Wetland and Waterbody Delineation Report

April 4, 2022

Ostrea Solar, LLC Project (NWS-2021-778)

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Acronyms and Abbreviations

Notation	Definition
APN	Assessor's Parcel Number
BESS	Battery Energy Storage System
BPA	Bonneville Power Administration
CAO	Critical Areas Ordinance
CCR	Cypress Creek Renewables, LLC
CWA	Clean Water Act
Ecology	State of Washington Department of Ecology
EFSEC	State of Washington Energy Facility Site Evaluation Council
°F	degrees Fahrenheit
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
kV	kilovolt
MPE	Maximum Project Extent is defined as the area that contains the Project footprint and additional construction areas. The larger extent of the MPE will allow for the shifting of project components, known as micro-siting, based on a final approved project design.
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
OHWM	Ordinary High Water Mark
O&M	Operations and Maintenance
PEM	Palustrine Emergent Wetland
Project	Ostrea Solar, LLC, Project
RCW	Revised Code of Washington
SBAS	Satellite-based Augmentation System
SDAM	Streamflow Duration Assessment Form
SR	State Route
TBD	To be determined
TRC	TRC Environmental Corporation
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WETS	Wetlands (Tables)
WOTUS	Waters of the U.S.
YCC	Yakima County Code

1.0 INTRODUCTION

TRC Environmental Corporation (TRC) was contracted by Cypress Creek Renewables, LLC (CCR) to conduct a wetland and waterbody delineation for the proposed Ostrea Solar, LLC Project (Project) located in Yakima County, Washington.

The objective of the wetland and waterbody delineation survey was to identify the spatial extent and arrangement of wetlands, streams, and other aquatic resources within the Project. Aquatic resources that are considered Waters of the U.S. (WOTUS) are subject to regulation under Section 404 of the Clean Water Act (CWA). The wetland and waterbody delineation surveys were completed by Jay Lorenz (Senior Scientist) and Nathalie Denis (Senior Biologist) on July 1, 2020, and by Erin Bergquist (Wetland Delineator/Botanist) and Laura Giese (Wetland Delineator/Botanist) May 10 to 15, 2021.

1.1 Project Location and Description

The Project is located approximately 22 miles east of the town of Moxee in Yakima County, Washington (Figure 1). The Project is located north of Washington State Route 24 (SR-24) and south of the Yakima Training Center in Sections 3, 9, and 11, Township 12 North, Range 23 East (Figure 2). The Survey Area for the wetland and waterbody delineation surveys encompasses 1,746 acres of private land that is currently used for grazing. The Survey Area for the wetland and waterbody delineation surveys includes the following Assessor's Parcel Numbers (APN): 231203-31001, 231211-11001, 231209-11001, 231210-24001, 231210-23001, 231210-22002, 231210-31001, and 231210-41002 (Figure 2). Maximum Project Extent (MPE) is defined as the area that contains the Project footprint and additional construction areas. The larger extent of the MPE will allow for the shifting of project components, known as micro-siting, based on a final approved project design. The life of the Project is anticipated to be 40 years.

The Project will use solar photovoltaic panels organized in arrays and aggregated to an injection capacity limited to 80 megawatts of alternating current solar capacity at the point of interconnection to the electric power grid. The Project will interconnect through a line tap to Bonneville Power Administration's (BPA's) Moxee to Midway 115 kilovolt (kV) transmission line that runs through the southern part of the Project. BPA's Moxee to Midway 115 kV transmission line connects to BPA's Moxee substation, which is approximately 23 miles west and north of the Project and BPA's shared Midway substation, which is approximately nine miles east and north of the Project. A security fence will be installed within 20 feet of the final approved locations of the panel arrays. The exact fence line located will be micro-sited based on the final approved design for the Project.

A Battery Energy Storage System (BESS) is required for the Project. The BESS system will store energy from the Project or grid, which will be supplied to the electrical grid when needed. The BESS will be located to the west of the substation.

An Operations and Maintenance (O&M) trailer and employee parking will be located just west of the Project substation. During construction, the employee parking area and the O&M trailer footprint will be used as a construction laydown yard. Access to the Project will be from SR-24 on the west side of the eastern-most parcel in the Maximum Project Extent (MPE).

1.2 Landscape Setting

The Project is located in the Columbia Plateau Ecoregion. The landscape in this ecoregion includes expansive sagebrush covering plains and valleys with isolated mountain ranges and river systems (USEPA 2010). The Project is located in the valley between Yakima Ridge and the Rattlesnake Hills (Figure 1). An unnamed ephemeral channel parallels SR-24 flowing southeast. Surface water flow in the area is from the Yakima Ridge located north of the Project to the unnamed ephemeral channel that parallels SR-24. This unnamed ephemeral channel is a fourth order tributary to the Columbia River via Dry Creek, Cold Creek, and the Yakima River.

The Survey Area is located on a south-facing slope of an anticline. Numerous ravines and gullies are located across the south-facing slope of the Survey Area. The ravines found on higher and steeper portions of the anticline are reduced to channels and upland draws on lower slopes. Much of the alluvium at the toe of the slope may have originated from mass wasting events that historically created the ravines high on the slope (Foxworthy 1962). The soils within the Project Boundary are predominantly mixed alluviums ranging from gravelly sandy loam to stony sandy loam. Elevations within the Project Boundary range from 1,348 to 2,100 feet.

The climate in the surrounding region consists of cool, dry summers, and mild, wet, and cloudy winters with the wettest months being December and January. Average temperature ranges from 36.4 degrees Fahrenheit (°F) in January to 84.6 °F in July (WRCC 2016). Average precipitation ranges from 0.25 inches in July to 1.01 inches in December (WRCC 2016). Annual average precipitation is 7.87 inches (WRCC 2016).

2.0 REGULATORY BACKGROUND

Wetlands and other WOTUS are protected under Section 404 of the CWA. Any activity that involves discharge of dredged or fill material into WOTUS is subject to regulation by the U.S. Army Corps of Engineers (USACE). WOTUS are defined to encompass navigable waterways; interstate waters; all other waters where their use, degradation, or destruction could affect interstate or foreign commerce; tributaries of any of these waters; and wetlands that meet any of these criteria or are adjacent to any of these waters or their tributaries. As of August 30, 2021, the 2015 Navigable Waters Protection Rule has been remanded. Per the USACE direction in an email from David Moore, USACE Biologist/Soil Scientist, on September 7, 2021, the 2008 Rapanos WOTUS guidance is being used to evaluate jurisdiction of wetlands and waterbodies.

Section 404 or Section 10 permits issued by the USACE under the authority of the CWA as well as all wetlands and waters identified as “waters of the state”, are subject to the Section 401 permitting program administered by the State of Washington Department of Ecology (Ecology). A separate application is required if there is no corresponding Section 404 permit. If the disturbance is more than 0.3 acre, a pre-application meeting with Ecology is required for the Section 401 permit as part of the Section 404 permitting process.

Ecology has developed the Eastern Washington State Wetland Rating System to categorize wetlands “based on specific attributes such as rarity, sensitivity to disturbance, and the functions they provide.” The rating system is used to provide a basis for developing standards for protecting and managing the wetlands including buffer distances, permitted uses in the wetland, and the amount of mitigation needed to compensate for impacts to the wetland. Wetlands are grouped into four categories based on their rarity, functions, importance in maintaining biodiversity, sensitivity to nearby disturbance, and how easy they are to replace (Table 2-1).

The Eastern Washington State Wetland Rating System classifies wetlands based on their hydrologic and geomorphic conditions (e.g., Lake Fringe Wetlands, Slope Wetlands, Riverine Wetlands, Depressional Wetlands) and their Cowardin Classification (forested class, scrub-shrub class, emergent class, or aquatic bed class).

Table 2-1. State of Washington Wetland Categories

Wetland Category	Description	Examples
Category I	Unique or rare wetland type, are more sensitive to disturbance than most wetlands, are relatively undisturbed and contain ecological attributes that are impossible or too difficult to replace within a human lifetime and provide a high level of functions. Generally, these wetlands are not common and make up a small percentage of the wetlands within Yakima County.	• Alkali wetlands; • Wetlands of high conservation value; • Bogs and calcareous fens, mature and old-growth forested wetlands with native slow growing trees, forested wetlands with stands of aspen; and • A functions rating score of 22 points or more in the Eastern Washington Wetland Rating System.
Category II	Wetlands that are difficult, though not impossible, to replace, and provide high levels of some functions. These wetlands occur more commonly than Category I wetlands, but still need a relatively high level of protection.	• Forested wetlands in the floodplains of rivers; • Mature and old-growth forested wetlands with fast growing native trees, which include alders, cottonwoods, willows, quaking Aspen, or water birch; • Vernal pools; and • A functions rating score between 19 to 21 points in the Eastern Washington Wetland Rating System.
Category III	Wetlands that are with a moderate level of functions and can often be adequately replaced with a well-planned mitigation project.	• Vernal pools; and • A functions rating score between 16 to 18 points in the Eastern Washington Wetland Rating System.
Category IV	Wetlands that have the lowest level of functions are often heavily disturbed. These are wetlands that should be able to be replaced, and, in some cases, be improved.	

Source: Eastern Washington State Wetland Rating System

The State of Washington 1990 State Growth Management Act defines critical areas as "(a) wetlands; (b) areas with a critical recharging effect on aquifers used for potable water; (c) fish and wildlife habitat conservation areas; (d) frequently flooded areas; and (e) geologically hazardous areas. 'Fish and wildlife habitat conservation areas'…does not include such artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of and are maintained by a port district or an irrigation district or company" (Revised Code of Washington (RCW) 36.70A.030). Per the Growth Management Act, each county designates critical areas and adopts development regulations conserving and protecting the designated critical areas.

Yakima County's Critical Areas Ordinance (CAO) defines hydrologically related Critical Area Features as (1) any floodway and floodplain identified as a special flood hazard area; (2) perennial and intermittent streams, excluding ephemeral streams, including the stream main channel and all secondary channels within the Ordinary High Water Mark (OHWM); (3) naturally occurring ponds under 20 acres and their submerged aquatic beds; and man-made lakes and ponds created within a stream channel; (4) wetlands; (5) flood-prone areas not included in a designated floodway and floodplain, but indicated as flood-prone (i.e., specific flood frequency, stream channel migration), by information observable in the field such as soils or geological evidence, or by materials such as flood studies, topographic surveys, photographic evidence, or other data; and (6) set distance of vegetative buffer from wetland and waterbodies as defined in the Yakima County CAO (CAO 16C.06.03). Vegetative buffer distances are set by the type of wetland or waterbody as shown in Table 2-2.

Table 2-2. Yakima County Critical Area Ordinance Vegetative Buffer Distances

Wetland/Stream Type	Buffer Width
Type 1 Shoreline streams, lakes, and ponds [Note Type 1 waterbodies are regulated by the Shoreline Master Program (YCC Title 16D)]	100'
Type 2 Streams, lakes, and ponds	100'
Type 3 Streams (Perennial), lakes, and ponds	50'
Type 4 Streams (Intermittent), lakes, and ponds	25'
Type 5 Streams (Ephemeral)	No buffer standards. Activities such as clearing, grading, dumping, filling, or activities that restrict or block flow, redirect flow to a point other than the original exit point from the property or result in the potential to deliver sediment to a drainage way/channel, are regulated under clearing and grading regulations. These drainages may also be protected under geologically hazardous area, floodplain, stormwater, building and construction, or other development regulations.
Type 1 Wetlands[a]	200'
Type 2 Wetlands[a]	100'
Type 3 Wetlands[a]	75'
Type 4 Wetlands[a]	50'

Source: Yakima County CAO (CAO 16C.06.16).
[a] Wetland type corresponds to State of Washington Wetland Rating categories.
YCC=Yakima County Code

Wetlands are ranked by their functions, values, uniqueness, and ability to be replaced or replicated. The Eastern Washington Wetland Rating System described above is used to provide a point based ranking system to assist in determining each wetlands categorization.

As part of the State of Washington Energy Facility Site Evaluation Council (EFSEC) permitting process, Yakima County will analyze if a critical area is likely to be present and whether a development proposal would impact the critical area. The decision on impacts may result in a decision of 1) no critical areas present; 2) critical areas present, but no impact; 3) critical areas

may be affected by the proposal but would not require a more detailed critical area report; or 4) a more detailed critical area report is required.

3.0 METHODS

3.1 Desktop Review

Prior to conducting the wetland delineation, TRC reviewed maps and data from the following sources:

- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) digital wetland mapping (USFWS 2020);
- U.S. Geological Survey (USGS) National Hydrography Dataset (NHD) digital waterway mapping (USGS 2020);
- U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) digital soil survey mapping (USDA NRCS 2020);
- USGS digital 7.5' quadrangle maps (USGS 1978, 1979); and
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panels for Yakima County (FEMA 2020).

In addition, TRC reviewed precipitation data from approximately 90 days prior to the field investigation using data obtained from a nearby weather station (Yakima Airport). Antecedent precipitation data were compared with the 30-year average precipitation data from the same location to determine if hydrologic conditions at the time of the 2020 and 2021 surveys were normal, wetter, or drier than normal (NOAA 2020). Historic aerial imagery of the Survey Area, ranging from 1996–2020, was also reviewed for areas exhibiting visible wetness signatures (Google Earth Pro 1996, 2003, 2004, 2005, 2006, 2009, 2011, 2013, 2015, and 2017).

3.2 Field Survey Methods

Surveys were conducted on APNs 231203-31001, 231211-11001, and 231209-11001 by Jay Lorenz (Senior Scientist) and Nathalie Denis (Survey Technician/Senior Biologist) on July 1, 2020. The survey area was expanded to include APNs 231210-24001, 231210-23001, 231210-22002, 231210-31001, and 231210-41002 in 2021. Surveys were conducted in the additional APNs by Erin Bergquist (Wetland Delineator/Botanist) and Laura Giese (Wetland Delineator/Botanist). In addition, Erin Bergquist and Laura Giese completed Streamflow Duration Assessment Forms for each delineated waterbody per the USACE guidance. Statements of qualifications for of each wetland delineator are provided below in Section 3.3.

3.2.1 Wetlands

The wetland delineation was conducted in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (USACE 2008), *United States Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1* (USACE 1987), and subsequent guidance documents (USACE 1991a, b; 1992).

On-site wetland determinations were made using the three criteria (vegetation, soil, and hydrology) and technical approach defined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid Region Version 2.0* (USACE 2008). According to

the procedures described therein, areas that under normal circumstances reflect a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology (e.g., inundated, or saturated soils) are considered wetlands. Wetland features were assigned a unique feature identification number with a “W” prefix. A Wetland Determination Data Form was completed for each wetland and its associated upland data point. Upland data points were assigned a unique feature ID number with a “U” prefix.

The geospatial boundary of each wetland was captured using tablets paired with an external Global Navigation Satellite System receiver with submeter accuracy (Juniper Geode Satellite-based Augmentation System (SBAS) <30 centimeters with real-time correction).

3.2.2 Waterbodies

Based on USACE guidance, and A Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States (Lichvar and McColley 2008), delineated waterbodies were identified by the presence of bed and bank or other OHWM indicators. Common identifiable indicators of an OHWM include open water or evidence of a clear, natural line visible on the bank; shelving; changes in soil characteristics; disturbance to or lack of terrestrial vegetation; presence of litter and debris; and watermarks indicative of inundation during high water conditions. The OHWM typically represents the potential limits of USACE jurisdiction. All waterbody features were assigned a unique feature ID number with an “S” prefix. Per the USACE guidance in an email from David Moore, USACE Biologist/Soil Scientist, on September 7, 2021, a Streamflow Duration Assessment Form (SDAM) was completed for each delineated waterbody feature. Methodology for completing the SDAM forms followed the Streamflow Duration Assessment Method for the Pacific Northwest Manual (Nadeau 2015).

For NWI/NHD stream features where OHWM indicators were absent, photo points were recorded and a representative photo was taken. These areas were classified as uplands.

The geospatial boundary of each waterbody was captured using tablets paired with an external Global Navigation Satellite System receiver with submeter accuracy (Juniper Geode SBAS <30 centimeters with real-time correction).

The USACE criteria to identify jurisdictional determinations for waterbodies includes the continuous presence of OHWM indicators and downstream connectivity to jurisdictional waterbodies. Downstream connectivity for delineated waterbodies in the field was determined based on the continuous presence of an OHWM and connection to downstream waterbodies. Downstream connectivity was identified in the field to the boundary of the Survey Area. Outside the Survey Area where land access was not available, aerial imagery was used to supplement field observations in determining downstream connectivity. For delineated features that did not have continuous bed bank or continuous evidence of an OHWM were determined not to have downstream connectivity.

For features with periodic OHWM indicators but no downstream connectivity, the geospatial boundary of the waterbody was mapped where the OHWM indicators were present.

3.3 Statement of Qualifications

Erin Bergquist is a wetland delineator with 18 years of experience in Section 404 permitting, wetland delineations, biological field surveys, and database management. Erin has worked with the USACE Regulatory Offices throughout the Midwest and Western U.S. to acquire the

necessary Section 404 permits including individual permits and Section 10 permits. She has conducted vegetation and wetland delineation field surveys throughout the Midwest and Western U.S.

Laura Giese, PWS, CF, CSE, is a Senior Field Biologist at TRC with more than 26 years of professional experience working in natural resources throughout the East and Midwest. Dr. Giese's experience includes wetland delineation and functional analyses, threatened and endangered species habitat assessments and surveys, vegetation surveys, stream assessment and restoration, wetland mitigation monitoring, forest management, and biomonitoring. She has authored numerous wetland, botanical, and forestry technical reports, and natural resources impact analyses. Delineation and biological habitat assessment work has been conducted in WI, IL, MI, OH, MD, PA, NC, DC, MD, WV, FL, GA, and OK.

Jay Lorenz, PhD has in excess of 40 years of experience in consulting, extension service education, teaching, and research. He provides senior level biology/ecology leadership, strategic advising, and review to projects in multiple market segments: pipeline, renewable energy, communication towers, transportation, transmission, water, and mine closure. He has conducted hundreds of wetland delineations in Oregon and Washington and was a co-principal for conducting local wetland inventories for the Salem-Keizer, Oregon urban growth boundary (45,000 acres) and Warm Springs Indian Reservation (640,000 acres). He is a long-time member of the Society of Wetland Scientists.

4.0 RESULTS

Desktop and field survey results are presented in the following discussion. SDAM forms are included in Appendix A. Wetland delineation forms are included in Appendix B. Representative photographs are included in Appendix C.

4.1 Precipitation Data and Analysis

The National Oceanic and Atmospheric Administration (NOAA) Agricultural Applied Climate Information System was used to obtain historical and antecedent rainfall data for the NRCS Climate Analyst for Wetlands (WETS) Tables and NOAA Regional Climate Centers. Historical rainfall records from the Yakima Airport NRCS WETS weather station were used to determine the normality of rainfall using Direct Antecedent Rainfall Evaluation Method (NOAA 2020). Precipitation data from the Yakima Airport weather station was used to determine the measured rainfall for the three months prior and during the delineations. Table 4-1 below presents a rainfall summary for eastern Yakima County.

Based on a review of antecedent precipitation and comparison with the previous average precipitation data for 2014 to 2020, conditions were determined to be average at the time of the 2018 and 2020 survey and to be drier during the 2021 survey (NOAA 2020). Drier than normal conditions could affect the features exhibiting wetland indicators (i.e., hydrophytic vegetation or hydric soils) that were identified within the Survey Area.

Table 4-1. Rainfall Summary for Yakima County, Washington

Prior Month		WETS Rainfall Percentile (in)		Evaluation Month: Varies			
		30th	70th	Measured Rainfall	Condition[a]	Month Weight[b]	Score[c]
Three months prior to July 2020 Survey Date							
1st	June	0.22	0.62	0.24	2	3	6
2nd	May	0.25	0.51	0.88	3	2	6
3rd	Apr	0.19	0.53	0.07	1	1	1
					Sum	**13**	
					Description[d]	**Normal**	
Three months prior to May 2021 Survey Date							
1st	Nov	0.19	0.62	0.04	1	3	3
2nd	Oct	0.31	0.85	0.08	1	2	2
3rd	Sept	0.49	0.96	0.94	2	1	2
					Sum	**7**	
					Description[d]	**Dryer than normal**	

[a] Condition values are 1 for < 30th percentile, 2 for between 30th and 70th percentiles, and 3 for > 70th percentile.
[b] Month Weight is 3 for the most recent month, 2 for the prior month, and so on.
[c] Score is the product of the Condition and Month Weight values.
[d] Drier than normal (sum = 6-9), normal (sum = 10-14), wetter than normal (sum = 15-18).
Source: NOAA 2020.

4.2 Hydric Soils

Soils within the Survey Area were identified using the soil survey from the NRCS (USDA NRCS 2020). The National Technical Committee for Hydric Soils defines hydric soils as "a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." The major and minor components of a soil map unit are classified as to how likely they are to be hydric and are rated on a range from hydric to nonhydric.

There are 23 soil map units within the Survey Area (Table 4-2). Of these, one soil map unit (83, Moxee silt loam, 2- to 15-percent slopes) is classified as containing a hydric soils component (Figure 3). In total, approximately, 649 acres (37 percent) of the Survey Area are classified as containing a hydric soils component.

Table 4-2. Soils Map Units with the Survey Area

Map Unit Symbol	Map Unit Name	Hydric Soil	Acres	Percent of MPE
3	Bakeoven very cobbly silt loam, 0 to 30-percent slopes	No	83	5
33	Esquatzel silt loam, 2 to 5-percent slopes	No	3	<1
35	Finley fine sandy loam, 0 to 5-percent slopes	No	36	2
36	Finley cobbly fine sandy loam, 0 to 5-percent slopes	No	6	<1
58	Hezel loamy fine sand, 2 to 15-percent slopes	No	3	<1
65	Kiona stony silt loam, 15 to 45-percent slopes	No	102	6
68	Lickskillet very stony silt loam, 5 to 45-percent slopes	No	10	1
81	Mikkalo silt loam, 15 to 30-percent slopes	No	15	1
83	Moxee silt loam, 2 to 15-percent slopes	Yes	649	37
127	Scooteney cobbly silt loam, 0 to 5-percent slopes	No	19	1
129	Selah silt loam, 5 to 8 percent slopes	No	31	2
130	Selah silt loam, 8 to 15 percent slopes	No	82	5
132	Shano silt loam, 2 to 5-percent slopes	No	84	5
142	Starbuck silt loam, 2 to 15-percent slopes	No	42	2
143	Starbuck-Rock outcrop complex, 0 to 45-percent slopes	No	70	4
179	Warden silt loam, 8 to 15-percent slopes	No	10	1
180	Warden silt loam, 15 to 30-percent slopes	No	12	1
187	Willis silt loam, 2 to 5-percent slopes	No	57	3
189	Willis silt loam, 8 to 15-percent slopes	No	430	25
208	Kiona stony silt loam, 15 to 45-percent slopes	No	2	<1
209	Lickskillet very stony silt loam, 5 to 45-percent slopes	No	1	<1
214	Willis silt loam, 8 to 15-percent slopes	No	<1	<1
215	Bakeoven very cobbly silt loam, 0 to 30-percent slopes	No	<1	<1
		Total	**1,746**	**100**

NRCS 2021

4.3 Vegetation and Land Use

The Survey Area is currently active rangeland with cattle observed on-site during the two survey events. Historic land use based on aerial photographs shows areas in the Project appearing to be used for agricultural purposes. Vegetation diversity and cover of native forbs and shrubs was low in the majority of the Survey Area. Common species observed were upland species cheatgrass (*Bromus tectorum*), crested wheatgrass (*Agropyron cristatum*), Russian thistle (*Salsola tragus*), tumble mustard (*Sisymbrium altissimum*), diffuse knapweed (*Centaurea diffusa*), flixweed (*Descurainia sophia*), fiddleneck (*Amsinckia intermedia*) and Sandberg bluegrass (*Poa secunda*). Native grass, forb, and shrub species were more common in the northern portion of the Survey Area including Indian ricegrass (*Oryzopsis hymenoides*), needle and thread grass (*Hesperostipa comata*), Sandberg bluegrass, green rabbitbrush (*Chrysothamnus viscidiflorus*), big sagebrush (*Artemisia tridentata*), longleaf phlox (*Phlox longifolia*), Carey's balsamroot (*Balsamorrhiza careyana*), and slender hawksbeard (*Crepis atribarba*). Very few big sagebrush are present in the Survey Area.

4.4 Site Alterations

The Survey Area is crossed by various two-track dirt roads, SR-24, trails created by cattle, and an existing high voltage transmission line right-of-way (Figure 2). Portions of the area have been farmed historically. Grazing occurs in the Survey Area for part of the year. No other site alterations were observed.

4.5 Floodplains

Based on review of FEMA FIRM Panels 53077C1175D (effective November 18, 2009), the majority of the Survey Area is within Zone X, Areas of Minimal Flood Hazard. A small portion of the southeast of the Project Boundary is mapped as Zone A, 100-year floodplain along the unnamed tributary of Dry Creek south of SR-24 (Figure 3).

The Yakima County CAO defines 100-year floodplains as critical areas. A flood hazard permit would be required for any proposed development in 100-year floodplains, and the Flood Hazard Protection General and Specific Standards in the Yakima County CAO (16C.05.28) are required for construction and operation activities in the 100-year floodplain.

4.6 Wetlands

No NWI-identified wetlands were identified in the Survey Area. Field surveys identified one seep wetland (W-01) in the northcentral portion of the Survey Area (Figure 4). W-01 is characterized as a freshwater palustrine emergent wetland (PEM) dominated by reed canarygrass (*Phalaris arundinacea*), bird's-foot trefoil (*Lotus corniculatus*), and Canada thistle (*Cirsium arvense*). The percent cover of bare ground is 85 percent. The wetland is located in an ephemeral channel (S-10). S-10 continues downstream and connects to S-7. Table 4-2 includes acreages, downstream connectivity, and state and county jurisdiction related to the wetland. Representative photos are in Appendix C and photo locations are depicted on Figure 4 (P-1 and P-2)

The hydrogeomorphic classification is slope wetland and its score in the Eastern Washington Wetland Rating System is 6 (out of a total possible score of 27). Based on its characteristics

and the score in the Eastern Washington Rating System, the wetland is classified as a Type 4 under the Yakima County CAO wetland classification and would require a 50-foot buffer.

Table 4-3. Delineated Wetland and Waterbodies and Recommended Respective Jurisdiction

Feature ID	Type	Acres	Downstream Connection	State and County Jurisdiction (Yakima County CAO)	Statutory Setbacks
W-001	PEM	0.02	Yes	Type 4 Wetland	50’

4.7 Waterbodies

Based on the USFWS NWI, 19 intermittent features are identified within the Survey Area (Figure 3; USFWS 2020). The USGS NHD identified the same 19 features as intermittent flowlines (USGS 2020). Based on field observations of the 19 features identified by NWI/NHD, 18 were identified as ephemeral channels within the Survey Area (Figure 4, Table 4-3). The remaining NWI/NHD-identified feature did not have OHWM indicators.

One roadside metal culvert was identified at the intersection of SR-24 and S-7 (Figure 4). Additional culverts under SR-24 are located outside the Survey Area. Based on the 2008 Rapanos Guidance, of the 18 ephemeral channels with OHWM indicators, 14 had downstream connectivity to downstream jurisdictional waterbodies. Photo points and representative photos (P-3 to P-21) for these areas are shown on Figure 4 and in Appendix C, respectively.

Lack of recent signs of scouring or erosion, and the lack of restrictive layers suggested that surface flow is rare in the Survey Area and most likely occurring following large precipitation events. The substrate in the delineated ephemeral channels was gravelly loam interspersed with cobbles. Upland vegetation was observed along the channels and in some areas was found in the channels. The ephemeral channels vary in width from 0.5 foot wide at their headwaters to 3 to 5 feet wide at the southern (downstream) end of the Survey Area. OHWM indicators include changes in vegetation, drainage patterns, and scour lines.

Large patches of dried “tumbleweed” species (include tumble mustard, kochia, knapweed, and Russian thistle) were found along and in deep piles in many of the channels limiting flow in those areas. The piles of tumbleweed varied in thickness from 0.5 feet to several feet deep in places and in width from one foot to over 10 feet wide. The tumbleweed was matted, and vegetation was not observed growing underneath. The culverts were also filled with tumbleweed. Tumbleweeds in the delineated ephemeral channels are shown in Photos P-7, P-8, P-9, P-10, P-11, and P-21.

The delineated ephemeral channels identified as having downstream connectivity in Table 4-4 (S-1, S-2, S-3, and S-4) flow south from the Survey Area, through culverts under SR-24, and into an ephemeral channel located south of the Survey Area that parallels SR-24. This unnamed channel is a fourth order tributary to the Columbia River via Dry Creek, Cold Creek, and the Yakima River.

The delineated ephemeral channels are rated Type 5 streams (Section 2.0, Table 2-2) by the Yakima County CAO. As noted in Table 2-2, Type 5 streams do not have a defined vegetation buffer but are regulated by other Yakima County development regulations for activities in the

Table 4-4. Delineated Wetland and Waterbodies

Feature ID	Classification	Average Width OHWM (Feet)	Crossing Length Temp/Perm (Linear Feet)[a, b]	Downstream Connection [a]	Notes
S-1	Ephemeral	0.5	0/0	Yes	Channel starts north of the Survey Area and flows generally southwest. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was three percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-3.
S-2	Ephemeral	2	0/0	Yes	Channel starts north of the Survey Area and flows generally southeast. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was four percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-4.
S-3	Ephemeral	1	0/0	Yes	Channel starts east of the Survey Area and flows generally southwest. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was four percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-5.
S-4	Ephemeral	1	0/0	Yes	Channel starts in the Survey Area and flows generally southwest. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was six percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-6.

Table 4-4. Delineated Wetland and Waterbodies

Feature ID	Classification	Average Width OHWM (Feet)	Crossing Length Temp/Perm (Linear Feet)[a, b]	Downstream Connection [a]	Notes
S-5	Ephemeral	1 to 2	TBD/4	Yes	Channel starts north of the Survey Area and flows generally south. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was four percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-7.
S-6	Ephemeral	0.5 to 2	TBD/2	Yes	Channel starts north of the Survey Area and flows generally south. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was three percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-8.
S-7	Ephemeral	0.5 to 1	TBD/1	Yes	Channel starts northeast of the Survey Area and flows generally south. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was three percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Points P-9, P-10, and P-21.
S-8	Ephemeral	1 to 2	0/0	Yes	Channel starts in the Survey Area and flows generally southeast. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was nine percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-11.

Table 4-4. Delineated Wetland and Waterbodies

Feature ID	Classification	Average Width OHWM (Feet)	Crossing Length Temp/Perm (Linear Feet)[a, b]	Downstream Connection [a]	Notes
S-9	Ephemeral	1 to 3	0/0	Yes	Channel starts north of the Survey Area and flows generally south. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was two percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-12.
S-10	Ephemeral	0.5	0/0	Yes	Channel starts north of the Survey Area and flows generally south. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was seven percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-13.
S-11	Ephemeral	0.5	0/0	Yes	Channel starts in the Survey Area and flows generally south. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was seven percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines.
S-12	Ephemeral	0.5	0/0	Yes	Channel starts north of the Survey Area and flows generally south. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was six percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-14.

Table 4-4. Delineated Wetland and Waterbodies

Feature ID	Classification	Average Width OHWM (Feet)	Crossing Length Temp/Perm (Linear Feet)[a, b]	Downstream Connection [a]	Notes
S-13	Ephemeral	0.5	0/0	No	Channel starts north of the Survey Area and flows generally southeast. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was six percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-15.
S-14	Ephemeral	0.5 to 1	0/0	No	Channel starts west of the Survey Area and flows generally south. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was six percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-16.
S-15	Ephemeral	2	TBD/2	Yes	Channel starts north of the Survey Area and flows generally southeast. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was two percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-17.
S-16	Ephemeral	2	TBD/2 (Estimated for potential road crossing)	Yes	Channel starts north of the Survey Area and flows generally southeast. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was two percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-18.

Table 4-4. Delineated Wetland and Waterbodies

Feature ID	Classification	Average Width OHWM (Feet)	Crossing Length Temp/Perm (Linear Feet)[a, b]	Downstream Connection [a]	Notes
S-17	Ephemeral	0.5 to 1	0/0	No	Channel starts east of the Survey Area and flows generally southeast. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was two percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-19.
S-18	Ephemeral	1 to 2	TBD/2	No	Channel starts east of the Survey Area and flows generally east. No riparian or submerged aquatic vegetation was observed. There were no observed macroinvertebrates. The slope was one percent. OHWM field indicators included changes in vegetation, drainage patterns, and scour lines. Photo Point P-20.

[a] The USACE has the final authority on the jurisdictional status and connectivity of a wetland or waterbody.
[b] The number of potential construction crossings will be determined by the Engineering and Procurement Contractor. The total linear feet will be provided in the Nationwide Permit application to the USACE and to EFSEC. TBD = To Be Determined

channel including clearing and grading regulations, geologically hazardous areas, floodplain, stormwater, building and construction, or other development regulations.

Five channels (S-5, S-6, S-7, S-15, and S-18) will be temporarily crossed by construction traffic. BMPs will be implemented at construction crossings, including but not limited to timber mats, or other similar types of temporary products, to limit impacts to the channel crossings. The BMPs will be removed when the construction is complete. The ephemeral channels will be restored to their current topography once construction is complete.

The east-west access road (Figure 5) that crosses the Project parallel to the existing transmission line will cross five of the ephemeral channels (S-5, S-6, S-7, S-15, and S-18). One of the internal access roads to the panels will cross S-5. A potential road crossing could be required at S-16 as the Project is micro-sited. The access road will be gravel. A culvert will be placed at each of the five channel crossings during construction and will be maintained for the life of the Project. Typical construction drawings of the culvert placement and associated erosion control devices are provided in Appendix D. The proposed gravel road is 20 feet wide and construction impacts are anticipated to be contained within the road right-of-way. The linear foot of each crossing is provided in Table 4-3.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Delineations and data collection for wetlands and waterbodies were conducted July 1, 2020, and May 10 to 15, 2021 in the proposed Ostrea Solar Project Survey Area. Based on field observations, one wetland and 18 ephemeral channels and their associated tributaries were identified within the Survey Area. Based on the 2008 Rapanos Guidance, 14 of the ephemeral features have a downstream connection and would be considered jurisdictional by the USACE. One culvert was identified at the intersection of Washington SR-24 and Channel S-7 in the Survey Area and additional culverts under SR-24 are located outside the Survey Area.

A total of five channels (S-5, S-6, S-7, S-15, and S-18) will be temporarily crossed by construction traffic. BMPs will be implemented at construction crossings, including but not limited to timber mats, or other similar types of temporary products, to limit impacts to the channel crossings. The BMPs will be removed when the construction is complete, and the channels restored to pre-construction topography as required. A total of five ephemeral channels (S-5, S-6, S-7, S-15, and S-18) will be permanently impacted by the development of the access road across the Project (<0.1 acres). S-4 will be permanently impacted by the development of an internal access road to access the panels.

However, the ultimate authority to determine federal wetland and waterway boundaries and jurisdiction rests with the USACE. Decisions made by USACE may result in modifications to the conclusions stated in this report. The delineated ephemeral channels are rated Type 5 streams. Type 5 streams do not have a defined vegetation buffer but are regulated by other Yakima County development regulations for activities in the channel including clearing and grading regulations, geologically hazardous areas, floodplain, stormwater, building and construction, or other development regulations.

As part of the EFSEC permitting process, Ecology will conduct a site visit to confirm the results of the wetland delineation and Waters of the State.

6.0 REFERENCES

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Figures

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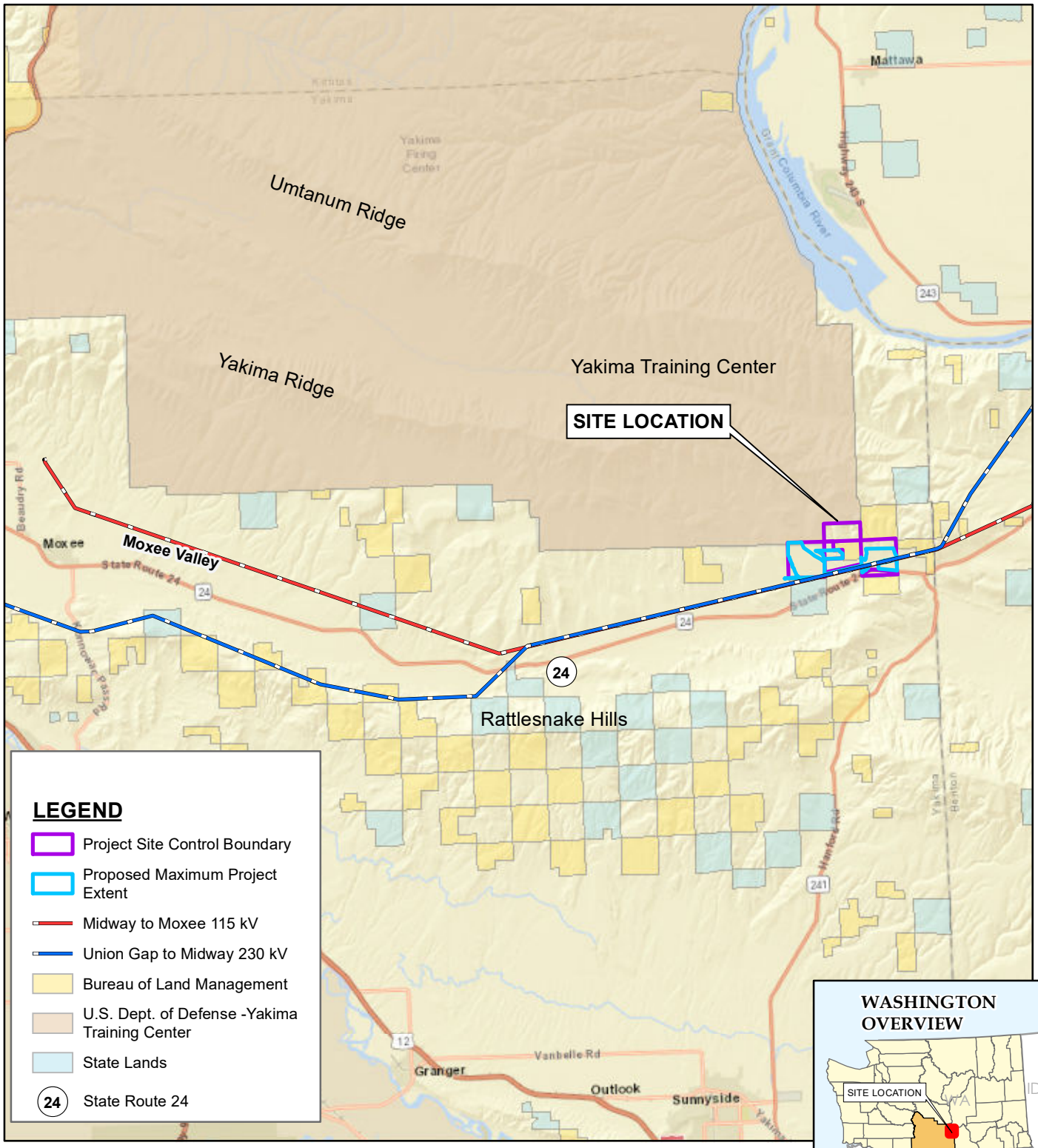

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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PROJECT:

CYPRESS CREEK RENEWABLES, LLC
OSTREA SOLAR, LLC
YAKIMA COUNTY, WASHINGTON

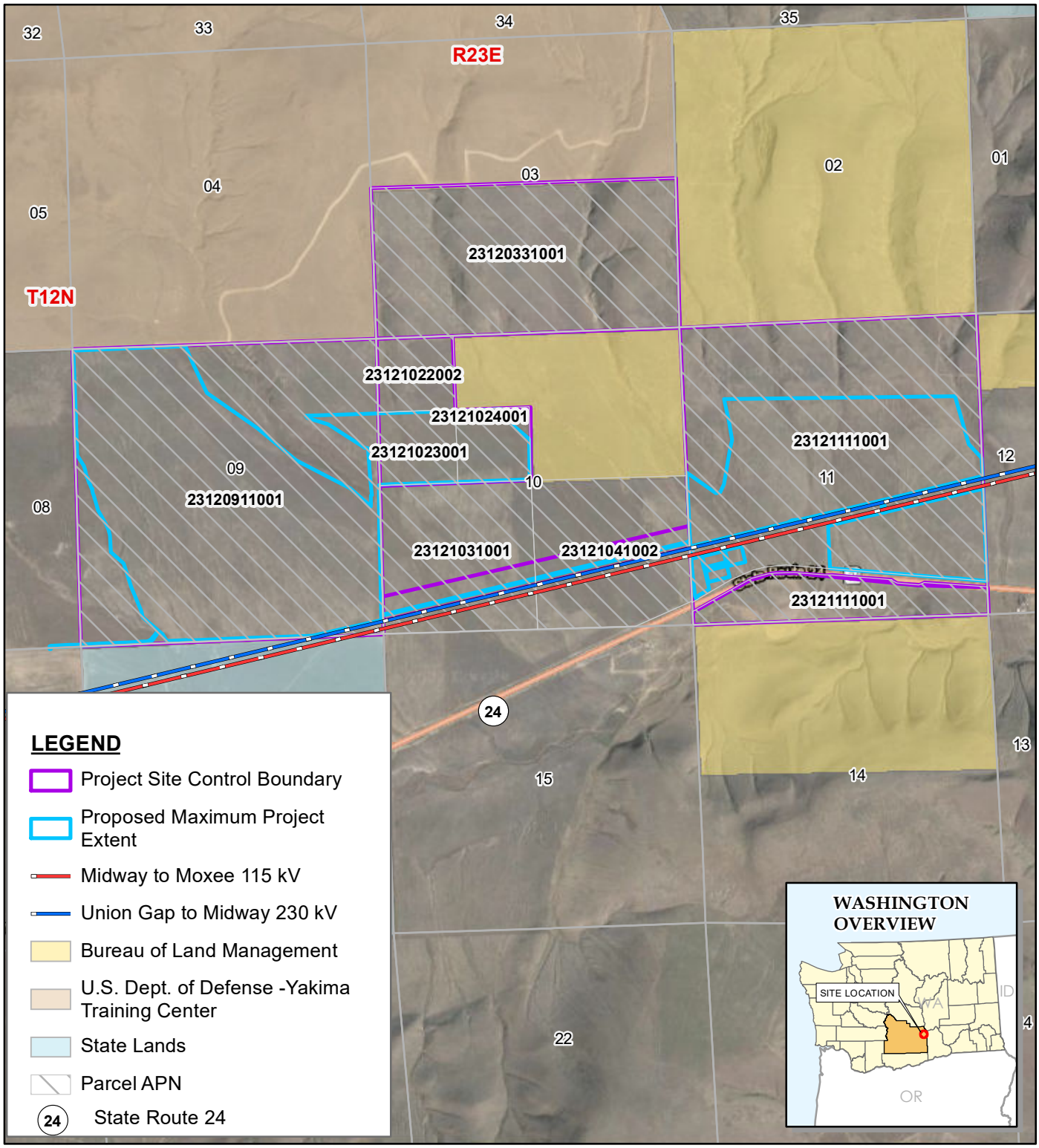
TITLE:

PROJECT OVERVIEW MAP

DRAWN BY:	R. BLAKE
CHECKED BY:	P. LORENZ
APPROVED BY:	E. BERGQUIST
DATE:	MARCH 2022
PROJ. NO.:	427473
FILE:	Fig 1 Ostrea Solar Project Study Area Wetland.mxd

FIGURE 1

S:\GIS\1-PROJECTS\CCR\Northwest\427473-Ostrea\Fig 1 Ostrea Solar Project Study Area Wetland.mxd -- Saved By: RBLAKE on 3/25/2022, 09:45:30 AM



BASE MAP FROM: GOOGLE, MAXAR TECHNOLOGIES.

N

1 " = 2,500 '
1:30,000

0 2,000 4,000 FEET

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PROJECT:

CYPRESS CREEK RENEWABLES, LLC
OSTREA SOLAR, LLC
YAKIMA COUNTY, WASHINGTON

TITLE:

SURVEY AREA

DRAWN BY:	R. BLAKE
CHECKED BY:	P. LORENZ
APPROVED BY:	E. BERGQUIST
DATE:	MARCH 2022
PROJ. NO.:	427473
FILE:	Fig 2_Ostrea_Survey Area Aerial Wetland.mxd

FIGURE 2

S:\GIS\1-PROJECTS\CCR\Northwest\427473-Ostrea\Fig 2_Ostrea_Survey Area Aerial Wetland.mxd -- Saved By: RBLAKE on 3/16/2022, 10:59:21 AM

TRC - GIS

Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet (Foot US)
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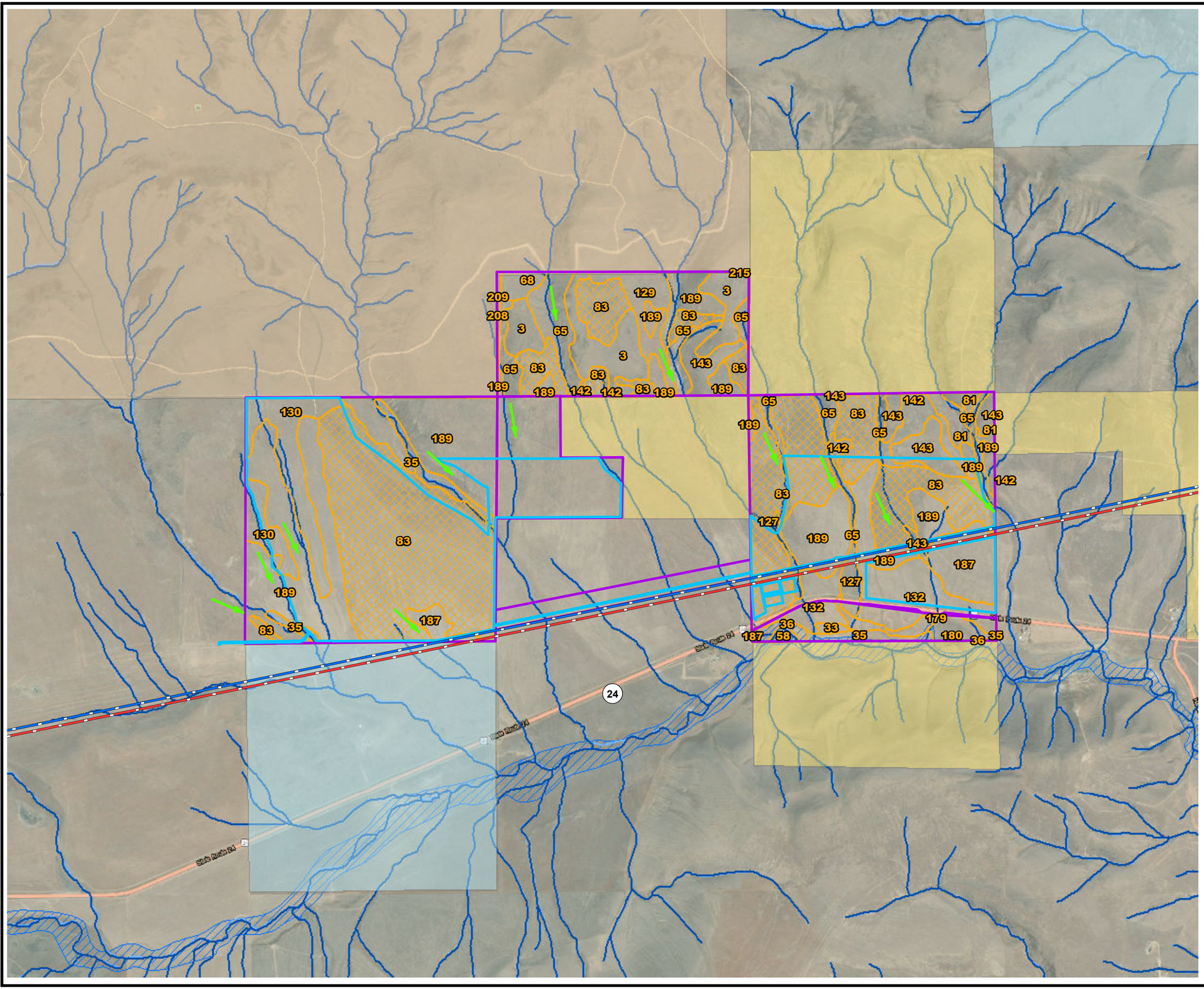
Path: S:\GIS\1-PROJECTS\CCR\Northwest\427473-Ostrea\Fig 3_Ostrea_hydric soils, NWI-NHD, and FEMA wetland.mxd



LEGEND

- Project Site Control Boundary
- Proposed Maximum Project Extent
- Midway to Moxee 115 kV
- Union Gap to Midway 230 kV
- NHD Flowline
- NWI
- FEMA 100-Year Flood Zone
- USDA-NRCS Web Soil Survey Soils
- Hydric Soils
- Bureau of Land Management
- U.S. Dept. of Defense -Yakima Training Center
- State Lands
- 3 Soil Map Unit Number
- Direction of Flow
- 24 State Route 24

NOTES

1. BASE MAP IMAGERY FROM ESRI/MAXAR 2019.
2. NWI DATA ACQUIRED FROM USFW WETLANDS MAPPER.
3. NHD FLOW LINE ACQUIRED FORM USGS.GOV.
4. SOILS DATA ACQUIRED FROM USDA/NRCS SSURGO SOILS DATABASE.
5. NWI RIPARIAN AND NHD FLOWLINE LAYERS COVER THE SAME FOOTPRINT IN THE STUDY AREA.
6. NO NHD WATERBODY IN MAP EXTENT.
7. FLOODPLAIN DATA FROM FEMA

N

0 1,000 2,000 Feet

1 " = 2,000 '
1:24,000

PROJECT:
CYPRESS CREEK RENEWABLES, LLC
OSTREA SOLAR, LLC
YAKIMA COUNTY, WASHINGTON

TITLE:
HYDRIC SOILS, NWI/NHD DATA, AND FEMA FLOODPLAIN

DRAWN BY:	R. BLAKE	PROJ. NO.:	427473
CHECKED BY:	P. LORENZ		
APPROVED BY:	E. BERGQUIST		**FIGURE 3**
DATE:	MARCH 2022		

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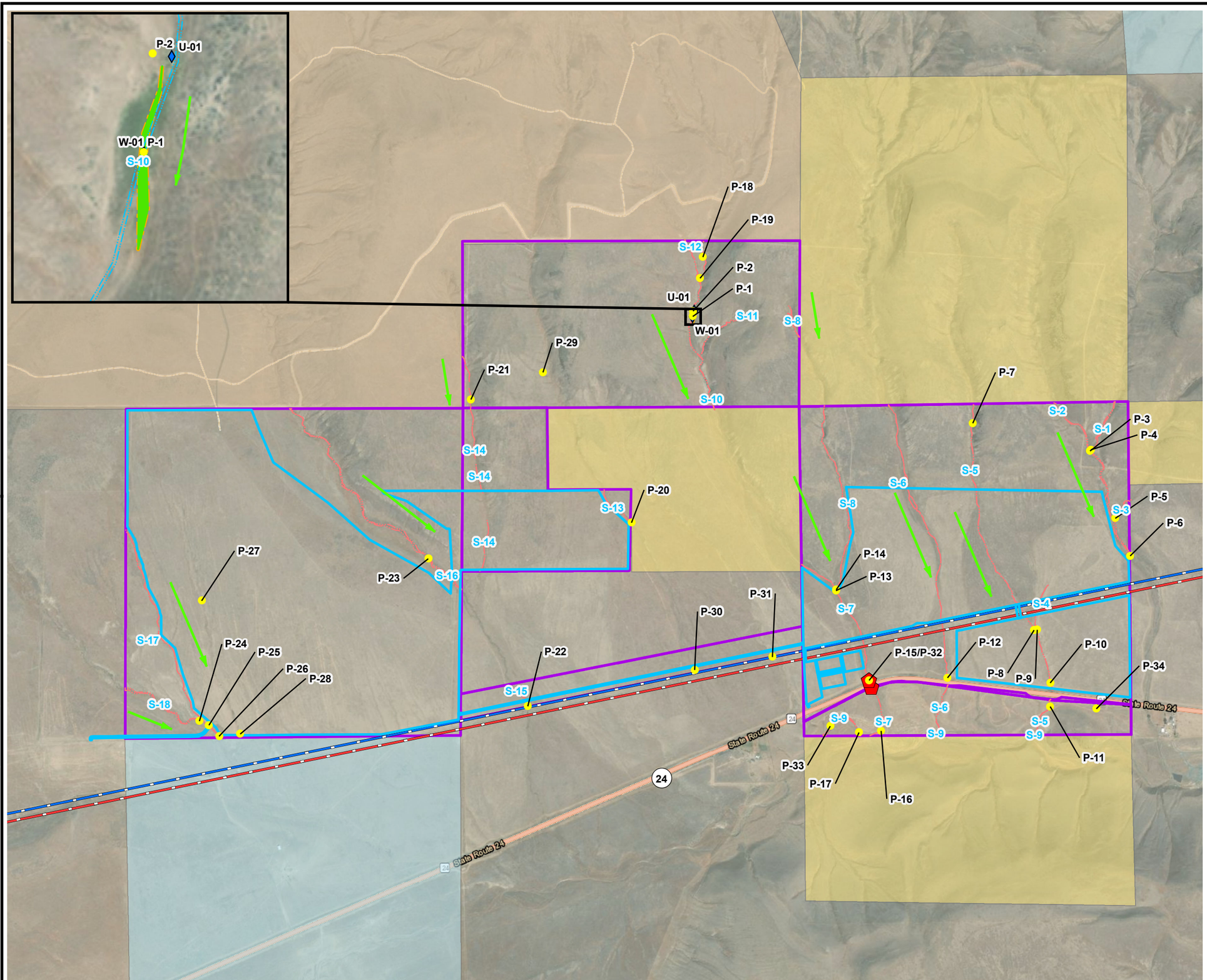
FILE NO.: Fig 3_Ostrea_hydric soils, NWI-NHD, and FEMA wetland.mxd



LEGEND

- Project Site Control Boundary
- Proposed Maximum Project Extent
- Midway to Moxee 115 kV
- Union Gap to Midway 230 kV
- Soil Pit
- Photograph Location
- Culvert
- Delineated Wetland
- Surveyed Stream
- Wetland 50ft Buffer
- Bureau of Land Management
- U.S. Dept. of Defense -Yakima Training Center
- State Lands
- Direction of Flow
- 24 State Route 24

NOTES

1. BASE MAP IMAGERY FROM ESRI/MAXAR 2019.
2. RESOURCES WERE DELINEATED BY TRC FIELD PERSONNEL NATHALIE DENIS AND JAY LORENZ ON JUNE 30TH TO JULY 2; ERIN BERGQUIST AND LAURA GIESE MAY 10TH TO 15TH, 2021
3. 50 FOOT WETLAND BUFFER IS BARELY VISIBLE AT CURRENT MAP SCALE.
4. P – PHOTOGRAPH POINT
5. S – STREAM
6. W – WETLAND
7. U - UPLAND

N

0 1,500 3,000 Feet

1 " = 1,500 '
1:18,000

PROJECT:
CYPRESS CREEK RENEWABLES, LLC
OSTREA SOLAR, LLC
YAKIMA COUNTY, WASHINGTON

TITLE:
SURVEY RESULTS

DRAWN BY:	R. BLAKE	PROJ. NO.:	427473
CHECKED BY:	P. LORENZ		
APPROVED BY:	E. BERGQUIST		**FIGURE 4**
DATE:	APRIL 2022		

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FILE NO.: Fig 4_Ostrea_Survey Results Wetland.mxd

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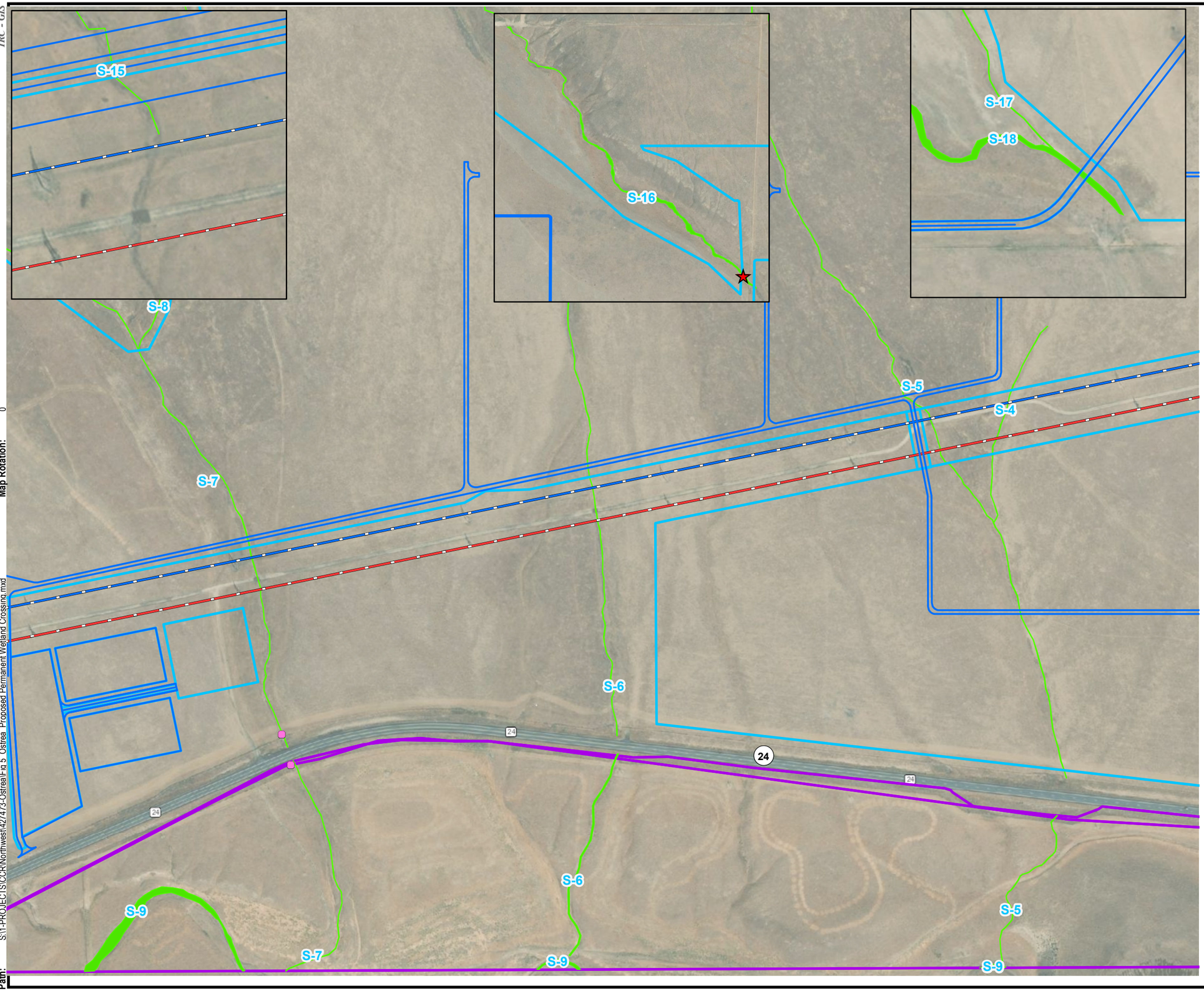
Map Rotation: 0
TRC - GIS



LEGEND

- Project Site Control Boundary
- Proposed Maximum Project Extent
- Midway to Moxee 115 kV
- Union Gap to Midway 230 kV
- Access Road
- Culvert
- Surveyed Stream
- 24 State Route 24
- Potential Road Crossing

NOTES

1. BASE MAP IMAGERY FROM ESRI/MAXAR 2019.
2. RESOURCES WERE DELINEATED BY TRC FIELD PERSONNEL NATHALIE DENIS AND JAY LORENZ ON JUNE 30TH TO JULY 2; ERIN BERGQUIST AND LAURA GIESE MAY 10TH TO 15TH, 2021
3. S – STREAM

N

0 175 350 Feet

1 " = 350 '

1:4,200

PROJECT:

CYPRESS CREEK RENEWABLES, LLC
OSTREA SOLAR, LLC
YAKIMA COUNTY, WASHINGTON

TITLE:

OSTREA PROPOSED PERMANENT WETLAND CROSSINGS

DRAWN BY:	R. BLAKE	PROJ. NO.:	427473
CHECKED BY:	P. LORENZ		
APPROVED BY:	E. BERGQUIST		**FIGURE 5**
DATE:	APRIL 2022		

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FILE NO.: Fig 5_Ostrea_Proposed Permanent Wetland Crossing.mxd

TRC - GIS
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Path: S:\1-PROJECTS\CCR\Northwest\427473-Ostrea\Fig 5_Ostrea_Proposed Permanent Wetland Crossing.mxd

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Appendix A. SDAM Forms

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Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar	Assessor EB
Address See Figure 4	Date5/10/2021
Waterway Name S-1	Coordinates at downstream end (ddd.mm.ss) Lat. 46°32'46.86" N
Reach Boundaries See Figure 4	Long. 119°53'52.12" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.5
☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

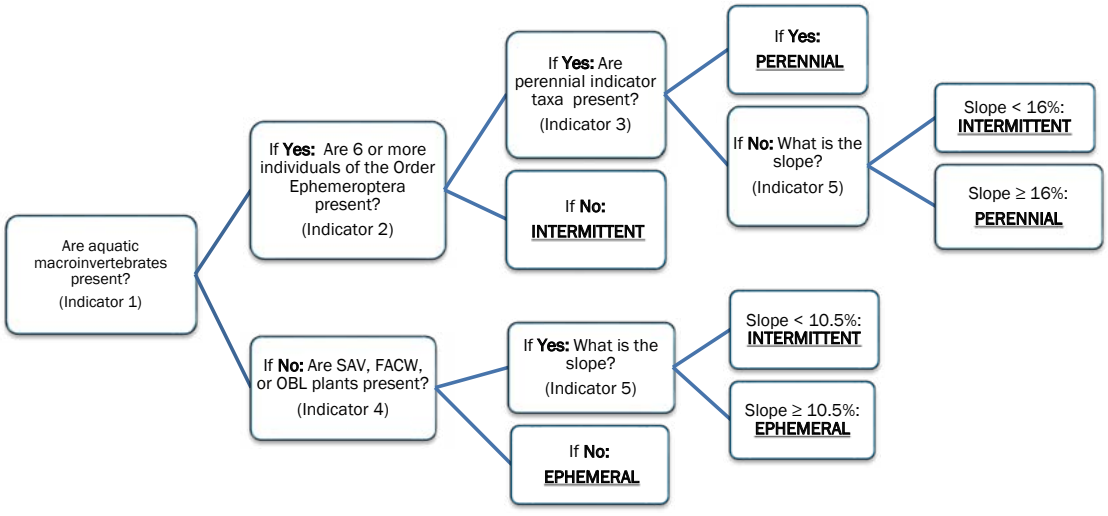
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__7%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-1. Attachment C Photo Log, P-3. Reach is from confluence upslope 100 feet.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar	Assessor EB
Address See Figure 4	Date5/10/2021
Waterway Name S-2 downstream at project boundary	Coordinates at downstream end (ddd.mm.ss) Lat. 46º32'30.25" N
Reach Boundaries See Figure 4	Long. 119º53'43.62" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 1
☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

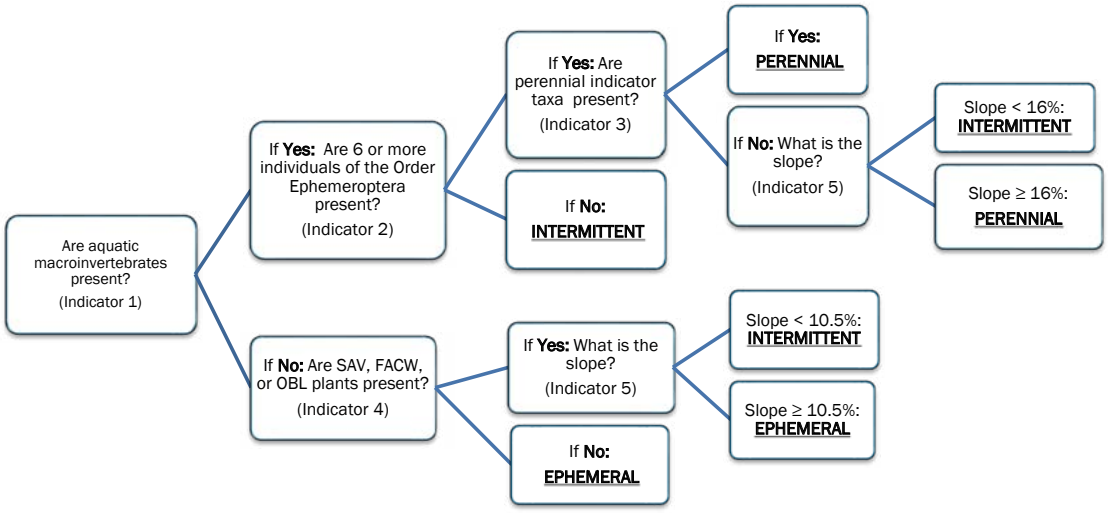
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__4%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-2 downstream at project boundary (P-6), Attachment C Photo Log, P-6. Reach is from confluence upslope 100 ft

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar	Assessor EB
Address See Figure 4	Date5/10/2021
Waterway Name S-2 at junction with S-1	Coordinates at downstream end (ddd.mm.ss) Lat. 46º32'47.03" N
Reach Boundaries See Figure 4	Long. 119º53'52.22" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 1
☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

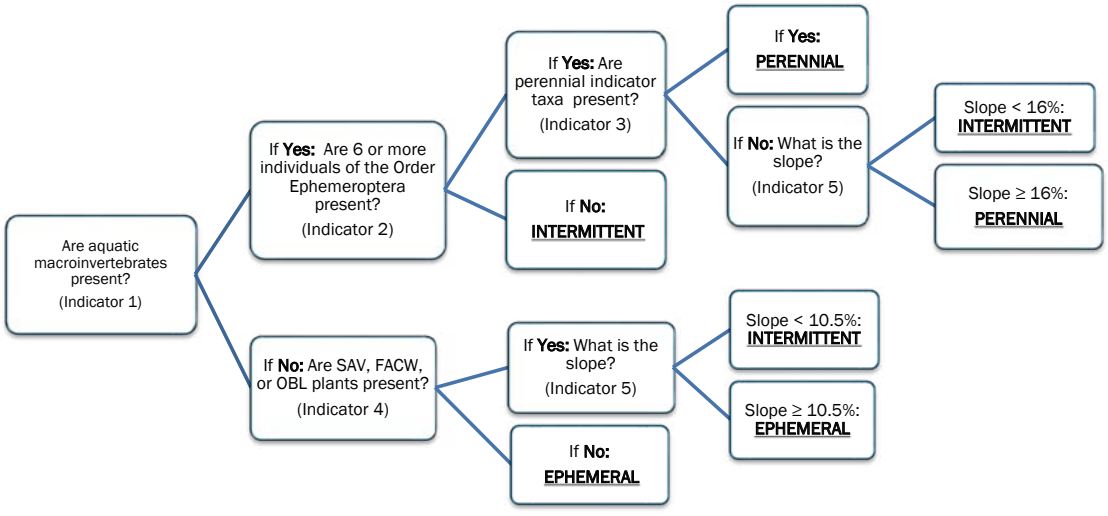
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__3%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-2 at junction with S-1(P-4), Attachment C Photo Log, P-4. Reach is from confluence upslope 100 ft

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4		Date 5/10/2021	
Waterway Name S-3		Coordinates at downstream end (ddd.mm.ss)	Lat. 46º32'36.13" N
Reach Boundaries See Figure 4			Long. 119º53'46.9" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.25	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

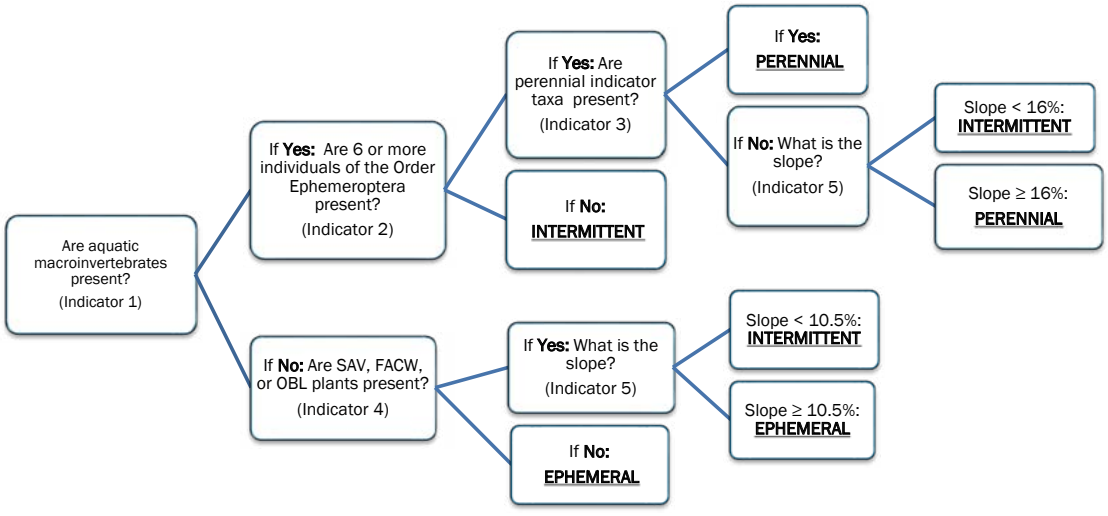
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__3%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-3. Attachment C Photo Log, P-5. Reach is from confluence upslope 100 feet.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4		Date5/12/2021	
Waterway Name S-4		Coordinates at downstream end (ddd.mm.ss)	Lat. 46º32'21.3" N
Reach Boundaries See Figure 4			Long. 119º54'4.76" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.33	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

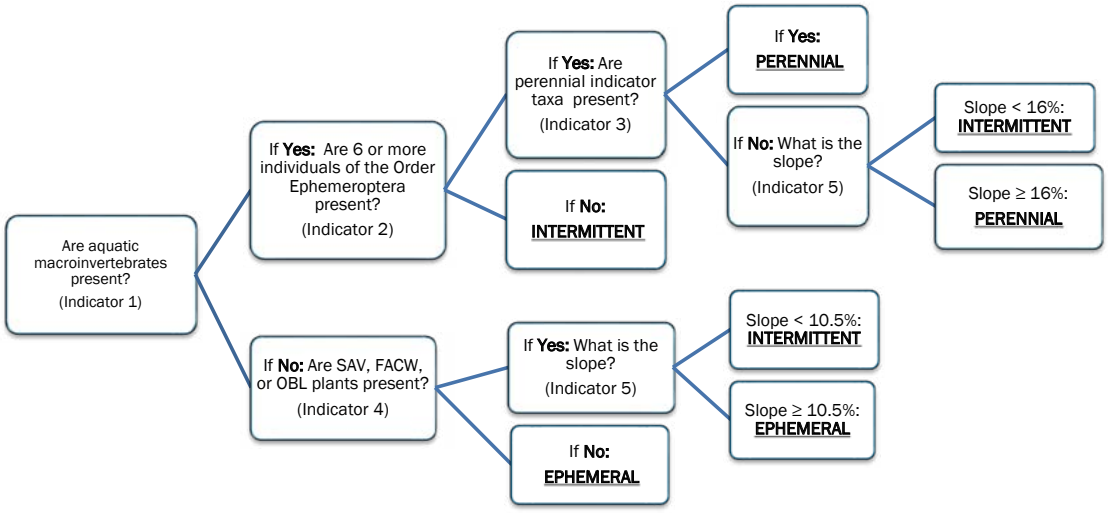
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	___4%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☒ Natural or Anthropogenic Disturbance Majority of channel is full of Russian thistle and other dried vegetation

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-4, Attachment C Photo Log, P-8. Reach is from the confluence upslope 100 feet

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name	Ostrea Solar	Assessor	EB
Address	See Figure 4	Date	5/12/2021
Waterway Name	S-5 at junction with S-4	Coordinates at downstream end (ddd.mm.ss)	Lat. 46º32'20.61" N
Reach Boundaries	See Figure 4		Long. 119º54'5.21" W
Precipitation w/in 48 hours (cm)	0	Channel Width (m) 0.5	☐ Disturbed Site / Difficult Situation (Describe in "Notes")

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

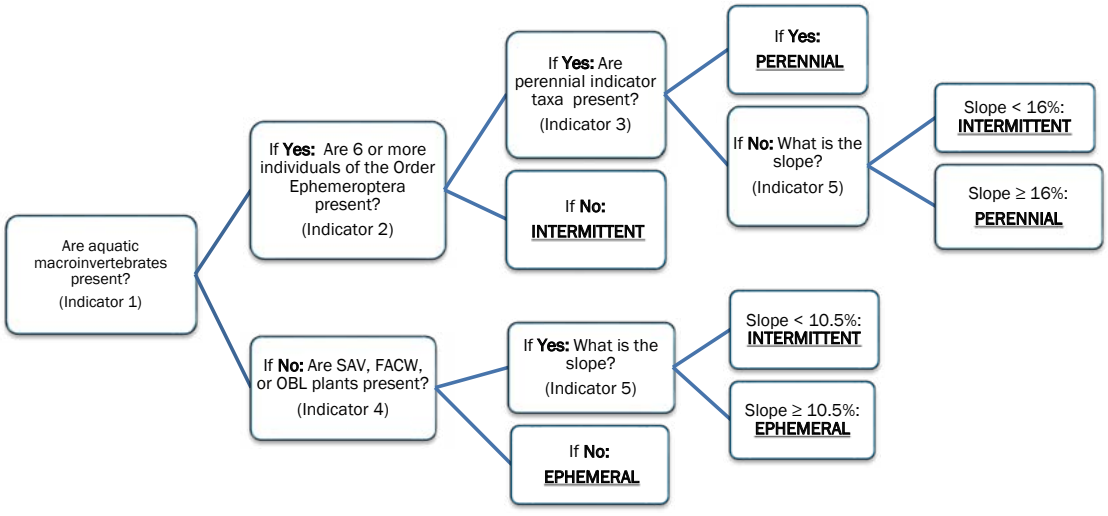
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	___6%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4 S-5 at junction at S-4 (P-9), Attachment C Photo Log, P-9. Reach is from the confluence to the Project Area Boundary.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name	Ostrea Solar	Assessor	EB
Address	See Figure 4	Date	5/14/2021
Waterway Name	S-5 north of Washington SR-24	Coordinates at downstream end (ddd.mm.ss)	Lat. 46°32'10.47" N
Reach Boundaries	See Figure 4		Long. 119°54'1.88" W
Precipitation w/in 48 hours (cm)	0	Channel Width (m)	0.3
[x] Disturbed Site / Difficult Situation (Describe in "Notes")			

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

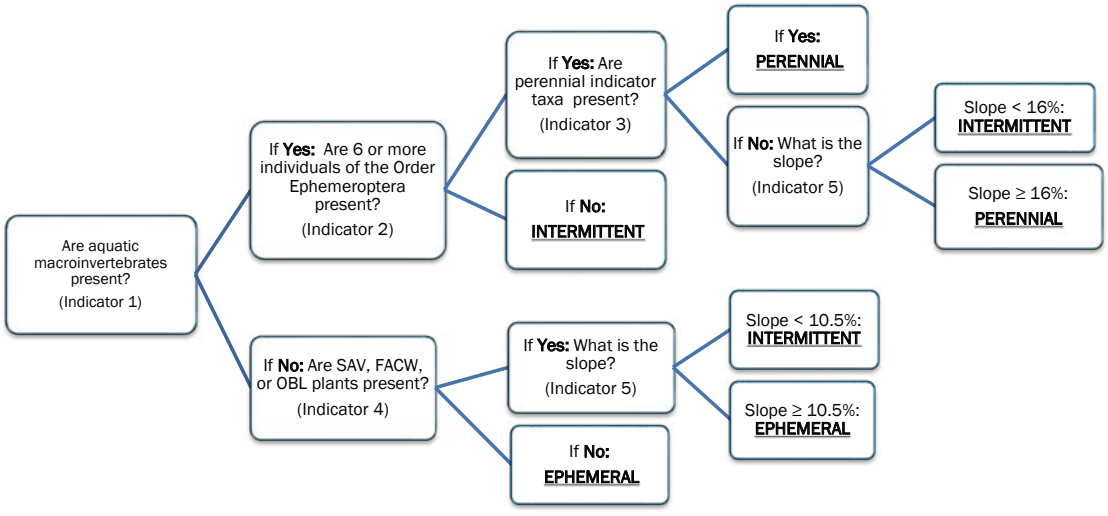
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	[ ] Yes	[x] No
2. Are 6 or more individuals of the Order Ephemeroptera present?	[ ] Yes	[x] No
3. Are perennial indicator taxa present? (refer to Table 1)	[ ] Yes	[x] No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	[ ] Yes	[x] No
5. What is the slope? (In percent, measured for the valley, not the stream)	__2_ %	

Conclusions



Single Indicators:

[ ] Fish

[ ] Amphibians

Finding:

[x] Ephemeral

[ ] Intermittent

[ ] Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☒ Natural or Anthropogenic Disturbance Channel flattens out at the fence where Russian thistle and other vegetation are piled up at the fence. No culvert was present at the road.

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-5 north of Washington SR-24, Attachment C Photo Log, P-10. Reach is from the road to project boundary.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4			Date5/12/2021
Waterway Name S-5, south of Washington SR-24		Coordinates at downstream end (ddd.mm.ss)	Lat. 46°32'6.76" N
Reach Boundaries See Figure 4			Long. 119°54'1.94" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.3	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

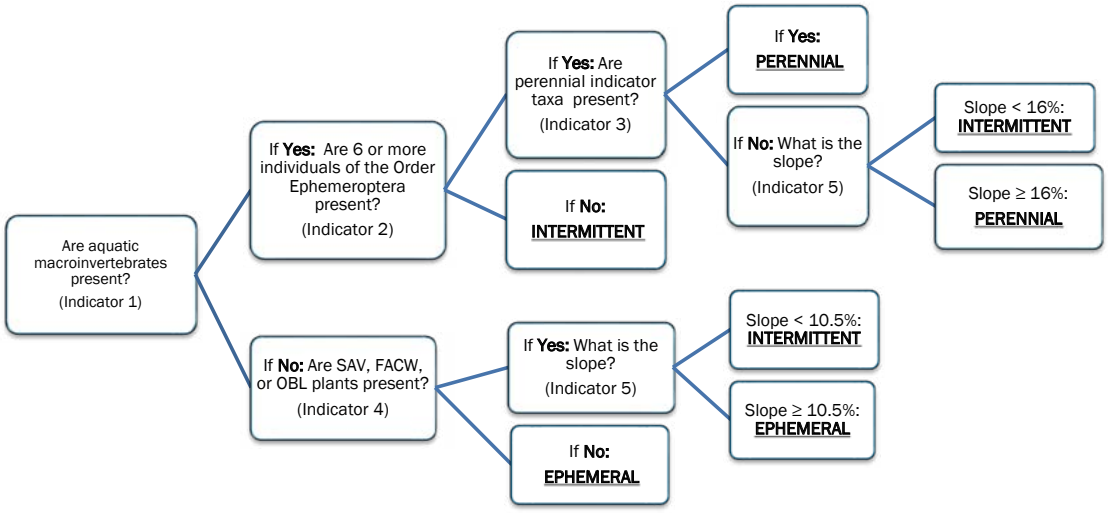
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	___5%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-5 south of Washington SR-24, Attachment C Photo Log, P-11.
Reach is from the confluence upslope to Washington SR-24

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4			Date5/9/2021
Waterway Name S-6		Coordinates at downstream end (ddd.mm.ss)	Lat. 46°32'11.4" N
Reach Boundaries See Figure 4			Long. 119°54'25.14" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.5	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

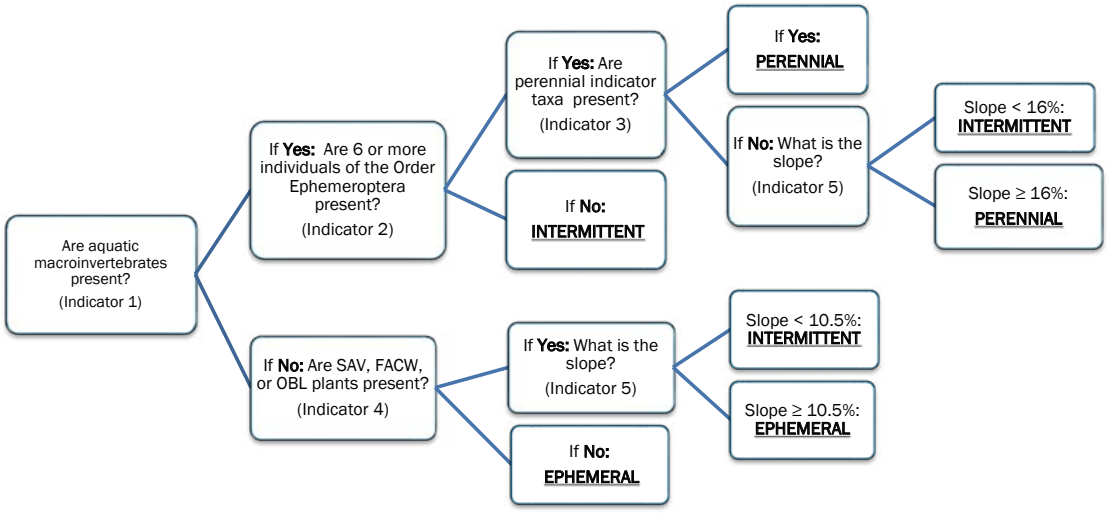
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__3%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☒ Natural or Anthropogenic Disturbance

Russian thistle and other dried vegetation are found in the majority of the channel.

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-6, Attachment C Photo Log, P-12. Reach is From fence upslope 100 ft

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name	Ostrea Solar	Assessor	EB
Address	See Figure 4	Date	5/9/2021
Waterway Name	S-7 at junction of S-8	Coordinates at downstream end (ddd.mm.ss)	Lat. 46°32'26.13" N
Reach Boundaries	See Figure 4		Long. 119°54'50.93" W
Precipitation w/in 48 hours (cm)	0	Channel Width (m)	0.5
☐ Disturbed Site / Difficult Situation (Describe in "Notes")			

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

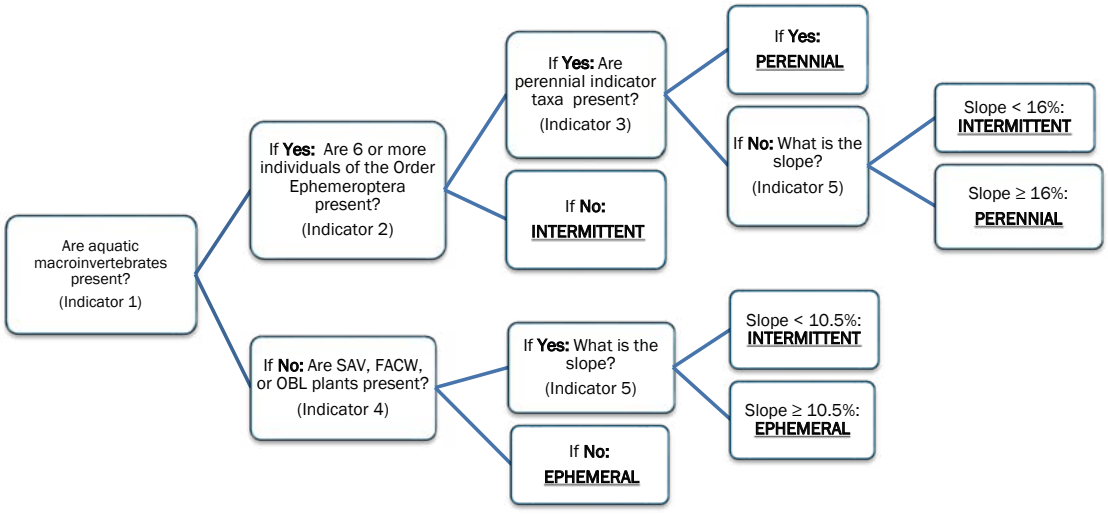
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__3%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-7 at junction of S-8 (P-13), Attachment C Photo Log, P-13.
Reach is from confluence upslope 100 ft

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4			Date5/9/2021
Waterway Name S-7 at junction of S-9		Coordinates at downstream end (ddd.mm.ss)	Lat. 46º32'3.25" N
Reach Boundaries See Figure 4			Long. 119º54'38.84" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.75	☒ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

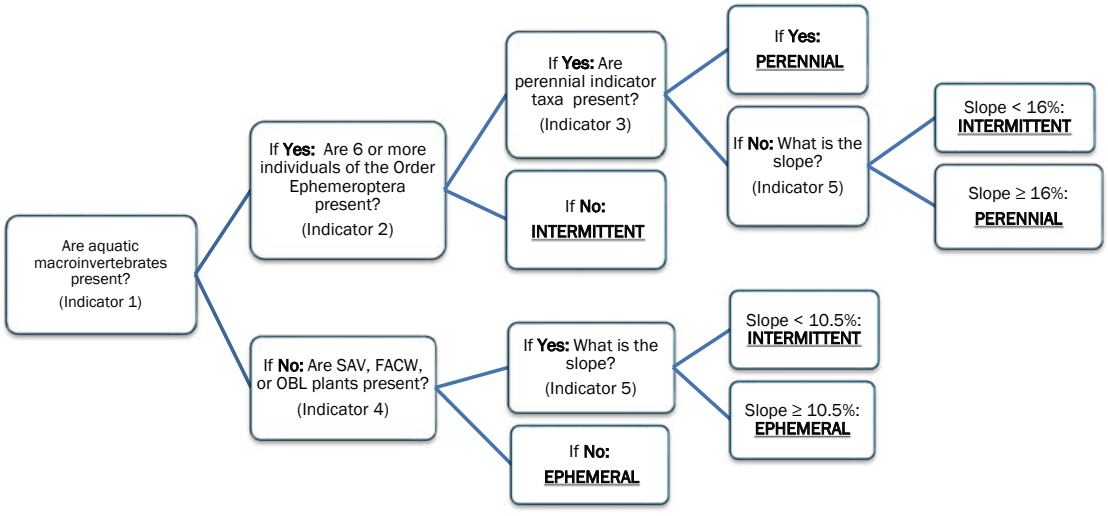
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__2%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☒ Natural or Anthropogenic Disturbance

☐ Other: _____

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

Area between S-7 and S-9 has been driven and altered. The area appears to be used as a two-track. The flow in this area appears to be overland from the end of S-7 to S-9. There are secondary channels located adjacent to the main S-7 channel that stop before S-9

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-7 at junction of S-9 (P-16), Attachment C Photo Log, P-16.
Reach is from confluence upslope 100 ft

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4			Date5/9/2021
Waterway Name S-7 north of Washington SR-24		Coordinates at downstream end (ddd.mm.ss)	Lat. 46°32'11.19" N
Reach Boundaries See Figure 4			Long. 119°54'42.69" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.5	[X] Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

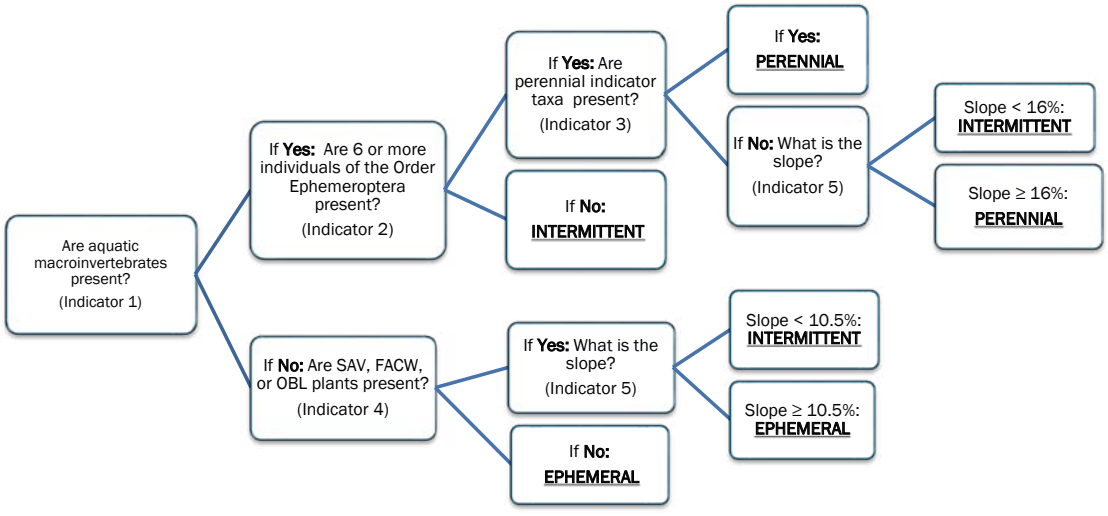
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	[ ] Yes	[X] No
2. Are 6 or more individuals of the Order Ephemeroptera present?	[ ] Yes	[X] No
3. Are perennial indicator taxa present? (refer to Table 1)	[ ] Yes	[X] No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	[ ] Yes	[X] No
5. What is the slope? (In percent, measured for the valley, not the stream)	__3%	

Conclusions



Single Indicators:

[ ] Fish

[ ] Amphibians

Finding:

[X] Ephemeral

[ ] Intermittent

[ ] Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☒ Natural or Anthropogenic Disturbance

Russian thistle and other dried vegetation are found in the majority of the channel. Culvert is completely choked with Russian thistle and other dried vegetation.

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-7 north of Washington SR-24, Attachment C Photo Log, P-15/P33. Reach is From fence upslope 100 ft

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4			Date5/9/2021
Waterway Name S-8		Coordinates at downstream end (ddd.mm.ss)	Lat. 46°32'26.17" N
Reach Boundaries See Figure 4			Long. 119°54'51.15" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.25	☒ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

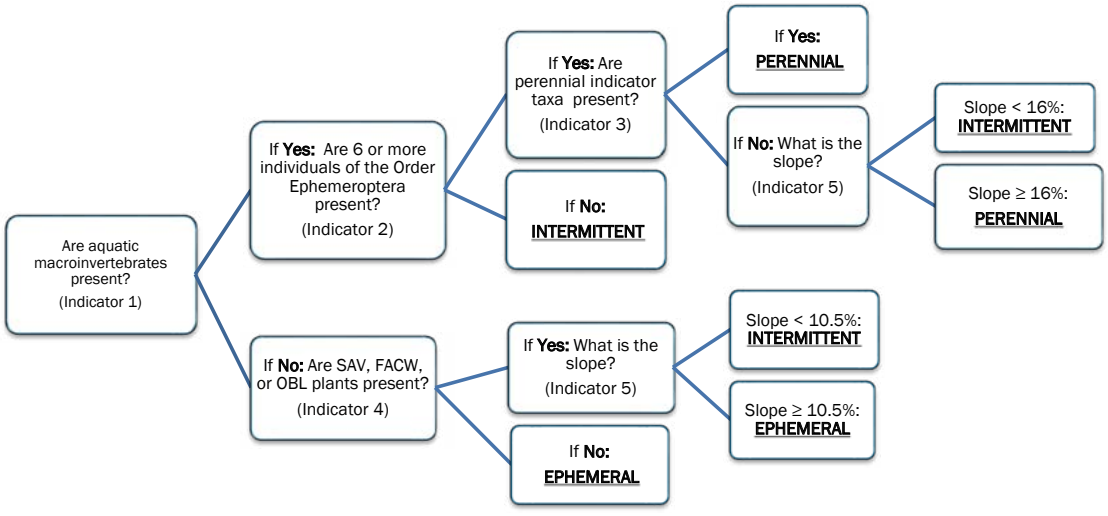
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__9%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☒ Natural or Anthropogenic Disturbance

Russian thistle and other dried vegetation are found in the majority of the channel.

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-8, Attachment C Photo Log, P-14. Reach is from junction to sudy area boundary.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4		Date5/14/2021	
Waterway Name S-9		Coordinates at downstream end (ddd.mm.ss)	Lat. 46º32'2.94" N
Reach Boundaries See Figure 4			Long. 119º54'45.28" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.5	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

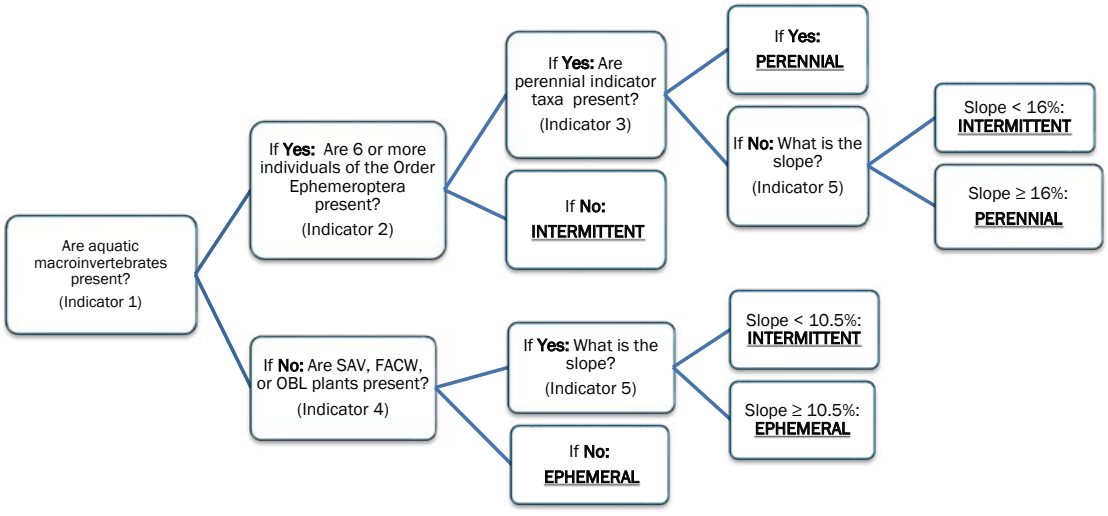
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__2%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-9, Attachment C Photo Log, P-17. Reach is from Project Area Boundary to Project Area Boundary.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar	Assessor EB
Address See Figure 4	Date5/14/2021
Waterway Name S-10	Coordinates at downstream end (ddd.mm.ss) Lat. 46º32'53.92" N
Reach Boundaries See Figure 4	Long. 119º55'18.10" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.5
	☐ Disturbed Site / Difficult Situation (Describe in "Notes")

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

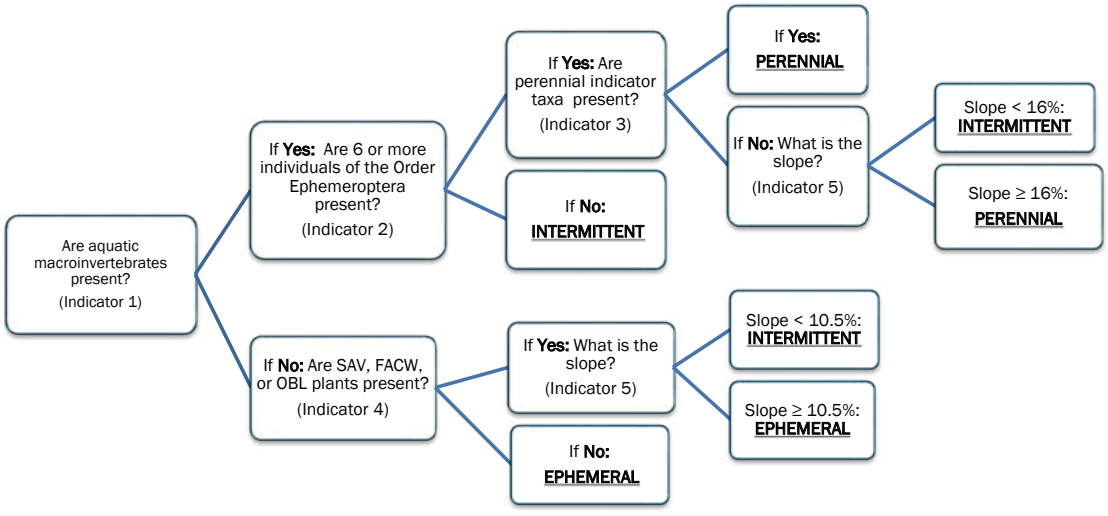
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__7%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-10, Attachment C Photo Log, P-19. Reach is from Project Area Boundary to Project Area Boundary.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4		Date5/14/2021	
Waterway Name S-11		Coordinates at downstream end (ddd.mm.ss)	Lat. 46°33'02.27" N
Reach Boundaries See Figure 4			Long. 119°55'21.32" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.25	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

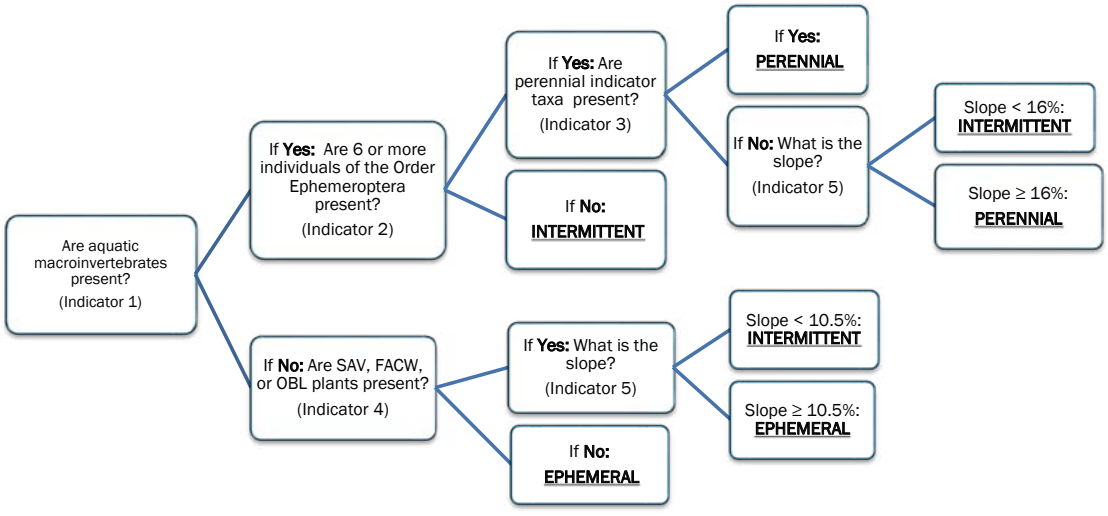
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__7%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-11. No photo. Reach is from start of channel to confluence.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4		Date5/14/2021	
Waterway Name S-12		Coordinates at downstream end (ddd.mm.ss)	Lat. 46°33'13.17" N
Reach Boundaries See Figure 4			Long. 119°55'21.07" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.25	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

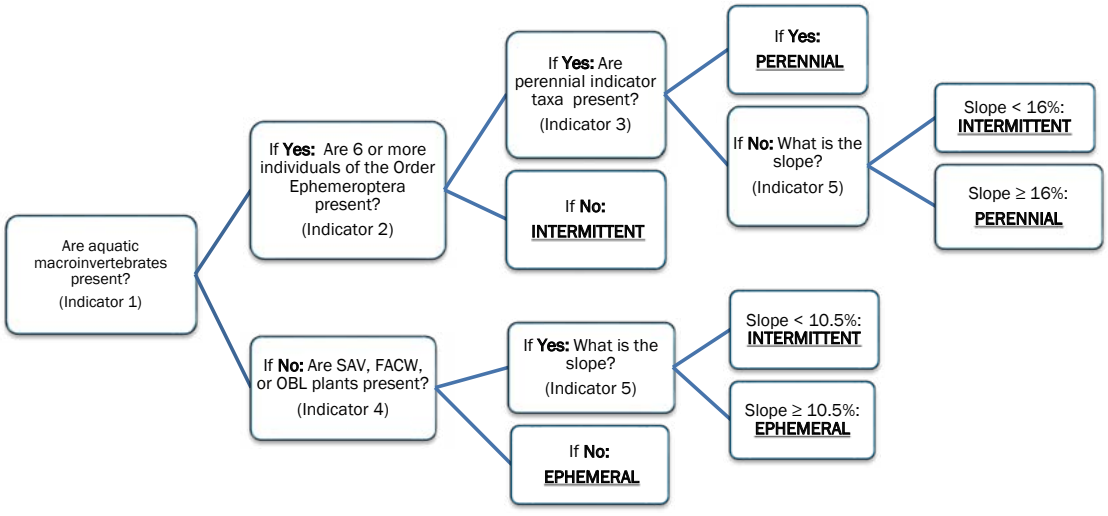
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__5%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-12, Attachment C Photo Log, P-18. Reach is from Project Area Boundary to confluence.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar	Assessor EB
Address See Figure 4	Date5/12/2021
Waterway Name S-13	Coordinates at downstream end (ddd.mm.ss) Lat. 46º32'36.16" N
Reach Boundaries See Figure 4	Long. 119º55'36.95" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.25
☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

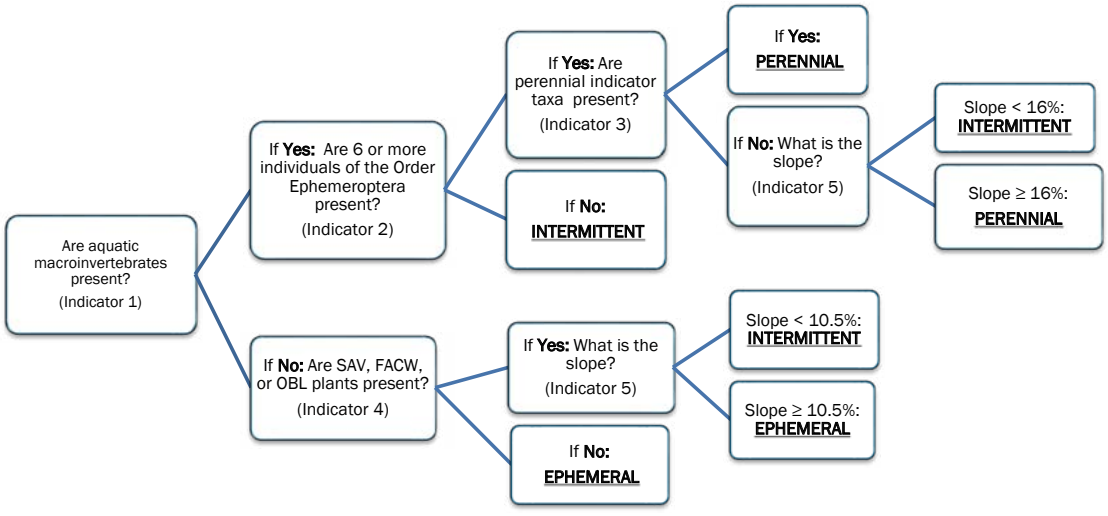
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	___6%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-13, Attachment C Photo Log, P-20. Reach is from Project Area Boundary to Project Area Boundary.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4			Date5/14/2021
Waterway Name S-14		Coordinates at downstream end (ddd.mm.ss)	Lat. 46°33'13.17" N
Reach Boundaries See Figure 4			Long. 119°55'21.07" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.25	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

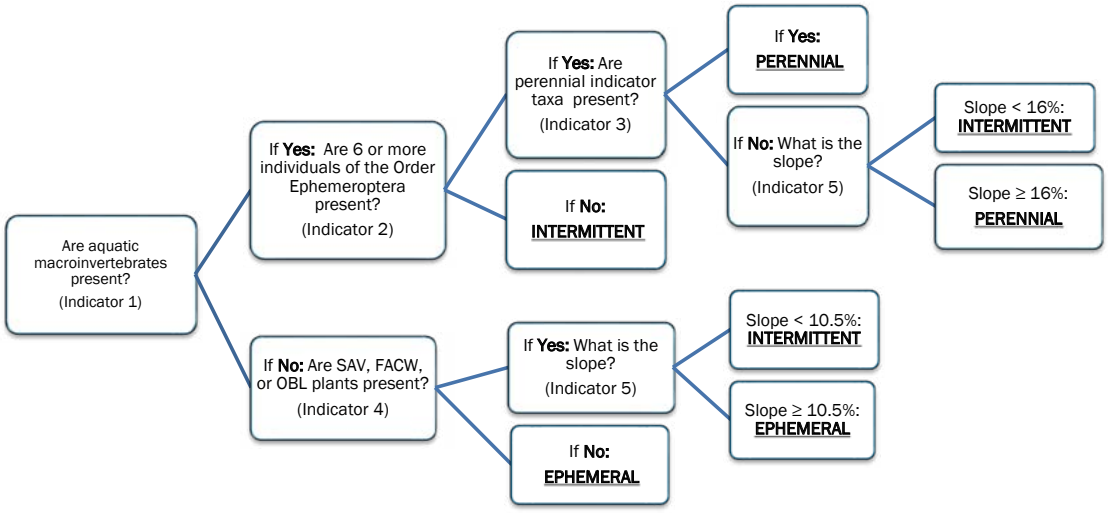
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__6%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-14. Attachment C Photo Log, P-21. Reach is from Project Area Boundary to where channel flattens out.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar	Assessor EB
Address See Figure 4	Date5/9/2021
Waterway Name S-15	Coordinates at downstream end (ddd.mm.ss) Lat. 46º32'7.44" N
Reach Boundaries See Figure 4	Long. 119º55'59.91" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.5
	[x] Disturbed Site / Difficult Situation (Describe in "Notes")

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

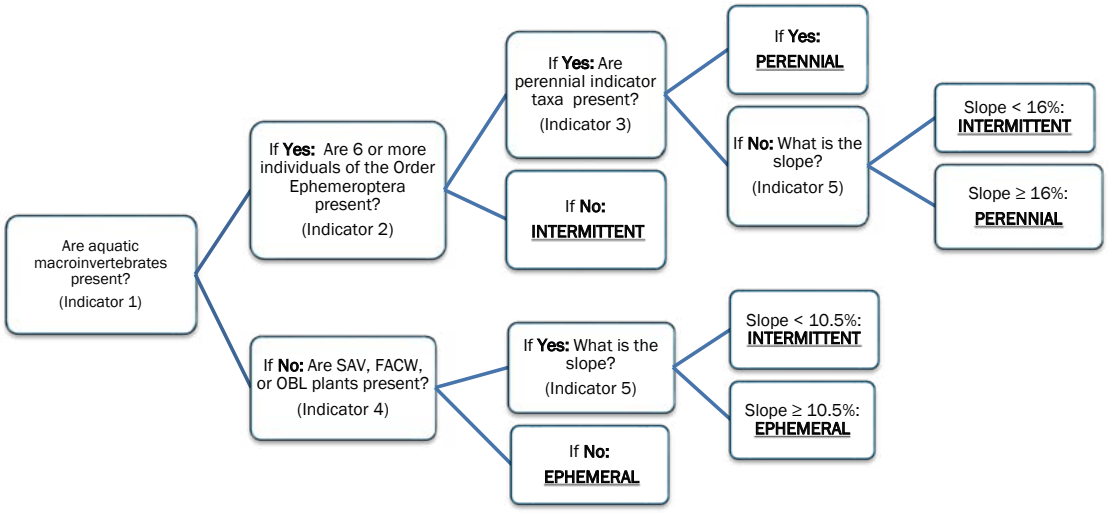
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	[ ] Yes	[x] No
2. Are 6 or more individuals of the Order Ephemeroptera present?	[ ] Yes	[x] No
3. Are perennial indicator taxa present? (refer to Table 1)	[ ] Yes	[x] No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	[ ] Yes	[x] No
5. What is the slope? (In percent, measured for the valley, not the stream)	__2%	

Conclusions



Single Indicators:

[ ] Fish

[ ] Amphibians

Finding:

[x] Ephemeral

[ ] Intermittent

[ ] Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☒ Natural or Anthropogenic Disturbance

Channel is crossed by two track road

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-15, Attachment C Photo Log, P-22. Reach is from From dirt 2-track upslope 100 ft

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar	Assessor EB
Address See Figure 4	Date5/13/2021
Waterway Name S-16	Coordinates at downstream end (ddd.mm.ss) Lat. 46º32'26.67" N
Reach Boundaries See Figure 4	Long. 119º56'16.27" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.5
	[x] Disturbed Site / Difficult Situation (Describe in "Notes")

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

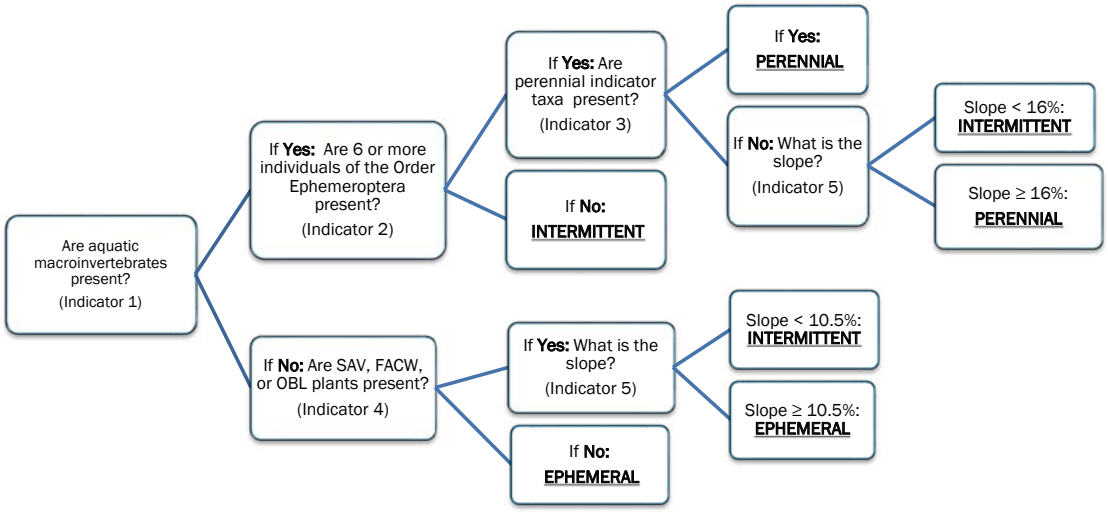
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	[ ] Yes	[x] No
2. Are 6 or more individuals of the Order Ephemeroptera present?	[ ] Yes	[x] No
3. Are perennial indicator taxa present? (refer to Table 1)	[ ] Yes	[x] No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	[ ] Yes	[x] No
5. What is the slope? (In percent, measured for the valley, not the stream)	__2%	

Conclusions



Single Indicators:

[ ] Fish

[ ] Amphibians

Finding:

[x] Ephemeral

[ ] Intermittent

[ ] Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☒ Natural or Anthropogenic Disturbance

Russian thistle and other dried vegetation are found in the majority of the channel and are piled up on the fence crossing the channel.

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-16, Attachment C Photo Log, P-23. Reach is from the site boundary to site boundary.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4			Date5/11/2021
Waterway Name S-17		Coordinates at downstream end (ddd.mm.ss)	Lat. 46°32'5.68" N
Reach Boundaries See Figure 4			Long. 119°57'14.01" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.5	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

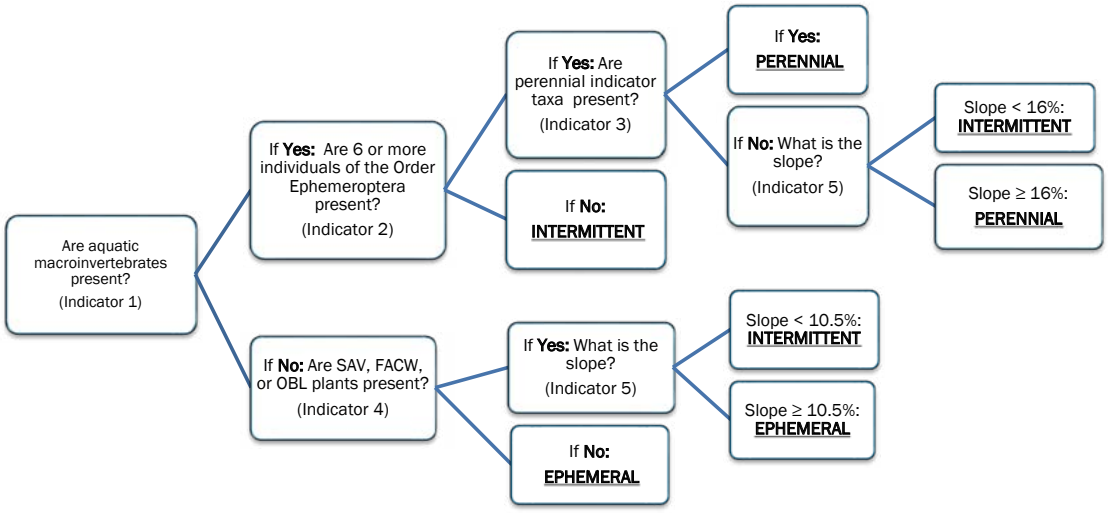
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__2%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-17, Attachment C Photo Log, P-24. Reach is from confluence upslope 100 ft

.

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Ostrea Solar		Assessor EB	
Address See Figure 4			Date5/13/2021
Waterway Name S-18		Coordinates at downstream end (ddd.mm.ss)	Lat. 46°32'3.1" N
Reach Boundaries See Figure 4			Long. 119°57'10.08" W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 0.25	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow_0_____

% of reach w/any flow (surface or hyporheic) __0___

# of pools observed__0_____

Observations

Observed Wetland Plants (and indicator status):

None

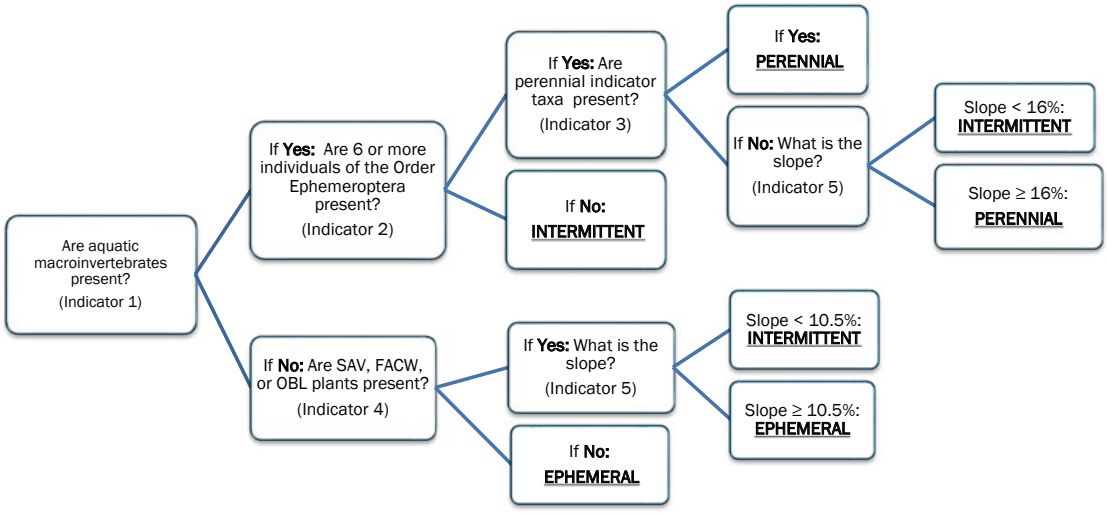
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
None			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	__1%	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

See Attachment B Figure 4, S-18, Attachment C Photo Log, P-25 and P-26. Reach is from From fence upslope to project boundary

Ancillary Information:

☐ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Appendix B. Data Forms

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WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Ostrea **City/County:** Yakima, Yakima **Sampling Date:** 2020-07-01
Applicant/Owner: CCR **State:** Washington **Sampling Point:** W-01
Investigator(s): Nathalie Denis, Jay Lorenz **Section, Township, Range:** Sec 3 T12N R23E
Landform (hillslope, terrace, etc.): Hillslope **Local relief (concave, convex, none):** Hillside seepage **Slope (%):** 5 to 10
Subregion (LRR): LRR C **Lat:** 46.5522666 **Long:** -119.9228425 **Datum:** WGS84
Soil Map Unit Name: Willis silt loam, 8 to 15 percent slopes **NWI classification:** R4SBC
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ___, Soil ___, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

Covertype is PEM. Area is wetland, all three wetland parameters are present.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 feet)			
1. *Phalaris arundinacea*	5	Yes	FACW
2. *Cirsium arvense*	2	Yes	FACU
3. *Lotus corniculatus*	2	Yes	FAC
4. *Carex stipata*	2	Yes	OBL
5.			
6.			
7.			
8.			
	11	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 89 **% Cover of Biotic Crust** ____

Dominance Test worksheet:

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

Prevalence Index worksheet:

Total % Cover of:		Multiply By:	
OBL species	2	x 1 =	2
FACW species	5	x 2 =	10
FAC species	2	x 3 =	6
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals	11	(A)	26 (B)

Prevalence Index = B/A = 2.4

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤ 3.0[1]

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

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

Sampling Point: W-01

SOIL

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 11	10YR 3/1	100					Gravelly 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.)

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches):

Hydric Soil Present? Yes __✓__ No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- __✓__ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) **(Nonriverine)**
- ____ Sediment Deposits (B2) **(Nonriverine)**
- ____ Drift Deposits (B3) **(Nonriverine)**
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- __✓__ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) **(Riverine)**
- ____ Sediment Deposits (B2) **(Riverine)**
- ____ Drift Deposits (B3) **(Riverine)**
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- __✓__ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes __✓__ No ____	Depth (inches):	1
Water Table Present?	Yes ____ No __✓__	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ____ No __✓__	Depth (inches):	

Wetland Hydrology Present? Yes __✓__ No ____

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

Some water in little hole on side of drainage otherwise soil wet but not saturated. Sulfur odor.

Remarks:

The criterion for wetland hydrology is met.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Ostrea **City/County:** Yakima, Yakima **Sampling Date:** 2020-07-01
Applicant/Owner: CCR **State:** WA **Sampling Point:** U-01
Investigator(s): Nathalie Denis, Jay Lorenz **Section, Township, Range:** Sec 3 T12N R23E
Landform (hillslope, terrace, etc.): Hillslope **Local relief (concave, convex, none):** Hillside seepage **Slope (%):** 5 to 10
Subregion (LRR): LRR C **Lat:** 46.552533 **Long:** -119.922827 **Datum:** WGS84
Soil Map Unit Name: Willis silt loam, 8 to 15 percent slopes **NWI classification:** Herbaceous Upland
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ___, Soil ___, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

Covertype is UPL.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	

Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 5 feet)			
1. *Asclepias speciosa*	5	Yes	FAC
2. *Achillea millefolium*	3	Yes	FACU
3. *Bromus tectorum*	2	No	UPL
4. *Tragopogon dubius*	1	No	UPL
5.			
6.			
7.			
8.			
	11	= Total Cover	

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 89 **% Cover of Biotic Crust** ____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply By:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	3	x 4 =	12
UPL species	3	x 5 =	15
Column Totals	11 (A)		42 (B)

Prevalence Index = B/A = 3.8

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%

____ Prevalence Index is ≤ 3.0[1]

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

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

Sampling Point: U-01

SOIL

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/2	100					Gravelly	

[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.)

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches):

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1) **(Nonriverine)**
- ____ Sediment Deposits (B2) **(Nonriverine)**
- ____ Drift Deposits (B3) **(Nonriverine)**
- ____ Surface Soil Cracks (B6)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- ____ Biotic Crust (B12)
- ____ Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ____ No ✓

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

Remarks:

No positive indication of wetland hydrology was observed.

Appendix C. Photographs

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Photo ID: P-1 Date Taken: 7/1/2020 Photo Direction: N Description: Wetland W-01 wetland soil pit.	
Photo ID: P-2 Date Taken: 7/1/2020 Photo Direction: S Description: Wetland W-01 upland soil pit (U-01).	

Photo ID: P-3 Date Taken: 5/10/2021 Photo Direction: NE Description: Channel S-1, looking upstream.	
Photo ID: P-4 Date Taken: 5/10/2021 Photo Direction: NW Description: Channel S-2, looking upstream.	

Photo ID: P-5 Date Taken: 5/10/2021 Photo Direction: NE Description: Channel S-3, looking upstream.	
Photo ID: P-6 Date Taken: 5/10/2021 Photo Direction: NW Description: Channel S-2, looking upstream.	

Photo ID: P-7 Date Taken: 7/2/2020 Photo Direction: N Description: Channel S-5, looking upstream.	
Photo ID: P-8 Date Taken: 5/10/2021 Photo Direction: NE Description: Channel S-4, looking upstream. Dried tumbleweeds are found along portions of the channel.	

Photo ID: P-9 Date Taken: 7/2/2020 Photo Direction: NW Description: Channel S-5, looking upstream. Dried tumbleweeds are found along portions of the channel.	
Photo ID: P-10 Date Taken: 5/14/2021 Photo Direction: N Description: Channel S-4.	

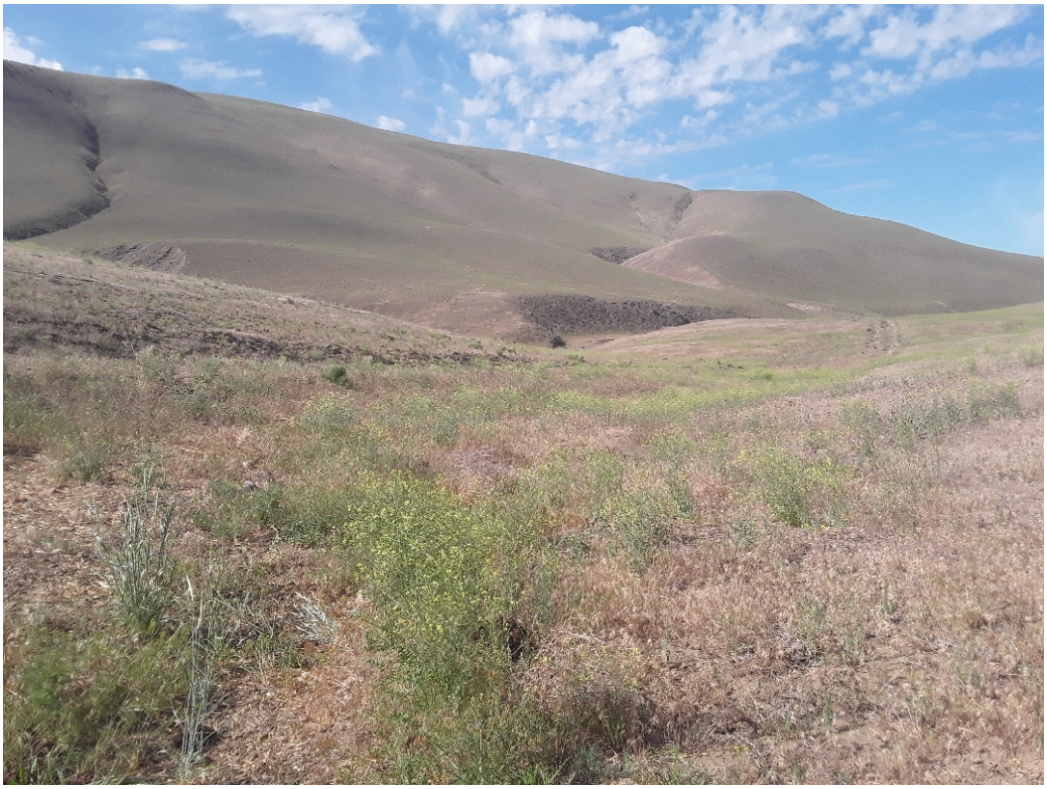
Photo ID: P-11 Date Taken: 5/10/2021 Photo Direction: SW Description: Channel S-5, looking downstream. Very faint OHWM between the highway and S-9	
Photo ID: P-12 Date Taken: 5/9/2021 Photo Direction: N Description: Channel S-6, looking upstream. Dried tumbleweeds are found along portions of the channel.	

Photo ID: P-13 Date Taken: 7/1/2020 Photo Direction: NW Description: Channel S-7, looking upstream	
Photo ID: P-14 Date Taken: 5/10/2021 Photo Direction: N Description: Channel S-8, looking upstream. Dried tumbleweeds are found along portions of the channel.	

Photo ID: P-15 Date Taken: 7/2/2020 Photo Direction: N Description: Channel S-7, looking upstream. Dried tumbleweeds are found along portions of the channel.	
Photo ID: P-16 Date Taken: 7/1/2021 Photo Direction: SW Description: S-7, looking downstream.	

Photo ID: P-17 Date Taken: 7/1/20 Photo Direction: SE Description: S-9, looking downstream.	
Photo ID: P-18 Date Taken: 7/1/2021 Photo Direction: N Description: S-12, looking upstream.	

Photo ID: P-19 Date Taken: 7/1/2020 Photo Direction: NW Description: Channel S-10, looking upstream	
Photo ID: P-20 Date Taken: 7/11/2021 Photo Direction: SE Description: S-13, looking downstream.	

Photo ID: P-21 Date Taken: 6/30/20 Photo Direction: NW Description: S-14, looking upstream.	
Photo ID: P-22 Date Taken: 7/1/20 Photo Direction: E Description: S-15, looking across the stream.	

Photo ID: P-23 Date Taken: 7/9/2021 Photo Direction: SE Description: S-16, looking downstream.	
Photo ID: P-24 Date Taken: 7/11/2020 Photo Direction: NW Description: S-17, looking upstream.	

Photo ID: P-25 Date Taken: 7/1/2020 Photo Direction: NW Description: S-18, looking upstream.	
Photo ID: P-26 Date Taken: 5/14/2021 Photo Direction: NW Description: NWI/NHD feature. No OHWM indicators were observed in the field.	

Photo ID: P-27 Date Taken: 5/9/2021 Photo Direction: NW Description: NWI/NHD feature. No OHWM indicators were observed in the field.	
Photo ID: P-28 Date Taken: 5/14/2021 Photo Direction: NW Description: NWI/NHD feature. No OHWM indicators were observed in the field.	

Photo ID: P-29 Date Taken: 6/30/2020 Photo Direction: E Description: NWI/NHD feature. No OHWM indicators were observed in the field.	
Photo ID: P-30 Date Taken: 5/9/2021 Photo Direction: N Description: NWI/NHD feature. No OHWM indicators were observed in the field.	

Photo ID: P-31 Date Taken: 5/14/2021 Photo Direction: N Description: NWI/NHD feature. Predominantly upland swale that had filled with dried tumbleweeds. Discontinuous OHWM indicators were observed in the field. See P-33 for where NWI/NHD features shows a connection to S-9. No OWHM indicators were observed at P-33.	
Photo ID: P-32 Date Taken: 7/9/2021 Photo Direction: SE Description: Culvert under SR-24 on S-7. Culvert opening is filled with dried tumbleweed.	

Photo ID: P-33 Date Taken: 5/14/2021 Photo Direction: NW Description: NWI/NHD feature. No OHWM indicators observed in the field.	
Photo ID: P-34 Date Taken: 5/14/2021 Photo Direction: N Description: NWI/NHD feature. No OHWM indicators observed in the field.	

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Appendix D. Typical Culvert Installation

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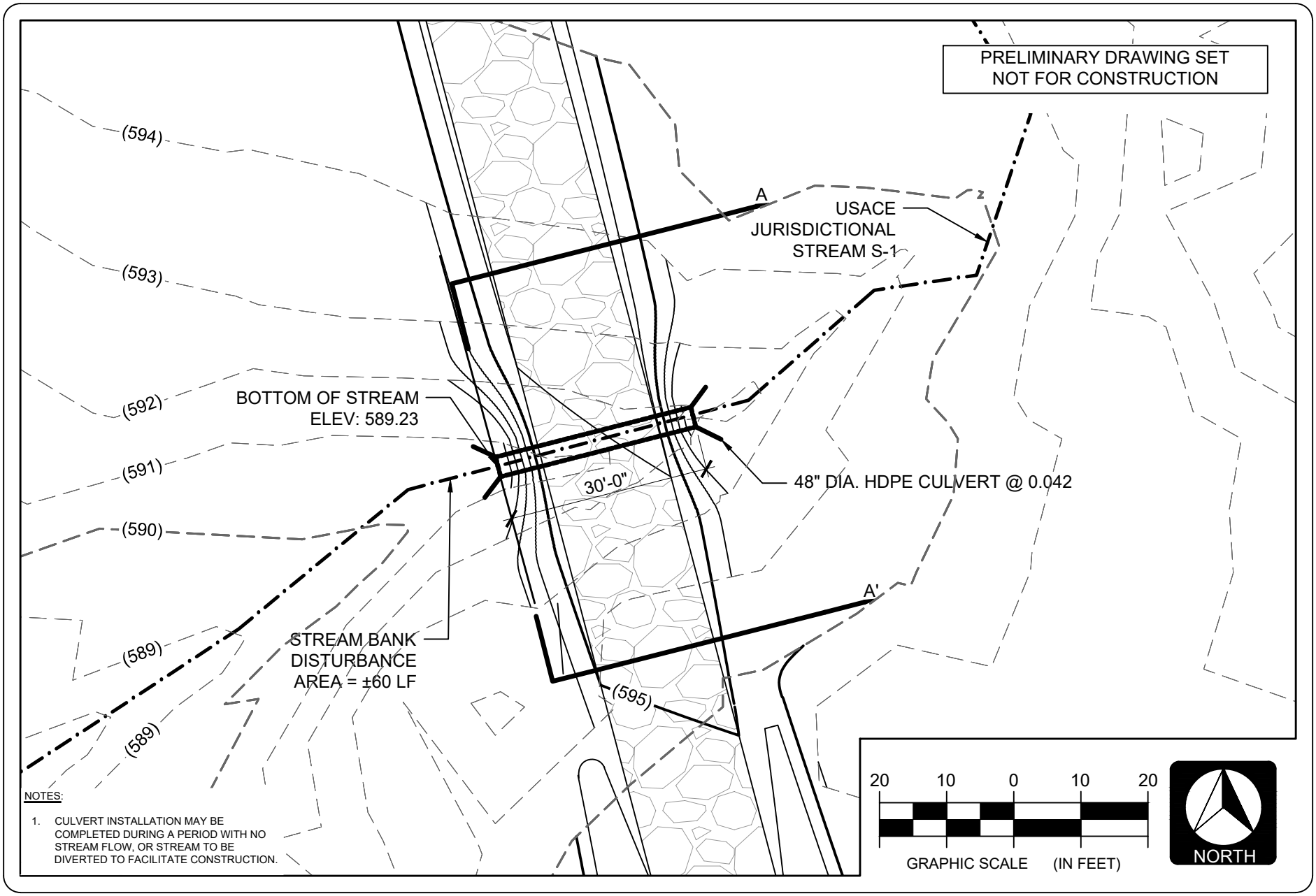


NOTES:

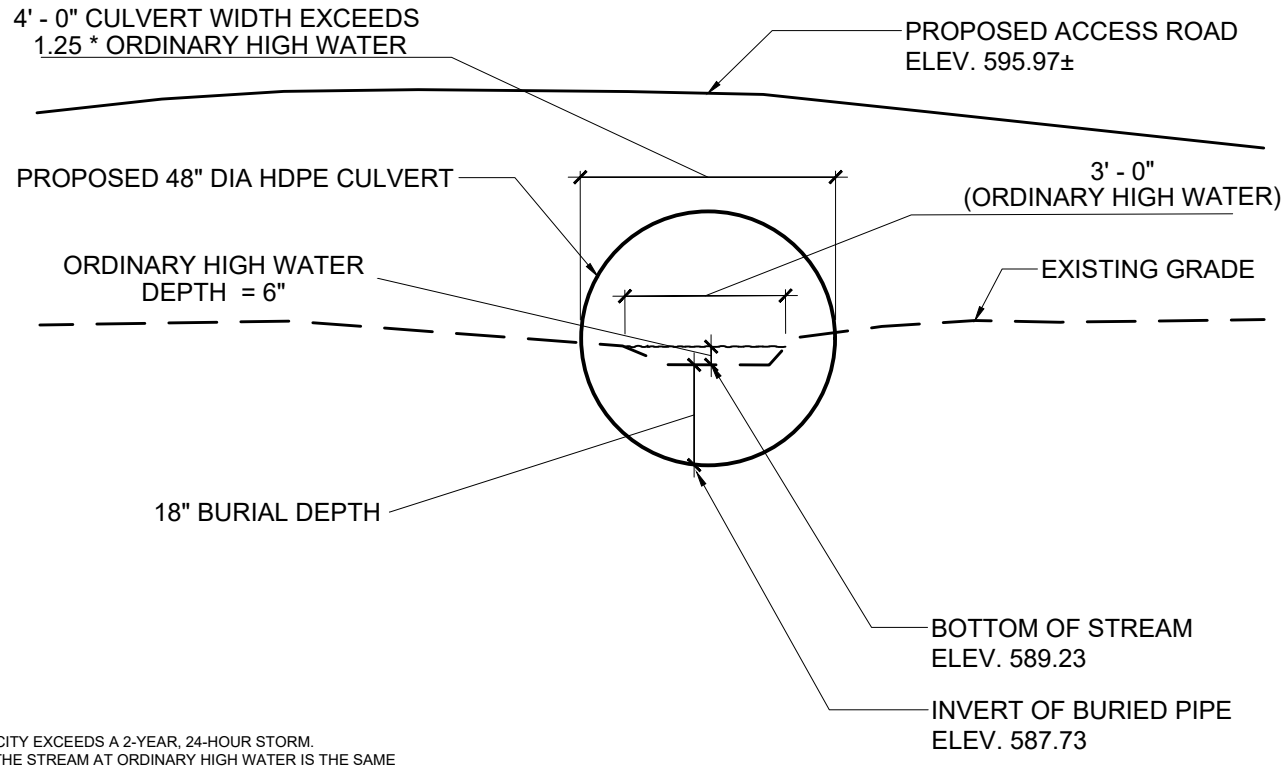
1. CULVERT INSTALLATION MAY BE COMPLETED DURING A PERIOD WITH NO STREAM FLOW, OR STREAM TO BE DIVERTED TO FACILITATE CONSTRUCTION.

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C.
217 Montgomery Street, Suite 1000
Syracuse, New York 13202
P. 315.471.0688

PROJECT TITLE: **TAYANDENEGA SOLAR**	**EDR** JOB NUMBER: **19047**
DRAWING TITLE: **S-1 CULVERT PLAN**	DRAWING NUMBER: FIG-1
DRAWN BY: **PJW** / CHECKED BY: **CB**	SCALE: **1" = 20'** / DATE: **03/11/2020**

J:\19047 Tayandenega Solar\Cad\Working Drawings\19047_Culvert Analysis_Working.dwg

PRELIMINARY DRAWING SET
NOT FOR CONSTRUCTION



NOTES:

1. CULVERT CAPACITY EXCEEDS A 2-YEAR, 24-HOUR STORM.
2. THE WIDTH OF THE STREAM AT ORDINARY HIGH WATER IS THE SAME AS THE BANK-FULL WIDTH.

1 CULVERT ELEVATION A-A' - FIG-1 FOR LOCATION

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C.
217 Montgomery Street, Suite 1000
Syracuse, New York 13202
P. 315.471.0688

PROJECT TITLE: **TAYANDENEGA SOLAR**	**EDR** JOB NUMBER: **19047**
DRAWING TITLE: **S-1 CULVERT DETAILS**	DRAWING NUMBER: FIG-2
DRAWN BY: **PJW** / CHECKED BY: **CB**	SCALE: **N.T.S.** / DATE: **03/11/2020**

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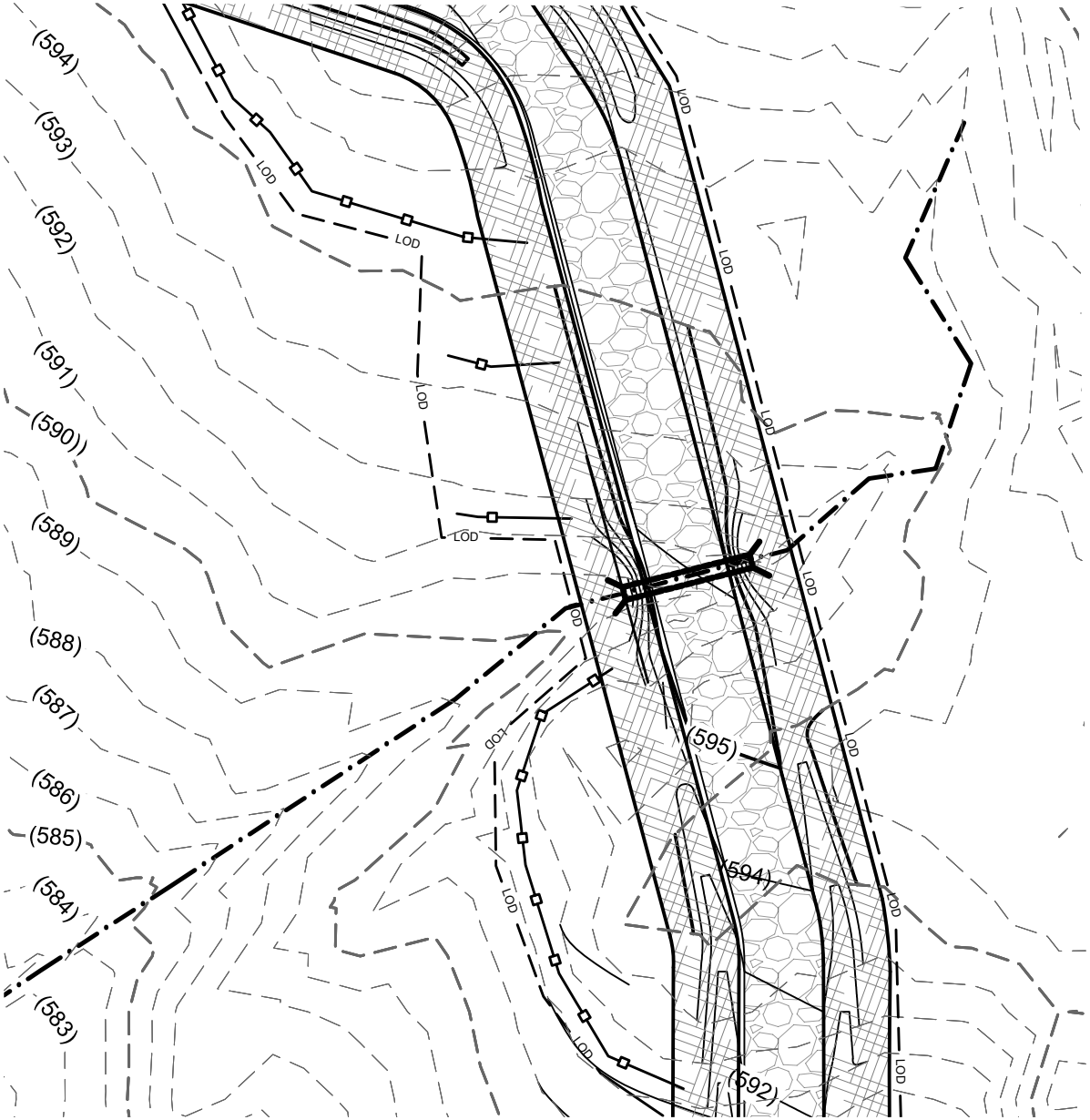

PRELIMINARY DRAWING SET
NOT FOR CONSTRUCTION

LEGEND

ITEM	SYMBOL
PROPOSED ACCESS ROAD	
ROLLED EROSION CONTROL PRODUCT (RECP)	
LIMITS OF DISTURBANCE	LOD
PROPOSED CULVERT	
SILT FENCE	

NOTES:

1. SEE FIG-1 FOR NOTES.
2. ROLLED EROSION CONTROL PRODUCT (RECP) SHALL BE TENSAR NORTH AMERICAN GREEN SC150, OR APPROVED EQUAL.

40 20 0 20 40

GRAPHIC SCALE (IN FEET)

NORTH

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C.
217 Montgomery Street, Suite 1000
Syracuse, New York 13202
P. 315.471.0688

PROJECT TITLE: **TAYANDENEGA SOLAR**	**EDR** JOB NUMBER: **19047**
DRAWING TITLE: **S-1 CULVERT EROSION & SEDIMENT CONTROL PLAN**	DRAWING NUMBER: FIG-3
DRAWN BY: **PJW** / CHECKED BY: **CB**	SCALE: **1" = 40'** / DATE: **03/11/2020**

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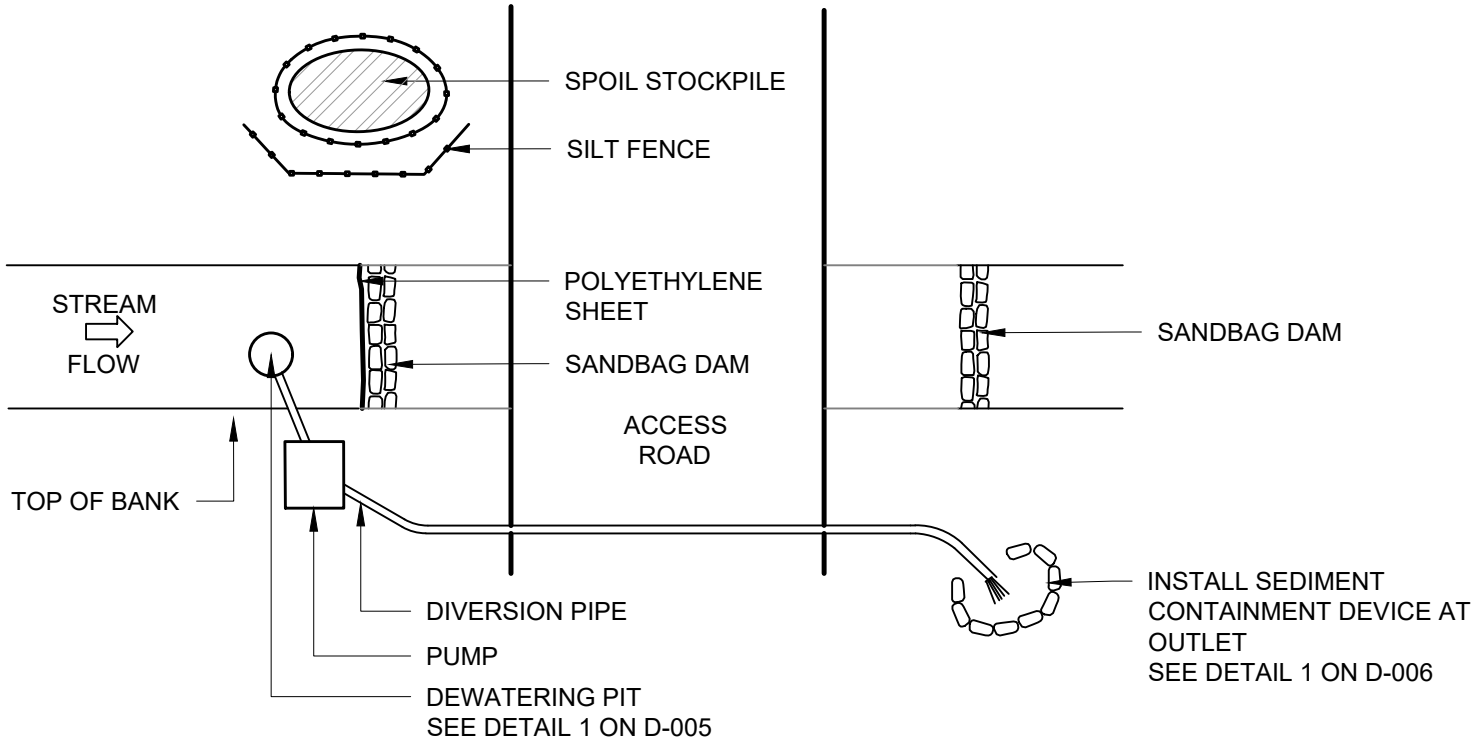
PRELIMINARY DRAWING SET
NOT FOR CONSTRUCTION



PLAN

1 TEMPORARY STREAM DIVERSION SCHEMATIC

Scale: NTS

TEMPORARY

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PROJECT TITLE: **TAYANDENEGA SOLAR**	**EDR** JOB NUMBER: **19047**
DRAWING TITLE: **S-1 CULVERT DETAILS**	DRAWING NUMBER: D-003
DRAWN BY: **PJW** / CHECKED BY: **CB**	SCALE: **N.T.S.** / DATE: **03/11/2020**

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