The City of Arcata, under Part 58 of Title 24 Code of Federal Regulation, has determined that the following proposed action under the Community Development Block Grant Program and contract number 17-CDBG-12017 is located in the 100-year floodplain and may impact semi-permanently flooded palustrine persistent emergent wetland and scrub shrub wetland.

- This action is located in an Area of Potential Effect within the 1% (100-year) floodplain as indicated on Flood Insurance Rate Map Panel numbers 5301260026R and 06023C0855G, revised June 21, 2017. The FIRM Panels are attached to this document. The wastewater treatment facility is not in a regulatory floodway and the Proposed Project will not impede flood flows. The treatment facility is designated AE with associated required base elevations as set by the City’s Floodplain Ordinance as shown on the attached FIRM Panels.

- The Area of Potential Effect also includes wetlands, as identified in the Final Wetland Delineation prepared by Stillwater Sciences in August 2020. Impacted wetlands are also mapped on the Fish and Wildlife Service- National Wetlands Inventory. Stillwater staff delineated all potential wetlands in the Area of Potential Effect and found 2.0 acres of potentially US Army Corps jurisdictional wetland within the project area. In addition, there are 10.87 acres of potential wetlands that are only subject to State- and LCP-jurisdiction. The proposed location of the new treated effluent outfall pipe (Outfall 003) and a small portion of scrub-shrub wetland near treatment Marsh #4 are the only identified areas of potentially permanent wetland impact related to Proposed Project activities. Further wetland areas within the Area of Potential Effect may be temporarily impacted by construction activities but will be re-vegetated upon project completion.

The Proposed Project will upgrade elements of the existing Arcata Wastewater Treatment Facility located at 601 South G Street in Arcata, Humboldt County. Arcata’s Wastewater Treatment Facility (Facility) includes the Arcata Marsh and Wildlife Sanctuary, and utilizes innovative treatment methods utilizing treatment wetlands. The City of Arcata is proposing to replace or upgrade elements of existing Facility infrastructure as part of the Arcata Wastewater Treatment Facility Upgrades Project. The work will include installation of buried pipe for the flow reconfiguration of disinfected enhancement wetlands effluent, installing a discharge pipe into a constructed Brackish Marsh at the north end of the Arcata Bay section of Humboldt Bay (Outfall 003), relocation of the electrical equipment building in the Facility to allow for improved road access for fire and emergency services (requiring installation of a new utility service line), construction of a mitigation wetland area, and raising levees to 14’ and 12’ respectively in zone VE and AE. Proposed scope of work includes improvements to
the internal stormwater system to ensure capacity for a 100-year storm event. The project will not eliminate any floodplain and will not create a net rise in flood waters.

E.O. 11988- Floodplain Management and E.O. 11990- Wetlands Protection apply to this project. City staff consulted with HUD Region 9 Environmental Officer Morgan Griffin and it was determined the project does not meet any of the exceptions at 24 CFR 55.12 and therefore requires an 8-step analysis of the direct and indirect impacts associated with modifications to the floodplain and wetlands within the Area of Potential Effect.

Step 3: Identify and evaluate practicable alternatives.

At the most basic level, the overarching purpose of the Arcata Wastewater Treatment Facility Upgrades Project is to replace aging infrastructure, improve quality of treated effluent discharged into Humboldt Bay, and meet discharge requirements.

Mechanical equipment is old and no longer performing efficiently. The natural systems have reduced treatment and hydraulic capacities due to years of solids accumulation and vegetation growth. This has resulted in numerous water quality violations that must be addressed. The Proposed Project addresses public health needs, including improving the hydraulic and treatment capacity of the treatment facility and meeting National Pollutant Discharge Elimination System (NPDES) permit requirements. The installation of Ultraviolet (UV) disinfectant equipment, proposed flow reconfiguration, and new State required effluent limits are driving factors for this project. The need to improve hydraulic and treatment capacity stems from the need to replace the chlorine disinfection system with UV and the need for ammonia treatment.

The primary objectives of the Proposed Project are as follows:

- The City’s primary objective is to provide wastewater treatment and disposal while improving existing levels of regulatory compliance for the protection of water quality and public health.
- The City seeks to address existing effluent violations and to produce a higher quality effluent that can be beneficially reused.
- The City seeks to operate the improved treatment facility with cost-effective methods available that meet the City’s overall system performance goals while improving the existing natural system and constructing a mechanical system to assure compliance with regulatory requirements.
- The City’s goal to minimize or eliminate disinfection byproducts associated with the use of chlorine and health hazards associated with the use and storage of large chlorine cylinders is another major project objective.
- The City seeks to move the existing outfall from the bay at Butcher Slough Outfall 001 to the “Brackish” Marsh Outfall 003 to maximize the volume of effluent receiving enhanced treatment and maximize the beneficial use of treated wastewater for habitat purposes. It is important to note that the “Brackish” Marsh was constructed from the City’s previous McDaniel Slough Restoration project, and will not contain brackish
waters until Outfall 003 is installed to decrease the salinity of the waters, which are tidally influenced.

Arcata performed an alternatives screening analysis and screened out the “No Action” and “offsite” alternatives as infeasible, as discussed below.

1. Locate the Project Outside of the Floodplain and Wetland (Offsite Alternative)

The project’s intent is to rehabilitate and improve the existing system, and a full relocation would not fit these parameters. This objective is based on both the logistic and economic and time constrained infeasibility of a full relocation of the facility. Arcata’s treatment facility is an integral part of the City’s environmental and cultural identity; its unique pairing of technical and natural treatment is one of the City’s landmark successes and its relocation would involve a redesign of the existing marsh system as well as the purchase and construction of a new facility offsite. There are only a handful of parcels within City limits that could house such a large facility, and the majority of them are already developed. In addition, many of the suitable industrially-zoned parcels in the northern portion of the City are subject to inundation in the case of a catastrophic failure of Matthew’s Dam at Ruth Lake. Suitably large parcels in the southern or eastern portion of Arcata would likely require conversion of prime agricultural lands, and would remain located in the Coastal Zone with similar impacts and permit processes. A further logistical challenge of a full relocation would be re-configuring the existing accompanying infrastructure, including pump stations and lines, which would involve a complete flow reconfiguration if and when the site is relocated in future.

Arcata is a small community of less than 20,000 inhabitants, roughly half of which are students; the cost of a full relocation has been estimated at up to $150 million by the City engineer. The City has approved a utility rate increase in the fee schedule to service the debt of the loans through the State Revolving Fund. The City is also currently re-assessing the Capital Connection Fee rate for expansion and new connections to the treatment facility.

2. No Action Alternative

Arcata’s wastewater treatment system must comply with regulatory requirements established by its NPDES permit issued by the California Regional Water Quality Control Board. As described in the City’s Wastewater Treatment Facility Improvements Project Report (2016c), effluent monitoring data shows that there have been ongoing exceedances of discharge limits on total suspended solids (TSS), biochemical oxygen demand (BOD, a measure of biodegradable organic matter), pH, dichlorobromomethane, chronic toxicity, chlorine, and fecal coliform since 2004.

The Treatment Facility system relies heavily on land-based, natural treatment systems. This system has served the City well but has a number of drawbacks in that there is not sufficient room to further expand the natural treatment systems for additional capacity, and natural systems are inherently greatly affected by the weather (temperature and precipitation). As regulatory requirements have gotten more stringent over the years and with the initiation of mandatory minimum penalties in 2000, it has become more difficult to reliably meet permit compliance with the land-based natural system. In 2012, the Facility began operating under a
new NPDES permit that specifically addressed several long-term issues regarding disinfection, treatment units, and outfalls. The new permit enabled changes to be made to improve wastewater treatment, protect beneficial uses, increase energy efficiency, reduce chemical usage, and reduce the potential for permit violations. Accordingly, the City initiated the Facility Plan and plant improvement project analyzed herein, which proposes a variety of improvements to the wastewater treatment system to increase treatment capacity and prevent the exceedance of discharge limitations. The Proposed Project addresses the following issues that must be addressed:

- Meet permit/regulatory requirements that protect public health and the environment; and in particular, address ongoing NPDES permit violations and regulatory compliance.
- Repair or rehabilitate aging infrastructure and address deferred maintenance.
- Provide reliable hydraulic and treatment capacity for both wet and dry weather flows, both now and in the future.
- Address City and Agency goals for facility resilience to flooding and sea level rise.

If the Proposed Project is not undertaken, ammonia discharge to Humboldt Bay will not improve and eventually the Facility would not be able to operate, which would render Arcata essentially uninhabitable for all residents and businesses. It has been determined that moving the facility is not warranted or feasible, as the facility also serves as the City’s corporation yard for the streets, utilities and equipment maintenance departments; at the present time due to both lack of available land and cost. The facility must continue to operate at its present site for the next 30-40 years at minimum. If the Proposed Project is not undertaken, the Facility will remain out of compliance with the requirements of the NPDES permit and the quality of treated effluent discharged into Humboldt Bay will not be addressed, which has the potential to result in a variety of negative effects to humans and wildlife. The City’s continued ability to utilize the Treatment Facility relies on undertaking the improvements discussed in this environmental assessment.

2. Other Alternatives Considered

Arcata considered several alternative sites actions believed to satisfy the objectives, purpose, and need of the project based on the required common improvements outlined below. Alternatives addressed the needed improvements in various ways.

- **Headworks Improvement**: Improve existing headworks equipment including new screw pump(s), new bars screens and vortex grit chamber replacement. A new flow split chamber to direct wastewater to the primary clarifier or the proposed oxidation ditch. No increase in the flow capacity of the headworks is proposed from 5.0 mgd.
- **Primary Clarifiers**: Replacement or rehabilitation of the primary clarifiers due to poor condition and age. Replacement capacity varies with alternative.
- **Primary Sludge and Scum Pumps**: Replace the primary sludge and scum pumps due to condition and age. Replacement capacity varies with alternative.
• **Oxidation Ponds Solids Removal and Transfer Structure Reconfiguration:** Dredging, dewatering and disposal of accumulated sludge in the oxidation ponds was proposed to address decreased capacity. Installation of new aeration and mixers to improve treatment. Reconfigure pond transfer structures for better flow and distribution.

• **Emergency Pond Pump Station:** Add suction and discharge piping to allow the pump station to pump out of Oxidation Pond 1 and into Oxidation Pond 2 for Pond(s) storage control and storm/extreme high flow pumping. Improve existing building structure and resiliency against storm or flooding conditions.

• **Treatment Wetland Nos. 1 – 4 Solids and Vegetation Maintenance:** Improve the hydraulic capacity and treatment occurring in Treatment Wetlands 1 – 4 by removing solids and vegetation, regrading deep and shallow zones and replanting vegetation.

• **Treatment Wetland No. 4 Influent Pumps and Treatment Wetlands Pump:** Treatment Wetland No. 4 was regraded and is being reconstructed for continued use in the wetlands treatment system.

• **Enhancement Wetlands Improvements:** Vegetation maintenance, new baffles and new inlet/outlet structures to improve treatment and hydraulic efficiency and capacity.

• **Pond Pump Station/Pump Station 1:** Replace mechanical equipment and upgrade to a combined wet well in order to improve flow by gravity. Replacement capacity will vary with each alternative up to 10 mgd.

• **Enhancement Wetlands (Hauser) Pump Station:** Replace mechanical equipment due to poor condition and age and permit requirements. Replacement pump capacity will be based on new permit requirements of up to 6 mgd.

• **Anaerobic Digesters and Sludge Heat/Mixing System:** Improve structural and mechanical equipment in phases. Project varies with alternative.

• **Outfall 003:** Install new pipes for discharge to Outfall 003 from HPS (EWPs) up to 6 mgd. Outfall 003 will discharge at the Brackish Marsh and be sized for up to approximately 6 mgd

• **UV Disinfection:** Install a 9.8 mgd capacity UV disinfection system within the existing CCB structure to replace the primary disinfection utilizing a chlorine gas disinfection system.

• **Secondary Treatment Unit:** A majority of the alternatives propose an additional secondary treatment unit to help meet treatment standards. Conventional activated sludge, oxidation ditch, and trickling filters were all considered as secondary treatment options. The oxidation ditch was the preferred secondary treatment system due to its reliability, simplicity and lower maintenance. Each alternative that incorporates an additional secondary treatment system will use oxidation ditches. Oxidation ditches require secondary clarifiers and a waste sludge pumping and thickening system.
• Flooding Risk Reduction: The following projects are also part of each alternative to protect the AWTF from flooding risk:
  ➢ Raise the levee(s) around the oxidation ponds, treatment wetlands, and the treatment plant/City Corporation Yard to minimum FEMA base flood elevations.
  ➢ Develop an adaptive management strategy and resiliency plan for anticipated environmental changes and natural disasters.
  ➢ Construct new facilities at higher base elevations that account for increased severity of storms, flooding hazards and wave action.
  ➢ Elevate all New/upgraded electrical connections a minimum of 2.0’ above the FEMA flood elevations inside of the AWTF protective levee system.
  ➢ Improve the internal stormwater routing collection, pumping and treatment system to accommodate the 1% Storm Event (100-year Storm Event)

Four alternatives were developed in the prepared Facility Plan (Carollo Engineers, 2017) to address improvements needed for the AWTF. Alternatives were conceived through a collaboration between City staff, LACO Associates, Carollo Engineers, and the community through public discussions in a series of public workshops.

**Alternative 1: Existing System Rehabilitation**
Alternative 1 proposes rehabilitating the existing system without constructing an additional secondary treatment system. Flows up to 5.9 mgd would go through primary treatment and flow through the oxidation ponds. Flows less than 2.3 mgd would then enter the treatment wetlands. Flows greater than 2.3 mgd would bypass the treatment wetlands and be mixed with the treatment wetlands effluent. Blended effluent less than 2.3 mgd would route to the enhancement wetlands. Blended treatment wetland effluent greater than 2.3 mgd would be mixed with enhancement wetlands effluent before entering the UV disinfection system and discharging into the Brackish Marsh (Outfall 003). Wet weather flows greater than 5.9 mgd would be stored in the Oxidation Pond 1. Flows exceeding storage would be pumped to the chlorine contact basin and discharged into Humboldt Bay (Outfall 001).

Specific improvements unique to Alternative 1 include:

- Constructing two new primary clarifiers, each with a 3.0 mgd capacity. This includes replacing the primary sludge and scum pumps and upgrading the sludge digestion system to accommodate the new capacity.
- Adding new aerators to Oxidation Pond 2 to improve BOD treatment capacity.
- Constructing a new Treatment Wetland No. 7 to increase the hydraulic capacity of the treatment wetlands from 1.8 mgd to 2.3 mgd.
- Replace Treatment Wetlands Pumps Station 1 pumps due to age and condition.
- Replace the Pond Pump Station with new pumps to increase capacity from 2.9 mgd to 3.6 mgd.
- Replace Enhancement Wetlands (Hauser) Pump Station pumps to increase capacity from 1.2 mgd to 2.4 mgd.

**Alternative 2: Existing System with Side-Stream Treatment**

Alternative 2 proposes constructing a side-stream secondary treatment system. Influent up to 5.9 mgd would be routed to the primary clarifiers and then be split to either the natural system or a side-stream secondary treatment system. Normal flows up to 2.3 mgd would be treated through the oxidation ponds and the treatment wetlands. Minimum flow between 0.5 mgd and 2.0 mgd would be routed to the side-stream secondary treatment. The effluent from the side-stream treatment system could be routed to the Treatment Wetlands or blended with the natural system effluent. The two secondary effluents would be combined and flows below 2.3 mgd would be sent to the enhancement wetlands. Flows between 2.3 and 5.9 mgd would be mixed with the enhancement wetland effluent, disinfected in the UV system and discharged into the Brackish Marsh (Outfall 003). Wet weather flows above 5.9 mgd would be stored in Oxidation Pond 1. Flows exceeding storage would be pumped to the chlorine contact basin and discharged into Humboldt Bay (Outfall 001).

Specific improvements unique to Alternative 2 include:

- Construct two new primary clarifiers each with a 3.0 mgd capacity.
- Adding aerators to Oxidation Pond 2 to improve mixing and reduce treatment capacity of the side-stream secondary treatment.
- Construct an oxidation ditch and a primary clarifier with a 2.0 mgd capacity. The oxidation would need to able to reduce the flow to 0.5 mgd.
- Additional sludge digestion capacity for the sludge from the secondary clarifier.
- Install a sludge thickening system for the oxidation ditch.

**Alternative 3: Existing System with Parallel Treatment**

Alternative 3 reduces the flow entering the natural system (oxidation ponds, treatment wetlands and enhancement wetlands) to 1.8 mgd year-round. This low capacity would maintain treatment and permit compliance. Flows between 1.8 mgd and 5.9 mgd would be sent to the parallel secondary treatment train. The two effluents would be mixed prior to entering the UV disinfection system. The proportion could be adjusted to achieve desired effluent water quality. Flow exceeding 5.9 mgd would be stored in the Oxidation Pond 1 or, if needed, routed to the chlorine contact basin, treated and discharged to Humboldt Bay through Outfall 001.

Specific improvements unique to Alternative 3 include:

- Constructing one new primary clarifier with a 1.8 mgd capacity. Primary sludge and scum pumps would also be replaced with pumps sized for the 1.8 mgd clarifier.
- Construct two oxidation ditches and secondary clarifiers. Each oxidation ditch and secondary clarifier will have a 2.0 mgd capacity and the total system capacity will be 4.1 mgd.
Increase the capacity of the sludge digestion system to account for the secondary clarifier.
Install a sludge thickening system for the oxidation ditch.

Because this system decreases the hydraulic capacity of the natural system to 1.8 mgd, the construction of Treatment Wetland No, 7 is not required. Construction is still recommended as a future, separate project.

**Alternative 4: Enhanced Natural System with Parallel Treatment**

Alternative 4 allows the natural system to handle 1.8 mgd during dry weather flows and up to 2.3 mgd during peak wet weather flows. The natural system includes the oxidation ponds and the treatment wetlands. Plant effluent between 2.3 mgd and 5.9 mgd would be sent to the parallel secondary treatment system (oxidation ditch). The two secondary effluents would be blended, sent to the new UV system and then discharged into the enhancement wetlands. The UV system would have a 9.8 mgd capacity. The enhancement wetland pump station would be replaced and would pump effluent from the enhancement wetlands to the Brackish Marsh (Outfall 003). Peak Influent flows greater than 5.9 mgd would be stored in Oxidation Ponds. If storage is at capacity, flows could be sent to the UV disinfection (up to 9.8 mgd) and discharged to Humboldt Bay (Outfall 001) as well as Outfall 003.

Specific improvements unique to Alternative 4 include:

- Reconstruct the primary clarifier with one rated for 2.3 mgd
- Install aerators in Oxidation Pond 2
- Construct oxidation ditches and secondary clarifiers that would handle flows between 2.3 and 5.9 mgd.
- Increase capacity of sludge digestion system and construct a sludge thickening system.
- Increase the pump capacity of the enhancement wetlands to 5.9 mgd.
- Construct the 9.8 mgd UV treatment system and use a single pass system where enhancement marsh (EM) waters are no longer brought back to the plant for disinfection for a second time

**Alternative Comparison**

The following section compares the above alternatives based on economics, construction and operation factors. Table 1 compares the cost of each alternative. Cost estimates include construction, engineering, legal, administrative, permitting costs and estimating contingencies. Cost estimates are not escalated for future years.

**Table 1: Cost comparison between each alternative. Costs are shown per million dollars**
### Table 2: Alternative comparison of non-economic criteria (adapted from 2017 Facility Plan)

<table>
<thead>
<tr>
<th>Alternatives</th>
<th>Meets Permit</th>
<th>Ease of O&amp;M</th>
<th>Constructability</th>
<th>Reliability</th>
<th>Ammonia Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Existing System Rehabilitation</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2. Existing System with Side-Stream Treatment</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3. Existing System Rehabilitation with Parallel Treatment</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>4. Enhanced Natural System with Parallel Treatment</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

- Alternative 1 was the least expensive alternative, however it received the lowest scores for meeting permit requirements, constructability, reliability and ammonia removal. The current facility has a limited BOD treatment capacity and relies on the chlorine disinfection system for additional BOD treatment. The new UV disinfection system required for all alternatives will reduce the BOD treatment capacity. Alternative 1 will rely only on the natural system for BOD removal. Improvements to the natural system will improve BOD treatment capacity. However, it will not be enough year round and with population growth. Alternative 1 will also not consistently meet ammonia and nitrogen limits.

Note: Costs do not include levee improvements

Table 2 compares the non-economic factors that the City deemed important when considering different alternatives. The City and consultants (LACO Associates and Carollo Engineers) determined the five criteria that were important for the project and ranked each project. A score of 1 is the least favorable, while a score of 4 is the most favorable.
Alternative 2 provides an additional secondary treatment system that will provide BOD treatment and meet ammonia and nitrogen limits. Alternative 2 is the second most expensive alternative and received low ranking regarding the non-economic criteria. The low ranking was due to Alternative 2 requiring the most project elements. This would increase the difficulty of operating and maintaining the treatment processes and facilities. Additionally, Alternative 2 still has limited capacities regarding the natural system and enhancement wetlands.

Alternative 3 constructs an additional secondary treatment system with a larger capacity than Alternative 2 because less treatment will occur in the natural system, Alternative 3 requires less construction and maintenance than Alternative 2. Alternative 3 was the highest scoring alternative for the non-economic criteria presented in Table 4.2. It achieved high rankings in reliability and ammonia removal due to the larger treatment capacity of the oxidation ditches compared to Alternative 2.

Alternative 4 was developed after the first three alternatives were presented to the Regional Water Quality Control Board. The RWQCB found that these three alternatives would not achieve the requirements of the permit. Alternatives 1, 2 and 3 did not provide the peak wet weather flow capacity (5.9 mgd) to pass through the Enhancement Wetlands. This is not in compliance with the Enclosed Bays and Estuaries Policy. Alternative 4 allows a peak pumped flow of 5.9 mgd at Outfall-003 to utilize the Enhancement Wetlands for additional treatment and meet the discharge requirements.

Selected Project
Alternative 4: Enhanced Natural System with Parallel Treatment was selected as the preferred alternative. Alternative 4 was preferred because it would have the best chance to meet treatment objectives in the 2019 NPDES permit year-round. This alternative is the most expensive and has the largest physical footprint. This alternative enables the City to meet new permit discharge requirements while continuing to promote the beneficial uses of the system for the future. The Proposed Project would undertake the necessary site improvements and would enable the City to comply with its NPDES requirements.

Step 4: Identify Potential Direct and Indirect Impacts of Associated with Floodplain Development.

The Proposed Project involves rehabilitation improvements to the existing wastewater treatment facility, which was intentionally built in close proximity to the Bay and surrounding wetlands, as the treatment system uses surrounding marshes and ponds for treatment of wastewater. The Proposed Project does not involve the creation or rehabilitation of existing housing units; there are no residential users in the Area of Potential Effect. The treatment facility is roughly 40 years old and in need of improvements to operate efficiently. Lands adjacent to Humboldt Bay are natural floodplains but have been diked to reduce flood risk to property. The project will not eliminate any floodplain and will not create a net rise in flood waters. As the site is pre-existing and contains no residential users, and the project includes facility upgrades to increase the site’s ability to withstand storm events, the project will not increase risk of loss of life.
Undertaking the project at the current treatment facility located per the current proposal will have minimum impacts to the floodplain because 1) the site is pre-existing and the new structures will be elevated a minimum of 2.0’ in the AE zone internal and the existing protective levee will be raised to a minimum of 14 feet NAVD in the VE zone surrounding the oxidation ponds, treatment plant and corporation yard. All other protective levees will be raised to a minimum of 12’ in the AE zone not subject to erosive waves; 2) the site is not a residential use and contains no residential users and loss of life will not be risked by locating new residential units or rehabilitating existing units in the floodplain; and 3) new construction will be undertaken within the footprint of the wastewater treatment plant core area, which is previously disturbed lands, and does not include wetlands areas; 4) all construction and rehabilitation will be undertaken in compliance with the City’s adopted Floodplain Ordinance to the satisfaction of the City’s Floodplain Administrator; and 5) the only permanently affected wetland area will be in the vicinity of the proposed Outfall 003, and are proposed to be replaced at a minimum 1:1 ratio. The area has experienced some flooding in the past but never above the proposed elevation.

**Impacts to Floodplain**

- The site’s pre-existing levee system will be augmented to further protect users. The additional elevation will also help to protect the financial investment of the proposed facility improvements. The treatment facility is currently partially protected by a newly repaired (2009 FEMA funded) rock armored levee (approx. 1.0 mile) constructed of native derived soils of elevation range 10.5’ to 14’ NAVD borrowed immediately from the bay side of the ringed facility. The levee separates the AE zone (Base Flood Elevation, 1% annual change of flooding) from the VE zone (Coastal High Hazard Area, 1% annual chance of flooding plus associated storm waves). The existing armored western facing dike adjacent to any VE zone will be raised to 14’ min. NAVD on top of the dike at a 1.5 to 1 max slope with an armored engineered fill soil prism to protect the dike and inner Facility from erosive storm driven wave action (4500 linear feet) and also an interior non armored crown dike encircling the facility’s core area (1775 linear feet). The remaining portions of dike (2200 linear feet) will be raised to 12’ min. NAVD for remaining dike areas along southeast and east sides of the Facility on the dike to meet the zone AE (BFE 10’ NAVD 88) requirements plus 2’ Safety factor. See Appendix A-Figure 2 for proposed levee augmentation.

- In addition to levee augmentation, the core Facility (6.5 acres) is equipped with a stormwater collection and pumping system. The system will be sized to accommodate the 100-year return event within the core facility and will be pumped into the to the City’s facility for treatment prior to discharge with the plant effluent. All work that is performed inboard of the levees surrounding the entire WWTP drain to the wastewater system.

- Impacts to the floodplain will also be limited due to construction occurring within the previously developed site. The project will have no net increase in flood water elevations in the floodplain.
• The City of Arcata is a member of the National Flood Insurance Program and structures located in the flood zone must comply with the local flood ordinance. The City of Arcata’s Flood Ordinance sets standards for the development and rehabilitation of structures in areas of special flood hazard, including Zones A and V. In general, the Ordinance prohibits encroachments, including fill, new construction, substantial improvements, and other development in areas of special flood hazard unless certification by a registered civil engineer is provided demonstrating that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

• HUD requires projects located in the floodplain to maintain flood insurance for the life of the property. The City maintains REMIF insurance for all City-owned facilities regardless of designated flood zone.

By elevating the buildings and minimizing impervious surfaces in and around the floodplain to the extent feasible, construction will have minimal effects on water resources. The City’s project engineer and floodplain administrator were consulted in order to design the building and the site plan in such a way that natural flood and erosion control, water quality, and groundwater recharge are preserved.

**Impacts to Wetlands**

In addition to concerns for life and property, the city considered the natural and beneficial values of the floodplain. The natural resources of the floodplain include water, biological, and societal resources. A Wetland Delineation and a Biological Assessment have been undertaken for the project.

• A delineation of potential jurisdictional waters and wetlands were conducted by qualified personnel on October 2–3, 8, and 17, 2019, and March 12, 2020. The delineation included any feature that could potentially meet the definition of a water protected under the Clean Water Act (and thus be subject to USACE-jurisdiction), the Porter Cologne Act (SWRCB [State]-jurisdiction), Section 1602 of Streambed Alteration Agreement (California Department of Fish and Wildlife [CDFW]-jurisdiction) and the California Coastal Commission/City of Arcata LCP (LCP-jurisdiction). LCP-jurisdiction includes one-parameter wetlands within the coastal zone.

• Per the Stillwater Sciences August 2020 Final Delineation of Waters and Wetlands, the Survey area contains 3.0 acres of potentially USACE-jurisdictional waters of the U.S., and 2.0 acres of potentially USACE-jurisdictional wetlands adjacent to these waters. Potentially jurisdictional waters of the U.S. are also considered to be waters of the State under State- and LCP-jurisdiction. In addition, there are 10.87 acres of wetlands that are only subject to State- and LCP-jurisdiction.

• The Proposed Project contains two elements that may result in permanent wetland impacts per Stillwater’s impacts assessment. This first element is the installation of a new effluent outfall pipe into the pre-existing Brackish Marsh. According to the delineation there are 0.23 acres of identified semi-permanently flooded palustrine...
persistent emergent wetland and seasonally saturated palustrine persistent emergent wetland in the vicinity of the new Outfall 003 location. The second element is treatment plant improvement activities near Treatment Marsh #4, which includes 0.08 acres of seasonally saturated/flooded palustrine broadleaved deciduous scrub-shrub wetlands. These wetland areas are subject to Section 404 of the Clean Water Act and thus under USACE-jurisdiction as well as State- and LCP-jurisdiction. It is not anticipated that the full 0.31 acre area will be permanently impacted. Stillwater’s impacts assessment predicts a permanently impacted area of 0.04 acres in total. Actual disturbance will not be calculable until project activities are underway, however, whatever areas in the vicinity of Treatment Marsh #4 or Outfall #003 are permanently impacted will be replaced on a minimum 1:1 basis.

- In terms of wetland impacts it is anticipated the construction of the buildings within the corporation yard and treatment plant area will have no quantifiable impact on nearby plant and animal life when conducted using standard City Best Management Practices. Impacts to wetlands and associated wildlife from the construction and use of proposed Outfall 003 and any other project elements identified by resource agency staff will be mitigated to a less than significant level through the Section 7 Consultation Process. Impacts to permanently impacted wetlands will be mitigated through a minimum 1:1 replacement of wetlands within the Area of Potential Effect at one of three potential locations as identified in Figure 1 in Appendix A. Temporary impacts to wetlands will be mitigated through onsite re-vegetation post-construction, as identified in the project’s mitigation monitoring and reporting program per the California Environmental Quality Act.

- Societal and aesthetic resources were also considered during the design process. Improvements to structures within the existing treatment plant will be shielded from public view by trees and shrubs. The Outfall 003 discharge pipe will be blended into the natural surroundings with native vegetation screening. The site will also maintain open space available to the public for recreational opportunities.

By mitigating for impacted wetlands at a minimum 1:1 ratio and entering into continued consultation with US Fish and Wildlife and the National Marine Fisheries Services through the formal Section 7 Consultation to be undertaken by the State Water Resources Control Board as Federal Lead for the overall project, construction will have minimal effects on wetlands and any associated wildlife that falls under the purview of associated federal regulatory agencies.

Step 5: Where practicable, design or modify the proposed action to minimize the potential adverse impacts to lives, property, and natural values within the floodplain and to restore, and preserve the values of the floodplain.

The proposed Action has been designed to minimize the potential adverse impacts to lives, property, and natural values within the floodplain, and to preserve the values of the floodplain.
**Preserving Lives and Preserving Property:** The project is limited to rehabilitation of an existing wastewater treatment facility. There are no residents onsite. No housing units are proposed to be constructed or rehabilitated through this project. Employees are briefed on the location of the flood hazard area and evacuation plans and all onsite staff undertake periodic safety trainings in accordance to the site’s adopted risk management plan. All new structures will be elevated to 14 feet NAVD above base flood elevation to protect both employees and the facility in case of flooding/tsunami. All construction will be elevated consistent with FEMA’s Lowest Floor Guide (http://www.fema.gov/pdf/nfip/manual200605/07lfg.pdf) and use flood resistant materials consistent with FEMA bulletins (https://www.fema.gov/media-library/assets/documents/2655?id=1580) and the requirements of the City’s Local Adopted Floodplain Ordinance. The City participates in the National Flood Insurance Program, and the treatment facility is insured under the City’s existing REMIF insurance, as are all City facilities, regardless of flood zone.

**Preserving Natural Values and Minimizing Impacts:** The site design chosen as outlined in Step 3 will have minimal floodplain impacts. By elevating the buildings, creating provisions for draining and stormwater reuse, retaining pervious surfaces throughout the treatment plant site, and compliance with State and federal stormwater regulations, construction will have minimal effects on water resources. All work that is performed inboard of the levees surrounding the entire WWTP drain to the wastewater system. Impacts to the floodplain will also be limited due to construction occurring within the previously developed site. US Fish and Wildlife and the National Marine Fisheries Service will also advise the City of Arcata on preservation of special-status vegetation and wildlife through the Section 7 consultation process which will be undertaken by the State Water Resources Control Board as part of the State Revolving Loan Funds process (an EPA program). Additionally, the City has implemented a policy of “no net loss” for all wetlands impacts though a restoration and compensatory mitigation program. The project also includes proposed energy conservation measures including replacing outdated bulbs and equipment with more energy efficient models, and adding additional solar panels to the roof of the drying beds to offset onsite energy use.

**Step 6: Reevaluate the Alternatives.**

Although the current treatment facility is in a floodplain, the treatment relies on proximity to the Bay and associated wetlands for secondary treatment, and the site’s upgrades include site armoring to minimize site risk. Additionally, steps were taken in order to minimize effects to floodplain values by ensuring permanently impacted wetlands are replaced on a minimum 1:1 basis.

As documented in Step 3, construction outside of the floodplain is not viable because the sites would not reuse the existing facility, and do not address the purpose and need of the project:

- The City’s primary objective is to provide wastewater treatment and disposal while improving existing levels of regulatory compliance for the protection of water quality and public health.
• The City seeks to address existing effluent violations and to produce a higher quality effluent that can be beneficially reused.
• The City seeks to operate the improved treatment facility with cost-effective methods available that meet the City’s overall system performance goals while improving the existing natural system and constructing a mechanical system to assure compliance with regulatory requirements.
• The City’s goal to minimize or eliminate disinfection byproducts associated with the use of chlorine and health hazards associated with the use and storage of large chlorine cylinders is another major project objective.
• The City seeks to move the existing outfall from the bay at Butcher Slough Outfall 001 to the “Brackish” Marsh Outfall 003 to maximize the volume of effluent receiving enhanced treatment and maximize the beneficial use of treated wastewater for habitat purposes. It is important to note that the “Brackish” Marsh was constructed from the City’s previous McDaniel Slough Restoration project, and will not contain brackish waters until Outfall 003 is installed to decrease the salinity of the waters, which are tidally influenced.

The no action alternative is also impractical because it will not satisfy the need to come into compliance with the State Water Board’s Time Schedule Order, will not improve effluent quality discharged into Humboldt Bay, and will not meet the requirements of the City’s most recently adopted NPDES permit.

It has been determined that it is infeasible to move the treatment facility to a different location, or to not undertake the proposed upgrades to the facility. Of the proposed alternatives to rehabilitate onsite, it was determined Alternative 4 was the only alternative that would allow the facility to remain in compliance with NPDES requirements year-round.

It is the City of Arcata’s determination that there is no practicable alternative for locating the project out of the flood zone. This is due to: 1) the need to continue to utilize the existing treatment facility; 2) the need to rehabilitate the facility to meet NPDES permit requirements; 3) the need to construct an economically feasible project; 4) the need to utilize the site’s existing permitting apparatus; and 5) the ability to mitigate and minimize impacts on human health, public property, and floodplain values. The project has been designed to minimize impacts to the floodplain and minimize property and human risk from exposure to the flood zone. All project improvements shall be required to adhere to the requirements of the City’s adopted Floodplain Ordinance, including anchoring and construction methods and practices to minimize flood damage, to the satisfaction of the City’s designated Floodplain Administrator. As a result of the proposed Action, the facility will be stronger and more resilient to wave damage.
Appendix A

Figures
Arcata Waste Water Treatment Plant Upgrade
Wetland Mitigation Areas

Site #1
1,260.2 sq. ft.

Site #2
1,346 sq. ft.
3,177.9 sq. ft.
Proposed AWTP Levee Augmentation
Attachment B

FIRM Panels and Area of Potential Effect (APE) Map
Stillwater Sciences

FINAL REPORT  ●  AUGUST 2020
Preliminary Delineation of Waters and Wetlands for the City of Arcata Wastewater Treatment Plant Improvement Project, California

PREPARED FOR
City of Arcata
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Arcata, CA 95521

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Suggested citation:

Cover photos: Wetland delineation Survey area, Arcata, California, Stillwater Sciences 2019 and 2020.
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Appendices
Appendix A. Wetland Delineation Datasheets
1 INTRODUCTION

1.1 Project Description and Proponent

The City of Arcata owns the wastewater collection, treatment, and disposal facilities that serve approximately 16,800 residents in the service area. The Arcata Wastewater Treatment Facility (AWTF) currently discharges treated wastewater to Humboldt Bay in conjunction with enhanced treatment wastewater to constructed freshwater marshes in the Arcata Marsh Wildlife Sanctuary (AMWS). These features collectively form the Arcata Wastewater Treatment Plant (WWTP).

The City of Arcata is proposing to replace a portion of existing Arcata WWTP infrastructure and upgrade several components as part of the Arcata WWTP Improvement Project (hereinafter, Project). The work will include installation of buried pipe for the flow reconfiguration of disinfected enhancement wetlands effluent, installing a discharge pipe into a constructed brackish marsh at the north end of the Arcata Bay section of Humboldt Bay (future outfall discharge point), relocation of the electrical equipment building in the AWTF to allow for improved road access for fire and emergency services (requiring installation of a new utility service line), and constructing a mitigation wetland area.

The Project proponent, City of Arcata, may be contacted at:

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1.2 Project Location and Survey area

The Project is located at 600 South G Street in Arcata, Humboldt County, California (Figure 1). The Survey area includes:

- Areas associated with the current and future Arcata WWTP including the southern edge of Gearheart enhancement marsh, the northern, eastern, and southern edges of Hauser enhancement marsh, the south east corner of Brackish Pond, and the adjacent levees, trails, and roadways within the AMWS;
- The AWTF including the levees surrounding various treatment marshes and oxidation ponds and the area northeast to South G Street;
- Multiple staging areas within paved and gravel parking lots; and
- A potential wetland mitigation area just south of Humboldt State University’s Samoa Facility (just east of Post Mile 8.00) to the northern edge of Western Pond.

These locations can be accessed from CA-255 (Samoa Boulevard) in Arcata, California by heading south on South I Street and South G Street (Figure 1). The potential wetland mitigation area can be accessed south of Post Mile 8.00 on CA-255 (Figure 1). The Survey area is in Section 34 of Township 6 North, Range 1 East of the Arcata North U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. Elevations range from 0 to 18 feet above mean sea level.
The entire Survey area is within the City of Arcata’s Coastal Zone governed by the City’s Local Coastal Program—LCP and Land Use and Development Guide (LUDG) General Plan (City of Arcata 2008). A portion of the potential mitigation area near Western Pond and a staging area along South I Street also fall within the appeal zone for the California Coastal Commission (CCC), where coastal development permits may be appealed to the CCC.

1.3 **Purpose of the Wetland Delineation**

The purpose of this delineation is to: (1) assess the geographic extent of water and wetland resources in the Survey area; (2) delineate any waters of the U.S., including wetlands, potentially subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) and/or Section 10 of the Rivers and Harbors Act of 1899; (3) delineate any additional waters of the State that may be subject to the jurisdiction of the State Water Resources Control Board (SWRCB), California Department of Fish and Wildlife (CDFW), and/or City of Arcata LCP/LUDG and CCC.

The wetland features in the Survey area are considered preliminary until verified by the San Francisco Regulatory Branch of the USACE. The USACE determines CWA jurisdiction of the wetland features in the Survey area. Previous correspondence between the USACE and the City of Arcata indicates that portions of the Arcata Wastewater Treatment Marsh are exempt from USACE-jurisdiction (City of Arcata 2010, Attachment 5). Per the April 21, 2020 final rule of the *Navigable Waters Protection Rule* (85 FR 22250), waste treatment systems, defined as “all components, including lagoons and treatment ponds (such as settling or cooling ponds), designed to either convey or retain, concentrate, settle, reduce, or remove pollutants, either actively or passively, from wastewater prior to discharge (or eliminating any such discharge),” are non-jurisdictional waters (i.e., not waters of the United States) (33 CFR 328). Furthermore, waters and features that are excluded in the final rule cannot be determined to be jurisdictional even when the water satisfies one or more of the conditions to be a jurisdictional water (e.g., lakes and ponds, and impoundments of jurisdictional waters). The final rule also notes that when an applicant receives a permit to impound a water of the United States in order to construct a waste treatment system (i.e., the permit received in 1956 for construction of the AWTF oxidation ponds and surrounding levees within the Humboldt Bay tidelands), the permitting agencies have affirmatively relinquished jurisdiction over the resulting waste treatment system as long as it is used for this permitted purpose.
Figure 1. Project location and waters/wetland delineation Survey area.
2 METHODS

2.1 Existing Conditions

Prior to the delineation, existing information on soils, hydrology, and precipitation in the Survey area was evaluated. Information on potential jurisdictional waters and wetlands was obtained from the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) online application, Wetlands Mapper (USFWS 2019) and the LCP Coastal Wetlands Map (City of Arcata 1989). Available data from the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) Web Soil Survey website were reviewed for the Survey area and nearby vicinity (NRCS 2019a). Mean high water shoreline data for Humboldt Bay (Northern Hydrology & Engineering 2014) were incorporated into Geographic Information Systems (GIS) and reviewed. Precipitation and climate records from the National Climatic Data Center (NCDC 2019 and 2020) were reviewed for nearby weather station Eureka Weather Forecast Office (WFO), Woodley Island, California.

2.2 Field Delineation

A delineation of potential jurisdictional waters and wetlands were conducted by qualified personnel on October 2–3, 8, and 17, 2019, March 12, 2020, and May 29, 2020 in accordance with the Corps of Engineers Wetlands Delineation Manual (1987 Manual, USACE 1987), Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (WMVC Supplement; USACE 2010), and USACE Regulatory Guidance Letter (RGL) No. 05-05 (USACE 2005). The delineation included any feature that could potentially meet the definition of a water protected under the Clean Water Act (and thus be subject to USACE-jurisdiction), the Porter Cologne Act (SWRCB [State]-jurisdiction), Section 1602 of Streambed Alteration Agreement (California Department of Fish and Wildlife [CDFW]-jurisdiction) and the City of Arcata LCP/LUDG (LCP-jurisdiction). LCP-jurisdiction includes one-parameter wetlands within the coastal zone and two-parameter wetlands within the City of Arcata. In addition, any wetland feature delineated within the Coastal Zone was reviewed for consistency against the LCP Coastal Wetland Map and the USFWS NWI map.

2.2.1 Waters determination

Under Section 404 of the CWA, the limits of USACE jurisdiction is defined at the High Tide Line (HTL) or Ordinary High Water Mark (OHWM). Under Section 10 of the Rivers and Harbors Act of 1899 for activities in navigable waters (i.e., Humboldt Bay) the limits of USACE jurisdiction is defined at Mean High Water (MHW). Furthermore, waters of the State include any surface water or groundwater, including saline waters, within the boundaries of the state (Porter-Cologne Act, Section 13050). All waters associated with the Arcata WWTP including Gearheart, Hauser, and Allen enhancement marshes and the AWTF treatment marshes and oxidation ponds (Figure 1) are exempt from USACE-jurisdiction per the final rule (33 CFR Part 328); however, they were delineated as waters of the State (State-jurisdiction).

The extent of waters in the Survey area were delineated by the location of the OHWM, HTL, and MHW. The OHWM is defined as the elevation established on the shore by water fluctuations, and is indicated by physical characteristics such as: (a) a clear, natural line impressed on the bank; (b) shelving; (c) changes in the character of soil; (d) destruction of terrestrial vegetation; (e) the presence of litter and debris; or (f) other appropriate means that consider the characteristics of the surrounding areas. The OHWM was identified in accordance with the USACE RGL 05-05.
33 CFR 328.3(d) defines the HTL as the line of intersection of the land with the water’s surface at the maximum height reached by a rising tide and may be determined, in the absence of actual data, by: (a) a line of oil or scum along shore objects; (b) a more or less continuous deposit of fine shell or debris on the foreshore or berm; (c) other physical markings or characteristics; (d) vegetation lines; or (e) tidal gages, or other suitable means that delineate the general height reached by a rising tide. The HTL encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm. The 2014 mean high water shoreline data for Humboldt Bay (Northern Hydrology & Engineering 2014) was used to delineate the extent of Section 10 waters.

Prior to the wetland delineation surveys, aerial photographs and topographic maps were reviewed to identify limits and connections of potential wetlands to traditional navigable waters (TNW) such as the Humboldt Bay. During the wetland delineation, waters in the Survey area were further reviewed for their connectivity to a TNW based on culvert connections and the existing drainage network. The OHWM and HTL of potentially jurisdictional waters were delineated in the field. Boundaries were mapped via a sub-meter Global Positioning System (GPS) unit (Trimble Geo 7x) and later post-processed, corrected, and incorporated into GIS where maps detailing the delineation results were generated.

2.2.2 Wetland determination

Wetlands were delineated in accordance with the 1987 Manual (USACE 1987) and WMVC Supplement (USACE 2010). The 1987 Manual and WMVC Supplement provide technical guidelines and methods for the three-parameter approach to determining the location and boundaries of USACE jurisdictional wetlands. This approach requires that an area must support positive indicators of hydrophytic vegetation, hydric soils, and wetland hydrology to be considered a jurisdictional wetland. A three-parameter wetland with a direct hydrological surface connection to a jurisdictional water in a typical year is considered an USACE jurisdictional wetland (i.e., adjacent wetlands). Connectivity of delineated wetlands to jurisdictional waters was evaluated in accordance with USACE RGL 07-01 (USACE 2007). As the Survey area is located within the Coastal Zone, all wetland features were also evaluated for potential LCP-jurisdiction which requires that only one or two of the three USACE wetland parameters (hydrophytic vegetation, hydric soils, and/or wetland hydrology) be present (1976 California Coastal Act, Public Resources Code Section 30000 et seq., City of Arcata 2008).

A total of 28 data points were sampled in potential USACE- and LCP-jurisdictional wetlands in the Survey area. If a data point met all three wetland parameters, it was considered an USACE wetland; if a point only met one or two wetland parameters, it was considered a LCP wetland; if a point met no wetland parameters, it was considered upland. Potential wetland areas were identified based on information generated from the pre-field review (e.g., the NWI Wetland Mapper results) and observations of hydrology and vegetation in the field. If a data point met all three parameters for a USACE jurisdictional wetland, then a paired data point was placed along the preliminary transition zone (the area in which a change from wetland to non-wetland conditions occurs) to determine the wetland/upland boundary. If a wetland was sampled and no adjacent uplands were identified within the Survey area, then a paired upland data point was not sampled. At each data point, a soil pit was dug and the following information was recorded using the USACE (2010) data forms:
1. **Vegetation**: Dominant plant species for each stratum (i.e., tree, sapling/shrub, herb, woody vine) by scientific name (genus and species) following the taxonomy the online Jepson eFlora (Jepson Flora Project 2019). Absolute percent cover and dominance were determined using the 50/20 rule outlined in the WMVC Supplement, and the wetland indicator status (OBL [obligate], FACW [facultative-wet], FAC [facultative], FACU [facultative-upland], and UPL [upland]) defined for the WMVC Region in the National Wetland Plant List: 2016 Wetland Ratings (Lichvar et al. 2016). Plant species not listed in the 2016 National Wetland Plant List were considered upland (UPL) species. A dominance test was performed to determine if the data point exhibited hydrophytic vegetation. If the dominance test was not conclusive and wetland hydrology and hydric soils were present, then the prevalence index was calculated.

2. **Hydrology**: Presence and depth of surface water, groundwater, and/or soil saturation were recorded. In addition, if primary (e.g., oxidized rhizospheres along living roots) and secondary indicators (e.g., drainage patterns, dry-season water table, saturation visible on aerial imagery) were observed, then they were also recorded at each data point.

3. **Soils**: Moistened soil matrix descriptions were recorded for each data point using the following: depth of the sample, color (as defined in Munsell soil color charts [Munsell Color 2000]), and texture. If present, redox features were then described by type (e.g., concentration, depletion, reduced matrix) and location (e.g., pore lining, root channel, or matrix). Hydric soils were determined using the WMVC Supplement primary indicators, such as sandy redox (S5). In addition, mapped soil units (described in Section 3.1.2) were considered and the current National List of Hydric Soils (NRCS 2019b) was consulted.

The location of each data point and wetland boundaries were recorded using a sub-meter accuracy GPS and photographs were taken of the representative site characteristics. All GPS data were post-processed, corrected, and incorporated into GIS. Mapped wetlands were classified according to the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979, Federal Geographic Data Committee [FCDC] 2013) based on the vegetation composition and structure at the data points.

### 3 RESULTS

#### 3.1 Historical Conditions

Historically, the Survey area was composed of Arcata Bay tidelands (i.e., tidal sloughs and marshes) (U.S. Coast Survey 1870). In the late 1800s, much of the Survey area was used for various industrial activities (e.g., wharf, railroad, timber transport) and later diked for agricultural purposes (i.e., farming and pasture) and nearby lumber mill operations. The WWTP enhancement marshes and AWTF oxidation ponds and treatment marshes were constructed between 1949–1983. Construction of the AWTF oxidation ponds and its surrounding levees within the tidelands of Humboldt Bay (approximately 70 acres) was authorized on May 17, 1956 by the USACE San Francisco District. Prior to the recent restoration associated with the McDaniel Slough Marsh Enhancement Project (City of Arcata 2013) and other mitigation efforts, a portion of the potential mitigation area near Western Pond was used for agricultural grazing. Brackish Pond, Western Pond, and North Pond were formerly grazed pasture prior to construction in 2007 and 2013.

The conversion of land and the historical industrial and agricultural land use in the Survey area has altered the natural vegetation, hydrology, and soils. Normal conditions have since established for much of the Survey area’s restored and undeveloped areas.
3.2 Existing Conditions

3.2.1 Hydrology

The Project is in the Mad River Lowland Subbasin of the Mad River Groundwater Basin. This basin includes the coastal floodplain from the Freshwater Fault north to the Mad River and is primarily composed of alluvium that is underlain by the Pleistocene Hookton Formation. This water-bearing formation consists of clay, sand, and gravel (CDWR 2004). The Hookton Formation is recharged by rainfall in the upland recharge areas east of Arcata (DWR 1973) in addition to lateral water movement into the alluvium from adjacent formations and some upward movement from leakage due to differences in head between the alluvium and underlying formations (Fuller 1975).

The Project is located within the Humboldt Bay Subwatershed (Hydrologic Unit Code [HUC] 12: 180101020601) of the Humboldt Bay-Frontal Pacific Ocean watershed in the North Coast Hydrologic Region and within the Jacoby Creek Watershed of the Eureka Plain Hydrologic Unit No. 110.00 (NRCWCB 2019). The Project is also within the Janes Creek and Jolly Giant Creek watersheds within the City of Arcata (City of Arcata 2016). The Survey area abuts Arcata Bay, the northernmost estuary of Humboldt Bay (a TNW). Arcata Bay occupies the low seaward end of several valleys which have been filled by floodplain and tidal flat deposits (Murray and Wunner 1988). The Project also includes Butcher Slough, a tributary to Arcata Bay (Figure 1).

The WWTP man-made freshwater enhancement marshes in the Survey area include Hauser Marsh, Gearheart Marsh, and Allen Marsh. Water associated with these enhancement marshes originates from the disinfection basins of the WWTP. This treated wastewater is eventually pumped back to the AWTF for final disinfection then discharged via an outfall pipe into the Arcata Bay section of Humboldt Bay. Additional man-made features in the Survey area include Brackish Pond, Western Pond, and North Pond (Figure 1). Brackish and Western ponds have direct connections (e.g., drainpipes with tidal flap, tide gate) to McDaniel Slough and eventually the Arcata Bay section of Humboldt Bay. The future outfall of treated AWTF effluent will discharge into Brackish Pond. The North Pond does not have a surface water connection to adjacent water bodies (Figure 1). The roadside ditch along South G Street near the AWTF has surface water connection to a tributary to Butcher Slough (Figure 1). Additional man-made waters adjacent to the Survey area include Klopp Lake and the AWTF oxidation ponds and treatment marshes. At these locations, the proposed Project construction occurs within the upland constructed levees above the mean high, high water and the normal water surface elevation of the AWTF oxidation ponds and treatment marshes.

The NWI Wetlands Mapper includes various palustrine and estuarine wetlands the Survey area (Figure 2). These features largely correlate with the LCP Coastal Wetlands Map and the field delineation results (Section 3.3).
Figure 2. National Wetlands Inventory map of the Survey area (Source: USFWS 2020).
3.2.2 Soil units

Soil units in the Survey area included Occidental, 0–2% slopes; Hydraquents-Wassents mucky silt loam, strongly saline, 0–3% slopes, very frequently flooded; and Urban land-Anthraltic Xerorthents association, 0–2% slopes (Figure 3). The NRCS soil survey mapped the AMWS and AWTF oxidation ponds and treatment marshes as water and no mapped soil unit was described within these limits (Figure 3). Prior to the current setting (i.e., AMWS, AWTF, McDaniel Slough Restoration), this region was composed of bay tidelands that were eventually diked and used for various industrial and agricultural purposes. As such, soils at these locations are disturbed and contain dredge spoils and nonnative fill material.

Occidental (0 to 2% slopes) is found in areas with elevations that range from 0 to 30 feet above mean sea level and with a mean annual precipitation of 35–80 inches, a mean annual air temperature of 50–55°C, and a frost-free period of 275–330 days (NRCS 2019a). The Occidental series is primarily located along the backslope of salt marshes. A typical profile consists of peat in the upper 0–3 inches (Oi horizon) with silty clay loam forming all other horizons below. It has a drainage class of very poorly drained with a depth to water table and redoximorphic features ranging from 0–4 inches (NRCS 2017, 2019a). It frequently ponds and is occasionally flooded with a slightly saline to strong saline profile. Occidental series is listed as a hydric soil in the region (NRCS 2019a) with an aquic soil regime (NRCS 2017). The water table from August through November is typically ≥35 inches (NRCS 2017) however ranges from 0–35 inches depth in December–July. The Project’s potential mitigation site near the McDaniel Slough and one staging area on the South I Street were located within this mapped soil unit.

Hydraquents-Wassents mucky silt loam, strongly saline, 0–3% slopes, very frequently flooded, is composed of 50% Hydraquents, low tidal and similar soils, 40% Wassents, and 10% minor components. It is found from 0 to 10 feet above mean sea level with a mean annual precipitation of 35–80 inches, a mean annual air temperature of 50–55°C, and a frost-free period of 275–365 days (NRCS 2019a). Hydraquents, low tidal is located on tidal flats with a parent material of mucky, silty, and clayey estuarine deposits and a slope of 0–3%. A typical profile consists entirely (0–59 inches) of mucky silty clay loam. It has a drainage class of very poorly drained, a depth to water table of 0 inches, is very frequently flooded, and strongly saline (NRCS 2019a). Hydraquents, low tidal is listed as a hydric soil in the region. The Wassents series shares Hydraquents properties and qualities except for its typical profile has mucky silt loam in the upper 6 inches, has a slope of 0–1%, and a subaqueous drainage class. Wassents is also listed as a hydric soil in the region. Minor components of this map unit include the Hydraquents, high tidal (5%) and marine waters (5%) (NRCS 2019a). The Arcata Bay section of Humboldt Bay is mapped as this soil unit type.

Urban land-Anthraltic Xerorthents association (0 to 2% slopes) is composed of 80% urban land, industrial and 20% anthraltic xerorthents and similar soils. This association is found from 0 to 10 feet above mean sea level with a mean annual precipitation of 41–43 inches, a mean annual air temperature of 50–55°C, and a frost-free period of 275–330 days (NRCS 2019a). Anthraltic Xerorthents is located on backslopes of fluviomarine terraces with a parent material of coarse-loamy fluviomarine deposit or coarse-loamy dredge spoils. A typical profile consists of gravelly loamy fine sand within the upper 0–6 inches with sandy loam, gravelly sand, and sand forming the horizons below. It has a drainage class of moderately well drained (NRCS 2019a). The AWTF and levees adjacent to the Arcata Bay section of Humboldt Bay as well as the industrial areas along South G Street are included in this mapped soil unit.
Figure 3. Mapped soil units in the Survey area.
Palustrine wetland data points closely resembled the hydric soil Occidental series (NRCS 2019a) with matrix colors ranging from 10YR (value of 2–4 and chroma of 1–2), 5Y 4/1, and 2.5Y (value of 2.5 and 5 and chroma of 1–2) (Appendix A). Data points commonly contained clay loam, silty clay, silty loam, silty clay loam and sandy loam. Soil samples were considered hydric when a positive primary indicator, such as redox depressions, depleted matrix, or loamy gleyed matrix was identified (data points W2–W7 in Appendix A). Estuarine wetland data point W1 confirmed the mapped hydric soil Wassents mucky silt loam (Appendix A). The soil matrix profile was 2.5Y and Gley 1 and confirmed hydric soils with hydrogen sulfide (A4) and loamy gleyed matrix (F2) (Appendix A). Estuarine wetland data point W8 contained a soil profile composed of sandy clay with significant redox features and closely resembled the mapped soil unit Anthraltic Xerorthents (Appendix A).

3.2.3 Vegetation

In undeveloped and restored areas, native vegetation is predominant. Vegetation communities documented in the Survey area include coastal scrub, riparian scrub, riparian forest, coastal and introduced grasslands, north coast salt marsh, and freshwater and brackish marshes. Stands of nonnative and landscaped vegetation were mostly observed along developed areas in the Survey area (e.g., roadside corridors, areas surrounding parking areas, and graveled low-use areas).

3.2.4 Precipitation

Local climate conditions are moist, cool, and influenced by the conditions of the Pacific Ocean, with wet cool winters and cool summers with frequent fog and strong winds. Rainfall occurs primarily between October through May, with mean annual rainfall ranging from 40–49 inches (based on the 1981–2010 period of record monthly normal [normal] for nearby Eureka WFO weather station) (NCDC 2019). The average monthly temperature range is approximately 46–49º F in winter and 54–59º F in the summer (NCDC 2019).

The Eureka WFO weather station recorded twice the normal monthly precipitation in September 2019 (i.e., 1.92 inches recorded in September 2019). The majority of which (i.e., 1.05 inches) was derived from a rain event two weeks preceding the initial field delineation in October 2019. No features from this precipitation event (i.e., ponding, high-water table, upper soil surface saturation) were observed, which indicated sufficient time had elapsed to drain shallow subsurface storm flow; as such, conditions were considered typical for the early October field delineation. Overall, the cumulative precipitation recorded for October 2019 (i.e., 1.51 inches) was below the normal average of 2.87 inches indicating conditions were drier for the month. However, the United States (U.S.) Drought Monitor did not indicate abnormally dry or drought conditions for Humboldt County in October 2019 (National Drought Mitigation Center 2019). Weather conditions during the October 2019 delineation varied from sunny and clear to scattered clouds with a high of 61–64º F, which was warmer than the Eureka WFO weather station normal average temperature of 54.4º F for October (NCDC 2019).

In March 2020, the Eureka WFO weather station recorded a total of 3.7 inches precipitation, less than the monthly normal (5.3 inches in March) (NCDC 2020). Low precipitation was recorded prior to the March 12, 2020 wetland delineation (0.1 inches accumulated since March 1) and the U.S. Drought Monitor indicated abnormally dry conditions for the region (National Drought Mitigation Center 2020). Weather conditions during the March 12, 2020 delineation varied from sunny and clear to scattered clouds with a high of 61–64º F, which was warmer than the Eureka WFO weather station normal average temperature of 54.4º F for October (NCDC 2019).
The slightly drier and/or warmer conditions during the October 2019 and March 2020 wetland delineations are unlikely to have influenced the delineation results as wetland features remained evident regardless of precipitation and temperature throughout the Survey area.

Prior to the May 29, 2020 delineation, the Eureka WFO weather station recorded above normal precipitation for the month (<2 inches above normal). All recorded precipitation occurred between May 2 and May 18. Consequently, any temporarily saturated and/or ponded features from this period had sufficient time to drain prior to the May wetland delineation. As a result, the earlier precipitation events were not likely to have influenced delineation results.

### 3.3 Preliminary Jurisdictional Waters and Wetlands

The Survey area contains 3 acres of potentially USACE-jurisdictional waters of the U.S. and 2 acres of potentially USACE-jurisdictional wetlands adjacent to these waters (Table 1, Figures 4 through 7 and 14, Appendix A). The potentially jurisdictional waters of the U.S. are also considered to be waters of the State under State- and LCP-jurisdiction. In addition, there are 10.87 acres of wetlands that are only subject to State- and LCP-jurisdiction (Table 1; Figures 4 through 9, 11, 13, and 14; Appendix A).

<table>
<thead>
<tr>
<th>Description</th>
<th>Acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Waters</strong></td>
<td></td>
</tr>
<tr>
<td>Arcata Bay (Humboldt Bay) (W-1)</td>
<td>0.3</td>
</tr>
<tr>
<td>Brackish Pond (W-2)</td>
<td>0.1</td>
</tr>
<tr>
<td>Western Pond (W-3)</td>
<td>1.8</td>
</tr>
<tr>
<td>North Pond (W-4)</td>
<td>0.7</td>
</tr>
<tr>
<td>Roadside Ditch (W-5)</td>
<td>&lt;0.1 (0.04)</td>
</tr>
<tr>
<td>Tributary to Butcher Slough (W-6)</td>
<td>&lt;0.1 (0.01)</td>
</tr>
<tr>
<td>Arcata WWTP enhancement marshes (SW-01 and SW-02)</td>
<td>0.6</td>
</tr>
<tr>
<td>AWTF oxidation ponds and treatment marshes (SW-03 through SW-11)</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>Wetlands</strong></td>
<td></td>
</tr>
<tr>
<td>Seasonally saturated palustrine persistent emergent wetlands (SS-01 through SS-05)</td>
<td>0.7</td>
</tr>
<tr>
<td>Seasonally flooded palustrine persistent emergent wetlands (SF-01)</td>
<td>0.4</td>
</tr>
<tr>
<td>Semipermanently flooded palustrine persistent emergent wetlands (SP-01)</td>
<td>&lt;0.1 (0.06)</td>
</tr>
<tr>
<td>Seasonally saturated/flooded palustrine broadleaved deciduous scrub-shrub wetlands (BL-01 and BL-04)</td>
<td>0.6</td>
</tr>
<tr>
<td>Estuarine regularly flooded persistent emergent wetlands (EP-01 and EP-02)</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Additional LCP-jurisdictional wetlands</strong></td>
<td></td>
</tr>
<tr>
<td>One-parameter wetlands within the City of Arcata Coastal Zone (OP-01)</td>
<td>1.5</td>
</tr>
<tr>
<td>One-parameter riparian within the City of Arcata Coastal Zone (R-01 through R-14)</td>
<td>0.8</td>
</tr>
<tr>
<td>Two-parameter wetlands within the City of Arcata Coastal Zone (TP-01 through TP-13)</td>
<td>5.0</td>
</tr>
</tbody>
</table>

1 Subject to Section 404 of the CWA thus under USACE-jurisdiction as well as State- and LCP-jurisdiction.
2 Subject to Section 10 of the Rivers and Harbors Act and USACE-jurisdictional
3 Subject to State- and LCP-jurisdiction
4 The constructed freshwater WWTP enhancement ponds in the Survey area were not considered USACE-jurisdictional waters and are described in Section 3.2.1.2.
Figure 4. Preliminary jurisdictional waters and wetlands in the Survey area.
Figure 5. Preliminary jurisdictional waters and wetlands in the Survey area.
Figure 6. Preliminary jurisdictional waters and wetlands in the Survey area.
Figure 7. Preliminary jurisdictional waters and wetlands in the Survey area.
Figure 8. Preliminary jurisdictional waters and wetlands in the Survey area.
Figure 9. Preliminary jurisdictional waters and wetlands in the Survey area.
Figure 10. Preliminary jurisdictional waters and wetlands in the Survey area.
Figure 11. Preliminary jurisdictional waters and wetlands in the Survey area.
Figure 12. Preliminary jurisdictional waters and wetlands in the Survey area.
Figure 13. Preliminary jurisdictional waters and wetlands in the Survey area.
Figure 14. Preliminary jurisdictional waters and wetlands in the Survey area.
3.3.1 Waters

The Survey area includes 3.0 acres of potential USACE-jurisdictional waters subject to Section 10 and/or Section 404 of the CWA (W-1 through W-6) as well as an additional 3.6 acres of non-federal waters of the State (SW-01 and SW-11) (Table 1, Figures 4, 6–9, 11, and 14).

3.3.1.1 Waters of the U.S.

Tidal waters of the Arcata Bay section of Humboldt Bay are the Navigable Waters of the U.S. documented in the Survey area (W-1, Figure 6). Humboldt Bay includes the Port of Humboldt Bay, a protected deep-water port with harbor facilities designed to serve cargo and other vessels, and a number of marinas that serve hundreds of small to mid-size boats and pleasure crafts (Humboldt Bay Harbor, Recreation, and Conservation District 2019). Furthermore, commercial oyster production operations that produce more than half of all oysters farmed in California are located in Humboldt Bay (Pomeroy et al. 2010).

Navigable Waters of the U.S. in the Survey Area (W-1) were categorized by the MHW (Sections 10 and 404 waters) and the ground-truthed HTL (Section 404 waters) (Figure 6, Table 1). HTL indicators were a line of scum and wracking debris along the shore, as well as the transition of vegetated and unvegetated habitat (i.e., the boundary between open mudflat and north coast salt marsh). In cases where that HTL included north coast salt marsh habitat the HTL was adjusted to the lower extent of this habitat. The north coast salt marsh habitat was categorized as estuarine wetlands and is described in Section 3.2.2. The upland levee crest boundaries surrounding the man-made Klopp Lake were delineated and indicated on Figures 6, 10, and 11.

Other Waters of the U.S. in the Survey area totaled 2.7 acres and included the nontidal waters Western Pond, Brackish Pond, North Pond, and a roadside ditch along South G Street that connects to a tributary to Butcher Slough (W-2 through W-6, respectively; all Section 404 waters) (Table 1, Figures 4, 6, 7, and 14). Both Western Pond and Brackish Pond are excavated ponds that are separated from the adjacent tidal waters of McDaniel Slough and eventually the Arcata Bay section of Humboldt Bay by a constructed eco-levee. Water is exchanged between these water bodies through drainpipes and a tide gate in the eco-levee. North Pond (W-4) is manmade pond with no direct surface connection to nearby waterbodies. Future construction may connect this water to the Arcata Bay. The perennial roadside ditch along South G Street, W-5, connects to a tributary to Butcher Slough (W-6) and eventually the Arcata Bay (Figures 6 and 7). At all four locations, the OHWM was identified in the field by a change in slope, lack of vegetation, and/or change in vegetation.

3.3.1.2 Waters of the State and LCP-jurisdictional waters

In addition to all potential USACE-jurisdictional waters described in Section 3.3.1.1, non-federal waters of the State totaled 3.6 acres in the Survey area and included the Arcata WWTP enhancement marshes (SW-01 and SW-02) and AWTF oxidation ponds and treatment marshes (SW-03 through SW-11) (Table 1, Figures 4, 7–9, and 11). These waters are also potential LCP-jurisdictional waters.

Hauser, Gearheart, and Allen enhancement marshes in or adjacent to the Survey area function as enhancement marshes that treat wastewater within the Arcata WWTP. Waters associated with these ponds eventually feedback into the AWTF prior to the receiving waters of the Arcata Bay. These marshes were composed of a mixture of open water and herbaceous emergent vegetation (i.e., *Typha latifolia* [broad-leaved cattail], *Schoenoplectus acutus* var. *occidentalis* [common
tule). The primary OHWM indicators at these locations included a break in slope and changes in vegetation. Upland vegetation bordered the southern and eastern ends of Hauser Marsh (SW-02) and was best characterized by data point U6 (Appendix A, Figure 6). Vegetation was composed of *Pinus radiata* (Monterey pine, UPL) with an understory of nonnative grasses and forbs. This feature lacked both wetland hydrology and hydric soils.

The AWTF treatment marshes and oxidation ponds are bound by constructed upland levees. The upland levee crests were included in the Survey area. If any riparian vegetation was noted along the levee crest then the riparian canopy edge was delineated as the upland boundary (Figures 7 through 9).

### 3.3.2 Wetlands

There is a total of 2.0 acres of potential USACE-jurisdictional wetlands and an additional 7.2 acres of LCP-jurisdictional wetlands in the Survey area (Table 1; Figures 4–7, 11, 13, and 14; Appendix A).

Wetland types within the Survey area include both nontidal (i.e., palustrine seasonally saturated/flooded or semi-permanently flooded persistent emergent wetlands and palustrine seasonally saturated broadleaved deciduous scrub-shrub wetlands), and tidal (i.e., estuarine regularly flooded persistent emergent wetlands). FGDC (2013) defines the palustrine system as all nontidal wetlands dominated by trees, shrubs, persistent emergent plants, emergent mosses or lichens (i.e., non-vascular) and all similar wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per thousand. Estuarine system is defined as consisting of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. Emergent wetlands are characterized by erect, rooted herbaceous hydrophytes, excluding mosses and lichens, that are the tallest life form, have at least 30% areal coverage, and are present for most of the growing season in most years (FGDC 2013). Broadleaved deciduous scrub-shrub wetlands are characterized by woody plants of this leaf type that are less than 20 feet tall and are the dominant life form with at least 30% areal coverage (FGDC 2013).

In general, due to landscape position and historic land modification, delineated wetlands did not always border a vegetated upland and a wetland data point was not paired. All constructed features (e.g., paved and graveled roads, trails) in the Survey area were delineated as upland.

#### 3.3.2.1 USACE-jurisdictional wetlands

**Palustrine emergent wetlands**

There are five seasonally saturated palustrine emergent wetlands (0.7 ac), one semi-permanently flooded palustrine emergent wetland (<0.1 ac), and one seasonally flooded palustrine emergent wetland (0.4 ac) in the Survey area (Table 1).

**Seasonally saturated wetlands**

Three seasonally saturated wetlands were located in low gradient depressions between developed trails and South I Street near Gearheart Marsh (SS-01, SS-02, and SS-05, Figure 4). At these locations, vegetation varied from mixed facultative forbs and grasses (SS-01, SS-02) to a dense patch of *Carex obnupta* (slough sedge, OBL; SS-05). Data point W3 characterizes these palustrine emergent wetlands. Dominant vegetation at this location included *Symphyotrichum chilense* (common Pacific aster, FAC), *Juncus effusus* (soft rush, FACW), and *Agrostis capillaris*.
(colonial bent, FAC); application of the dominance test using the “50/20 rule” confirmed hydrophytic vegetation was present. The soil profile consisted of clay loam that contained prominent redox concentrations (2–10%) within the upper 15 inches of the soil profile and confirmed the primary hydric soil indicator as redox depressions (F8). Wetland hydrology was established from the presence of oxidized rhizospheres along living roots (C3) (Appendix A). The paired upland data point S2 characterized a two-parameter wetland (TP-01) which lacked hydrophytic vegetation (Figure 4). Dominant upland vegetation at data point S2 included *Convulvulus arvensis* (bindweed, NL/UPL) and *Rubus ursinus* (California blackberry, UPL) (Appendix A).

Another seasonally saturated emergent wetland (SS-03) was located along a vegetated berm adjacent to Brackish Pond (W-2) (Figure 4). Wetland SS-03 is composed of a mixture of facultative plants (e.g., common Pacific aster, *Dipsacus fullonum* [wild teasel], and *Conium maculatum* [poison hemlock]) and upland coastal scrub species (*Baccharis pilularis* [coyote brush]). These facultative species tend to occur in disturbed and, at least periodic, saturated soils in the North Coast region. Some gravel fill was noted within the upper four inches and below 10 inches of the soil profile, however an intact soil horizon was observed within the sample (4–10 inches) and the primary hydric soil indicator of depleted matrix (F3) was confirmed (data point W5, Appendix A). The presence of this hydric soil indicated enough time had elapsed since the 2007 ground disturbance from the creation of Brackish Pond and the area was saturated for long enough period to develop redoximorphic features. Wetland hydrology was established from the presence of the primary indicator, oxidized rhizospheres along living roots (C3) (Appendix A). The upland boundary at this location was delineated by the parking and developed areas along South I Street as well as developed trails (Figure 4).

Seasonal-saturated wetland SS-04 was adjacent to Western Pond (W-3) near a potential mitigation area (Figure 4). Dominant hydrophytic vegetation included *Salix* spp. saplings (various willows, FAC and FACW), *Deschampsia cespitosa* (tufted hair grass, FACW), *Festuca arundinacea* (tall fescue, FAC), and colonial bent. Redoximorphic features within the upper 12 inches of the soil sample confirmed the hydric soil indicator redox dark surface (F6) and the presence of oxidized rhizospheres along living roots confirmed wetland hydrology at this location (Appendix A). Upland boundaries were defined by one- and two-parameter wetlands: OP-01, TP-07, TP-09 and TP-10 (Figure 14).

**Semi-permanently flooded wetlands**

A semi-permanently flooded wetland (SP-01) was delineated along the levee toeslope immediately adjacent to Brackish Pond (W-2) (Figure 4). Hydrophytic plant species at this location included common Pacific aster, *Atriplex prostrata* (fat-hen, FAC), *Potentilla anserina* subsp. *pacific* (Pacific silverweed, OBL), and tufted hair grass. Overstory canopy included *Sequoia sempervirens* (coast redwood, NL/UPL) (data point W6, Appendix A). The soil profile consisted of silty clay loam that contained greater than 60% gleyed matrix and confirmed the primary hydric soil indicator as loamy gleyed matrix (F2). Wetland hydrology was established from the presence of a high-water table five inches from the soil surface with saturation extending to the surface of the soil pit (Appendix A). Wetland SP-01 was bordered by upland developed areas and the wetland SS-03 (Figure 4).

**Seasonally flooded wetlands**

The feature known as “No Name Pond” in the AMWS was previously delineated in 2010. This feature was classified as a seasonally flooded wetland (SF-01) during the May 2020 delineation. Review of aerial imagery over the last three decades indicate that most of the open water area in this wetland has since filled in with dense emergent vegetation. Vegetation was primarily
composed of *Typha latifolia* (broadleaved cattail). The northern extent of SF-01 is bound by the Humboldt Bay Trail and the easterly extent is bound by a segment of the AMWS trial network (Figure 6). *Rubus armeniacus* [Himalayan blackberry, FAC] along with other coastal scrub species (i.e., coyote brush, twinberry, California blackberry) form a dense upland thicket along the shoulder and backslope of the adjacent levee/trail prisms.

**Palustrine broadleaved deciduous scrub-shrub wetlands**

Palustrine broadleaved deciduous scrub-shrub wetlands, BL-01 through BL-04, totaled 0.6 acre in the Survey area. BL-01 was located along the seasonally saturated shoulder and backslope of the Hauser Marsh levee along South I Street Road (Figure 4). BL-02 extended along the west side of the Humboldt Bay Trail near the AWTF (Figure 7). BL-03 and BL-04 were just south of the Humboldt Bay Trail segment between AWTF and South I Street (Figure 5).

Canopy within wetland BL-01 included *Salix lasiolepis* (arroyo willow, FACW) and Sitka willow. Herbaceous understory species included nonnative facultative plants common to disturbed sites (i.e., *Trifolium repens* [white clover], *Lotus corniculatus* [bird’s-foot trefoil], colonial bent, and *Festuca perennis* [rye grass, FAC]). Hydric soils were determined by the primary indicator depleted matrix and oxidized rhizospheres along living roots confirmed wetland hydrology (data point W4, Appendix A). No paired upland point was identified rather the upland region was delineated by the developed areas of South I Street (Figure 4).

Wetlands BL-02 and BL-03 were previously delineated in 2010 for the Humboldt Bay Trail (North) Project (see Wetland 12 and 14 in Winzler & Kelly 2010). Wetlands BL-02 through BL-04 receive seasonal runoff from the adjacent areas (i.e., trails, roadsides, and hillslope) and were primarily composed of woody vegetation (i.e., arroyo willow, *Morella californica* [wax myrtle, FACW], *Rubus ursinus* [California blackberry, FACU], Himalayan blackberry). As such, these features were typed as palustrine seasonally flooded broadleaved deciduous scrub-shrub wetlands during the 2020 delineations (Figures 5 and 7).

Wetland BL-04 is east of SS-05 and Hauser Marsh within a topographic low depression. It is composed of mostly arroyo willow, Himalayan blackberry, and slough sedge (Figure 5).
Estuarine persistent emergent wetlands

Estuarine persistent emergent wetlands (EP-01 and EP-02) in the Survey area contained north coast salt marsh habitat. Wetland EP-01 is regularly flooded by Arcata Bay tidal waters (W-01) (Figure 6). Hydrophytic salt marsh species observed within this wetland included *Salicornia pacifica* (common pickleweed, OBL), *Distichlis spicata* (salt grass, FACW), *Triglochin maritima* (common arrow-grass, OBL), *Jaumea carnosa* (marsh jaumea, OBL), *Spartina densiflora* (dense-flowered cord grass, OBL), fat-hen, tufted hair grass, and *Limonium californicum* (western marsh-rosemary, OBL) (data point W1, Appendix A). Anaerobic soils (e.g., hydrogen sulfide odor) along with other primary indicators (e.g., loamy gleyed matrix and a high-water table) confirmed hydric soils and wetland hydrology at data point W1 (Appendix A). This wetland is bordered by coastal scrub uplands (UPL-02, data point U1) composed of coyote brush, *Helminthotheca echioides* (bristly ox-tongue, FAC), *Rubus armeniacus* (Himalayan blackberry, FAC), California blackberry, poison hemlock, radish, common Pacific aster, and rye grass and one-parameter riparian habitat (R-01 and R-02) (Figure 6, Appendix A).

EP-02 was identified along the west side of the Humboldt Bay Trail (North) and connects to palustrine wetland BL-02 (Figure 7). This feature was located at the upper extent of the HTL and abuts Arcata Bay to the southeast (Figures 1 and 7). EP-02 is composed of north coast salt marsh species, characterized by data point W8 (Figure 7). Hydrophytic vegetation included high cover from tufted hair grass (Appendix A). The soil profile consisted of a matrix 2.5Y4/2–5/2 with high redox concentrations (30%) and depletions (5–15%) and confirmed the hydric soil indicator sandy redox (S5). A high water table was observed at 9.5 inches below the surface. Surrounding uplands, UPL-05, lacked hydric soils and wetland hydrology. Upland vegetation included *Dactylis glomerata* (orchard grass, FACU), *Anthoxanthum odoratum* (sweet vernal grass, FAC), and coyote brush (UPL). An additional upland data point (U5) was collected within the nearby vegetated areas of AWTF (Figure 7). No wetland parameters were observed at this location (Appendix A).

3.3.2.2 LCP-jurisdictional wetlands

In addition to all potential USACE-jurisdictional waters and adjacent wetlands described in Sections 3.2.1 and 3.2.2, an additional 6.9 acres of potential LCP-jurisdictional wetlands were identified in the Survey area (Table 1, Figures 4–7, 11, 13, and 14). Boundaries for these wetlands were delineated from data points with one or two positive primary wetland parameters located within the Coastal Zone. Table 2 provides the acreage of each delineated feature in the Survey area.
Table 2. Preliminary LCP-jurisdictional wetlands in the Survey area.

<table>
<thead>
<tr>
<th>Description</th>
<th>Acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Two-parameter wetlands</strong></td>
<td></td>
</tr>
<tr>
<td>TP-01</td>
<td>0.03</td>
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<td>TP-13</td>
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<td><strong>One-parameter wetlands</strong></td>
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<td>R-01</td>
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<tr>
<td><strong>Overall</strong></td>
<td>7.24</td>
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</table>

Two-parameter wetlands (TP-01 and TP-02) between South I Street and Gearheart Marsh lacked hydrophytic vegetation; however, both hydric soils and hydrology were observed (Figure 4). Dominant upland plant species included bindweed and California blackberry. This upland plant composition is likely due to the slightly higher topographic position of these features. TP-11 through TP-13 were similarly positioned along upper shoulder and crest of surrounding levees of Hauser Marsh and No Name Pond and mostly composed of California blackberry with some shrubs of Himalayan blackberry, red elderberry, twinberry, willow, and coyote brush (Figure 11). Additional two-parameter wetlands TP-03 through TP-06 were located in patches along a managed (i.e., mowed) vegetated area between Gearheart and Allen marshes (Figure 4). These wetlands were located along the lower end of the adjacent trail prism and all but TP-03 contained dominant hydrophytic vegetation comprised primarily by *Scirpus microcarpus* (small-fruited bulrush, OBL) with a mixture of facultative and upland species common to disturbed sites (i.e., rye grass, *Raphanus sativus* [radish, NL/UPL], Himalayan blackberry) (Appendix A). A small stand of *Picea sitchensis* (Sitka spruce, FAC) formed TP-03. These two-parameter wetlands were best characterized by data point S4 (Appendix A). Hydrophytic vegetation was dominant and wetland hydrology was confirmed by a high water table at 11.5 inch depth from surface, while
hydric soils were lacking. The upland boundary for these wetlands were delineated by parking and managed areas along South I Street and developed trails as well as by vegetated uplands (UPL-03) characterized by upland data point U2 (Figure 4). At this upland data point, vegetation was dominated by upland ruderal plant species including *Daucus carota* (wild carrot, FACU), rye grass, and radish; both hydric soil and wetland hydrology were lacking (Appendix A).

One- and two-parameter wetlands located at the potential mitigation area near Western Pond did not have wetland hydrology indicators within the sampled soil pits, indicating the water table and saturation were generally below 16 inches in depth but at or near the land surface for a duration sufficient to promote the formation of hydric soils (TP-07–TP-10) and/or to support the growth of hydrophytes (TP-07–TP-10, OP-01) (Appendix A, Figure 14). These wetlands are characterized by vegetation communities commonly associated with seasonally wet conditions including tall fescue meadows (TP-07), *Juncus lescurii* (San Francisco rush, FACW) swales (TP-08), and various aged willow stands (TP-10 [<5 years] and TP-09 [<10 years]). These vegetation communities are common to brackish marshes and low-gradient areas with some tidal influence. Data point S10 best characterizes TP-07 and TP-08 wetlands; data point S9 describes TP-09 and TP-10 (Appendix A). Uplands were delineated where the upland scrub species (e.g., California blackberry) (UPL-02 had established dominant cover and hydric soils and hydrology were lacking (data point U3, Appendix A; Figure 14).

One-parameter riparian wetlands in the Survey area include R-01 through R-13. Wetlands R-01 and R-02 were positioned along the crest and upper slopes of the AWTF levee along Butcher Slough and Arcata Bay (W-1) (Figure 6). Vegetation was primarily hydrophytic tree and shrub species including *Alnus rubra* (red alder, FACW), *Pinus contorta* subsp. *contorta* (shore pine, FAC), wax myrtle, and *Salix* spp. (various willows). The one-parameter riparian wetlands R-01 and R-02 were bound by uplands UPL-01 and UPL-02, which were often managed (i.e., mowed) and composed of upland ruderal herbaceous forbs and grasses (Figure 6, Appendix A). The riparian canopy that extended beyond the narrow drainages near the Humboldt Bay Trail (North) and South G street formed the one-parameter riparian wetlands R-03 and R-04 (Figure 7). The riparian canopy overhang from Allen Marsh was captured in R-14 which abutted the upland AMWS trail network (Figure 4).

The staging area on the northern end of South I Street contains several patches of one-parameter riparian wetlands composed of willow scrub (e.g., arroyo and shining willow) (R-05 through R-13, Figure 13). This staging area is primarily upland developed habitat containing graveled and paved roads as well as large vegetated mounds/spoil piles (Figure 13). Data point S11 best characterizes the one-parameter riparian wetlands observed at this location (Appendix A). Hydrophytic vegetation was dominant while both hydric soils and wetland hydrology were lacking. Other vegetated areas in this staging area were composed of upland ruderal herbaceous species (UPL-07; data point U6, Appendix A). Dominant vegetation at these locations included nonnative *Bromus hordeaceus* (soft chess, FACU), *Plantago lanceolata* (English plantain, FACU), and wild teasel (Appendix A).

### 3.3.3 Upland developed

Four staging areas were assessed during the March 12, 2020 wetland delineation. Except for the staging area along the northern end of South I Street (Figure 13), these features were paved and/or graveled areas with frequent use by the public (e.g., vehicle parking, access) and lacked wetland hydrology, hydrophytic vegetation and hydric soils (Figures 6, 11, and 12). In general, all paved and graveled areas in the Survey area were delineated as upland developed habitat. Data points U6 and U7 characterize the adjacent vegetated upland habitat for the two staging areas.
along South I Street (Figures 11 and 13, Appendix A). These features contain upland grassland and coastal scrub species and Monterey pine. The adjacent vegetated habitats of the two staging areas along South G Street were not assessed as the Project activities will not extend beyond the paved/graveled features (Figures 6 and 12). All active trail networks and levee crests in the Survey area were delineated as upland developed habitat (Figures 4 through 11).

4 REFERENCES


City of Arcata. 2010. Request for Jurisdictional Determination regarding non-waters of the United States; or alternatively, application for waste treatment exemption for existing Arcata Wastewater Treatment ponds/marshes and wetlands.


USACE (U.S. Army Corps of Engineers). 1956. Office of the District Engineer permit to construct levees to provide a sewage oxidation pond in Humboldt Bay, California. 17 May 1956, to City of Arcata, California from San Francisco District, California, USACE.


Winzler & Kelly. 2010. Wetlands delineation and habitat mapping Rail-With-Trail Connectivity Project, City of Arcata Humboldt County, California. Prepared for K. Diemer, Environmental Services Department, City of Arcata, by Winzler & Kelly, Eureka, California.
Appendix A

Wetland Delineation Datasheets
**Project/Site:** City of Arcata WWTP Improvement  
**City/County:** Arcata/ Humboldt  
**Sampling Date:** 10/2/2019  
**Applicant/Owner:** City of Arcata  
**State:** CA  
**Sampling Point:** W1

**Investigator(s):** Emmalen Craydon/Emily King Teraoka  
**Section, Township, Range:** CA T6N (R1E)  
**Landform (hillslope, terrace, etc.):** tidal marsh; toe slope along levee  
**Local relief (concave, convex, none):** none  
**Slope (%):** 0-2  
**Subregion (LRR):** LRRA  
**Lat:** See EP-01 wetland; data point W1 in map  
**Long:**  
**Datum:** WGS 84

**Soil Map Unit Name:** Hydraquents - wassents mucky silt loam  
**NWI classification:** E2AB3M

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

**Are Vegetation, Soil, or Hydrology significantly disturbed?** Are “Normal Circumstances” present? Yes [ ] No [x]  
(If needed, explain any answers in Remarks.)

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

- **Hydrophytic Vegetation Present?** Yes [x] No [ ]
- **Hydric Soil Present?** Yes [x] No [ ]
- **Wetland Hydrology Present?** Yes [x] No [ ]
- **Is the Sampled Area within a Wetland?** Yes [x] No [ ]

**Remarks:**

All three wetland parameters are present in the sampled area. Sampled location is within salt marsh along Arcata Bay and is within the Coastal Zone.

**VEGETATION – Use scientific names of plants.**

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 2m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
<th>Dominance Test worksheet:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td>Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td>Total Number of Dominant Species Across All Strata: 2 (B)</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td>Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td>Prevalence Index worksheet:</td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td>Total % Cover of: Multiply by:</td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td>OBL species x 1 =</td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td>FACW species x 2 =</td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
<td></td>
<td>FAC species x 3 =</td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td></td>
<td></td>
<td>FACU species x 4 =</td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td></td>
<td></td>
<td>UPL species x 5 =</td>
</tr>
<tr>
<td>11.</td>
<td></td>
<td></td>
<td></td>
<td>Column Totals: (A) (B)</td>
</tr>
<tr>
<td>Woody Vine Stratum (Plot size: 1m²)</td>
<td>98 = Total Cover</td>
<td></td>
<td></td>
<td>Prevalence Index = B/A =</td>
</tr>
</tbody>
</table>

**Hydrophytic Vegetation Indicators:**

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0¹
- [ ] 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- [ ] 5 - Wetland Non-Vascular Plants¹
- [ ] Problematic Hydrophytic Vegetation¹ (Explain)

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

**Hydrophytic Vegetation Present?** Yes [x] No [ ]

**Remarks:**

Dominant vegetation is composed of hydrophytic salt marsh species. Additional species include Distichlis spicata and Limonium californicum.
**Profile Description:** (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>(inches)</td>
<td>Color (moist)</td>
<td>% Color (moist)</td>
<td>% Type</td>
<td>Loc²</td>
</tr>
<tr>
<td>0-6</td>
<td>2.5Y 3/1</td>
<td>100</td>
<td></td>
<td>mucky silt loam</td>
</tr>
<tr>
<td>6-14</td>
<td>GLEY 14/N</td>
<td>100</td>
<td></td>
<td>mucky silt loam</td>
</tr>
</tbody>
</table>

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)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) (except MLRA 1)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Restrictive Layer (if present):**

- Type: 
- Depth (inches): 14

**Hydric Soil Present?** Yes X No ___

**Remarks:**

Gleyed matrix colors confirmed hydric soil indicator loamy gleyed matrix. (Gravel/fill associated with adjacent levee) Confirmed Wassents - (Hydric soil)

**HYDROLOGY**

**Wetland Hydrology Indicators:**

- Primary Indicators (minimum of one required; check all that apply)
  - Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Surface Soil Cracks (B6)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparsely Vegetated Concave Surface (B8)

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

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

**Field Observations:**

- Surface Water Present? Yes X No ___ Depth (inches):
- Water Table Present? Yes X No ___ Depth (inches): 6” from surface (includes capillary fringe)
- Saturation Present? Yes X No ___ Depth (inches): 6” to surface

**Wetland Hydrology Present?** Yes X No ___

**Remarks:**

Multiple primary and secondary indications of wetland hydrology present.
Project/Site: City of Arcata WWTP Improvement
City/County: Arcata/ Humboldt
Applicant/Owner: City of Arcata
State: CA
Investigator(s): Emmalien Craydon/Emily King Teraoka
Section, Township, Range: CA T6N (R1E)
Sampling Date: 10/8/2019
Sampling Point: W2

Landform (hillslope, terrace, etc.): depression, diked former bay tidelands
Local relief (concave, convex, none): concave
Slope (%): 0
Subregion (LRR): LRRA
Lat: see SS-01 wetland, data point W2 in map
Long: Datum: WGS 84

Soil Map Unit Name: Water
NWI classification: no listing

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:
All three wetland parameters are present in the sampled area. Sampled location is within the Coastal Zone.

VEGETATION – Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 2m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
<th>Dominance Test worksheet:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bromus carinatus</td>
<td>20</td>
<td>YES</td>
<td>NL/UPL</td>
<td>Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)</td>
</tr>
<tr>
<td>2. Holcus lanatus</td>
<td>20</td>
<td>YES</td>
<td>FAC</td>
<td>Total Number of Dominant Species Across All Strata: 4 (B)</td>
</tr>
<tr>
<td>3. Symphyotrichum chilense</td>
<td>15</td>
<td>YES</td>
<td>FAC</td>
<td>Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)</td>
</tr>
<tr>
<td>4. Sonchus asper</td>
<td>5</td>
<td>NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Equisetum arvense</td>
<td>10</td>
<td>NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8.</td>
<td></td>
<td></td>
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<tr>
<td>9.</td>
<td></td>
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<tr>
<td>10.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woody Vine Stratum (Plot size: 2m²)</td>
<td>70</td>
<td></td>
<td>Total Cover</td>
<td></td>
</tr>
<tr>
<td>1. Rubus armeniacus</td>
<td>10</td>
<td>YES</td>
<td>FAC</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>10</td>
<td>YES</td>
<td>FAC</td>
<td></td>
</tr>
</tbody>
</table>

% Bare Ground in Herb Stratum 20

Remarks:
Dominant vegetation is primarily composed of facultative species and the dominance test passed for hydrophytic vegetation. Vegetation is routinely mowed, location between S. I Street and trail in the Arcata Marsh Wildlife Sanctuary.
### SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color (moist)</td>
<td>%</td>
<td>Color (moist)</td>
</tr>
<tr>
<td>0-8</td>
<td>2.5Y 5/2</td>
<td>98</td>
<td>10YR 5/8</td>
</tr>
<tr>
<td>8-15</td>
<td>5Y 4/1</td>
<td>90</td>
<td>7.5 YR 4/6</td>
</tr>
</tbody>
</table>

**Type:** C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

**Restrictive Layer (if present):**

- **Type:** ______________
- **Depth (inches):** ______________

**Hydric Soil Present?** Yes **X** No **____**

**Remarks:**

Located within a low depression, and redoximorphic features present in soil profiled confirming hydric soil indicator redox depressions.

### HYDROLOGY

**Wetland Hydrology Indicators:**

- **Primary Indicators (minimum of one required; check all that apply):**
  - Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Surface Soil Cracks (B6)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparsely Vegetated Concave Surface (B8)

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

**Field Observations:**

- **Surface Water Present?** Yes **X** No **____** Depth (inches): ____________
- **Water Table Present?** Yes **X** No **____** Depth (inches): ____________
- **Saturation Present?** Yes **X** No **____** Depth (inches): ____________

**Wetland Hydrology Present?** Yes **X** No **____**

**Remarks:**

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial)

No high water table or saturation present at location however primary wetland hydrology indicator oxidized rhizospheres along living roots was evident.
WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Arcata WWTP Improvement  City/County: Arcata/ Humboldt  Sampling Date: 10/8/2019
Applicant/Owner: City of Arcata  State: CA  Sampling Point: W3
Investigator(s): Emmalien Craydon/Emily King Teraoka  Section, Township, Range: CA T6N (R1E)
Landform (hillslope, terrace, etc.): depression, diked former bay tidelands  Local relief (concave, convex, none): concave
Subregion (LRR): LRRA  Lat: see SS-02 wetland; data point W3 in map  Long:  Datum: WGS 84
Soil Map Unit Name: WATER  NWI classification: no listing

Are climatic / hydrologic conditions on the site typical for this time of year?  Yes X  No  (If no, explain in Remarks.)
Are Vegetation some, Soil , or Hydrology significantly disturbed? Are “Normal Circumstances” present?  Yes X  No
Are Vegetation , Soil , or Hydrology naturally problematic?  (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?  Yes X  No
Hydric Soil Present?  Yes X  No
Wetland Hydrology Present?  Yes X  No

Is the Sampled Area within a Wetland?  Yes X  No

Remarks:
All three wetland parameters are present in the sampled area. Sampled location is within the Coastal Zone.

VEGETATION – Use scientific names of plants.

### Tree Stratum (Plot size: 3m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>% Cover</th>
<th>Dominant Indicator</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Absolute % Cover:  Dominant Species? | Indicator Status

### Sapling/Shrub Stratum (Plot size: 3m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>% Cover</th>
<th>Dominant Indicator</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>0 = Total Cover</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Herb Stratum (Plot size: 3m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>% Cover</th>
<th>Dominant Indicator</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Achillea millefolium</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Rumex crispus</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Symphyotrichum chilense</td>
<td>60 YES FAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Ranunculus repens</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Cyperus eragrostis</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Juncus effusus</td>
<td>15 YES FACW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Oenanthe sarmentosa</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Agrostis capillaris</td>
<td>15 YES FAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Holcus lanatus</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Sonchus oleraceus</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>0 = Total Cover</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Woody Vine Stratum (Plot size: 3m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>% Cover</th>
<th>Dominant Indicator</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>125 = Total Cover</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

% Bare Ground in Herb Stratum: 0

Remarks:
Dominant vegetation is primarily composed of facultative species and the dominance test passed for hydrophytic vegetation. Vegetation is routinely mowed, location between S. I Street and trail in the Arcata Marsh Wildlife Sanctuary.
## SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color (moist)</td>
<td>%</td>
</tr>
<tr>
<td>0-8</td>
<td>2.5Y 5/2</td>
<td>98</td>
</tr>
<tr>
<td>8-15</td>
<td>5Y 4/1</td>
<td>90</td>
</tr>
</tbody>
</table>

1. Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

<table>
<thead>
<tr>
<th>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Histosol (A1)</td>
</tr>
<tr>
<td>Black Histic (A3)</td>
</tr>
<tr>
<td>Hydrogen Sulfide (A4)</td>
</tr>
<tr>
<td>Depleted Below Dark Surface (A11)</td>
</tr>
<tr>
<td>Thick Dark Surface (A12)</td>
</tr>
<tr>
<td>Sandy Mucky Mineral (S1)</td>
</tr>
<tr>
<td>Sandy Gleyed Matrix (S4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicators for Problematic Hydric Soils:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 cm Muck (A10)</td>
</tr>
<tr>
<td>Red Parent Material (TF2)</td>
</tr>
<tr>
<td>Very Shallow Dark Surface (TF12)</td>
</tr>
<tr>
<td>Other (Explain in Remarks)</td>
</tr>
</tbody>
</table>

**Restrictive Layer (if present):**

<table>
<thead>
<tr>
<th>Type:</th>
<th>Depth (inches):</th>
<th>Hydric Soil Present?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

**Remarks:**

Located within a low depression, and redoximorphic features present in soil profiled confirming hydric soil indicator redox depressions.

## HYDROLOGY

**Wetland Hydrology Indicators:**

<table>
<thead>
<tr>
<th>Primary Indicators (minimum of one required; check all that apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water (A1)</td>
</tr>
<tr>
<td>High Water Table (A2)</td>
</tr>
<tr>
<td>Saturation (A3)</td>
</tr>
<tr>
<td>Water Marks (B1)</td>
</tr>
<tr>
<td>Sediment Deposits (B2)</td>
</tr>
<tr>
<td>Drift Deposits (B3)</td>
</tr>
<tr>
<td>Algal Mat or Crust (B4)</td>
</tr>
<tr>
<td>Iron Deposits (B5)</td>
</tr>
<tr>
<td>Surface Soil Cracks (B6)</td>
</tr>
<tr>
<td>Inundation Visible on Aerial Imagery (B7)</td>
</tr>
<tr>
<td>Sparingly Vegetated Concave Surface (B8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Indicators (2 or more required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)</td>
</tr>
<tr>
<td>Salt Crust (B11)</td>
</tr>
<tr>
<td>Aquatic Invertebrates (B13)</td>
</tr>
<tr>
<td>Hydrogen Sulfide Odor (C1)</td>
</tr>
<tr>
<td>Oxidized Rhizospheres along Living Roots (C3)</td>
</tr>
<tr>
<td>Presence of Reduced Iron (C4)</td>
</tr>
<tr>
<td>Recent Iron Reduction in Tilled Soils (C6)</td>
</tr>
<tr>
<td>Stunted or Stressed Plants (D1) (LRR A)</td>
</tr>
<tr>
<td>Other (Explain in Remarks)</td>
</tr>
</tbody>
</table>

**Field Observations:**

| Surface Water Present? | Yes | No | Depth (inches): | |
|------------------------|-----|----|-----------------||
| Water Table Present?   | Yes | No | Depth (inches): |
| Saturation Present?    | Yes | No | Depth (inches): |

<table>
<thead>
<tr>
<th>Wetland Hydrology Present?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

**Remarks:**

No high water table or saturation present at location however primary wetland hydrology indicator oxidized rhizospheres along living roots was evident.
WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Arcata WWTP Improvement  City/County: Arcata/ Humboldt  Sampling Date: 10/8/2019
Applicant/Owner: City of Arcata  State: CA  Sampling Point: W4
Investigator(s): Emmalien Craydon/Emily King Teraoka  Section, Township, Range: CA T6N (R1E)
Landform (hillslope, terrace, etc.): Vegetated levee (former bay tidelands, diked)  Local relief (concave, convex, none): none
Subregion (LRR): LRRA  Lat: See BL-01 wetland; data point W4 in maps  Long: See GPS WPT 130  Datum: WGS 84
Soil Map Unit Name: Water  NWI classification: no listing

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.

<table>
<thead>
<tr>
<th>Hydrophytic Vegetation Present?</th>
<th>Yes ☒ No ☐</th>
<th>Is the Sampled Area within a Wetland?</th>
<th>Yes ☒ No ☐</th>
</tr>
</thead>
</table>

Remarks:

All three wetland parameters are present in the sampled area. Sampled location is within the Coastal Zone. Area located between South I Street and Arcata WWTP Gearheart treatment marsh.

VEGETATION – Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 3m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salix lasiolepis</td>
<td>80</td>
<td>Yes</td>
<td>FACW</td>
</tr>
<tr>
<td>2. Salix (sitchensis)</td>
<td>20</td>
<td>Yes</td>
<td>FACW</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sapling/Shrub Stratum (Plot size: 3m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Herb Stratum (Plot size: 3m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trifolium repens</td>
<td>20</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>2. Lotus corniculatus</td>
<td>20</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>3. Agrostis capillaris</td>
<td>25</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>4. Festuca perennis</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Symphyotrichum chilense</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Juncus effusus</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Woody Vine Stratum (Plot size: 3m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rubus armeniacus</td>
<td>15</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>2.</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Bare Ground in Herb Stratum</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Remarks:                             |                   |                   |                 |
|                                      | Dominant midstory canopy composed of fac-wet willow species; herbaceous vegetation is primarily composed of facultative species and the dominance test passed for hydrophytic vegetation. Regular vegetation management (mowing) immediately adjacent to S. I Street |
### SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Color (moist)</th>
<th>%</th>
<th>Color (moist)</th>
<th>%</th>
<th>Type</th>
<th>Loc</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>10YR 4/2</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-15</td>
<td>10YR 4/1</td>
<td>10</td>
<td>10YR 6/1</td>
<td>50</td>
<td>D</td>
<td>M</td>
<td>silty clay loam</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.5YR 5/8</td>
<td>40</td>
<td></td>
<td></td>
<td>C</td>
<td>PL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Histosol (A1)</td>
<td></td>
</tr>
<tr>
<td>Histic Epipedon (A2)</td>
<td></td>
</tr>
<tr>
<td>Black Histic (A3)</td>
<td></td>
</tr>
<tr>
<td>Hydrogen Sulfide (A4)</td>
<td></td>
</tr>
<tr>
<td>Depleted Below Dark Surface (A11)</td>
<td>✔</td>
</tr>
<tr>
<td>Thick Dark Surface (A12)</td>
<td></td>
</tr>
<tr>
<td>Sandy Mucky Mineral (S1)</td>
<td></td>
</tr>
<tr>
<td>Sandy Gleyed Matrix (S4)</td>
<td>✔</td>
</tr>
</tbody>
</table>

#### Hydric Soil Indicators for Problematic Hydric Soils:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 cm Muck (A10)</td>
<td></td>
</tr>
<tr>
<td>Red Parent Material (TF2)</td>
<td></td>
</tr>
<tr>
<td>Very Shallow Dark Surface (TF12)</td>
<td></td>
</tr>
<tr>
<td>Other (Explain in Remarks)</td>
<td></td>
</tr>
</tbody>
</table>

#### Restrictive Layer (if present):

<table>
<thead>
<tr>
<th>Type</th>
<th>Depth (inches)</th>
<th>Remarks</th>
</tr>
</thead>
</table>

#### Hydric Soil Present? Yes ☒ No X

#### Remarks:

Soil profile contains a depleted matrix with redox concentrations.

### HYDROLOGY

#### Wetland Hydrology Indicators:

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

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water (A1)</td>
<td></td>
</tr>
<tr>
<td>High Water Table (A2)</td>
<td></td>
</tr>
<tr>
<td>Saturation (A3)</td>
<td></td>
</tr>
<tr>
<td>Water Marks (B1)</td>
<td></td>
</tr>
<tr>
<td>Sediment Deposits (B2)</td>
<td></td>
</tr>
<tr>
<td>Drift Deposits (B3)</td>
<td>✔</td>
</tr>
<tr>
<td>Algal Mat or Crust (B4)</td>
<td></td>
</tr>
<tr>
<td>Iron Deposits (B5)</td>
<td></td>
</tr>
<tr>
<td>Surface Soil Cracks (B6)</td>
<td></td>
</tr>
<tr>
<td>Inundation Visible on Aerial Imagery (B7)</td>
<td></td>
</tr>
<tr>
<td>Sparsely Vegetated Concave Surface (B8)</td>
<td></td>
</tr>
</tbody>
</table>

**Secondary Indicators (2 or more required):**

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

#### Field Observations:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water Present?</td>
<td>Yes ☒ No X Depth (inches):</td>
</tr>
<tr>
<td>Water Table Present?</td>
<td>Yes ☒ No X Depth (inches):</td>
</tr>
<tr>
<td>Saturation Present?</td>
<td>Yes ☒ No X Depth (inches):</td>
</tr>
</tbody>
</table>

#### Wetland Hydrology Present? Yes ☒ No X

#### Remarks:

No high water table or saturation present at location however primary wetland hydrology indicator oxidized rhizospheres along living roots was evident.

---

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial)
**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

**Project/Site:** City of Arcata WWTP Improvement  
**City/County:** Arcata/ Humboldt  
**Applicant/Owner:** City of Arcata  
**State:** CA  
**Sampling Date:** 10/3/2019  
**Investigator(s):** Emmalien Craydon/Emily King Teraoka  
**Landform (hillslope, terrace, etc.):** Vegetated levee berm (Former bay tidelands, diked)  
**Local relief (concave, convex, none):** flat/berm  
**Sampling Point:** W5

---

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

- **Hydrophytic Vegetation Present?** Yes X No  
- **Hydric Soil Present?** Yes X No  
- **Wetland Hydrology Present?** Yes X No

**Dominance Test worksheet:**  
- Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)  
- Total Number of Dominant Species Across All Strata: 3 (B)  
- Percent of Dominant Species That Are OBL, FAC, or FAC: 67 (A/B)

**Prevalence Index worksheet:**  
- Total % Cover of: OBL species x 1 =  
- FACW species x 2 =  
- FAC species x 3 =  
- FACU species x 4 =  
- UPL species x 5 =  
- Column Totals: (A) (B)  
- Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation  
- 2 - Dominance Test is >50%  
- 3 - Prevalence Index is ≤3.0  
- 4 - Morphological Adaptations' (Provide supporting data in Remarks or on a separate sheet)  
- 5 - Wetland Non-Vascular Plants'  
- Problematic Hydrophytic Vegetation' (Explain)

---

**Remarks:**

Dominant vegetation is primarily composed of facultative species and the dominance test passed for hydrophytic vegetation.

---

**VEGETATION – Use scientific names of plants.**

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 4 m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
<th>Dominance Test worksheet:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Baccharis pilularis</td>
<td>35</td>
<td>Yes</td>
<td>UPL</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 = Total Cover</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Sapling/Shrub Stratum (Plot size: 4 m²) | |  |
|---------------------------------------|-------------------|---|---|---|
| 1. | Symphyotrichum chilense | 40 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 = Total Cover | |

| Herb Stratum (Plot size: 4 m²) | |  |
|---------------------------------|-------------------|---|---|---|
| 1. | Rubus armeniacus | 45 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 0 = Total Cover | |

| Woody Vine Stratum (Plot size: 4 m²) | |  |
|-------------------------------------|-------------------|---|---|---|

| Remarks: | |  |
|-------------------------------|-------------------|---|---|---|

---

OtherDominant vegetation is primarily composed of facultative species and the dominance test passed for hydrophytic vegetation.
SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color (moist)</td>
<td>%</td>
</tr>
<tr>
<td>0-4</td>
<td>10YR 2/1</td>
<td>100</td>
</tr>
<tr>
<td>4-8</td>
<td>10YR 4/1</td>
<td>90</td>
</tr>
</tbody>
</table>

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

Indicators for Problematic Hydric Soils:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

Restrictive Layer (if present):

Type: base-fill
Depth (inches): 8

Hydric Soil Present? Yes X No

Remarks:

Disturbed area; fill observed within the soil sample however band of intact soil layer with redox concentrations in a depleted matrix

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

- Surface Water Present? Yes X No
- Water Table Present? Yes X No
- Saturation Present? Yes X No

Wetland Hydrology Present? Yes X No

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

Formerly bay tidal area (U.S. Coast Survey 1870); then diked and land had modified use (pasture/industrial)

Remarks:

No high water table or saturation present at location however primary wetland hydrology indicator oxidized rhizospheres along living roots was evident.
WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Arcata WWTP Improvement
City/County: Arcata/ Humboldt
Sampling Date: 10/3/2019
Applicant/Owner: City of Arcata
State: CA
Sampling Point: W6
Investigator(s): Emmalien Craydon/Emily King Teraoka
Section, Township, Range: CA T6N (R1E)

Landform (hillslope, terrace, etc.): toeslope of levee; fringe to Brackish Pond
Local relief (concave, convex, none): concave-flat
Slope (%): 0-1
Subregion (LRR): LRRA
Lat: See SP-01 wetland, data point W6 in map
Long: Datum: WGS 84

Soil Map Unit Name: Water
NWI classification: PEM1B

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [ ] No [X] (If no, explain in Remarks.)
Are Vegetation [X], Soil [X], or Hydrology [X] significantly disturbed? Are “Normal Circumstances” present? Yes [X] No [ ]
Are Vegetation [X], Soil [X], or Hydrology [X] naturally problematic? (If needed, explain any answers in Remarks.)

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

<table>
<thead>
<tr>
<th>Hydrophytic Vegetation Present?</th>
<th>Yes [X] No [ ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydric Soil Present?</td>
<td>Yes [X] No [ ]</td>
</tr>
<tr>
<td>Wetland Hydrology Present?</td>
<td>Yes [X] No [ ]</td>
</tr>
<tr>
<td>Is the Sampled Area within a Wetland?</td>
<td>Yes [X] No [ ]</td>
</tr>
</tbody>
</table>

Remarks:
All three wetland parameters are present in the sampled area. Immediately adjacent to Brackish Pond. Sampled location is within the Coastal Zone.

VEGETATION – Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 4 m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sequoia semperviresens</td>
<td>45</td>
<td>Yes</td>
<td>NL/UPL</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
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<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sapling/Shrub Stratum (Plot size: 4 m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>45 = Total Cover</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Herb Stratum (Plot size: 4 m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Symphyotrichum chilense</td>
</tr>
<tr>
<td>2. Atriplex prostrata</td>
</tr>
<tr>
<td>3. Polypogon monspiliensis</td>
</tr>
<tr>
<td>4. Potentilla anserina</td>
</tr>
<tr>
<td>5. Triglochin maritima</td>
</tr>
<tr>
<td>6. Deschampsia cespitosa</td>
</tr>
<tr>
<td>7.</td>
</tr>
<tr>
<td>8.</td>
</tr>
<tr>
<td>9.</td>
</tr>
<tr>
<td>10.</td>
</tr>
<tr>
<td>11.</td>
</tr>
<tr>
<td>0 = Total Cover</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Woody Vine Stratum (Plot size: 4 m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>110 = Total Cover</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Bare Ground in Herb Stratum</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
</tr>
</tbody>
</table>

Remarks:
Dominant vegetation is primarily composed of facultative species and the dominance test passed for hydrophytic vegetation.

Dominant Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

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

Hydrophytic Vegetation Indicators:
1. Rapid Test for Hydrophytic Vegetation
2. Dominance Test is >50%
3. Prevalence Index is ≤3.0
4. Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
5. Wetland Non-Vascular Plants¹
Problematic Hydrophytic Vegetation¹ (Explain)

Hydrophytic Vegetation Present? Yes [X] No [ ]
Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color (moist)</td>
<td>%</td>
</tr>
<tr>
<td>0-4</td>
<td>10YR 3/1</td>
<td>100</td>
</tr>
<tr>
<td>4-11</td>
<td>GLEY 1.2.5/N</td>
<td>50</td>
</tr>
</tbody>
</table>

1 Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

Soil profile contains a gleyed matrix and confirmed hydric soil indicator loamy gleyed matrix.

HYDROLOGY

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

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (LRR A)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Soil profile contains a gleyed matrix and confirmed hydric soil indicator loamy gleyed matrix.

A high water table and saturation present throughout the entire soil pit and wetland hydrology was confirmed at this location.
WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Arcata WWTP Improvement
City/County: Arcata/ Humboldt
Sampling Date: 10/2/2019
Applicant/Owner: City of Arcata
State: CA
Sampling Point: W7
Investigator(s): Emmalien Craydon/Emily King Teraoka
Section, Township, Range: CA T6N (R1E)
Landform (hillslope, terrace, etc.): Fringe of excavated pond
Local relief (concave, convex, none): concave edge
Slope (%): 1
Subregion (LRR): LRR
Lat: See wetland SS-04; data point W7
Long: Datum: WGS 84
Soil Map Unit Name: Occidental, 0 to 2 percent slopes
NWI classification: PEM1D

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:
All three wetland parameters are present in the sampled area. Sampled location is within the Coastal Zone. Adjacent to Western Pond.

VEGETATION – Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 4m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = Total Cover</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sapling/Shrub Stratum (Plot size: 4m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salix (sitchensis)</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>0 = Total Cover</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Herb Stratum (Plot size: 2m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Deschampsia cespitosa</td>
</tr>
<tr>
<td>2. Festuca arundinacea</td>
</tr>
<tr>
<td>3. Helminthotheca echinoides</td>
</tr>
<tr>
<td>4. Agrostis capillaris</td>
</tr>
<tr>
<td>5. Achillea millefolium</td>
</tr>
<tr>
<td>6. Plantago lanceolata</td>
</tr>
<tr>
<td>7. Leontodon saxatilis</td>
</tr>
<tr>
<td>8. Potentilla anserina</td>
</tr>
<tr>
<td>9. Daucus carota</td>
</tr>
<tr>
<td>10. Juncus effusus</td>
</tr>
<tr>
<td>11. Lotus corniculatus</td>
</tr>
<tr>
<td>119 = Total Cover</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Woody Vine Stratum (Plot size: 2m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>0 = Total Cover</td>
</tr>
</tbody>
</table>

% Bare Ground in Herb Stratum: 0

Dominant Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

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

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ 5 - Wetland Non-Vascular Plants¹
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:
Dominant vegetation is primarily composed of facultative species and the dominance test passed for hydrophytic vegetation.
### SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color (moist)</td>
<td>%</td>
<td>Color (moist)</td>
</tr>
<tr>
<td>0-4</td>
<td>10YR 4/1</td>
<td>85</td>
<td>10YR 5/8</td>
</tr>
<tr>
<td>4-12</td>
<td>2.5YR 2.5/1</td>
<td>95</td>
<td>2.5YR 4/8</td>
</tr>
</tbody>
</table>

**Type:** C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

**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)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

Indicators of Problematic Hydric Soils:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

Restrictive Layer (if present):

- Type: 
- Depth (inches): 

Hydric Soil Present?  Yes  X  No  

Remarks:

Soil profile matrix color's with redox concentrations confirms hydric soil indicator redox dark surface.

### HYDROLOGY

Wetland Hydrology Indicators:

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

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

**Secondary Indicators (2 or more required)**

- Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (LRR A)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) (LRR A)
- Frost-Heave Hummocks (D7)
- Other (Explain in Remarks)

Field Observations:

- Surface Water Present?  Yes  X  No  
- Water Table Present?  Yes  X  No  
- Saturation Present?  Yes  X  No  

Depth (includes capillary fringe): 

Wetland Hydrology Present?  Yes  X  No  

Remarks:

No high water table or saturation present at location however primary wetland hydrology indicator oxidized rhizospheres along living roots was evident.
WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Arcata WWTP Improvement  City/County: Arcata/Humboldt  Sampling Date: 3/12/2020
Applicant/Owner: City of Arcata  State: CA  Sampling Point: W8
Investigator(s): Emmalien Craydon/Emily King Teraoka  Section, Township, Range: CA T6N R1E
Landform (hillslope, terrace, etc.): coastal marsh  Local relief (concave, convex, none): concave  Slope (%): 0
Subregion (LRR): LRRA  Lat: see EP-02  Long: Datum: WGS 84
Soil Map Unit Name: Urban land-Anthraionic Xerorthents association, 0–2% slopes.  NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? 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:
The sampled area is within an one-parameter wetland within the Coastal Zone/City of Arcata LCP-jurisdiction. Only hydrophytic vegetation observed at this location. Precipitation below monthly normal, abnormally dry conditions reported (Nat Drought Mit Center 2020)

VEGETATION – Use scientific names of plants.

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Plot size</th>
<th>% Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
<th>Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Stratum</td>
<td>5m²</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
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<tr>
<td>3.</td>
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<tr>
<td>4.</td>
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<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>= Total Cover</td>
</tr>
<tr>
<td>Sapling/Shrub Stratum</td>
<td>3m²</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Baccharis pilularis</td>
<td>20</td>
<td>Yes</td>
<td>NL-UPL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Salix (hookeriana)</td>
<td>5</td>
<td>Yes</td>
<td>FACW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
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<tr>
<td>4.</td>
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<tr>
<td>5.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>= Total Cover</td>
</tr>
<tr>
<td>Herb Stratum</td>
<td>3m²</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Deschampsia cespitosa</td>
<td>70</td>
<td>Yes</td>
<td>FAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Holcus lanatus</td>
<td>8</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Foeninulum vulgare</td>
<td>1</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Syphyotrichum chilense</td>
<td>5</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Dispacus fullo num</td>
<td>5</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Helminotheca echoides</td>
<td>1</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Juncus lesscuri</td>
<td>5</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8.</td>
<td></td>
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<td>9.</td>
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<td>10.</td>
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<tr>
<td>11.</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>= Total Cover</td>
</tr>
<tr>
<td>Woody Vine Stratum</td>
<td>3m²</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
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<td></td>
<td></td>
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<tr>
<td>2.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>= Total Cover</td>
</tr>
</tbody>
</table>

% Bare Ground in Herb Stratum: 0

Remarks:
Dominance test passed for hydrophytic vegetation. Species composition is a mixture of saltmarsh species bordered by coyote brush and willow.
SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color (moist)</td>
<td>%</td>
</tr>
<tr>
<td>0-14</td>
<td>2.5Y4/2</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-17</td>
<td>2.5Y5/2</td>
<td>55</td>
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</tbody>
</table>

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

Restrictive Layer (if present):

Type: 

Depth (inches): 

Remarks:

Soil profile contains redox concentrations in upper 12 inches

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

- Surface Water Present? Yes ☑ No ☑ Depth (inches):
- Water Table Present? Yes ☑ No ☑ Depth (inches): 9.5” below surface (includes capillary fringe)
- Saturation Present? Yes ☑ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☑ No ☑

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

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (industrial)

Remarks:

High water table within the upper 12 inches indicating wetland hydrology in the sampled area.
**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

**Project/Site:** City of Arcata WWTP Improvement  
**City/County:** Arcata/ Humboldt  
**Sampling Date:** 5/29/2020

**Applicant/Owner:** City of Arcata  
**State:** CA

**Investigator(s):** Emmalien Craydon/Emily King Teraoka  
**Section, Township, Range:** CA T6N R1E

**Landform (hillslope, terrace, etc.):** toeslope, drainage on artificial fill  
**Local relief (concave, convex, none):** concave  
**Slope (%):** 1

**Subregion (LRR):** LRRA  
**Lat:** See BL-03  
**Long:** See GPS WPT  
**Datum:** WGS 84

**Soil Map Unit Name:** Water  
**NWI classification:** PSS1C

**Remarks:**

- All three wetland parameters are present in the sampled area. Sampled area is within the Coastal Zone. Precipitation in May 2020 was above “monthly normal” for the region.

### VEGETATION – Use scientific names of plants.

**Tree Stratum** (Plot size: 5m²)

1. *Salix lasiolepis*  
   - Absolute % Cover: 20  
   - Dominant Species?: Yes  
   - Indicator Status: FACW

2.  
3.  
4.  
5.  

**Total Cover:** 20

**Sapling/Shrub Stratum** (Plot size: 5m²)

1. *Salix lasiolepis*  
   - Absolute % Cover: 100  
   - Dominant Species?: Yes  
   - Indicator Status: FACW

2. *Lonicera involucrata*  
   - Absolute % Cover: 30  
   - Dominant Species?: Yes  
   - Indicator Status: FAC

3. *Sambucus racemosa*  
   - Absolute % Cover: 10  
   - Dominant Species?: No  
   - Indicator Status: FACU

4.  
5.  

**Total Cover:** 140

**Herb Stratum** (Plot size: 5m²)

1. *Ranunculus repens*  
   - Absolute % Cover: 5  
   - Dominant Species?: Yes  
   - Indicator Status: FAC

2. *Polystichum munitum*  
   - Absolute % Cover: 5  
   - Dominant Species?: Yes  
   - Indicator Status: FAC

3. *Deschampsia cespitosa*  
   - Absolute % Cover: 2  
   - Dominant Species?: No  
   - Indicator Status: FACU

4. *Festuca perenne*  
   - Absolute % Cover: 5  
   - Dominant Species?: Yes  
   - Indicator Status: FAC

5. *Holcus lanatus*  
   - Absolute % Cover: 5  
   - Dominant Species?: Yes  
   - Indicator Status: FAC

6. *Epilobium ciliatum*  
   - Absolute % Cover: 5  
   - Dominant Species?: Yes  
   - Indicator Status: FACW

7.  
8.  
9.  
10.  
11.  

**Total Cover:** 27

**Woody Vine Stratum** (Plot size: 5m²)

1. *Rubus ursinus*  
   - Absolute % Cover: 20  
   - Dominant Species?: Yes  
   - Indicator Status: FACU

2. *Rubus armeniacus*  
   - Absolute % Cover: 50  
   - Dominant Species?: Yes  
   - Indicator Status: FAC

**Total Cover:** 70

**Remarks:**

- % Bare Ground in Herb Stratum: 0

---

**Hydrophytic Vegetation Present?** Yes  
**Hydric Soil Present?** Yes  
**Wetland Hydrology Present?** Yes

**Is the Sampled Area within a Wetland?** Yes

**Hydrophytic Vegetation Indicators:**

1 - Rapid Test for Hydrophytic Vegetation
2 - Dominance Test is >50%
3 - Prevalence Index is ≤3.0
4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
5 - Wetland Non-Vascular Plants
6 - Problematic Hydrophytic Vegetation (Explain)

**Hydrophytic Vegetation Present?** Yes  
**Remarks:**

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

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>7.5YR2.5/1</td>
<td>100</td>
<td>Color (moist)</td>
<td>%</td>
</tr>
<tr>
<td>6-15</td>
<td>7.5YR 2.5/1</td>
<td>80</td>
<td>7.5YR5/8</td>
<td>20</td>
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</table>

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

**Restrictive Layer (if present):**

- Type: ____________________________
- Depth (inches): ____________________

**Hydric Soil Present?** Yes X No ___

**Hydrology**

**Wetland Hydrology Indicators:**

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

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

- Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Stunted or Stressed Plants (D1) (LRR A)
- Other (Explain in Remarks)

**Secondary Indicators (2 or more required):**

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

**Field Observations:**

- Surface Water Present? Yes _No X_ Depth (inches): ____________
- Water Table Present? Yes _No X_ Depth (inches): ____________
- Saturation Present? Yes _No X_ Depth (inches): ____________

**Wetland Hydrology Present?** Yes X No ___

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

**Remarks:**

Three secondary indicators of wetland hydrology are present at this sampling location.
**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

**Project/Site:** City of Arcata WWTP Improvement  
**City/County:** Arcata/ Humboldt  
**Sampling Date:** 10/2/2019  
**Applicant/Owner:** City of Arcata  
**State:** CA  
**Sampling Point:** S1

**Investigator(s):** Emmalien Craydon/Emily King Teraoka  
**Section, Township, Range:** CA T6N (R1E)  
**Landform (hillocks, terrace, etc.):** crest/upper edge of levee; fluviomarine terrace  
**Local relief (concave, convex, none):** convex to flat  
**Slope (%):** 0  
**Subregion (LRR):** LRRA  
**Lat:** See R-01 riparian, data point S1 in map  
**Long:**  
**Datum:** WGS 84  
**Soil Map Unit Name:** Urban land-Anthraltic Xerorthents association, 0–2% slopes.  
**NWI classification:** None

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

Are Vegetation, Soil, or Hydrology significantly disturbed?  
Are “Normal Circumstances” present?  
**Yes**  
**No**  
(If needed, explain any answers in Remarks.)

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

<table>
<thead>
<tr>
<th>Hydrophytic Vegetation Present?</th>
<th>Yes</th>
<th>No</th>
<th>Is the Sampled Area within a Wetland?</th>
<th>Yes</th>
<th>No</th>
<th>Remarks:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Hydrophytic Vegetation Indicators:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Rapid Test for Hydrophytic Vegetation</td>
</tr>
<tr>
<td>2 - Dominance Test is &gt;50%</td>
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<tr>
<td>3 - Prevalence Index is ≤3.0</td>
</tr>
<tr>
<td>4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)</td>
</tr>
<tr>
<td>5 - Wetland Non-Vascular Plants</td>
</tr>
<tr>
<td>Problematic Hydrophytic Vegetation (Explain)</td>
</tr>
</tbody>
</table>

**Hydrophytic Vegetation Present?**  
**Yes**  
**No**  
(Explain)

**Hydric Soil Present?**  
**Yes**  
**No**  
(Explain)

**Wetland Hydrology Present?**  
**Yes**  
**No**  
(Explain)

**Remarks:**

One wetland parameter present (hydrophytic vegetation) and the sampled area is within the Coastal Zone. Riparian vegetation present at this location.

**VEGETATION – Use scientific names of plants.**

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 5 m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
<th>Number of Dominant Species That Are OBL, FACW, or FAC:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Alnus rubra</td>
<td>85</td>
<td>Yes</td>
<td>FACW</td>
<td>3 (A)</td>
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<tr>
<td>2. Pinus contorta ssp. contorta</td>
<td>15</td>
<td>No</td>
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<td>3.</td>
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<td>4.</td>
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<tr>
<td>Total Cover</td>
<td>100</td>
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<thead>
<tr>
<th>Sapling/Shrub Stratum (Plot size: 5 m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Baccharis pilularis</td>
<td>10</td>
<td>Yes</td>
<td>NL-UPL</td>
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<td>2.</td>
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<td>3.</td>
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<tr>
<td>Total Cover</td>
<td>100</td>
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<tr>
<th>Herb Stratum (Plot size: 2 m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Symphyotrichum chilense</td>
<td>20</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>2. Daucus carota</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>3. Vicia sativa ssp. sativa</td>
<td>2</td>
<td>No</td>
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</tr>
<tr>
<td>4. Raphanus sativus</td>
<td>5</td>
<td>No</td>
<td></td>
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<tr>
<td>5. Achillea millefolium</td>
<td>2</td>
<td>No</td>
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<tr>
<td>6. Plantago lanceolata</td>
<td>2</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>7. Cynosurus echinatus</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>8. Festuca perennis</td>
<td>50</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>9.</td>
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<tr>
<td>10.</td>
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<tr>
<td>11.</td>
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<tr>
<td>Total Cover</td>
<td>101</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Woody Vine Stratum (Plot size: 2 m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
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<tr>
<td>Total Cover</td>
<td>0</td>
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</tbody>
</table>

**Remarks:**

Dominant vegetation is primarily composed of facultative and fac-wet species and the dominance test passed for hydrophytic vegetation.
**SOIL**

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Color (moist)</th>
<th>%</th>
<th>Redox Features</th>
<th>Color (moist)</th>
<th>%</th>
<th>Type</th>
<th>Loc</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-13</td>
<td>10YR 3/1</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td>C</td>
<td>PL</td>
<td>sandy loam</td>
<td></td>
</tr>
</tbody>
</table>

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)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

Indicators for Problematic Hydric Soils:\n
- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

Restrictive Layer (if present):

- Type: __________________________
- Depth (inches): __________________

Hydric Soil Present? Yes ______ No X

Remarks:

No hydric soil indicators observed in sampled soil profile.

---

**HYDROLOGY**

Wetland Hydrology Indicators:

- Primary Indicators (minimum of one required; check all that apply)
  - Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Surface Soil Cracks (B6)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparsely Vegetated Concave Surface (B8)

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

Field Observations:

- Surface Water Present? Yes ______ No X Depth (inches): __________
- Water Table Present? Yes ______ No X Depth (inches): __________
- Saturation Present? Yes ______ No X Depth (inches): __________
  (includes capillary fringe)

Wetland Hydrology Present? Yes ______ No X

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

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial)

Remarks:

No wetland hydrology indicators observed in sampled area.
WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Arcata WWTP Improvement
City/County: Arcata/ Humboldt
Applicant/Owner: City of Arcata
State: CA
Sampling Date: 10/8/2019
Investigator(s): Emmalien Craydon/Emily King Teraoka
Section, Township, Range: CA T6N (R1E)
Landform (hillslope, terrace, etc.): depression (historic bay tidelands, diked)
Local relief (concave, convex, none): slight concave
Subregion (LRR): LRRA
Lat: See TP-01 wetland; data point S2 in map
Long: 
Datum: WGS 84
Soil Map Unit Name: Water
NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  
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:

The sampled area is within a two-parameter wetland within the Coastal Zone/City of Arcata LCP-jurisdiction. Both hydric soil and wetland hydrology were identified, however dominant vegetation was composed of upland species.

VEGETATION – Use scientific names of plants.

| Tree Stratum | Absolute % Cover | Dominant Species? | Indicator Status | Meaning | Aperture 
|--------------|------------------|-------------------|----------------|---------|---------
| Convolvulus arvensis | 80 | Yes | NL-UPL |
| Holcus lanatus | 20 | No |
| Agrostis capillaris | 5 | No |
| Raphanus sativus | 5 | No |
| Brassica rapa | 5 | No |
| Festuca perennis | 5 | No |

| Sapling/Shrub Stratum | Absolute % Cover | Dominant Species? | Indicator Status | Meaning | Aperture 
|-----------------------|------------------|-------------------|----------------|---------|---------
| Rubus ursinus | 30 | Yes | FACU |

| Herb Stratum | Absolute % Cover | Dominant Species? | Indicator Status | Meaning | Aperture 
|--------------|------------------|-------------------|----------------|---------|---------
| Convolvulus arvensis | 80 | Yes | NL-UPL |
| Holcus lanatus | 20 | No |
| Agrostis capillaris | 5 | No |
| Raphanus sativus | 5 | No |
| Brassica rapa | 5 | No |
| Festuca perennis | 5 | No |

| Woody Vine Stratum | Absolute % Cover | Dominant Species? | Indicator Status | Meaning | Aperture 
|-------------------|------------------|-------------------|----------------|---------|---------
| Rubus ursinus | 30 | Yes | FACU |

| Remarks: | | |
| Dominant vegetation is not hydrophytic. Dominance test failed for hydrophytic vegetation. Vegetation is routinely mowed, location between S. I Street and trail in the Arcata Marsh Wildlife Sanctuary. | | |
### SOIL

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-8</td>
<td>2.5Y5/2 98</td>
<td>10YR5/8 2 C PL</td>
<td>CLAY LOAM</td>
<td></td>
</tr>
<tr>
<td>8-15</td>
<td>5Y4/1 90</td>
<td>7.5YR4/6 10 C PL</td>
<td>CLAY LOAM</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Color (moist)</th>
<th>%</th>
<th>Color (moist)</th>
<th>%</th>
<th>Type</th>
<th>Loc</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-8</td>
<td>2.5Y5/2</td>
<td>98</td>
<td>10YR5/8</td>
<td>2</td>
<td>C</td>
<td>PL</td>
<td>CLAY LOAM</td>
<td></td>
</tr>
<tr>
<td>8-15</td>
<td>5Y4/1</td>
<td>90</td>
<td>7.5YR4/6</td>
<td>10</td>
<td>C</td>
<td>PL</td>
<td>CLAY LOAM</td>
<td></td>
</tr>
</tbody>
</table>

**Soil profile contains a depleted matrix with redox concentrations and confirms hydric soil indicator depleted matrix.**

### HYDROLOGY

**Wetland Hydrology Indicators:**

- **Primary Indicators (minimum of one required; check all that apply):**
  - Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Surface Soil Cracks (B6)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparingly Vegetated Concave Surface (B8)

- **Secondary Indicators (2 or more required):**
  - Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)

- **Field Observations:**
  - Surface Water Present? Yes No Depth (inches): ____________
  - Water Table Present? Yes No Depth (inches): ____________
  - Saturation Present? Yes No Depth (inches): ____________

**Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial); now Arcata Marsh Wildlife Sanctuary**

**Remarks:**

No high water table or saturation present at location however primary wetland hydrology indicator oxidized rhizospheres along living roots was evident.
City of Arcata WWTP Improvement

City/County: Arcata/Humboldt

Sampling Date: 10/8/2019

Applicant/Owner: City of Arcata

State: CA

Sampling Point: S3

Investigator(s): Emmalien Craydon/Emily King Teraoka

Section, Township, Range: CA T6N (R1E)

Landform (hillslope, terrace, etc.): fringe of WWTP treatment marsh

Local relief (concave, convex, none): sloped

Slope (%): 10

Subregion (LRR): LRRA

Lat: See TP-02 wetland, data point S3 in map

Long: WGS 84

Soil Map Unit Name: Water

NWI classification: PAB3Hh

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 ☑

(If needed, explain any answers in Remarks.)

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

<table>
<thead>
<tr>
<th>Hydrophytic Vegetation Present?</th>
<th>Yes ☐ No ☑</th>
<th>Is the Sampled Area within a Wetland?</th>
<th>Yes ☐ No ☑</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydric Soil Present?</td>
<td>Yes ☐ No ☑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetland Hydrology Present?</td>
<td>Yes ☐ No ☑</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks:
The sampled area is within a two-parameter wetland within the Coastal Zone/City of Arcata LCP jurisdiction. Both hydric soil and wetland hydrology were identified, however dominant vegetation was composed of upland species. Adjacent to WWTP treatment marsh.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0 = Total Cover

Sapling/Shrub Stratum (Plot size: 3m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0 = Total Cover

Herb Stratum (Plot size: 3m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equisetum arvense</td>
<td>20</td>
<td>FAC</td>
</tr>
<tr>
<td>Convolvulus arvensis</td>
<td>15</td>
<td>NL-UPL</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0 = Total Cover

Woody Vine Stratum (Plot size: 3m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubus ursinus</td>
<td>100</td>
<td>FACU</td>
</tr>
<tr>
<td>Rubus armeniacus</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

35 = Total Cover

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:

OBL species x 1 =

FACW species x 2 =

FAC species x 3 =

FACU species x 4 =

UPL species x 5 =

Column Totals: (A) (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0

4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)

5 - Wetland Non-Vascular Plants

Problematic Hydrophytic Vegetation (Explain)

Dominance test failed for hydrophytic vegetation. Dominant vegetation is primarily upland species.
# SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Color (moist)</th>
<th>%</th>
<th>Color (moist)</th>
<th>%</th>
<th>Type</th>
<th>Loc</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7</td>
<td></td>
<td>10YR 4/1</td>
<td>85</td>
<td>10YR 5/8</td>
<td>15</td>
<td>C</td>
<td>PL</td>
<td>clay loam</td>
<td></td>
</tr>
<tr>
<td>7-14</td>
<td></td>
<td>10YR 4/1</td>
<td>80</td>
<td>10YR 4/6</td>
<td>20</td>
<td>C</td>
<td>PL</td>
<td>clay loam</td>
<td></td>
</tr>
</tbody>
</table>

- **Type:** C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.
- **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)
  - Depleted Below Dark Surface (A11)
  - Thick Dark Surface (A12)
  - Sandy Mucky Mineral (S1)
  - Sandy Gleyed Matrix (S4)
- **Indicators of Problematic Hydric Soils:**
  - 2 cm Muck (A10)
  - Red Parent Material (TF2)
  - Very Shallow Dark Surface (TF12)
  - Other (Explain in Remarks)

## Restrictive Layer (if present):
<table>
<thead>
<tr>
<th>Type:</th>
<th>Depth (inches):</th>
<th>Hydric Soil Present?</th>
<th>Yes ❗ No</th>
</tr>
</thead>
</table>

## Remarks:
Soil profile matrix color's with redox concentrations confirms hydric soil indicator redox dark surface.

# HYDROLOGY

## Wetland Hydrology Indicators:

- **Primary Indicators (minimum of one required; check all that apply)**
  - Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Surface Soil Cracks (B6)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparsely Vegetated Concave Surface (B8)

- **Secondary Indicators (2 or more required)**
  - Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
  - Salt Crust (B11)
  - Aquatic Invertebrates (B13)
  - Hydrogen Sulfide Odor (C1)
  - Oxidized Rhizospheres along Living Roots (C3)
  - Presence of Reduced Iron (C4)
  - Recent Iron Reduction in Tilled Soils (C6)
  - Stunted or Stressed Plants (D1) (LRR A)
  - FAC-Neutral Test (D5)
  - Frost-Heave Hummocks (D7)

## Field Observations:

- **Surface Water Present?** Yes ❗ No ❗ Depth (inches): 
- **Water Table Present?** Yes ❗ No ❗ Depth (inches): 
- **Saturation Present?** Yes ❗ No ❗ Depth (inches): 

## Wetland Hydrology Present? Yes ❗ No ❗

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

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial); currently adjacent to Arcata WWTP treatment marsh

## Remarks:
No high water table or saturation present at location however primary wetland hydrology indicator oxidized rhizospheres along living roots was evident.
City of Arcata WWTP Improvement | Arcata/ Humboldt | 10/17/2019
---|---|---
City of Arcata | CA | S4
Emmalien Craydon/Emily King Teraoka | CA T6N (R1E) |

Landform (hillslope, terrace, etc.): base of trail prism, toeslope (historic bay tidelands/marsh, obilized)
Local relief (concave, convex, none): toeslope
Slope (%): 0

Subregion (LRR): LRRA
Lat: See TP-05 wetland, Data point S4 in map
Long: Datum: WGS 84

Soil Map Unit Name: Water
NWI classification: no listing

Hydrophytic Vegetation Present? Yes X No

Hydric Soil Present? Yes X No

Wetland Hydrology Present? Yes

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? Are “Normal Circumstances” present? Yes X No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Is the Sampled Area within a Wetland? Yes X No

Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Vegetation
2 - Dominance Test is >50%
3 - Prevalence Index is ≥3.0
4 - Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
5 - Wetland Non-Vascular Plants1
6 - Problematic Hydrophytic Vegetation1 (Explain)

Hydrophytic Vegetation Present? Yes X No

Remarks:
The sampled area is within a two-parameter wetland within the Coastal Zone/City of Arcata LCP jurisdiction. Both hydrophytic vegetation and wetland hydrology were identified, however hydric soils were lacking.

Vegetation is routinely mowed, location between S. I Street and trail in the Arcata Marsh Wildlife Sanctuary.
### SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-11</td>
<td>10YR 3/2</td>
<td>100</td>
</tr>
<tr>
<td>11-20</td>
<td>10YR 3/1</td>
<td>100</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Location</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.</td>
<td>PL=Pore Lining, M=Matrix</td>
<td>Hydric Soil Present? Yes No</td>
</tr>
</tbody>
</table>

**Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial); currently Arcata Marsh Wildlife Sanctuary**

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

<table>
<thead>
<tr>
<th>Surface Water (A1)</th>
<th>High Water Table (A2)</th>
<th>Saturation (A3)</th>
<th>Water Marks (B1)</th>
<th>Sediment Deposits (B2)</th>
<th>Drift Deposits (B3)</th>
<th>Algal Mat or Crust (B4)</th>
<th>Iron Deposits (B5)</th>
<th>Surface Soil Cracks (B6)</th>
<th>Inundation Visible on Aerial Imagery (B7)</th>
<th>Sparsely Vegetated Concave Surface (B8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☑</td>
<td>☐</td>
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<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Secondary Indicators (2 or more required)

<table>
<thead>
<tr>
<th>Water-Stained Leaves (B9)</th>
<th>Salt Crust (B11)</th>
<th>Aquatic Invertebrates (B13)</th>
<th>Hydrogen Sulfide Odor (C1)</th>
<th>Oxidized Rhizospheres along Living Roots (C3)</th>
<th>Presence of Reduced Iron (C4)</th>
<th>Recent Iron Reduction in Tilled Soils (C6)</th>
<th>Stunted or Stressed Plants (D1) (LRR A)</th>
<th>FAC-Neutral Test (D5)</th>
<th>Frost-Heave Hummocks (D6) (LRR A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(except MLRA 1, 2, 4A, and 4B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Field Observations:**

<table>
<thead>
<tr>
<th>Surface Water Present?</th>
<th>Yes ☑ No X</th>
<th>Depth (inches): 11.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Table Present?</td>
<td>Yes ☑ No X</td>
<td>Depth (inches): 11.5</td>
</tr>
<tr>
<td>Saturation Present?</td>
<td>Yes ☑ No X</td>
<td>Depth (inches): 11.5</td>
</tr>
</tbody>
</table>

**Wetland Hydrology Present? Yes ☑ No X**

**Remarks:**

Water table present 11.5 inches below surface.
**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

**Project/Site:** City of Arcata WWTP Improvement  
**City/County:** Arcata/ Humboldt  
**Sampling Date:** 10/3/2019  
**Applicant/Owner:** City of Arcata/HSU  
**State:** CA  
**Sampling Point:** S5

**Investigator(s):** Emmalien Craydon/Emily King Teraoka  
**Section, Township, Range:** CA T6N (R1E)  
**Landform (hillslope, terrace, etc.):** Diked former pasture (historic bay tidelands)  
**Local relief (concave, convex, none):** none  
**Slope (%):** 0  
**Subregion (LRR):** LRRA  
**Lat:** See OP-01 wetland, Data point S5 in map  
**Long:** Datum: WGS 84  
**Soil Map Unit Name:** Occidental, 0 to 2 percent slopes  
**NWI classification:** PEM1D

**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**  
(If needed, explain any answers in Remarks.)

**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.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes X</td>
<td>No</td>
<td>Yes X</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes □ X □</td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**
This location is a one-parameter wetland (only hydrophytic vegetation present) within the City of Arcata LCP-jurisdiction/Coastal Zone.

**VEGETATION – Use scientific names of plants.**

| Tree Stratum   | (Plot size: 4 m²) | Absolute % Cover | Dominant Species? | Indicator Status | | | | |
|----------------|-------------------|------------------|-------------------|-----------------|---|---|---|
| 1.             |                   |                  |                   |                 |   |   |   |
| 2.             |                   |                  |                   |                 |   |   |   |
| 3.             |                   |                  |                   |                 |   |   |   |
| 4.             |                   |                  |                   |                 |   |   |   |
| 5.             |                   |                  |                   |                 |   |   |   |
| 6.             |                   |                  |                   |                 |   |   |   |
| 7.             |                   |                  |                   |                 |   |   |   |
| 8.             |                   |                  |                   |                 |   |   |   |
| 9.             |                   |                  |                   |                 |   |   |   |
| 10.            |                   |                  |                   |                 |   |   |   |
| 11.            |                   |                  |                   |                 |   |   |   |

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

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

**Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0
- 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants
- Problematic Hydrophytic Vegetation (Explain)

**Hydrophytic Vegetation Present?** Yes □ X □ No □

**Remarks:**
Dominant vegetation is primarily composed of facultative species and the dominance test passed for hydrophytic vegetation.
SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Although some redox features were present, the soil profile did not meet hydric soil indicator parameters.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

- Surface Water Present? Yes No X
- Water Table Present? Yes No X
- Saturation Present? Yes No X

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

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial)

Remarks:

No wetland hydrology indicators observed in sampled area.
**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

Project/Site: City of Arcata WWTP Improvement  
City/County: Arcata/Humboldt  
Sampling Date: 10/17/2019

Applicant/Owner: City of Arcata/HSU  
State: CA  
Sampling Point: S6

Investigator(s): Emmalien Craydon/Emily King Teraoka  
Section, Township, Range: CA T6N (R1E)

Landform (hillslope, terrace, etc.): Diked former pasture (historic bay tidelands)  
Local relief (concave, convex, none): none  
Slope (%): 0

Subregion (LRR): LRR AA  
Lat: See OP-01 wetland, Data point S6 in map  
Long:  
Datum: WGS 84

Soil Map Unit Name: Occidental, 0 to 2 percent slopes  
NWI classification: PEM1D

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? Yes ☐ No ☒  
Are “Normal Circumstances” present? Yes ☒ No ☐  
(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: This location is a one-parameter wetland (only hydrophytic vegetation present) within the City of Arcata LCP-jurisdiction/Coastal Zone.

**VEGETATION – Use scientific names of plants.**

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 4m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
<th>Dominance Test worksheet:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td>Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td>Total Number of Dominant Species Across All Strata: 4 (B)</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td>Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td>Prevalence Index worksheet:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total % Cover of: Multiply by:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OBL species x 1 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FACW species x 2 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FAC species x 3 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FACU species x 4 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UPL species x 5 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Column Totals: (A) (B)</td>
</tr>
<tr>
<td></td>
<td>0 = Total Cover</td>
<td></td>
<td></td>
<td>Prevalence Index = B/A =</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Woody Vine Stratum (Plot size: 4m²)</th>
<th>% Bare Ground in Herb Stratum</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rubus armeniacus</td>
<td>80 = Total Cover</td>
<td>Yes ☒ No ☐</td>
</tr>
</tbody>
</table>

**Hydrophytic Vegetation Indicators:**

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0¹
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants¹
- Problematic Hydrophytic Vegetation¹ (Explain)

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

Remarks: Dominance test passed for hydrophytic vegetation. Species composition is mostly nonnative weed species that are facultative.
Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color (moist)</td>
<td>%</td>
</tr>
<tr>
<td>0-18</td>
<td>10YR 3/2</td>
<td>100</td>
</tr>
<tr>
<td>18-22</td>
<td>10YR 3/2</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

Restrictive Layer (if present):

Type: ______________________
Depth (inches): ________________

Hydric Soil Present? Yes No ☒

Remarks:

Although some redox features were present, the soil profile did not meet hydric soil indicator parameters.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (LRR A)
- Other (Explain in Remarks)
- FAC-Neutral Test (D5)
- Shallow Aquitard (D3)
- Geomorphic Position (D2)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Frost-Heave Hummocks (D7)
- Drainage Patterns (B10)
- Raised Ant Mounds (D6) (LRR A)
- Geomorphic Position (D2)
- No wetland hydrology indicators observed in sampled area.

Field Observations:

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

Wetland Hydrology Present? Yes No ☒

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

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial)

Remarks:

No wetland hydrology indicators observed in sampled area.
VEGETATION – Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 4m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
<th>Dominance Test worksheet:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td>Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td>Total Number of Dominant Species Across All Strata: 1 (B)</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td>Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sapling/Shrub Stratum (Plot size: 4m²)</th>
<th>0 = Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Herb Stratum (Plot size: 4m²)</th>
<th>0 = Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Festuca arundinacea</td>
<td>15 No FAC</td>
</tr>
<tr>
<td>2. Elymus repens</td>
<td>85 Yes FAC</td>
</tr>
<tr>
<td>3. Holcus lanatus</td>
<td>5 No</td>
</tr>
<tr>
<td>4. Daucus carota</td>
<td>5 No</td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Woody Vine Stratum (Plot size: )</th>
<th>110 = Total Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
</tbody>
</table>

Is the Sampled Area within a Wetland? Yes Yes No X

Remarks:

This location is a one-parameter wetland (only hydrophytic vegetation present) within the City of Arcata LCP-jurisdiction/Coastal Zone.

Hydrophytic Vegetation Indicators:

- Rapid Test for Hydrophytic Vegetation
- Dominance Test is >50%
- Prevalence Index is ≤3.0
- Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants
- Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes X No
SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color (moist)</td>
<td>%</td>
</tr>
<tr>
<td>0-17</td>
<td>10 YR 3/1</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>10 YR 6/1</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

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)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

| Redox Depressions (F8) |

Indicators for Problematic Hydric Soils:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

Restrictive Layer (if present):

<table>
<thead>
<tr>
<th>Depth (inches):</th>
<th>Hydric Soil Present?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes _____ No X</td>
</tr>
</tbody>
</table>

Remarks:

No hydric soil indicators observed in sampled soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (LRR A)
- Other (Explain in Remarks)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) (LRR A)
- Frost-Heave Hummocks (D7)

Field Observations:

- Surface Water Present? Yes _____ No X Depth (inches): ________
- Water Table Present? Yes _____ No X Depth (inches): ________
- Saturation Present? Yes _____ No X Depth (inches): ________

Wetland Hydrology Present? Yes _____ No X

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial)

Remarks:

No wetland hydrology indicators observed in sampled area.
WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Arcata WWTP Improvement
City/County: Arcata/ Humboldt
Applicant/Owner: City of Arcata/HSU
State: CA
Investigator(s): Emmalien Craydon/Emily King Teraoka
Section, Township, Range: CA T6N (R1E)
Landform (hillslope, terrace, etc.): Diked former pasture (historic bay tidelands)
Local relief (concave, convex, none): none
Slope (%): 0-2
Subregion (LRR): LARR
Lat: Datum: WGS 84
Soil Map Unit Name: Occidental, 0 to 2 percent slopes
NWI classification: PEM1D

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 __________

Remarks:
This location is a one-parameter wetland (only hydrophytic vegetation present) within the City of Arcata LCP-jurisdiction/Coastal Zone.

VEGETATION – Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 2m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = Total Cover</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sapling/Shrub Stratum (Plot size: 2m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = Total Cover</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Herb Stratum (Plot size: 2m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Conium maculatum</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>2. Festuca perennis</td>
<td>45</td>
<td>Yes FAC</td>
<td></td>
</tr>
<tr>
<td>3. Symphyotrichum chilense</td>
<td>45</td>
<td>Yes FAC</td>
<td></td>
</tr>
<tr>
<td>4. Lotus corniculatus</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>5. Trifolium repens</td>
<td>10</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>6. Ranunculus repens</td>
<td>10</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>7. Cirsium vulgaris</td>
<td>2</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>8. Plantago major</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>9. Daucus carota</td>
<td>15</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>10. Dipsacus fulanum</td>
<td>157</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>11. Dipsacus carota</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>0 = Total Cover</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Woody Vine Stratum (Plot size: 2m²)</th>
<th>Total % Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>0</td>
</tr>
<tr>
<td>0 = Total Cover</td>
<td></td>
</tr>
</tbody>
</table>

% Bare Ground in Herb Stratum: 0

Remarks:
Dominant vegetation is primarily composed of facultative species and the dominance test passed for hydrophytic vegetation.

Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Vegetation
2 - Dominance Test is >50%
3 - Prevalence Index is ≤3.0
4 - Morphological Adaptations
   (Provide supporting data in Remarks or on a separate sheet)
5 - Wetland Non-Vascular Plants
   (Explain)

Hydrophytic Vegetation Present? Yes ☒ No __________
### SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Color (moist)</th>
<th>%</th>
<th>Redox Features</th>
<th>%</th>
<th>Type</th>
<th>Loc</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>10YR 2/2</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>fill within profile</td>
<td></td>
</tr>
</tbody>
</table>

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

**Indicators for Problematic Hydric Soils:**

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

**Restrictive Layer (if present):**

- Type: 
- Depth (inches): gravel/fill throughout

**Hydric Soil Present?** Yes ☐ No ☑

**Remarks:**

No hydric soil indicators observed in sampled soil profile.

### HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (LRR A)
- Other (Explain in Remarks)
- Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) (LRR A)
- Frost-Heave Hummocks (D7)

**Field Observations:**

- Surface Water Present? Yes ☐ No ☑
- Water Table Present? Yes ☐ No ☑
- Saturation Present? Yes ☐ No ☑

**Wetland Hydrology Present?** Yes ☐ No ☑

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

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial)

**Remarks:**

No wetland hydrology indicators observed in sampled area.
**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

**Project/Site:** City of Arcata WWTP Improvement  
**City/County:** Arcata/ Humboldt  
**Sampling Date:** 10/3/2019

**Applicant/Owner:** City of Arcata  
**State:** CA  
**Sampling Point:** S9

**Investigator(s):** Emmalien Craydon/Emily King Teraoka  
**Section, Township, Range:** CA T6N (R1E)

**Landform (hillslope, terrace, etc.):** Diked former pasture (historic bay tidelands)  
**Local relief (concave, convex, none):** none  
**Slope (%):** 0

**Subregion (LRR):** LRRA  
**Lat:** See TP-00 wetland, Data point S9 in map  
**Long:** Datum: WGS 84

**Soil Map Unit Name:** Occidental, 0 to 2 percent slopes

**Wetland Hydrology Present:** Yes

**Remarks:**

The sampled area is within a two-parameter wetland within the Coastal Zone/City of Arcata LCP jurisdiction. Both hydrophytic vegetation and hydric soils were identified and no wetland hydrology indicators were present. Restoration activities (willow plantings) fairly recent.

**Dominant vegetation is primarily composed of facultative and fac-wet species and the dominance test passed for hydrophytic vegetation.**

---

**VEGETATION – Use scientific names of plants.**

**Tree Stratum** (Plot size: 8 m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>% Cover</th>
<th>Dominant</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picea sitchensis</td>
<td>10</td>
<td>Yes</td>
<td>FACW</td>
</tr>
<tr>
<td>Salix lasiandra</td>
<td>30</td>
<td>Yes</td>
<td>FACW</td>
</tr>
<tr>
<td>Salix (sitchensis)</td>
<td>40</td>
<td>Yes</td>
<td>FACW</td>
</tr>
</tbody>
</table>

**Sapling/Shrub Stratum** (Plot size: 2 m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>% Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranunculus repens</td>
<td>15</td>
</tr>
<tr>
<td>Conium maculatum</td>
<td>5</td>
</tr>
<tr>
<td>Juncus (patens)</td>
<td>2</td>
</tr>
<tr>
<td>Agrostis capillaris</td>
<td>20</td>
</tr>
</tbody>
</table>

**Herb Stratum** (Plot size: 2 m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>% Cover</th>
<th>Dominant</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranunculus repens</td>
<td>15</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>Conium maculatum</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Juncus (patens)</td>
<td>2</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Agrostis capillaris</td>
<td>20</td>
<td>Yes</td>
<td>FAC</td>
</tr>
</tbody>
</table>

**Woody Vine Stratum** (Plot size: 2 m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>% Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>42</td>
</tr>
</tbody>
</table>

**Summary of Findings**

- Hydrophytic Vegetation Present? Yes
- Hydric Soil Present? Yes
- Wetland Hydrology Present? Yes
- Is the Sampled Area within a Wetland? Yes

**Remarks:**

Detailed analysis of vegetation and soil conditions as per the WETLAND DETERMINATION DATA FORM standards.
### Soil Sampling Point: S9

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Color (moist)</th>
<th>%</th>
<th>Redox Features</th>
<th>Color (moist)</th>
<th>%</th>
<th>Type</th>
<th>Loc'</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>10YR 2/1</td>
<td>98</td>
<td>10YR 5/8</td>
<td>2</td>
<td>C</td>
<td>PL</td>
<td>clay loam</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-16</td>
<td>10YR 2/1</td>
<td>90</td>
<td>10YR 5/8</td>
<td>10</td>
<td>C</td>
<td>PL</td>
<td>clay loam</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

- [ ] Histosol (A1)  
- [ ] Histic Epipedon (A2)  
- [ ] Black Histic (A3)  
- [ ] Hydrogen Sulfide (A4)  
- [ ] Depleted Below Dark Surface (A11)  
- [x] Thick Dark Surface (A12)  
- [ ] Sandy Mucky Mineral (S1)  
- [ ] Sandy Gleyed Matrix (S4)  

**Indicators of Problematic Hydric Soils:**

- [ ] 2 cm Muck (A10)  
- [ ] Red Parent Material (TF2)  
- [ ] Very Shallow Dark Surface (TF12)  
- [ ] Other (Explain in Remarks)  

**Restrictive Layer (if present):**

- Type:  
- Depth (inches): 16  
- Hydric Soil Present? Yes X No  

**Remarks:**

Soil profile matrix color's with redox concentrations confirms hydric soil indicator redox dark surface.

---

### Hydrology

**Wetland Hydrology Indicators:**

<table>
<thead>
<tr>
<th>Primary Indicators (minimum of one required; check all that apply)</th>
<th>Secondary Indicators (2 or more required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water (A1)</td>
<td>Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)</td>
</tr>
<tr>
<td>High Water Table (A2)</td>
<td>Salt Crust (B11)</td>
</tr>
<tr>
<td>Saturation (A3)</td>
<td>Aquatic Invertebrates (B13)</td>
</tr>
<tr>
<td>Water Marks (B1)</td>
<td>Hydrogen Sulfide Odor (C1)</td>
</tr>
<tr>
<td>Sediment Deposits (B2)</td>
<td>Oxidized Rhizospheres along Living Roots (C3)</td>
</tr>
<tr>
<td>Drift Deposits (B3)</td>
<td>Presence of Reduced Iron (C4)</td>
</tr>
<tr>
<td>Algal Mat or Crust (B4)</td>
<td>Recent Iron Reduction in Tilled Soils (C6)</td>
</tr>
<tr>
<td>Iron Deposits (B5)</td>
<td>Stunted or Stressed Plants (D1) (LRR A)</td>
</tr>
<tr>
<td>Surface Soil Cracks (B6)</td>
<td>Other (Explain in Remarks)</td>
</tr>
<tr>
<td>Inundation Visible on Aerial Imagery (B7)</td>
<td>Frost-Heave Hummocks (D7)</td>
</tr>
<tr>
<td>Sparsely Vegetated Concave Surface (B8)</td>
<td></td>
</tr>
</tbody>
</table>

**Field Observations:**

- Surface Water Present? Yes X No Depth (inches):  
- Water Table Present? Yes X No Depth (inches):  
- Saturation Present? Yes X No Depth (inches):  

**Wetland Hydrology Present?** Yes X No  

**Remarks:**

No wetland hydrology indicators observed in sampled area.
**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

**Project/Site:** City of Arcata WWTP Improvement  
**City/County:** Arcata/ Humboldt  
**Sampling Date:** 10/17/2019  
**Applicant/Owner:** City of Arcata/HSU  
**State:** CA  
**Sampling Point:** S10

**Investigator(s):** Emmalen Craydon/Emily King Teraoka  
**Section, Township, Range:** CA T6N (R1E)  
**Landform (hillslope, terrace, etc.):** Diked former pasture (historic bay tidelands)  
**Local relief (concave, convex, none):** none  
**Slope (%):** 0  
**Subregion (LRR):** LRRA  
**Lat:** See TP-07 wetland, Data point S10 in map  
**Long:** Datum: WGS 84  
**Soil Map Unit Name:** Occidental, 0 to 2 percent slopes  
**NWI classification:** PEM1D

---

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

<table>
<thead>
<tr>
<th>Hydrophytic Vegetation Present?</th>
<th>Yes</th>
<th>No</th>
<th>Is the Sampled Area within a Wetland?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydric Soil Present?</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetland Hydrology Present?</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**

The sampled area is within a two-parameter wetland within the Coastal Zone/City of Arcata LCP-jurisdiction. Both hydrophytic vegetation and hydric soil were identified, however wetland hydrology indicators were not observed.

---

**VEGETATION – Use scientific names of plants.**

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Plot size: 4m²</th>
<th>% Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
<th>Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)</th>
<th>Total Number of Dominant Species Across All Strata: 2 (B)</th>
<th>Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)</th>
<th>Prevalence Index = B/A =</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
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<td>2.</td>
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<tr>
<td>3.</td>
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<tr>
<td>4.</td>
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<tr>
<td>5.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sapling/Shrub Stratum</td>
<td>Plot size: 4m²</td>
<td>0 = Total Cover</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1.</td>
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<td>2.</td>
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<td>3.</td>
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<tr>
<td>4.</td>
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<tr>
<td>5.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herb</td>
<td>Plot size: 4m²</td>
<td>0 = Total Cover</td>
<td>Conium maculatum</td>
<td>FAC</td>
<td>Total % Cover of: Multiply by:</td>
<td>OBL species x 1</td>
<td>FACW species x 2</td>
<td>FAC species x 3</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td>45</td>
<td>Yes</td>
<td>FAC</td>
<td>OBL species x 1</td>
<td>FACW species x 2</td>
<td>FAC species x 3</td>
<td>FACU species x 4</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>0</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>90</td>
<td>Yes</td>
<td>FAC</td>
<td>OBL species x 1</td>
<td>FACW species x 2</td>
<td>FAC species x 3</td>
<td>FACU species x 4</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>5</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td>8</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td>5</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
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<tr>
<td>8.</td>
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<tr>
<td>9.</td>
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</tr>
<tr>
<td>10.</td>
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</tr>
<tr>
<td>11.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woody Vine Stratum</td>
<td>Plot size: 4m²</td>
<td>154 = Total Cover</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Bare Ground in Herb Stratum</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**

Dominance test passed for hydrophytic vegetation. Species composition is mostly nonnative species that are facultative.
SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color (moist)</td>
<td>%</td>
</tr>
<tr>
<td>0-8</td>
<td>10YR 3/2</td>
<td>100</td>
</tr>
<tr>
<td>8-16</td>
<td>10YR 3/2</td>
<td>20</td>
</tr>
<tr>
<td>8-16</td>
<td>10YR 5/1</td>
<td>60</td>
</tr>
</tbody>
</table>

Remarks:
Soil profile contains a depleted matrix with redox concentrations and confirms hydric soil indicator depleted matrix.

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one required; check all that apply)
- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (LRR A)
- Other (Explain in Remarks)

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

Field Observations:
- Surface Water Present? Yes No Depth (inches):_________
- Water Table Present? Yes No Depth (inches):_________
- Saturation Present? Yes No Depth (inches):_________
(includes capillary fringe)

Wetland Hydrology Present? Yes No

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial)

Remarks:
No wetland hydrology indicators observed in sampled area.
WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Arcata WWTP Improvement
City/County: Arcata/ Humboldt
Applicant/Owner: City of Arcata
State: CA
Sampling Point: S11

Investigator(s): Emmalien Craydon/Emily King Teraoka
Section, Township, Range: CA T6N (R1E)
Landform (hillslope, terrace, etc.): coastal plain
Local relief (concave, convex, none): none
Subregion (LRR): LRRA
Lat: see R-05 through R-12/13
Long: see notes
Datum: WGS 84

Soil Map Unit Name: Occidental, 0 to 2 percent slopes
NWI classification: none

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

Are Vegetation, Soil, or Hydrology significantly disturbed? Yes No
(If needed, explain any answers in Remarks.)

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

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

Remarks:
The sampled area is within an one-parameter wetland within the Coastal Zone/City of Arcata LCP-jurisdiction. Only hydrophytic vegetation observed at this location. Precipitation below monthly normal, abnormally dry conditions reported (Nat Drought Mit Center 2020)

VEGETATION – Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 10m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
<th>Dominance Test worksheet:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salix lasiandra</td>
<td>10</td>
<td>Yes</td>
<td>FACW</td>
<td>Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td>Total Number of Dominant Species Across All Strata: 7 (B)</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td>Percent of Dominant Species That Are OBL, FACW, or FAC: 71 (A/B)</td>
</tr>
<tr>
<td>4.</td>
<td>10</td>
<td>Yes</td>
<td>FACW</td>
<td>Prevalence Index worksheet:</td>
</tr>
<tr>
<td></td>
<td>= Total Cover</td>
<td></td>
<td></td>
<td>Multiply by:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OBL species x 1 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FACW species x 2 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FAC species x 3 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FACU species x 4 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UPL species x 5 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Column Totals: (A) (B)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Prevalence Index = B/A =</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Woody Vine Stratum (Plot size: 5m²)</th>
<th>% Bare Ground in Herb Stratum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>15</td>
</tr>
<tr>
<td>2.</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td>= Total Cover</td>
</tr>
</tbody>
</table>

Hydrophytic Vegetation Indicators:

1. Rapid Test for Hydrophytic Vegetation
2. Dominance Test is ≥50%
3. Prevalence Index is ≤3.0
4. Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
5. Wetland Non-Vascular Plants

Problematic Hydrophytic Vegetation (Explain)

Remarks:
Dominance test passed for hydrophytic vegetation. Species composition is a mixture of willow with an understory of mostly herbaceous nonnative species.
SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9</td>
<td>10YR 3/1</td>
<td>100</td>
<td>Color (moist)</td>
<td>%</td>
</tr>
<tr>
<td>9-12</td>
<td>10YR 3/1</td>
<td>98</td>
<td>10YR 4/6</td>
<td>2</td>
</tr>
</tbody>
</table>

Soil profile contains redox concentrations however located below 6 inches from surface and less than 3” in upper 12” of soil profile and a hydric soil indicator was not confirmed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)
- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

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

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

Wetland Hydrology Present? Yes No

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (industrial)

Remarks:
No wetland hydrology indicators observed in sampled area.
WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Arcata WWTP Improvement
City/County: Arcata/Humboldt
Sampling Date: 10/2/2019

Applicant/Owner: City of Arcata
State: CA
Sampling Point: U1

Investigator(s): Emmalien Craydon/Emily King Teraoka
Section, Township, Range: CA T6N (R1E)

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

Subregion (LRR): LRRA
Lat: See UPL-01 upland; data point U1 in map
Long: Datum: WGS 84

Soil Map Unit Name: Urban land-Anthraltic Xerorthents association, 0–2% slopes.
NWI classification: No listing

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? Yes No (If needed, explain any answers in Remarks.)

Are Vegetation, Soil, or Hydrology naturally problematic? Yes No

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:
No wetland parameters were present and the sampled area is within an upland.

VEGETATION – Use scientific names of plants.

Tree Stratum

<table>
<thead>
<tr>
<th>Plot size: 5 m²</th>
<th>% Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pinus contorta ssp. contorta</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>2. Alnus rubra</td>
<td>25</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

= Total Cover

Sapling/Shrub Stratum

<table>
<thead>
<tr>
<th>Plot size: 5 m²</th>
<th>% Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Baccharis pilularis</td>
<td>60</td>
<td>Yes</td>
<td>NL-UPL</td>
</tr>
<tr>
<td>2. Genista monspessulana</td>
<td>10</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

= Total Cover

Herb Stratum

<table>
<thead>
<tr>
<th>Plot size: 5 m²</th>
<th>% Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Symphyotrichum chilense</td>
<td>8</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>2. Daucus carota</td>
<td>8</td>
<td>Yes</td>
<td>FACU</td>
</tr>
<tr>
<td>3. Angelica lucida</td>
<td>1</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>4. Dipsacus fullonum</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>5. Avena barbata</td>
<td>2</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>6. Anthoxanthum odoratum</td>
<td>10</td>
<td>Yes</td>
<td>FACU</td>
</tr>
<tr>
<td>7. Plantago lanceolata</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>8. Foeniculum vulgare</td>
<td>3</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>9. Festuca arundinacea</td>
<td>2</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>10. Cynosurus echinatus</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

= Total Cover

Woody Vine Stratum

<table>
<thead>
<tr>
<th>Plot size: 5 m²</th>
<th>% Cover</th>
<th>Dominant Species?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rubus armeniacus</td>
<td>45</td>
<td>Yes</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

= Total Cover

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FAC, or FAC: 3
Total Number of Dominant Species Across All Strata: 6
Percent of Dominant Species That Are OBL, FAC, or FAC: 50

Prevalence Index worksheet:

Total % Cover of:

OBL species x 1 =
FACW species x 2 =
FAC species x 3 =
FACU species x 4 =
UPL species x 5 =

Column Totals: (A) (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation
2 - Dominance Test is >50%
3 - Prevalence Index is ≥3.0
4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
5 - Wetland Non-Vascular Plants

Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes No

Remarks:

Dominance test not conclusive for hydrophytic vegetation and prevalence test not required since hydric soils and wetland hydrology were not observed. Based on dominant upland plant species composition, vegetation is considered upland.
SOIL Sampling Point: U1

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix Color (moist)</th>
<th>%</th>
<th>Redox Features Color (moist)</th>
<th>%</th>
<th>Type¹</th>
<th>Loc²</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-13</td>
<td>10YR 3/1</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sandy loam</td>
<td></td>
</tr>
</tbody>
</table>

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

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Redox Gleyed Matrix (S4)
- Sandy Gleyed Matrix (S4)

Indicators of Problematic Hydric Soils:

- 2 cm Muck (A10)
- Loamy Mucky Mineral (F1) (except MLRA 1)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

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

Restrictive Layer (if present):

- Type: 
- Depth (inches): 

Hydric Soil Present? Yes [ ] No [X] 

Remarks:

No hydric soil indicators observed in sampled soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)
- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (LRR A)
- Other (Explain in Remarks)

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

Field Observations:

- Surface Water Present? Yes [ ] No [X] Depth (inches): 
- Water Table Present? Yes [ ] No [X] Depth (inches): 
- Saturation Present? Yes [ ] No [X] Depth (inches): 

Wetland Hydrology Present? Yes [ ] No [X] 

Remarks:

No wetland hydrology indicators observed in sampled area.

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial)
WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Arcata WWTP Improvement  City/County: Arcata/ Humboldt  Sampling Date: 10/17/2019
Applicant/Owner: City of Arcata  State: CA  Sampling Point: U2
Investigator(s): Emmalien Craydon/Emily King Teraoka  Section, Township, Range: CA T6N (R1E)
Landform (hillslope, terrace, etc.): near base of trial prism, toeslope  Local relief (concave, convex, none): none  Slope (%): 1
Subregion (LRR): LRRA  Lat: See UPL-03 upland; datapoint U2  Long:  Datum: WGS 84
Soil Map Unit Name: Water  NWI classification: no listing

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:

No wetland parameters were present and the sampled area is within an upland.

VEGETATION – Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum</th>
<th>(Plot size: 4m²)</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapling/Shrub Stratum</td>
<td>(Plot size: 4m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herb Stratum</td>
<td>(Plot size: 4m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Festuca perennis</td>
<td>25%</td>
<td>Yes</td>
<td>FAC</td>
<td></td>
</tr>
<tr>
<td>2. Ranunculus repens</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Daucus carota</td>
<td>25%</td>
<td>Yes</td>
<td>FACU</td>
<td></td>
</tr>
<tr>
<td>4. Raphanus sativus</td>
<td>60%</td>
<td>Yes</td>
<td>NL/UPL</td>
<td></td>
</tr>
<tr>
<td>5. Symphyotrichum chilense</td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Geranium (molle)</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woody Vine Stratum</td>
<td>(Plot size: 4m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Bare Ground in Herb Stratum</td>
<td>35%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks:

Dominance test failed for hydrophytic vegetation. Dominant vegetation is primarily upland species. Vegetation is routinely mowed, location between S. I Street and trail in the Arcata Marsh Wildlife Sanctuary.
**SOIL**

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12</td>
<td>7.5YR 3/1</td>
<td>100</td>
<td>7.5YR 3/1</td>
<td>sandy loam</td>
</tr>
<tr>
<td>12-17</td>
<td>7.5YR 3/1</td>
<td>99</td>
<td>7.5YR 5/8</td>
<td>sandy loam</td>
</tr>
</tbody>
</table>

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

**Indicators for Problematic Hydric Soils**:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

**Restrictive Layer (if present):**

- Type: ______________________
- Depth (inches): ________________

**Remarks:**

A lot of mixed fill within the soil profile. Although some redox features were present, the soil profile did not meet hydric soil indicator parameters.

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (LRR A)
- FAC-Neutral Test (D5)
- Frost-Heave Hummocks (D7)

**Field Observations:**

- Surface Water Present? Yes _____ No _____
- Water Table Present? Yes _____ No _____
- Saturation Present? Yes _____ No _____

**Wetland Hydrology Present?**

- Yes _____ No _____

**Remarks:**

Although water table was observed in the soil pit it was below 12" from the surface and did not pass wetland hydrology parameters for high water table.
WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Arcata WWTP Improvement
City/County: Arcata/ Humboldt
Sampling Date: 10/3/2019
Applicant/Owner: City of Arcata/HSU
State: CA
Sampling Point: U3

Investigator(s): Emmalien Craydon/Emily King Teraoka
Section, Township, Range: CA T6N (R1E)

Landform (hillslope, terrace, etc.): Diked former pasture (historic bay tidelands)
Local relief (concave, convex, none): none
Slope (%): 0

Subregion (LRR): LRRA
Lat: See UPL-04 upland, Data point U3 in map
Long: Datum: WGS 84

Soil Map Unit Name: Occidental, 0 to 2 percent slopes
NWI classification: PEM1D

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:

No wetland parameters were present and the sampled area is within an upland.

VEGETATION – Use scientific names of plants.

<table>
<thead>
<tr>
<th>Stratum</th>
<th>(Plot size: 2 m²)</th>
<th>% Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Stratum</td>
<td>(Plot size: 2 m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2.</td>
<td></td>
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</tr>
<tr>
<td>3.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td>= Total Cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapling/Shrub Stratum</td>
<td>(Plot size: 2 m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
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<tr>
<td>3.</td>
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<tr>
<td>4.</td>
<td></td>
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</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>= Total Cover</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herb Stratum</td>
<td>(Plot size: 2 m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
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<tr>
<td>3.</td>
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<td></td>
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</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td>= Total Cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woody Vine Stratum</td>
<td>(Plot size: 2 m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Rubus ursinus</td>
<td>100</td>
<td>Yes</td>
<td>FACU</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Bare Ground in Herb Stratum</td>
<td>0 = Total Cover</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0
☐ 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
☐ 5 - Wetland Non-Vascular Plants
☐ Problematic Hydrophytic Vegetation (Explain)

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

Dominance test failed for hydrophytic vegetation. Vegetative cover entirely comprised of the upland species California blackberry.
Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Color (moist)</th>
<th>%</th>
<th>Color (moist)</th>
<th>%</th>
<th>Type</th>
<th>Loc</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>10YR 3/2</td>
<td>100</td>
<td>10YR 5/6</td>
<td>2</td>
<td>C</td>
<td>PL</td>
<td>silt loam</td>
<td></td>
</tr>
<tr>
<td>10-12</td>
<td>10YR 3/1</td>
<td>98</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>silt loam</td>
<td></td>
</tr>
</tbody>
</table>

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

Indicators for Problematic Hydric Soils:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

Restrictive Layer (if present):

- Type:
- Depth (inches):
- Hydric Soil Present? Yes ☑ No ❌

Hydrological Parameters:

- Although some redox features were present, the soil profile did not meet hydric soil indicator parameters.

HISTORICAL contexts:

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial)

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

Wetland Hydrology Present? Yes ☑ No ❌

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (pasture/industrial)

Remarks:

No wetland hydrology indicators observed in sampled area.
**Project/Site:** City of Arcata WWTP Improvement
**City/County:** Arcata/ Humboldt
**Applicant/Owner:** City of Arcata
**State:** CA
**Investigator(s):** Emmalien Craydon/Emily King Teraoka
**Sampling Point:** U4
**Landform (hillslope, terrace, etc.):** coastal plain
**Local relief (concave, convex, none):** none
**Slope (%):** 0
**Subregion (LRR):** LRRA
**Lat:** see UPL-05
**Long:**Datum: WGS 84

**Soil Map Unit Name:** Urban land-Anthrahtic Xerorthents association, 0–2% slopes
**NWI classification:** none

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

**Are Vegetation, Soil, or Hydrology significantly disturbed?**
**Are “Normal Circumstances” present?** Yes □ No □
(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:**
No wetland parameters were present and the sampled area is within an upland.

**VEGETATION – Use scientific names of plants.**

**Tree Stratum (Plot size: 3m^2) Absolute % Cover Dominant Species? Indicator Status**

| 1. | Baccharis piluaris | 5 | Yes | NL-UPL |
| 2. | Geranium dissectum | 5 | No  |     |
| 3. | Foeniculum vulgare | 5 | No  | FACU |
| 4. | Rubus armeniacus | 5 | No  |     |
| 5. | Prunella vulgaris | 2 | No  |     |
| 6. | Vicia sp. | 2 | No  |     |
| 7. | Anthoxanthum odoratum | 15 | Yes | FAC |
| 8. | Daucus carota | 5 | No  |     |
| 9. | Helmintheca echoides | 2 | No  |     |
| 10. | Holcus lanatus | 10 | No  |     |
| 11. | | 101 | Total Cover |

**Sapling/Shrub Stratum (Plot size: 3m^2) Absolute % Cover**

1. Baccharis piluaris 5
2. Geranium dissectum 5
3. Foeniculum vulgare 5
4. Rubus armeniacus 5
5. Prunella vulgaris 2
6. Vicia sp. 2
7. Anthoxanthum odoratum 15
8. Daucus carota 5
9. Helmintheca echoides 2
10. Holcus lanatus 10
11. | 101 | Total Cover |

**Herb Stratum (Plot size: 3m^2) Absolute % Cover**

1. Dactylis glomerata 50
2. Geranium dissectum 5
3. Foeniculum vulgare 5
4. Rubus armeniacus 5
5. Prunella vulgaris 2
6. Vicia sp. 2
7. Anthoxanthum odoratum 15
8. Daucus carota 5
9. Helmintheca echoides 2
10. Holcus lanatus 10
11. | 101 | Total Cover |

% Bare Ground in Herb Stratum 10

**Woody Vine Stratum (Plot size: 3m^2) Absolute % Cover**

1. | 0 | Total Cover |

**Remarks:**
Dominance test failed for hydrophytic vegetation. Vegetative cover comprised of upland species.
### SOIL Sampling Point: U4

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color (moist)</td>
<td>%</td>
<td>Color (moist)</td>
</tr>
<tr>
<td>0-6</td>
<td>10YR 4/2</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>6-10</td>
<td>10YR 4/2</td>
<td>96</td>
<td>10YR5/8</td>
</tr>
<tr>
<td>10-17</td>
<td>10YR5/2</td>
<td>65</td>
<td>10YR5/8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10YR7/1</td>
</tr>
</tbody>
</table>

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)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

#### Indicators of Problematic Hydric Soils:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

#### Restrictive Layer (if present):

- Type: 
- Depth (inches): 

#### Hydric Soil Present? Yes [ ] No [X] 

### HYDROLOGY

#### Wetland Hydrology Indicators:

- Primary Indicators (minimum of one required; check all that apply)
  - Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Surface Soil Cracks (B6)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparsely Vegetated Concave Surface (B8)

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

#### Field Observations:

- Surface Water Present? Yes [ ] No [X] Depth (inches): 
- Water Table Present? Yes [ ] No [X] Depth (inches): 
- Saturation Present? Yes [ ] No [X] Depth (inches): (includes capillary fringe)

#### Wetland Hydrology Present? Yes [ ] No [X] 

### Remarks:

- Redox features were below 6 inches of soil profile and depletions were less than 2 inches in the upper 12 inches from the surface. The soil profile did not meet hydric soil indicator parameters.
- Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (industrial).
- No wetland hydrology indicators observed in sampled area.
**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

**Project/Site:** City of Arcata WWTP Improvement  
**City/County:** Arcata/ Humboldt  
**Sampling Date:** 3/12/2020

**Applicant/Owner:** City of Arcata  
**State:** CA  
**Sampling Point:** U5

**Investigator(s):** Emmalien Craydon/Emily King Teraoka  
**Section, Township, Range:** CA T6N (R1E)

**Landform (hillslope, terrace, etc.):** coastal plain  
**Local relief (concave, convex, none):** none  
**Slope (%):** 0

**Subregion (LRR):** LRRA  
**Lat:** see UPL-05  
**Long:**  
**Datum:** WGS 84

**Soil Map Unit Name:** Urban land-Anthrahtic Xerorthents association, 0–2% slopes  
**NWI classification:** none

**Remarks:**
- Precipitation below monthly normal, abnormally dry conditions reported (Nat Drought Mit Center 2020)

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

<table>
<thead>
<tr>
<th>Hydrophytic Vegetation Present?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydric Soil Present?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Wetland Hydrology Present?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**Is the Sampled Area within a Wetland?** Yes | No

**Remarks:**
- No wetland parameters were present and the sampled area is within an upland.

**VEGETATION** – Use scientific names of plants.

**Tree Stratum** (Plot size: 3m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td>0 = Total Cover</td>
</tr>
</tbody>
</table>

**Sapling/Shrub Stratum** (Plot size: 3m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Herb Stratum** (Plot size: 3m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>45</td>
<td>Yes</td>
<td>NL-UPL</td>
</tr>
<tr>
<td>2.</td>
<td>10</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>20</td>
<td>Yes</td>
<td>FACU</td>
</tr>
<tr>
<td>4.</td>
<td>10</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>15</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>5</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>10</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>1</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>126</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Woody Vine Stratum** (Plot size: 3m²)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**% Bare Ground in Herb Stratum** 20

**Remarks:**
- Dominance test failed for hydrophytic vegetation. Vegetative cover comprised of upland species.
### Soil Profile Description:
(Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix Color (moist)</th>
<th>Redox Features Color (moist)</th>
<th>%</th>
<th>Type</th>
<th>Loc</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12</td>
<td>10YR 3/1</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td>sandy loam</td>
<td>with fill</td>
</tr>
</tbody>
</table>

**Redox Features**

- 0-12: No redox features present and the soil profile did not meet hydric soil indicator parameters.

**Restrictive Layer (if present):**
- Type: mixed fill/gravel
- Depth (inches): 12

**Hydric Soil Indicators:**
- Applicable to all LRRs, unless otherwise noted.

**Indicators for Problematic Hydric Soils:**

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

**Hydric Soil Present?** Yes [X] No

**Remarks:**
No redox features present and the soil profile did not meet hydric soil indicator parameters.

### Hydrology

**Wetland Hydrology Indicators:**
- Primary Indicators (minimum of one required; check all that apply)
  - Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Surface Soil Cracks (B6)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparsely Vegetated Concave Surface (B8)

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

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

**Field Observations:**
- Surface Water Present? Yes [X] No
- Water Table Present? Yes [X] No
- Saturation Present? Yes [X] No (includes capillary fringe)

**Wetland Hydrology Present?** Yes [X] No

**Remarks:**
Historic bay tidal lands (U.S. Coast Survey 1870); formerly diked with modified land use (industrial)

No wetland hydrology indicators observed in sampled area.
**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

**Project/Site:** City of Arcata WWTP Improvement  
**City/County:** Arcata/ Humboldt  
**Sampling Date:** 3/12/2020

**Applicant/Owner:**  
**State:** CA  
**Sampling Point:** U6

**Investigator(s):** Emmalien Craydon/Emily King Teraoka  
**Section, Township, Range:** CA T6N (R1E)

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

**Subregion (LRR):** LRRA  
**Lat:** see UPL-06  
**Long:**  
**Datum:** WGS 84

**Soil Map Unit Name:** Water  
**NWI classification:** none

**Remarks:**

No wetland parameters were present and the sampled area is within an upland.  
Precipitation below monthly normal, abnormally dry conditions reported (Nat Drought Mit Center 2020)

**Vegetation** – Use scientific names of plants.

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Plot Size</th>
<th>% Cover</th>
<th>Dominant Species</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Stratum</td>
<td>5m²2</td>
<td></td>
<td>60</td>
<td>Yes</td>
</tr>
<tr>
<td>1. Pinus radiata</td>
<td></td>
<td>10</td>
<td>No</td>
<td>FAC</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>70</td>
<td>Total Cover</td>
<td></td>
</tr>
<tr>
<td>Sapling/Shrub Stratum</td>
<td>3m²2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herb Stratum</td>
<td>3m²2</td>
<td></td>
<td>0</td>
<td>NI-UPL</td>
</tr>
<tr>
<td>1. Raphanus sativus</td>
<td>15</td>
<td>Yes</td>
<td>NI-UPL</td>
<td></td>
</tr>
<tr>
<td>2. Festuca microstachys</td>
<td>35</td>
<td>Yes</td>
<td>NI-UPL</td>
<td></td>
</tr>
<tr>
<td>3. Briza major</td>
<td>15</td>
<td>Yes</td>
<td>NI-UPL</td>
<td></td>
</tr>
<tr>
<td>4. Rumex acetosella</td>
<td>10</td>
<td>No</td>
<td>UPL</td>
<td></td>
</tr>
<tr>
<td>5. Plantago lanceolata</td>
<td>5</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Daucus carota</td>
<td>2</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Holcus lanatus</td>
<td>10</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Eschscholzia californica</td>
<td>5</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Allium triquenra</td>
<td>8</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Anthoxanthum odoratum</td>
<td>10</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>115</td>
<td>Total Cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woody Vine Stratum</td>
<td>3m²2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Bare Ground in Herb Stratum</td>
<td>10</td>
<td>0</td>
<td>Total Cover</td>
<td></td>
</tr>
</tbody>
</table>

**Hydrophytic Vegetation Present?** Yes  
**Hydric Soil Present?** Yes  
**Wetland Hydrology Present?** Yes  
**Is the Sampled Area within a Wetland?** Yes

**Remarks:**

Dominance test failed for hydrophytic vegetation. Vegetative cover comprised of upland species.
**SOIL**

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix Color (moist) %</th>
<th>Redox Features Color (moist) %</th>
<th>Type</th>
<th>Loc</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12</td>
<td>10YR 3/2 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Hydric Soil Indicators:** (Applicable to all LRRs, unless otherwise noted.)
  - Histosol (A1)
  - Histic Epiopedon (A2)
  - Black Histic (A3)
  - Hydrogen Sulfide (A4)
  - Depleted Below Dark Surface (A11)
  - Thick Dark Surface (A12)
  - Sandy Mucky Mineral (S1)
  - Sandy Gleyed Matrix (S4)

- **Indicators for Problematic Hydric Soils:**
  - 2 cm Muck (A10)
  - Red Parent Material (TF2)
  - Very Shallow Dark Surface (TF12)
  - Other (Explain in Remarks)

- **Restrictive Layer (if present):**
  - Type: ______________________
  - Depth (inches):_________________

- **Hydric Soil Present?** Yes ☒ No ☒

- **Remarks:**
  - The soil profile did not meet hydric soil indicator parameters.

**HYDROLOGY**

**Wetland Hydrology Indicators:**

- **Primary Indicators (minimum of one required; check all that apply):**
  - Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Surface Soil Cracks (B6)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparsely Vegetated Concave Surface (B8)

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

- **Field Observations:**
  - Surface Water Present? Yes ☒ No ☒ Depth (inches):__________
  - Water Table Present? Yes ☒ No ☒ Depth (inches):__________
  - Saturation Present? Yes ☒ No ☒ Depth (inches):__________

- **Wetland Hydrology Present?** Yes ☒ No ☒

- **Remarks:**
  - No wetland hydrology indicators observed in sampled area.
WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: City of Arcata WWTP Improvement
City/County: Arcata/Humboldt
Sampling Date: 3/12/2020
Applicant/Owner: City of Arcata
State: CA
Sampling Point: U7

Investigator(s): Emmalien Craydon/Emily King Teraoka
Section, Township, Range: CA T6N R1E
Landform (hillslope, terrace, etc.): coastal plain
Local relief (concave, convex, none): none
Slope (%): 0
Subregion (LRR): LRRA
Lat: see UPL-07
Long: Datum: WGS 84

Soil Map Unit Name: Occidental, 0 to 2 percent slopes
NWI classification: none

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

Are Vegetation, Soil, or Hydrology significantly disturbed? Are “Normal Circumstances” present? Yes No
(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
- Are the Sampled Area within a Wetland? Yes No

Remarks:

- No wetland parameters were present and the sampled area is within an upland.
  - Precipitation below monthly normal, abnormally dry conditions reported (Nat Drought Mit Center 2020)

VEGETATION – Use scientific names of plants.

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 3m²)</th>
<th>Absolute Cover</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Baccharis pilularis</td>
<td>15 Yes</td>
<td>NL-UPL</td>
<td></td>
</tr>
<tr>
<td>2. Salix hookeriana</td>
<td>10 Yes</td>
<td>FACW</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Gasping/Shrub Stratum (Plot size: 3m²)

| 1. Baccharis pilularis       | 15 Yes         | NL-UPL            |
| 2. Salix hookeriana         | 10 Yes         | FACW              |
| 3.                          |                |                   |
| 4.                          |                |                   |
| 5.                          |                |                   |

Herb Stratum (Plot size: 3m²)

| 1. Trifolium dubium         | 5 No           |                   |
| 2. Bromus hordeaceaus       | 45 Yes         | FACU              |
| 3. Plantago lanceolata      | 5 No           |                   |
| 4. Briza major              | 5 No           |                   |
| 5. Daucus carota            | 5 No           |                   |
| 6. Plantago lanceolata      | 8 Yes          | FACU              |
| 7. Conium maculatum        | 5 No           |                   |
| 8. Lotus corniculatus       | 2 No           |                   |
| 9. Festuca (microstachys)   | 2 No           |                   |
| 10. Brassica rapa           | 5 No           |                   |
| 11. Dispacus fullonum       | 8 Yes          | FAC              |

Woodly Vine Stratum (Plot size: 2m²)

| 1. Rubus armeniacus         | 100 Yes        | FACU              |
| 2.                          | 100 Yes        | FACU              |

% Bare Ground in Herb Stratum: 0

Remarks:

- Dominance test not conclusive for hydrophytic vegetation. Vegetative cover comprised of upland species.
### SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12</td>
<td>10YR 3/2</td>
<td>% 100</td>
<td></td>
<td>a lot of fill/gravel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>sandy loam</td>
<td></td>
</tr>
</tbody>
</table>

Redox Features (inches) | Color (moist) | % | Type | Loc |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

Indicators for Problematic Hydric Soils:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

Restrictive Layer (if present):

- Type: fill/gravel/rock
- Depth (inches): 12

No redox features were present within upper 12 inches of the soil profile which had a lot of fill/gravel and no hydric soil indicator parameters observed.

### HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

- Surface Water Present? Yes No Depth (inches): ___________
- Water Table Present? Yes No Depth (inches): ___________
- Saturation Present? Yes No Depth (inches): ___________

Wetland Hydrology Present? Yes No

Historic bay tidelands (U.S. Coast Survey 1870); formerly diked with modified land use (industrial)

Remarks:

No wetland hydrology indicators observed in sampled area.
**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

**Project/Site:** City of Arcata WWTP Improvement  
**City/County:** Arcata/ Humboldt  
**Applicant/Owner:** City of Arcata  
**Sampling Date:** 5/29/2020  
**State:** CA  
**Investigator(s):** Emmalien Craydon/Emily King Teraoka  
**Sampling Point:** U8  
**Landform (hillslope, terrace, etc.):** compacted imported fill, near historic landfill  
**Local relief (concave, convex, none):** none  
**Slope (%):** 1  
**Subregion (LRR):** LRRA  
**Lat:**  
**Long:** See GPS WPT  
**Datum:** WGS 84  
**Soil Map Unit Name:** Water  
**NWI classification:** PEMA1A  

**Remarks:**  
No wetland parameters are present and the sampled area is within an upland. Sampled area is within the Coastal Zone. Precipitation in May 2020 was above "monthly normal" for the region.

**VEGETATION – Use scientific names of plants.**

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Species (Plot size: 3m²)</th>
<th>Cover (%)</th>
<th>Dominant Species?</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Stratum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Anthoxanthum odoratum</td>
<td>50</td>
<td>Yes</td>
<td>FACU</td>
<td></td>
</tr>
<tr>
<td>2. Festuca perenne</td>
<td>5</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Vicia gigantea</td>
<td>25</td>
<td>Yes</td>
<td>NL-UPL</td>
<td></td>
</tr>
<tr>
<td>4. Raphanus sativa</td>
<td>5</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Pktanigo lanceolata</td>
<td>1</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Hypocharis radicata</td>
<td>3</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Symphyotrichum chilense</td>
<td>3</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Daucus carota</td>
<td>1</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Holcus lanatus</td>
<td>2</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Bromus/Agrostis</td>
<td>5</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Vicia sativa</td>
<td>5</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woody Vine Stratum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Rubus armeniacus</td>
<td>15</td>
<td>Yes</td>
<td>FAC</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>15</td>
<td>Yes</td>
<td>FAC</td>
<td></td>
</tr>
</tbody>
</table>

**Dominance Test worksheet:**

- Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
- Total Number of Dominant Species Across All Strata: 3 (B)
- Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

**Prevalence Index worksheet:**

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

**Morphological Adaptations:**

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≥3.0
- 4 - Morphological Adaptations
  - 5 - Wetland Non-Vascular Plants

<table>
<thead>
<tr>
<th>Hydrophytic Vegetation Present?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remarks:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dominant vegetation failed the dominance test for hydrophytic vegetation.
### SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-8</td>
<td>10 YR4/2</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-15</td>
<td>10YR 4/1</td>
<td>90</td>
<td>10YR5/8</td>
<td>C</td>
</tr>
</tbody>
</table>

- **Type:** C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.
- **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)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

#### Indicators for Problematic Hydric Soils:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

#### Restrictive Layer (if present):

- **Type:**
- **Depth (inches):**

#### Hydric Soil Present? Yes X No

#### Remarks:

No hydric soil indicators are present.

### HYDROLOGY

#### Wetland Hydrology Indicators:

- **Primary Indicators (minimum of one required; check all that apply):**
  - Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Surface Soil Cracks (B6)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparingly Vegetated Concave Surface (B8)

- **Secondary Indicators (2 or more required):**
  - Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
  - Salt Crust (B11)
  - Aquatic Invertebrates (B13)
  - Hydrogen Sulfide Odor (C1)
  - Oxidized Rhizospheres along Living Roots (C3)
  - Presence of Reduced Iron (C4)
  - Recent Iron Reduction in Tilled Soils (C6)
  - Stunted or Stressed Plants (D1) (LRR A)
  - FAC-Neutral Test (D2)
  - Shallow Aquitard (D3)
  - Drainage Patterns (B10)
  - Dry-Season Water Table (C2)
  - Saturation Visible on Aerial Imagery (C9)
  - Geomorphic Position (D2)
  - FAC-Neutral Test (D5)
  - Raised Ant Mounds (D6) (LRR A)
  - Frost-Heave Hummocks (D7)

#### Field Observations:

- Surface Water Present? Yes X No
- Water Table Present? Yes X No
- Saturation Present? Yes X No

#### Wetland Hydrology Present? Yes X No

#### Remarks:

No wetland hydrology indicators are present at this sampling location.