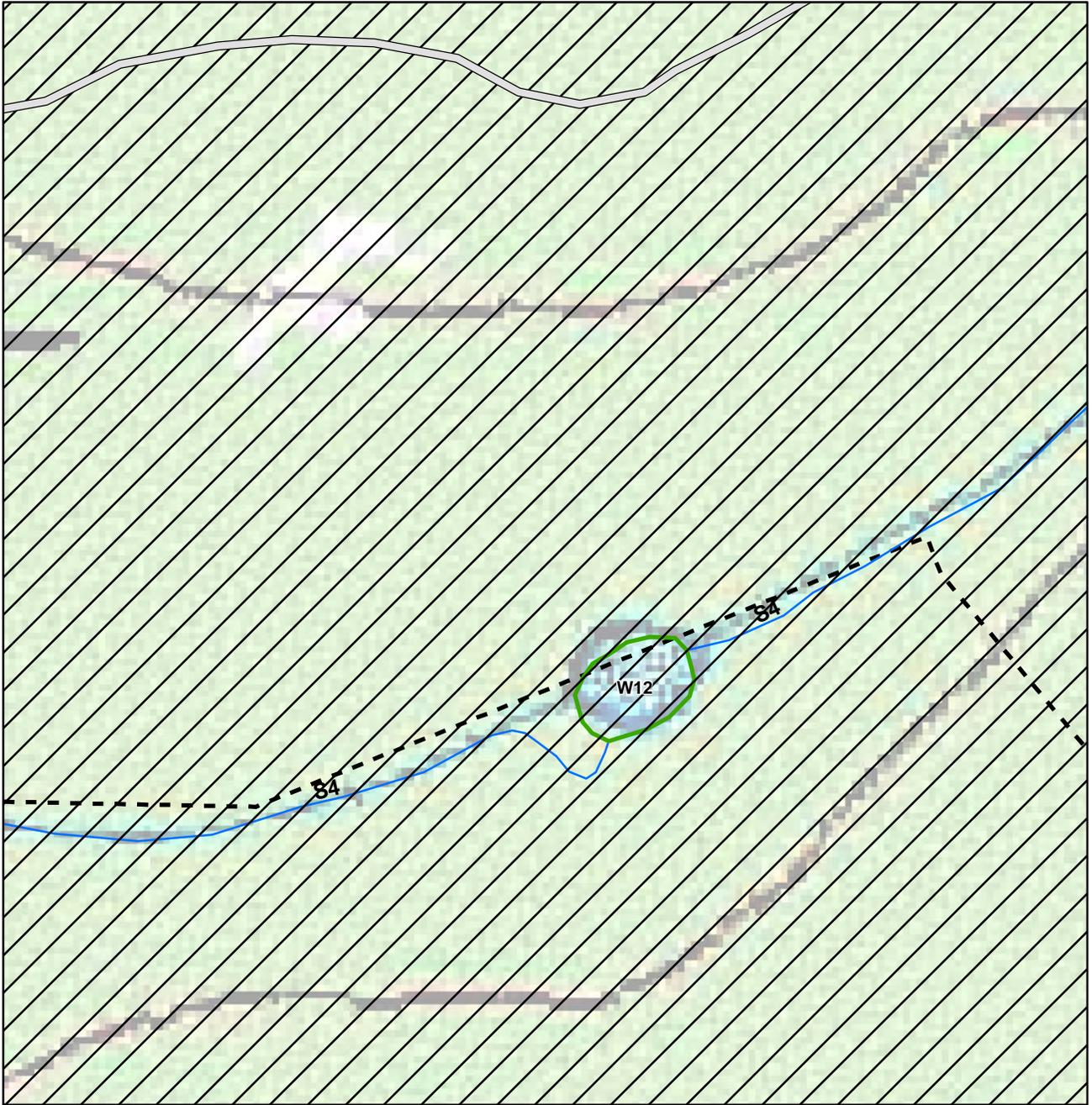
Note:

1. USGS 24K Quadrangle: Teanaway.



Appendix D Figure 16
Wetland Buffers

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



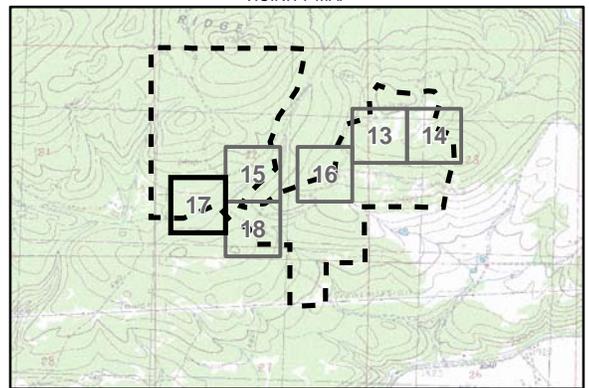
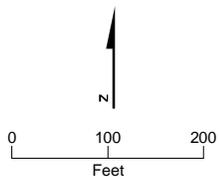
VICINITY MAP

LEGEND

-  Stream
-  Road
-  Relatively Undisturbed Buffer
-  Wetland Boundary
-  Wetland Survey Area

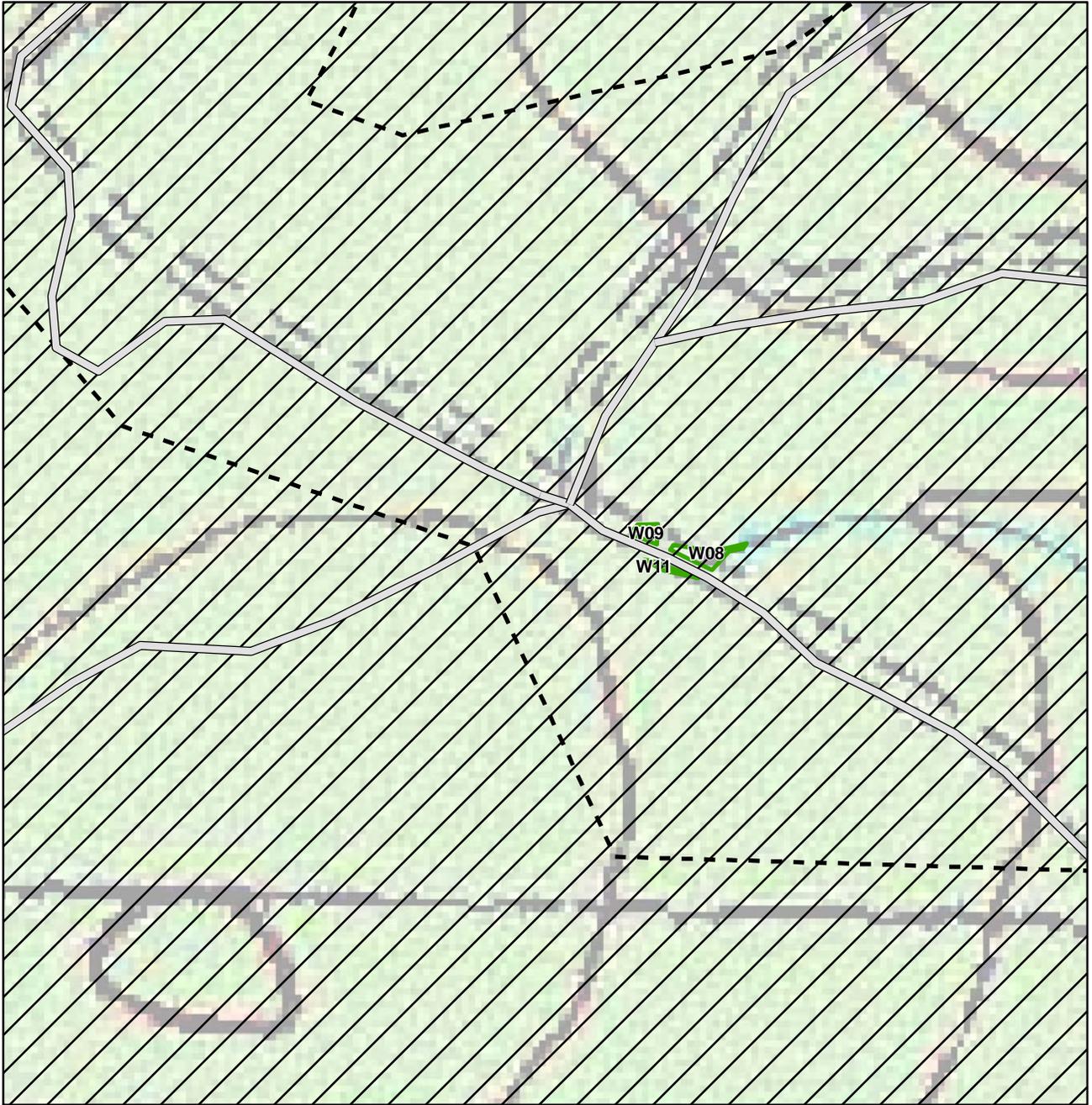
Note:

1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 17
Wetland Buffers**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



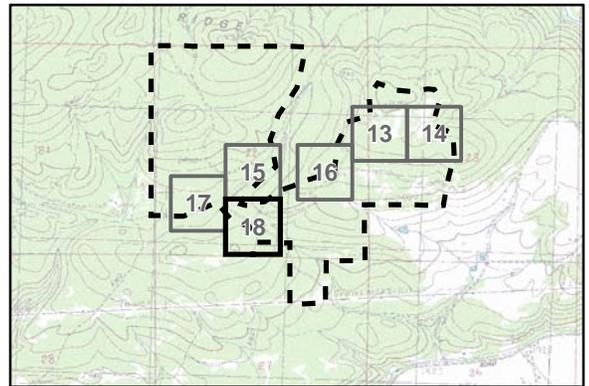
VICINITY MAP

LEGEND

-  Stream
-  Road
-  Relatively Undisturbed Buffer
-  Wetland Boundary
-  Wetland Survey Area

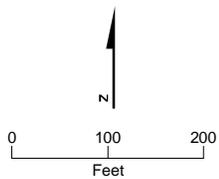
Note:

1. USGS 24K Quadrangle: Teanaway.



**Appendix D Figure 18
Wetland Buffers**

Wetland Delineation Report
Teanaway Solar Reserve
Kittitas County, Washington



APPENDIX E

**Washington State Department of
Ecology Function Assessment Forms**

Summary of Function Assessments

Wetland Name: W1-W7 **AU ID#:** W1-W7 (patchwork of wetlands)
Date: 6/9/09 - 6/10/09 **T/S/R:** ZON/522/16E
Investigator Name: Forrest Parsons / Sel Shaich **Size of AU:** 0.6 acre
Katrina Kapanais

Wetland Classification:

Depressional Long-duration Depressional Short-duration
 When box is shaded, then index or rating is not required

Function	Index For Potential/Suitability	Index For Opportunity
<i>Water Quality Functions</i>		
Removing Sediment	8	2
Removing Nutrients/Nitrogen	5	1
Removing Nutrients/Phosphorous	7	1
Removing Metals & Toxic Organics	6	0
<i>Water Quantity Functions</i>		
Reducing Downstream Erosion and Flooding	4	<i>Use Qualitative Rating (High, Moderate, Low) since opportunity could not be modeled</i> LOW
Recharging Groundwater	9	No opportunity rating required for long and short-duration All wetlands were judged to have high opportunity

Function	Index For Potential	Index For Opportunity
<i>Habitat Functions</i>		
General Habitat	5	8
Habitat for Invertebrates	9	8
Habitat for Amphibians	4	8
Habitat for Aquatic Birds	3	<i>Use Qualitative Rating (High, Moderate, Low) since opportunity could not be modeled</i> LOW
Habitat for Aquatic Mammals Enter index for Long-duration Wetlands	Short-duration wetlands were judged as unsuitable year round habitat	7
Richness of Native Plants	2	No model developed since all wetlands were judged to have same opportunity
Supporting Food Webs	8	5

Rationale for dividing wetland into multiple assessment units

Does not apply

Information of special note in the AU (such as endangered/threatened species, local significance, etc.):

Does not apply

Description of areas that were not directly observed and explanation as to why:

Does not apply

General Comments:

Refer to wetland report for maps and photos
Refer to wetland rating forms for hydroperiods.

Summary of Function Assessments

Wetland Name: W8, W9, W11 **AU ID#:** W8, W9, W11 (patchwork of wetlands)
Date: 6/9/09, 6/10/09, 6/16/09, 6/17/09 **T/S/R:** ZON/522/16E
Investigator Name: Forrest Parsons / Joel Shaich **Size of AU:** 0.05 acre
Rahim Kapantau

Wetland Classification:

Depressional Long-duration Depressional Short-duration
 When box is shaded, then index or rating is not required

Function	Index For Potential/Suitability	Index For Opportunity
<i>Water Quality Functions</i>		
Removing Sediment	8	3
Removing Nutrients/Nitrogen	5	1
Removing Nutrients/Phosphorous	8	2
Removing Metals & Toxic Organics	7	3
<i>Water Quantity Functions</i>		
Reducing Downstream Erosion and Flooding	1	<i>Use Qualitative Rating (High, Moderate, Low) since opportunity could not be modeled</i> LOW
Recharging Groundwater	9	No opportunity rating required for long and short-duration All wetlands were judged to have high opportunity

Function	Index For Potential	Index For Opportunity
<i>Habitat Functions</i>		
General Habitat	3	7
Habitat for Invertebrates	8	8
Habitat for Amphibians	4	8
Habitat for Aquatic Birds	2	<i>Use Qualitative Rating (High, Moderate, Low) since opportunity could not be modeled</i> LOW
Habitat for Aquatic Mammals Enter index for Long-duration Wetlands	Short-duration wetlands were judged as unsuitable year round habitat	7
Richness of Native Plants	2	No model developed since all wetlands were judged to have same opportunity
Supporting Food Webs	8	5

Rationale for dividing wetland into multiple assessment units

Does not apply

Information of special note in the AU (such as endangered/threatened species, local significance, etc.):

Does not apply

Description of areas that were not directly observed and explanation as to why:

Does not apply

General Comments:

Refer to wetland report for maps and photos.
Refer to wetland rating forms (Appendix D) for hydro periods

Summary of Function Assessments

Wetland Name: W10 **AU ID#:** W10
Date: 6/9/09, 6/10/09, 6/17/09, 6/16/09 **T/S/R:** 20N/S22/R16E
Investigator Name: Forrest Parsons/Joel Shaich/Kathryn Kapanais **Size of AU:** 0.02 acre

Wetland Classification:

Depressional Long-duration Depressional Short-duration
 When box is shaded, then index or rating is not required

Function	Index For Potential/Suitability	Index For Opportunity
<i>Water Quality Functions</i>		
Removing Sediment	8	5
Removing Nutrients/Nitrogen	5	1
Removing Nutrients/Phosphorous	8	5
Removing Metals & Toxic Organics	7	7
<i>Water Quantity Functions</i>		
Reducing Downstream Erosion and Flooding	1	<i>Use Qualitative Rating (High, Moderate, Low) since opportunity could not be modeled</i> LOW
Recharging Groundwater	9	No opportunity rating required for long and short-duration All wetlands were judged to have high opportunity

Function	Index For Potential	Index For Opportunity
<i>Habitat Functions</i>		
General Habitat	6	7
Habitat for Invertebrates	9	8
Habitat for Amphibians	6	8
Habitat for Aquatic Birds	3	<i>Use Qualitative Rating (High, Moderate, Low) since opportunity could not be modeled</i> LOW
Habitat for Aquatic Mammals Enter index for Long-duration Wetlands	Short-duration wetlands were judged as unsuitable year round habitat	7
Richness of Native Plants	4	No model developed since all wetlands were judged to have same opportunity
Supporting Food Webs	8	5

Rationale for dividing wetland into multiple assessment units

N/A

Information of special note in the AU (such as endangered/threatened species, local significance, etc.):

N/A

Description of areas that were not directly observed and explanation as to why:

N/A

General Comments:

Summary of Function Assessments

Wetland Name: W12 **AU ID#:** W12
Date: 7/9/09 **T/S/R:** 20N/523/R16E
Investigator Name: Peggy O'Neill / Nichole Seidell **Size of AU:** 0.3 acre

Wetland Classification:

Depressional Long-duration Depressional Short-duration
 When box is shaded, then index or rating is not required

Function	Index For Potential/Suitability	Index For Opportunity
<i>Water Quality Functions</i>		
Removing Sediment	8	1
Removing Nutrients/Nitrogen	3	0
Removing Nutrients/Phosphorous	7	0
Removing Metals & Toxic Organics	4	0
<i>Water Quantity Functions</i>		
Reducing Downstream Erosion and Flooding	6	<i>Use Qualitative Rating (High, Moderate, Low) since opportunity could not be modeled</i> Moderate
Recharging Groundwater	7	No opportunity rating required for long and short-duration All wetlands were judged to have high opportunity

Function	Index For Potential	Index For Opportunity
<i>Habitat Functions</i>		
General Habitat	7	9
Habitat for Invertebrates	7	10
Habitat for Amphibians	6	9
Habitat for Aquatic Birds	7	<i>Use Qualitative Rating (High, Moderate, Low) since opportunity could not be modeled</i> <i>Moderate</i>
Habitat for Aquatic Mammals Enter index for Long-duration Wetlands	Short-duration wetlands were judged as unsuitable year round habitat	8
	17	
Richness of Native Plants	7	No model developed since all wetlands were judged to have same opportunity
Supporting Food Webs	7	5

Rationale for dividing wetland into multiple assessment units

N/A

Information of special note in the AU (such as endangered/threatened species, local significance, etc.):

N/A

Description of areas that were not directly observed and explanation as to why:

N/A

General Comments:

Refer to wetland report and wetland rating forms for photographs and maps.

ATTACHMENT C

Cultural Resources Report
*(privileged and confidential: restricted
distribution)*

ATTACHMENT D

Figures Referenced in Text



LEGEND

-  Proposed Project Area
-  City Boundary
-  Interstate
-  Highway
-  Major Road

Note:

1. USGS 100K Quadrangle: Wenatchee.

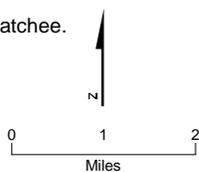
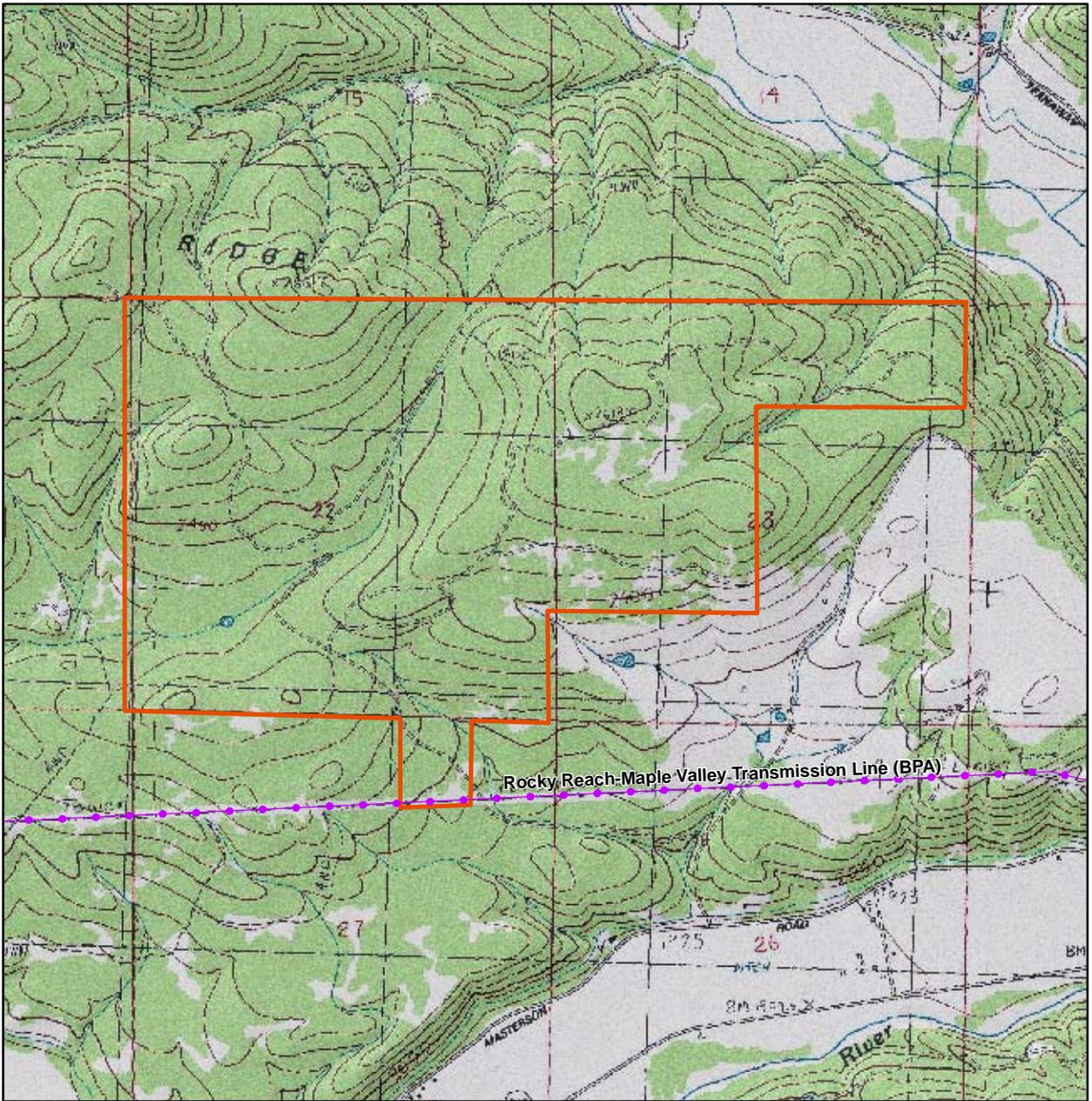


FIGURE 1
Vicinity Map
 Teanaway Solar Reserve
 Kittitas County, Washington



VICINITY MAP

LEGEND

- Existing BPA Transmission Line
- ▣ Proposed Project Area

Note:
1. USGS 24K Quadrangle: Teanaway.

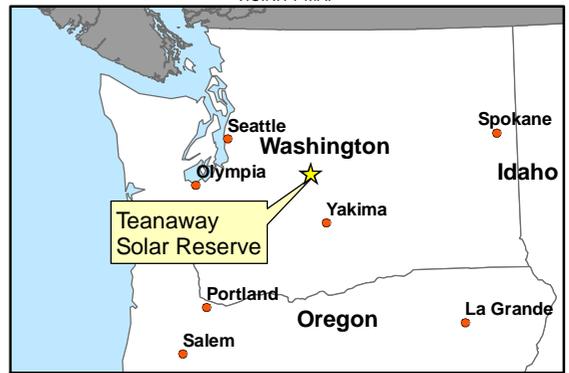
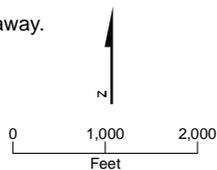
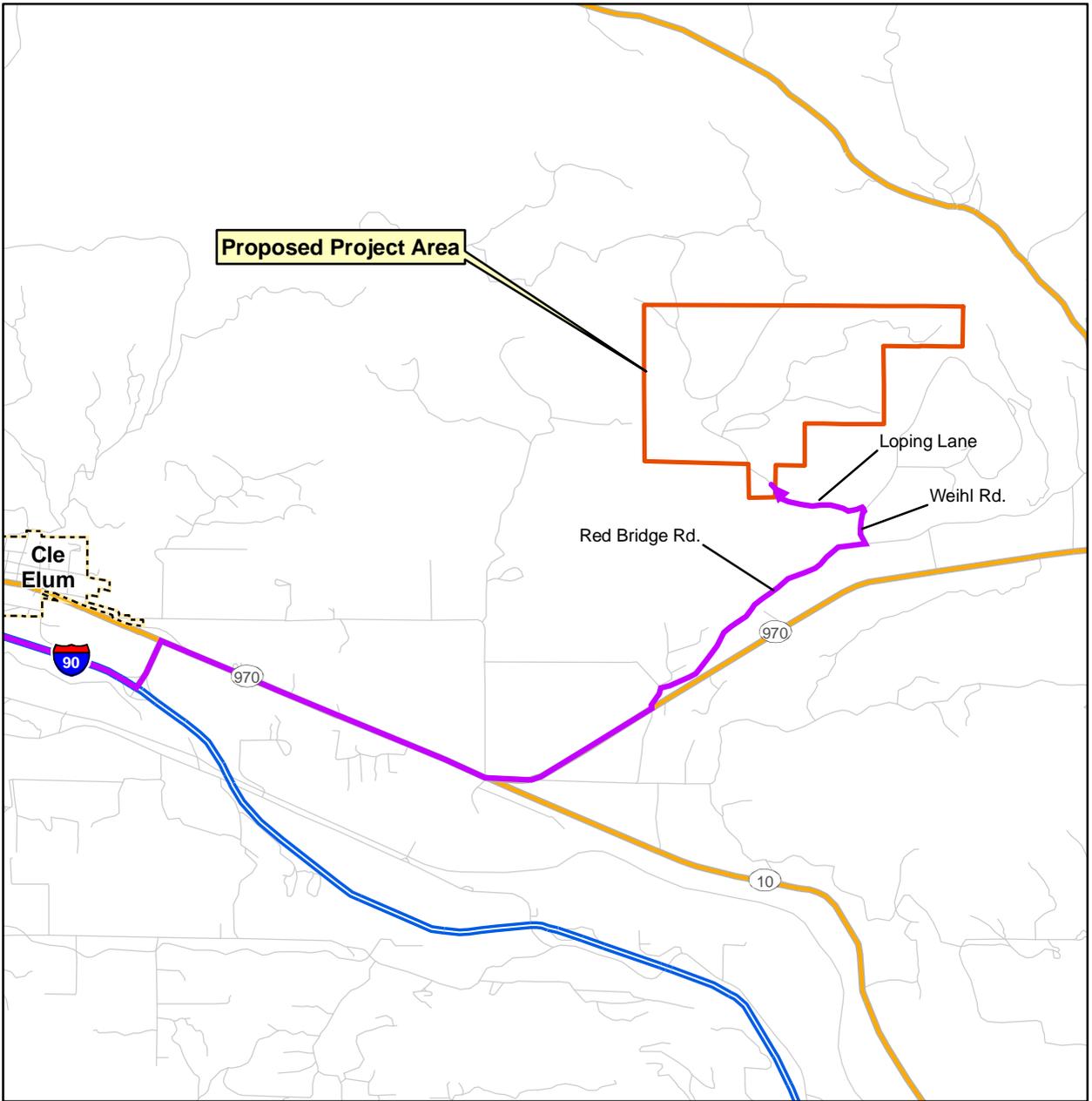


FIGURE 2
U.S. Geological Survey Topographic Map
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

-  Proposed Project Area
-  Site Access Route
-  City Boundary
-  Interstate
-  Highway
-  Major Road
-  Minor Road

Note:

1. Street Data: 2002 ESRI StreetMap USA.

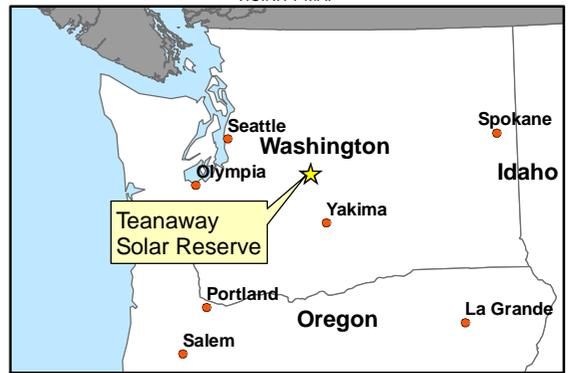
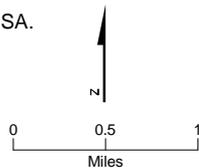
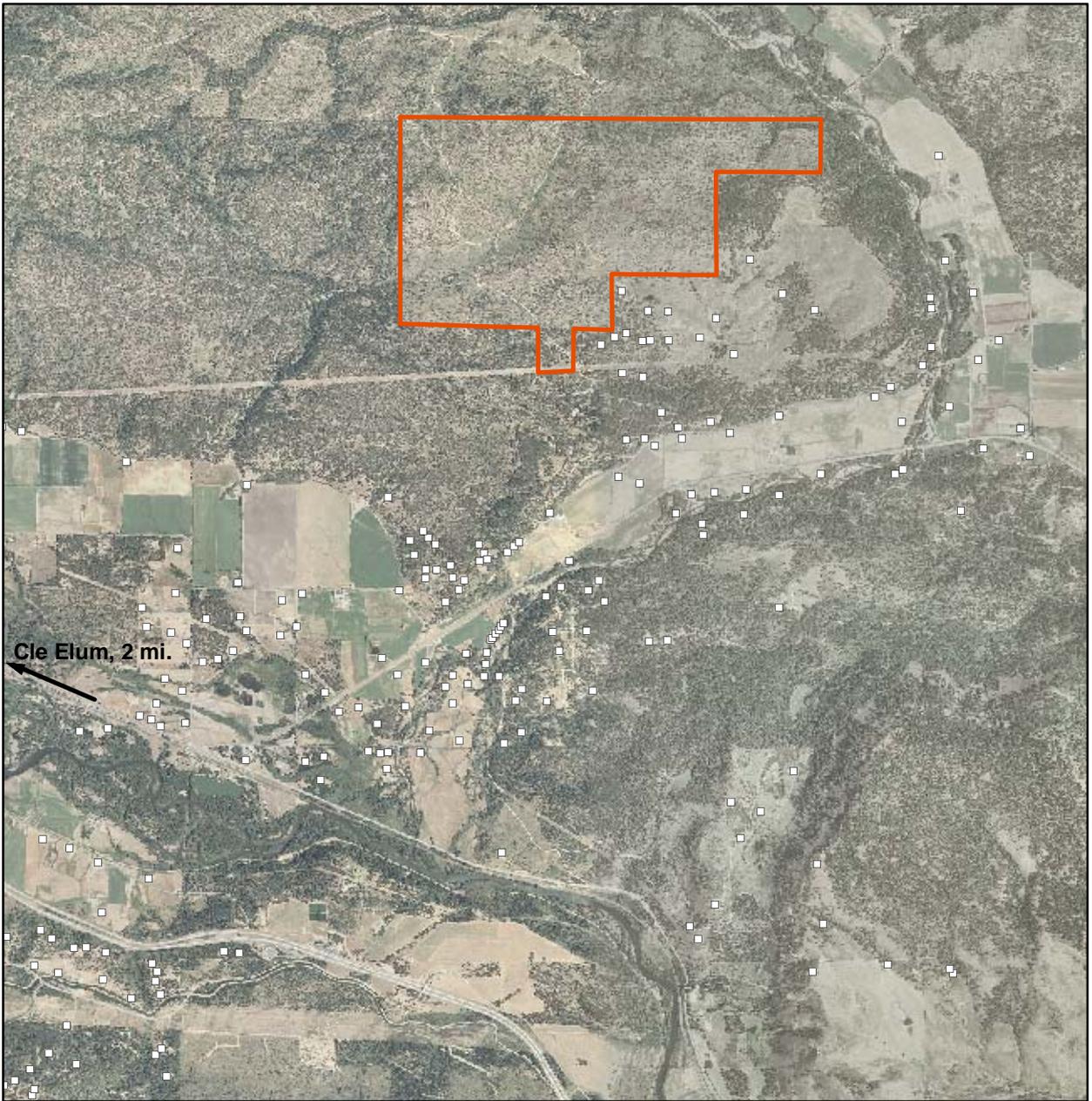


FIGURE 3
Site Access Map
 Teanaway Solar Reserve
 Kittitas County, Washington



VICINITY MAP

LEGEND

-  Proposed Project Area
-  Identified Structure

Notes:

1. Aerial Imagery: 2006 1m NAIP.
2. Structures identified from aerial, not ground verified.

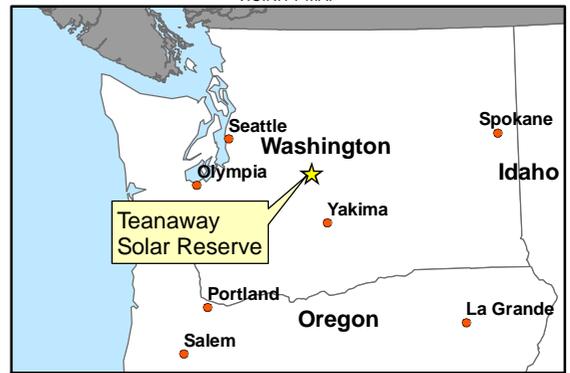
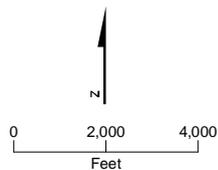
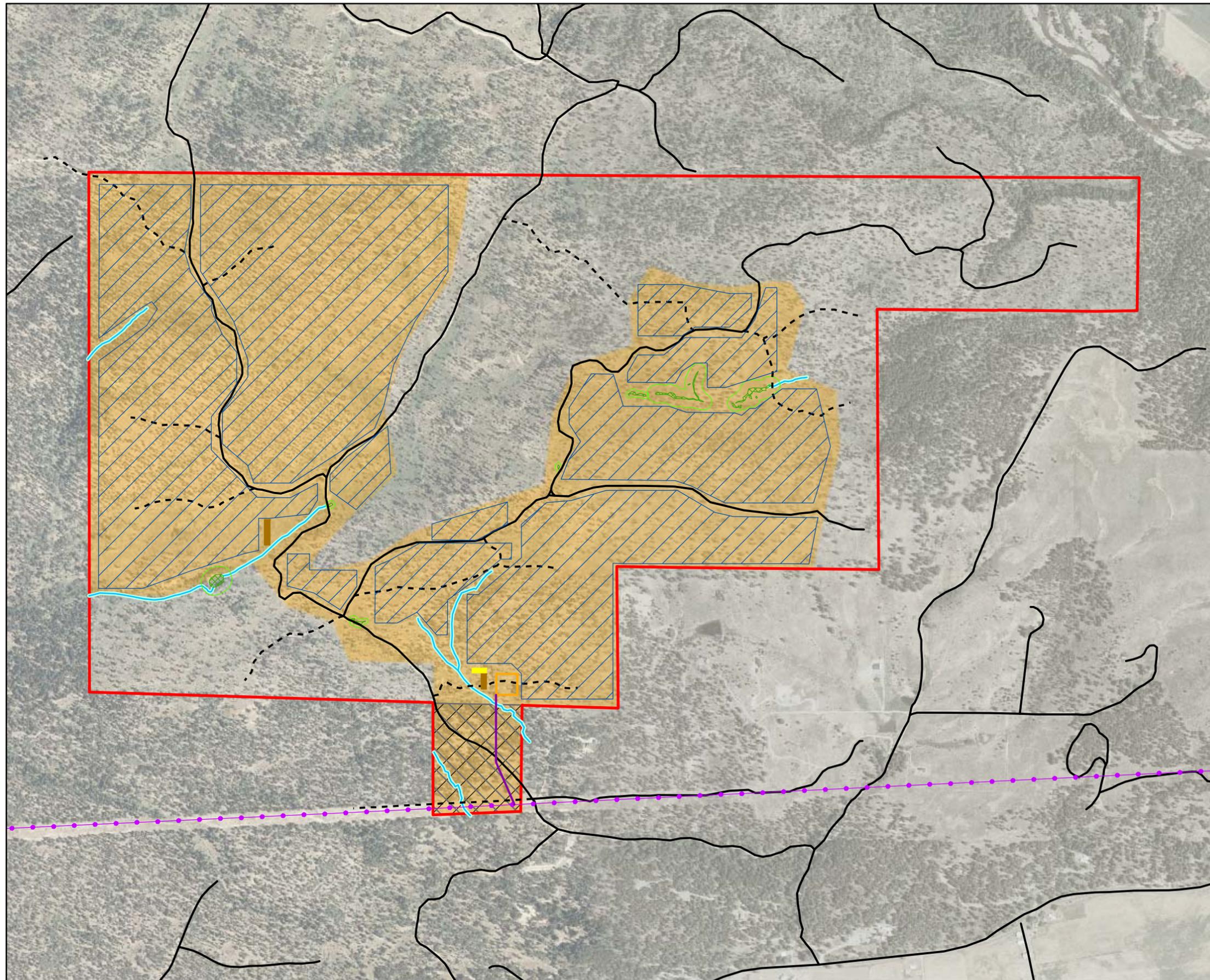


FIGURE 4
Identified Structure Map
 Teanaway Solar Reserve
 Kittitas County, Washington



- LEGEND**
- Proposed Project Area
 - Surveyed Area (580 acres)
 - Proposed Powerline Route to Grid
 - Potential Module Placement Area
 - Proposed O&M Facility
 - Proposed Substation
 - Proposed Switchgear
 - Transmission and Access Corridor
 - Existing Transmission Line
 - Road
 - Minor Dirt Road
 - Wetland
 - Wetland Buffer
 - Stream
 - Stream Buffer

Note:
1. Aerial Imagery: 2006 1m NAIP.

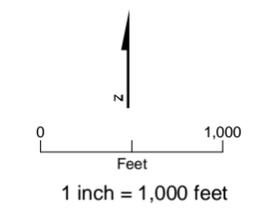
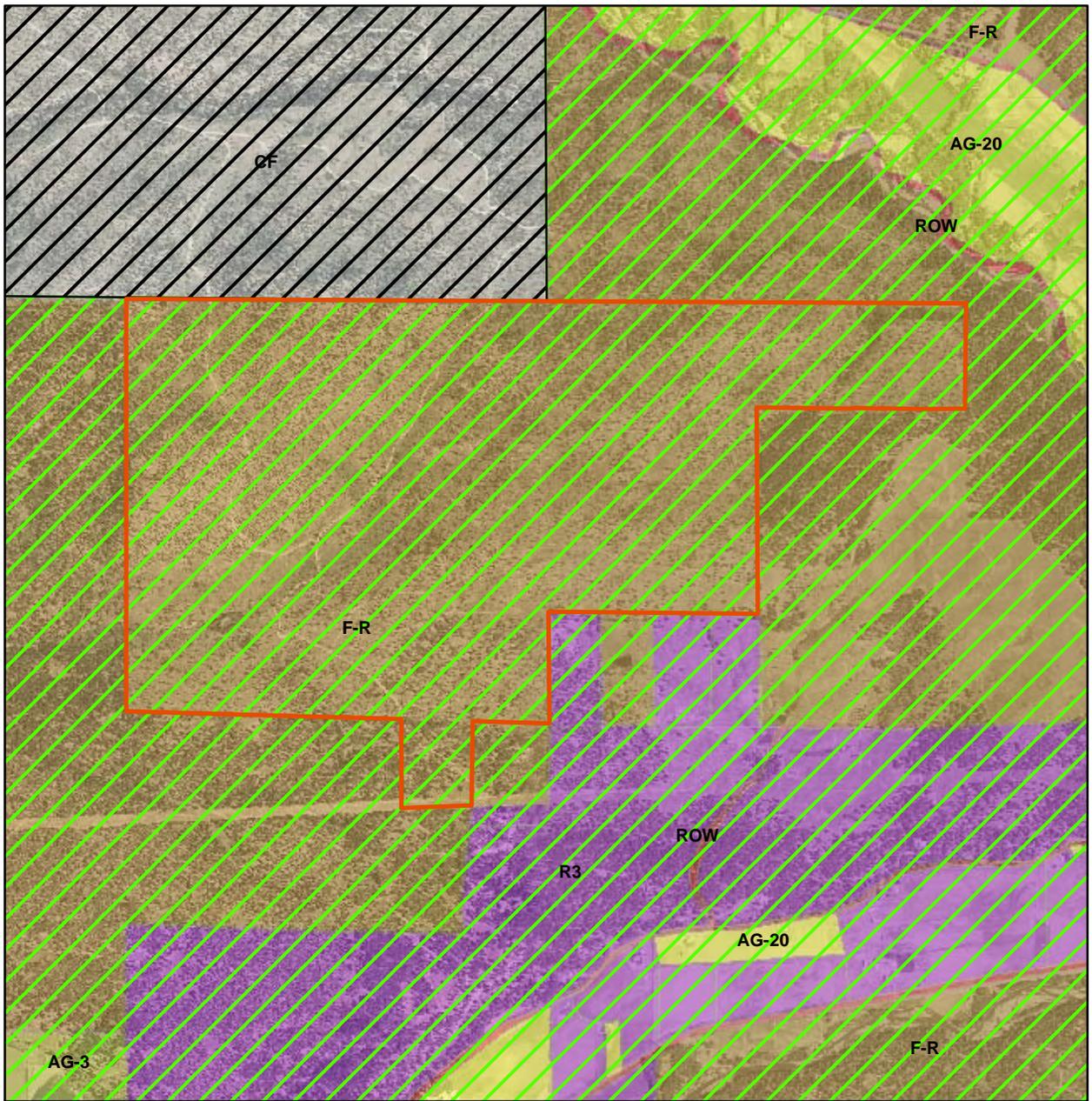


FIGURE 5
Conceptual Site Layout
Teanaway Solar Reserve
Kittitas County, Washington



LEGEND

-  Proposed Project Area
- Land Use**
-  COMMERCIAL FOREST
-  RURAL
- Zoning**
-  AG-20, Agricultural 20
-  AG-3, Agricultural 3
-  CF, Commercial Forest
-  F-R, Forest & Range
-  R3, Rural 3
-  ROW, Right-of-Way

Note:
1. Aerial Imagery: 2006 1m NAIP.

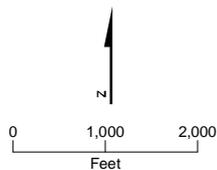
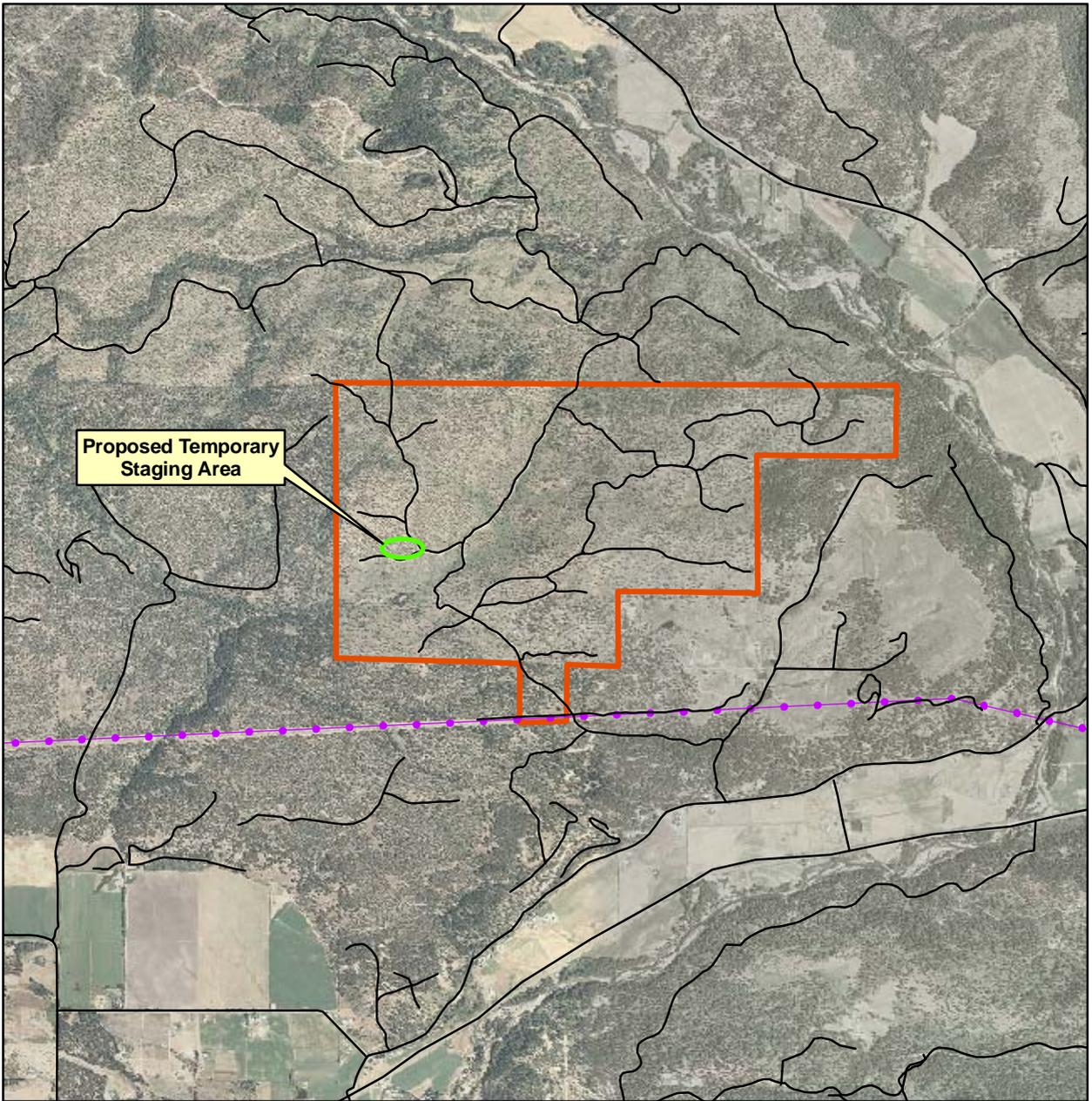


FIGURE 6
Land Use/Zoning Map
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

-  Proposed Project Area
-  Proposed Temporary 5-Acre Staging Area
-  Road
-  Existing BPA Transmission Line

Note:
1. Aerial Imagery: 2006 1m NAIP.

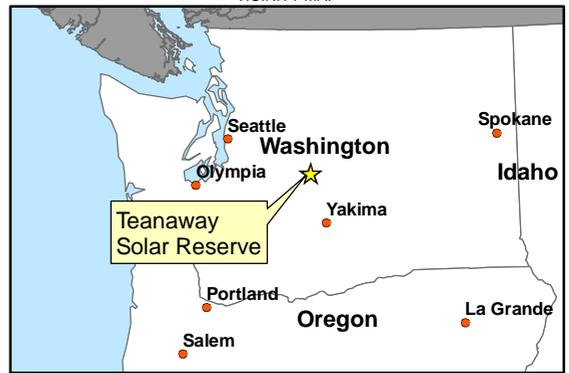
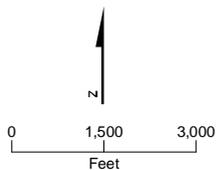
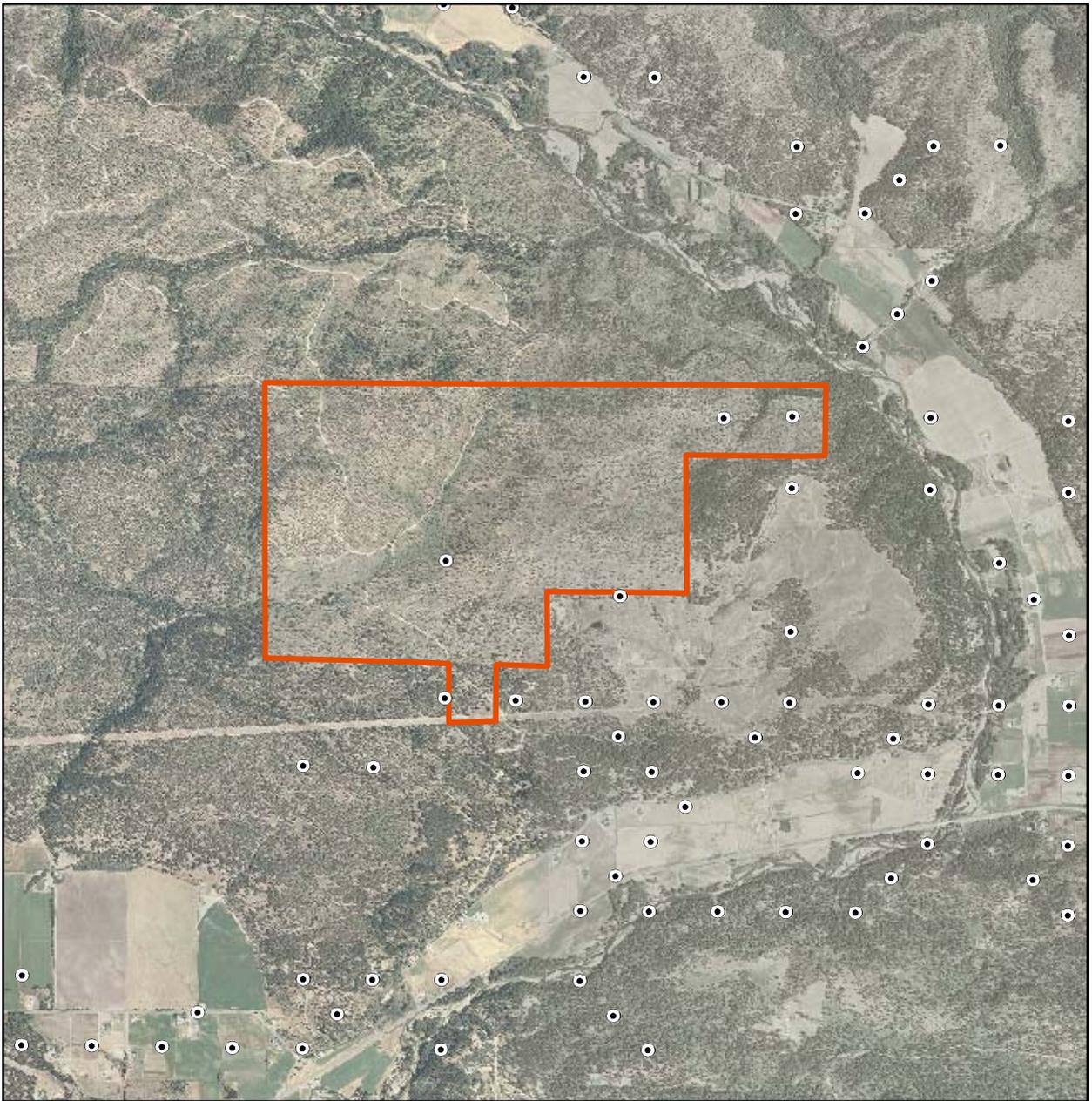


FIGURE 7
Staging Area Map
Teanaway Solar Reserve
Kittitas County, Washington



VICINITY MAP

LEGEND

- Well Location
- ▭ Proposed Project Area

Notes:

1. Well Log Data: Washington State Department of Ecology Water Resources Program.
2. Aerial Imagery: 2006 1m NAIP.

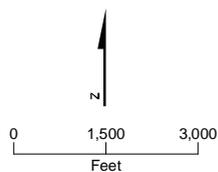
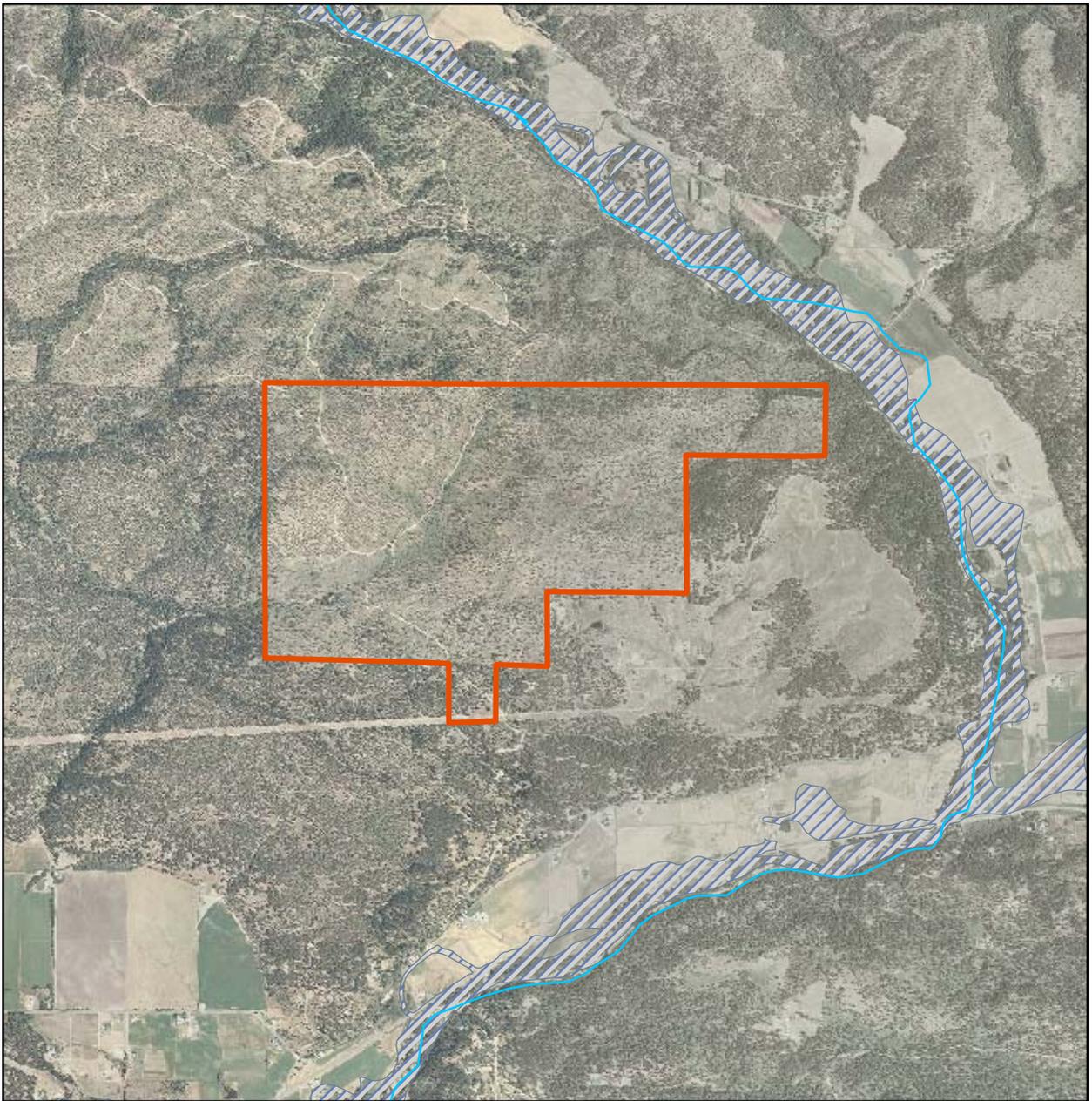


FIGURE 8
Designated Critical Areas:
Aquifer Recharge Areas
 Teanaway Solar Reserve
 Kittitas County, Washington



VICINITY MAP

LEGEND

-  Proposed Project Area
-  FEMA 100-year Flood Zone
-  Shoreline Management Act Stream
(450 feet from proposed project area)

Notes:

1. Flood Data: Federal Emergency Management Agency Flood Insurance Rate Map.
2. Stream Data: Washington Department of Ecology.
3. Aerial Imagery: 2006 1m NAIP.

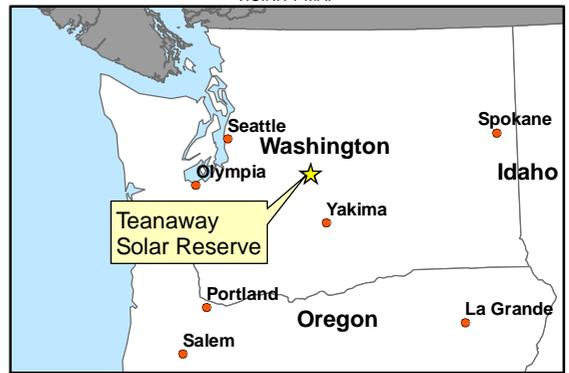
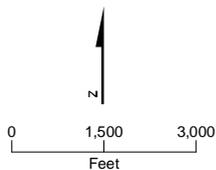
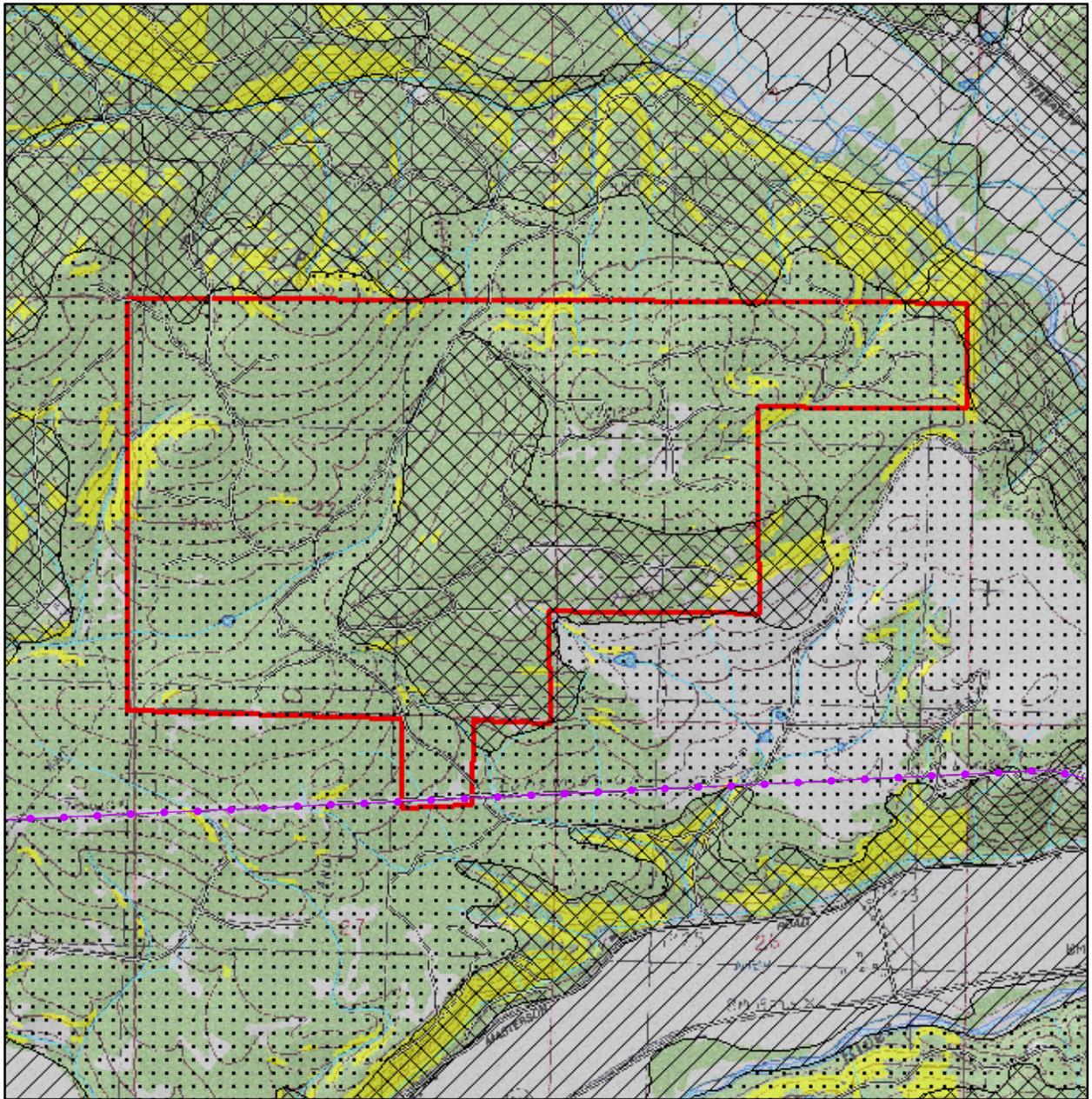


FIGURE 9
Designated Critical Areas: FEMA Federal Insurance Rate Map for Kittitas County
 Teanaway Solar Reserve
 Kittitas County, Washington



VICINITY MAP

LEGEND

- | | |
|-----------------------|--------------------------------|
| Existing BPA | Slope |
| Transmission Line | 0 - 25% (not symbolized) |
| Road | 25%+ |
| Proposed Project Area | Soil Susceptibility to Erosion |
| Stream | Slight |
| Waterbody | Moderate |
| | Severe |

Notes:

1. USGS 24K Quadrangle: Teanaway.
2. Soils Data: Soil Survey Geographic (SSURGO) Database.

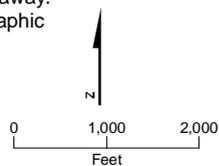


FIGURE 10
Designated Critical Areas: Erosion-Prone Soils and Geologic Hazards
 Teanaway Solar Reserve
 Kittitas County, Washington

ATTACHMENT E

Photographs of Solar Equipment

ATTACHMENT E

Photo Plates

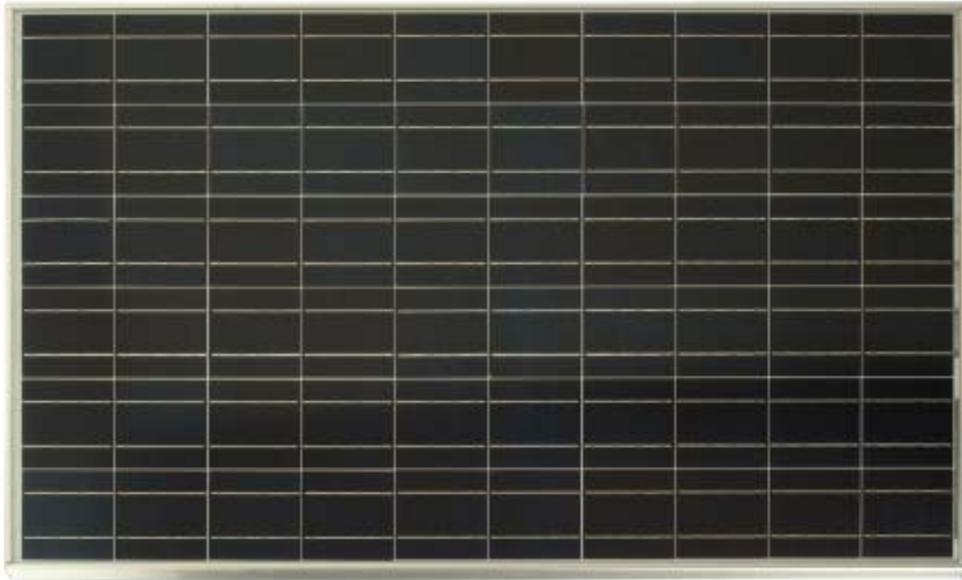


Photo Plate 1: Representative Solar Module (Source: Sharp Electronics Corporation)



Photo Plate 2: Single-Axis Tracking System by RayTracker

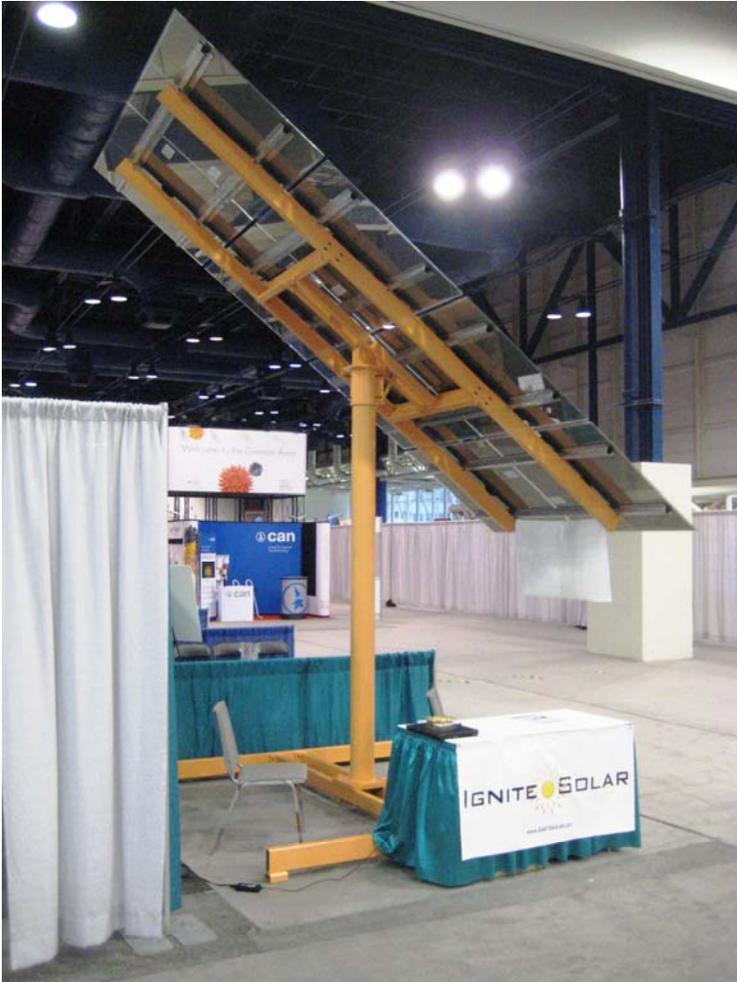


Photo Plate 3: Top of Pole-Mount Tracking System Holding Eight Solar Modules by Ignite Solar



Photo Plate 4: Proposed Fixed Tilt Mounting Structure (Source: Conergy)

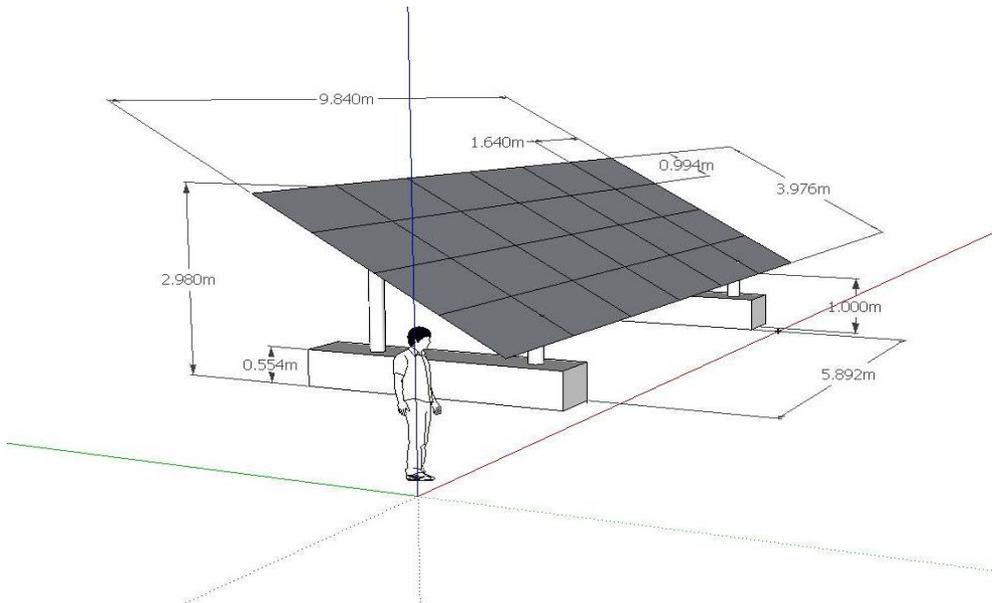


Photo Plate 5: Representative Mounting Structure with Dimensions



Photo Plate 6: Representative Mounting Structure, Cutaway View (Source: Conergy)



Photo Plate 7: Use of Timber Construction Materials in a Ground-Mounted Solar System



Photo Plate 8: Outdoor Compatible Commercial Inverters (Source: Xantrex)



Photo Plate 9: Example of 2-MW Inverter Building with Transformer (Source: Xantrex/Schneider Electric)



Photo Plate 10: Staging Area for a Solar Facility



Photo Plate 11: Example of Cabling Being Installed in Trenches for Interconnection to Grid



Photo Plate 12: Example of Cabling Being Installed in Trenches for Interconnection to Grid

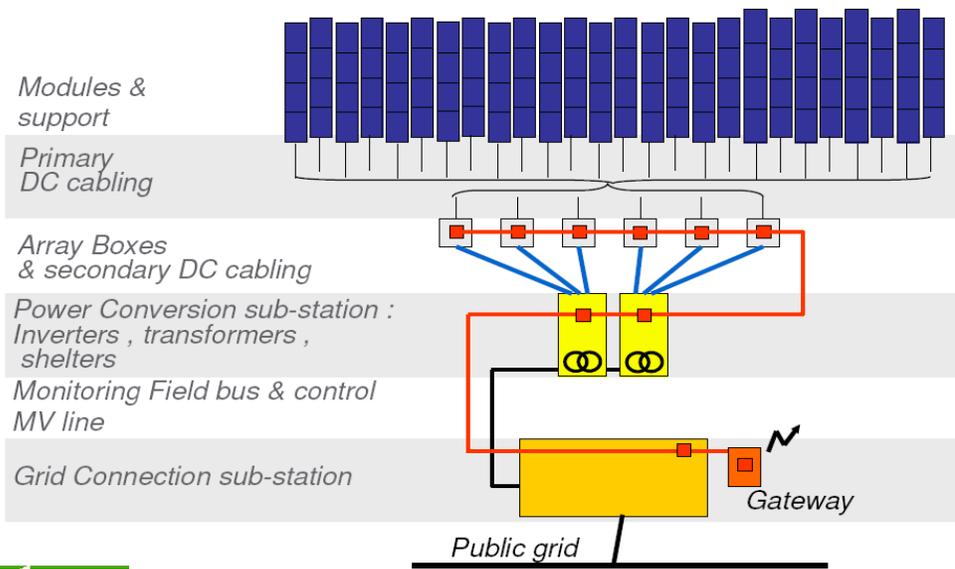


Photo Plate 13: Typical Cabling Diagram for a Photovoltaic System (Source: Xantrex/Schneider Electric)

ATTACHMENT F
**Zone of Visual Influence Technical
Memorandum**

Teanaway Solar Reserve Potential Visual Impact Simulation

PREPARED FOR: Howard Trott, Teanaway Solar Reserve, LLC
PREPARED BY: Mark Greenig, CH2M HILL
COPIES: Nichole Seidell, CH2M HILL
DATE: August 14, 2009

The purpose of this technical memorandum is twofold: (1) provide background documentation for the conclusions presented in the Aesthetics section of the Expanded SEPA Checklist, and (2) assist Kittitas County in evaluating the potential visual impacts associated with the proposed project.

The first step in evaluating the potential visual impacts associated with the proposed project was to determine areas from which the project could potentially be visible. To achieve this goal, a geographic information system- (GIS) based visibility assessment, called a Zone of Visual Influence (ZVI) analysis, was conducted. Environmental Systems Research Institute (ESRI) ArcGIS software was used for the analysis. The ZVI data were overlaid on a map of the general proposed project area in order to graphically depict areas from which the project would be potentially visible. Figure 1 shows a conceptual layout of the project. Figure 2 illustrates the potential visibility of solar panels in four areas of the project site. Four maps (Figures 3 to 6) were developed to show the potential visibility of solar panels in each of the four areas (as depicted in Figure 1).

The software that was used to produce the ZVI measured 10-meter digital elevation models that were derived from multiple sources. These sources consisted of 7.5' (1:24,000) U.S. Geological Survey (USGS) topographic quadrangle maps, elevation manuscripts, and aerial photographs. The elevation models represent ground elevations.

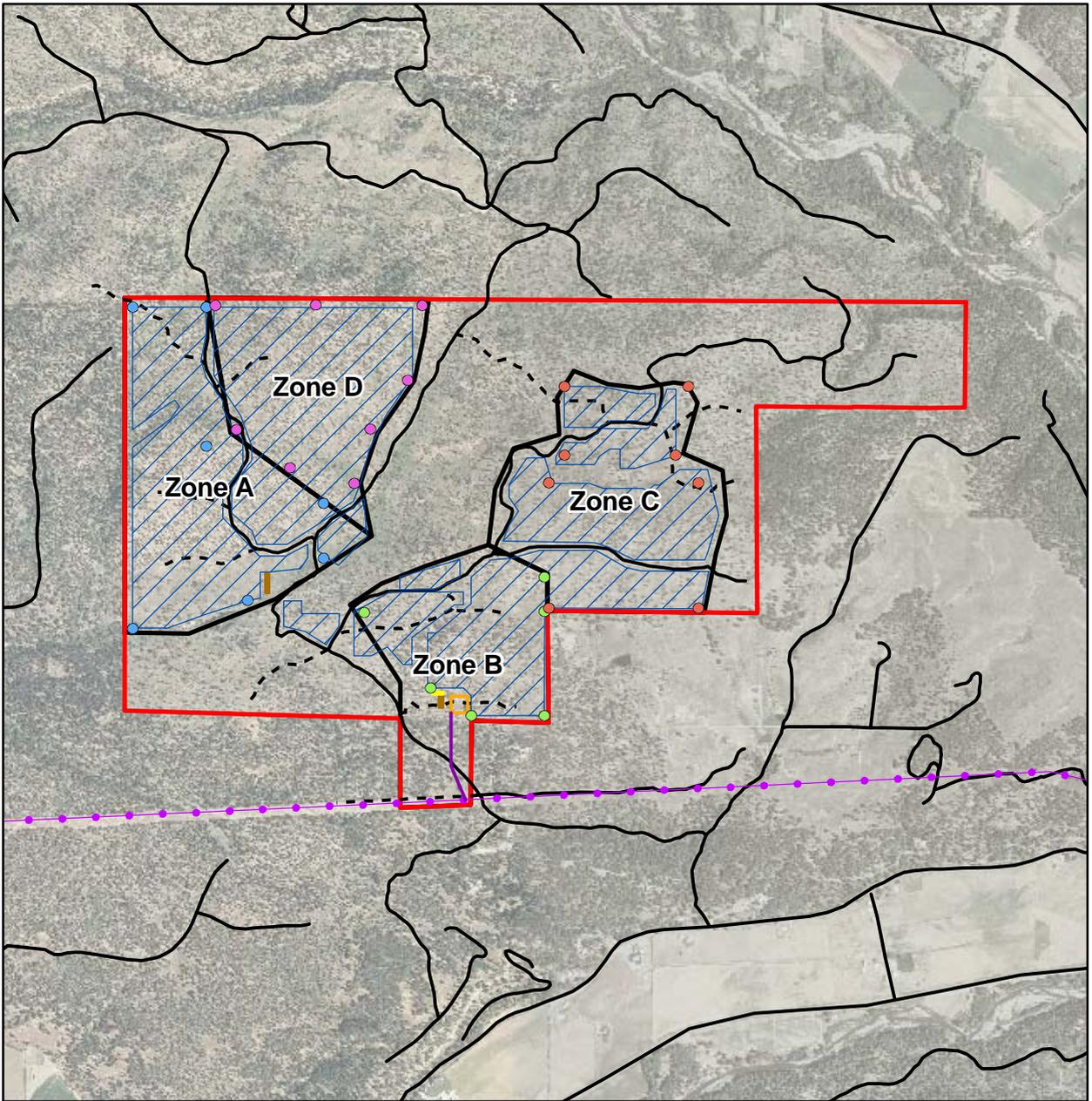
The ZVI model calculated lines of sight between points that represent solar panels 10 feet above the adjacent terrain and ground areas from which they would be potentially visible. The model did not take into account the presence of trees, buildings, or other features, so in some areas where project visibility is indicated, views will be screened by trees, vegetation, or other structures. In addition, the ZVI model is a line-of-sight model that does not account for attenuating factors such as distance, haze, humidity, background landscape, or weather, which would make the project invisible or barely visible from certain locations under many atmospheric or weather conditions.

The ZVI maps indicate areas from which the proposed project would be potentially visible. To get a better idea of how visible the project would be, four locations were selected from around the project area to represent the "seen" area. Photographs were taken from each location to depict existing views and conceptual depictions of how the project would appear from each location were developed.

Despite being identified as an area from which the project would be potentially visible (see Figures 1 through 6), it was difficult to find publically accessible locations on the northwest facing slopes of Lookout Mountain from which the project site can be seen. Based on several site visits and discussions with neighbors in the area on July 26, 2009, many if not most, of the residences on the slopes of Lookout Mountain have views towards the project site that are obscured or at least partially screened by trees. Two areas were found that did have views of the project area. One area (Location 1) is on private property and the second (Location 2) is on a public road. Both of these locations are approximately 1.5 miles from the closest edge of the project. Location 1 is in a pasture above a residence and Location 2 is near the intersection of Ridgewater Drive and Lambert Road. These locations were chosen to depict some of the closest elevated residential areas that could have views of the project. Figure 7a depicts the existing view towards the project from Location 1 and Figure 7b is a conceptual depiction of what the view might look like if the project were constructed. Figures 8a and 8b illustrate similar views and conceptual depictions from Location 2.

It should be noted that some residences on the north side of State Route (SR) 970 are closer to the project site than the residences on the northwest face of Lookout Mountain. However, it appears that most will not see the project clearly because they “face away” from the project, are located below it, or seem to be screened from it by vegetation and terrain.

Locations 3 and 4 were selected to represent views of the project from areas south of Interstate 90 (I-90). Location 3 is approximately 3.5 miles to the southwest of the project and Location 4 is approximately 4 miles to the southwest. Location 3 is alongside Watson Cutoff Road just below the intersection with Upper Peoh Point Road. Location 4 is on Watson Cutoff Road at a lower elevation than Location 3 and is approximately 0.2 mile from I-90. Both of these locations were identified in the ZVI maps to be within the seen area of the project. Figure 9a depicts the existing view towards the project from Location 3 and Figure 9b is a conceptual depiction of what the view might look like with the project in place. Figures 10a and 10b illustrate similar views and conceptual depictions from Location 4.



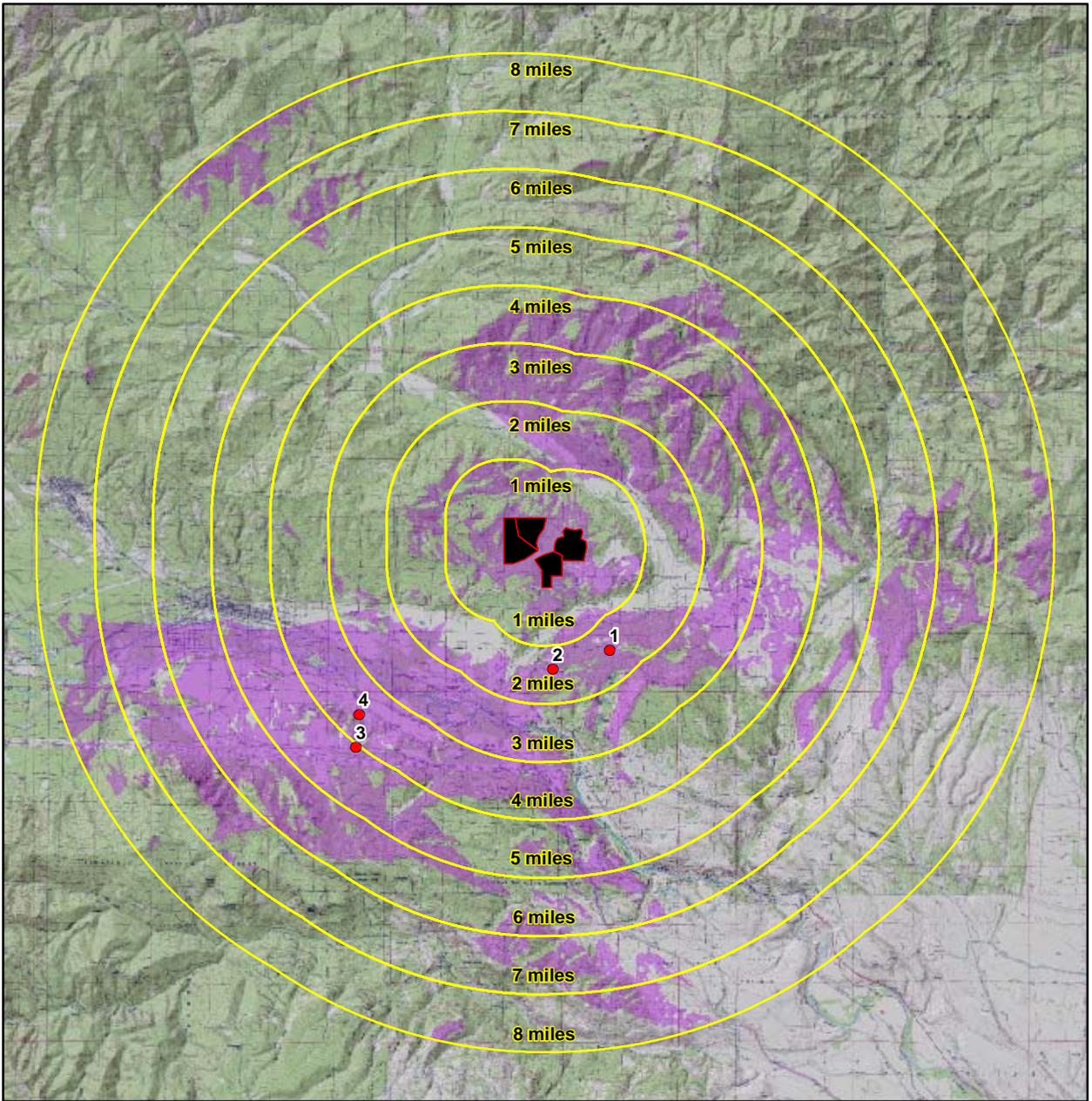
VICINITY MAP

LEGEND

-  Proposed Project Area
-  Proposed Potential Module Location
-  ZVI Zone
-  Proposed O&M Facility
-  Zone A
-  Zone B
-  Zone C
-  Zone D
-  Proposed Powerline Route to Grid
-  Proposed Substation
-  Proposed Switchgear
-  Road
-  Minor Dirt Road
-  Existing Transmission Line



FIGURE 1
ZVI Analysis Zone Points
 Teanaway Solar Reserve
 Kittitas County, Washington



VICINITY MAP

LEGEND

- Simulation Viewpoint
- Area Considered in ZVI
- ZVI Zone
- Distance from Project Area
- ☞ Zone of Potential Visual Influence

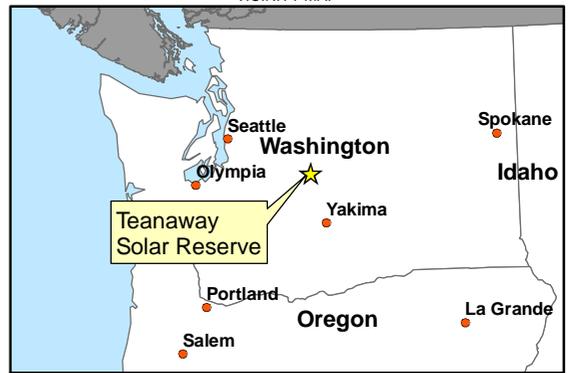
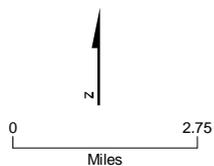
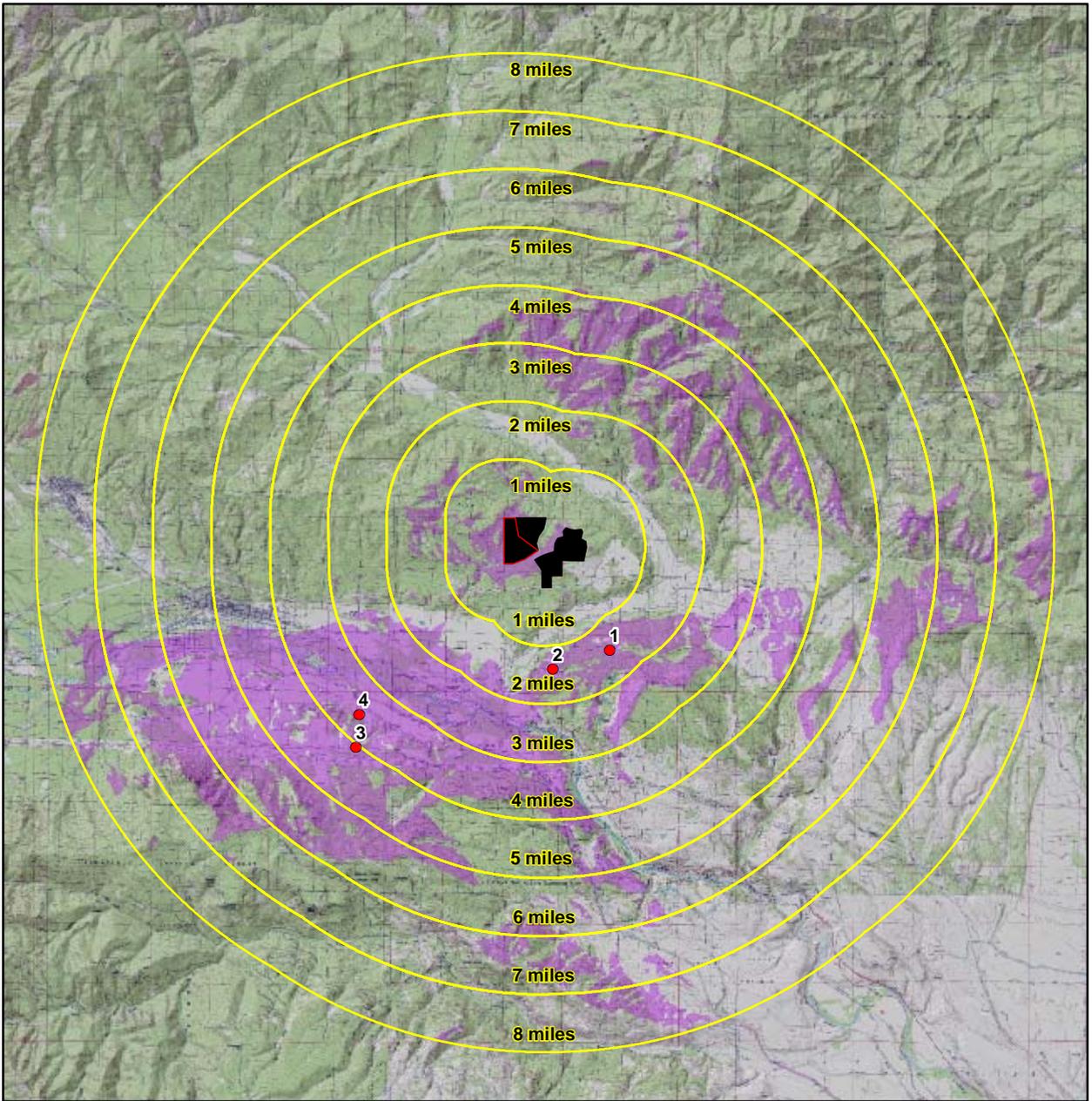


FIGURE 2
Zone of Visual Influence-All Zones
 Teanaway Solar Reserve
 Kittitas County, Washington



VICINITY MAP

LEGEND

- Simulation Viewpoint
- Area Considered in ZVI
- ZVI Zone
- Distance from Project Area
- ☞ Zone of Potential Visual Influence

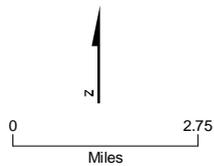
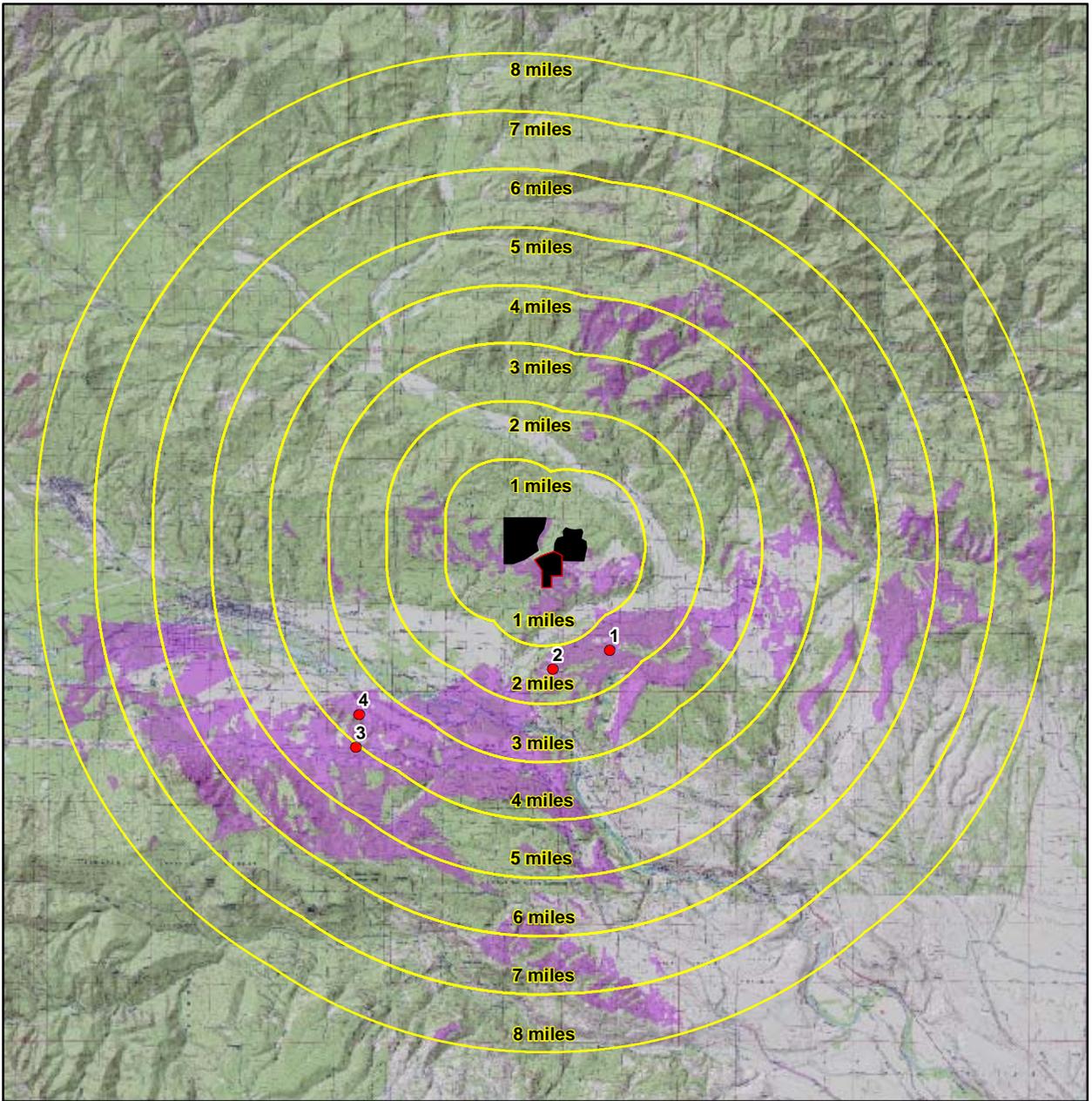


FIGURE 3
Zone of Visual Influence-Zone A
 Teanaway Solar Reserve
 Kittitas County, Washington



VICINITY MAP

LEGEND

- Simulation Viewpoint
- Area Considered in ZVI
- ZVI Zone
- Distance from Project Area
- ⊕ Zone of Potential Visual Influence

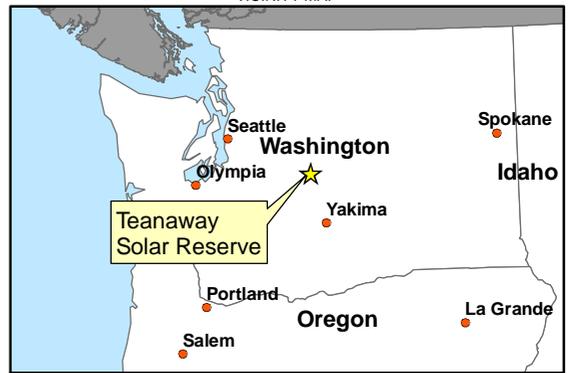
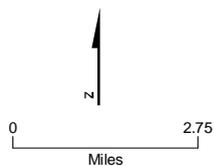
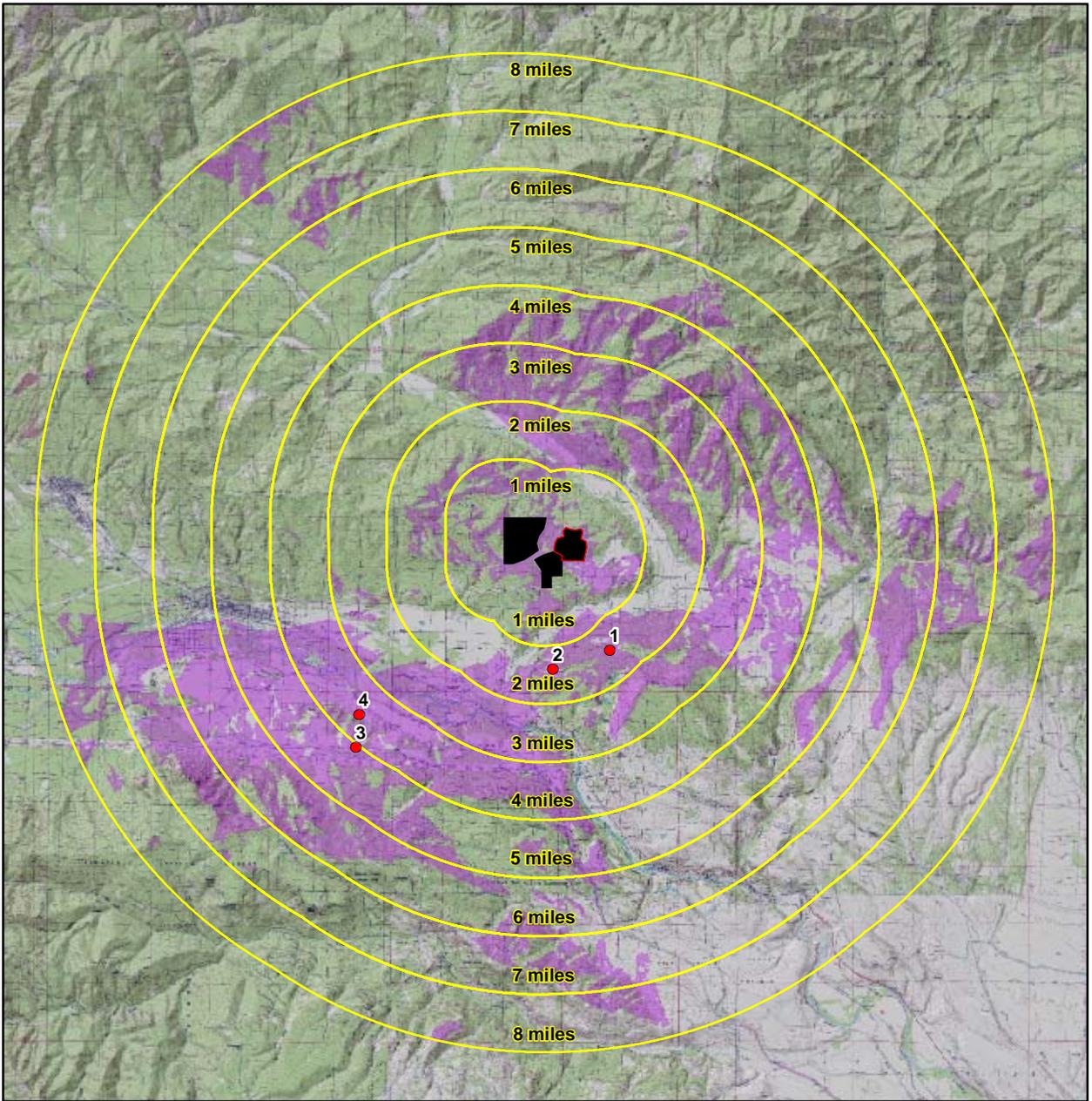


FIGURE 4
Zone of Visual Influence-Zone B
 Teanaway Solar Reserve
 Kittitas County, Washington



VICINITY MAP

LEGEND

- Simulation Viewpoint
- Area Considered in ZVI
- ZVI Zone
- Distance from Project Area
- ◊ Zone of Potential Visual Influence

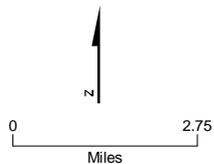
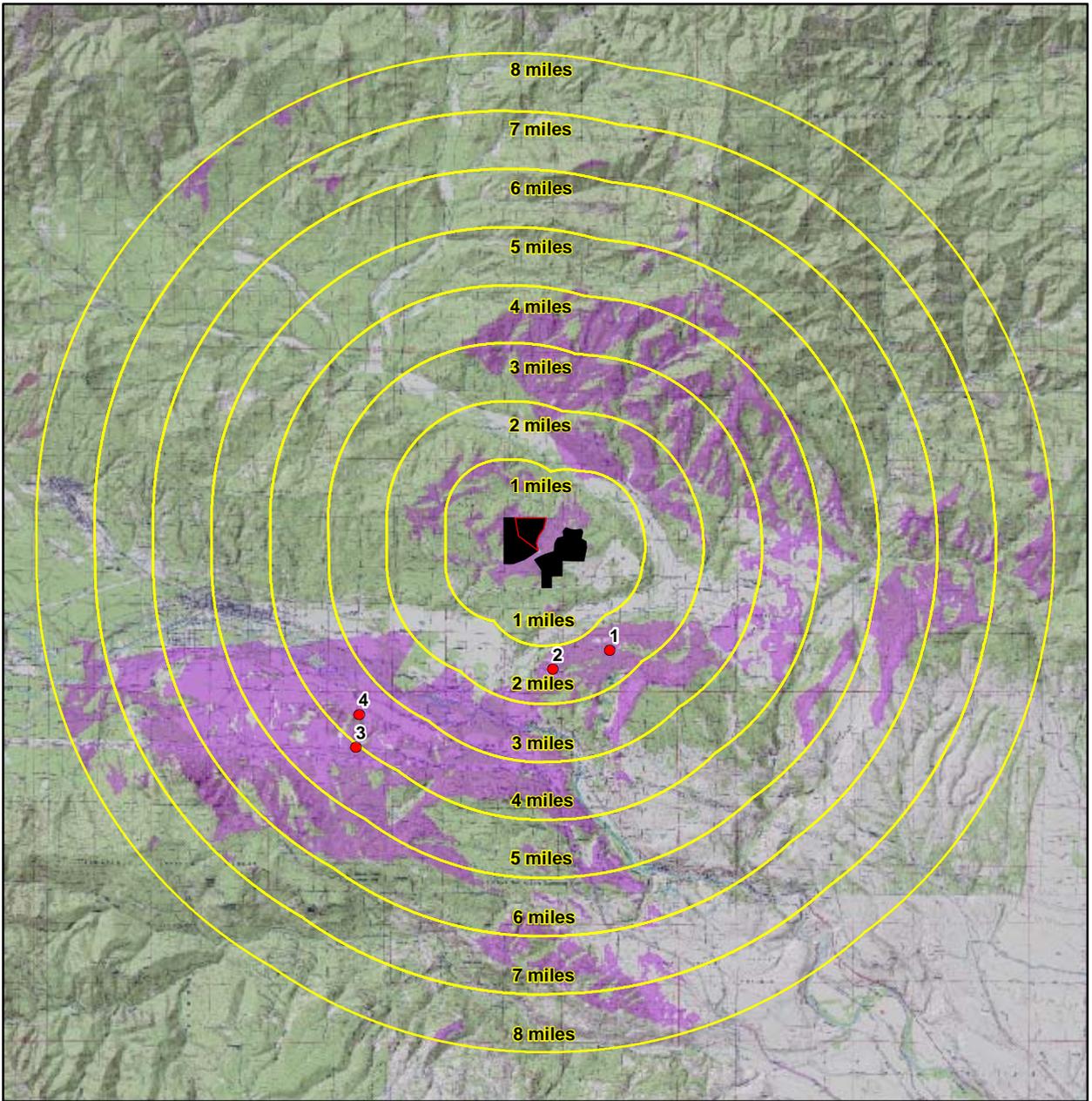


FIGURE 5
Zone of Visual Influence-Zone C
 Teanaway Solar Reserve
 Kittitas County, Washington



VICINITY MAP

LEGEND

- Simulation Viewpoint
- Area Considered in ZVI
- ZVI Zone
- Distance from Project Area
- ☞ Zone of Potential Visual Influence

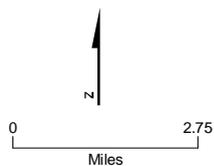


FIGURE 6
Zone of Visual Influence-Zone D
 Teanaway Solar Reserve
 Kittitas County, Washington

Location 1 — Residence 1/4 Mile West of Lambert Road



Figure 7a
Existing View Looking West at Project Site



Figure 7b
Conceptual Depiction of View with Project

Location 2 – Ridgewater Drive



Figure 8a
Existing View Looking West at Project Site



Figure 8b
Conceptual Depiction of View with Project

Location 3 — Watson Cutoff Road (Upper)



Figure 9a
Existing View Looking Northeast at Project Site



Figure 9b
Conceptual Depiction of View with Project

Location 4 – Watson Cutoff Road (Lower)



Figure 10a
Existing View Looking Northeast at Project Site



Figure 10b
Conceptual Depiction of View with Project