TECHNICAL MEMORANDUM

To: Jackie McCloud, Environmental Sustainability Manager, City of Watsonville Public Works Department

From: Sarah Faraola, Environmental Analyst

Subject: Memorandum in Support of a CEQA Categorical Exemption for the City of Watsonville Middle Struve Slough Water Quality and Habitat Enhancement Project

Date: October 29, 2021

CC: Jonathan Pilch, Watsonville Wetlands Watch

Att: A, 100% Design Plans; B, Habitat Enhancement Plan; C, Biotic Report; D, Wetland Delineation; E, Cultural Resources Report; F, Hazardous Waste Sites Database Search Results

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Project Overview

The City of Watsonville (City) as lead agency and the non-profit organization Watsonville Wetlands Watch have partnered to propose the Middle Struve Slough Water Quality and Habitat Enhancement Project (Project). The Project is a multi-benefit ecosystem and watershed restoration project with the purpose of improving water quality through stormwater capture and infiltration, habitat restoration and enhancement; and wetland watershed protection measures.

In compliance with the California Environmental Quality Act (CEQA), the City reviewed the proposed improvements and determined that this project falls within the CEQA Guidelines Section 15333 (Class 33), which provides an exemption from CEQA for Small Habitat Restoration Projects. These classes of projects would not have a significant effect on the environment and, therefore, are declared to be categorically exempt from the requirement for the preparation of an environmental document. The purpose of this memorandum is to provide the rationale for this determination.

Project Location

The Middle Struve Slough project area is located in the northwestern portion of the City of Watsonville, Santa Cruz County. It is one of the six (6) branches of the greater Watsonville Slough System, an approximately 800 acre wetland complex that comprises one of the State's largest remaining freshwater wetlands. Middle Struve Slough is bounded by Pennsylvania Drive to the north and east, Hope Drive to the west, and an existing paved footpath to the south. The Project is located along the Upper Struve Slough Trail, a bicycle and pedestrian trail that is a part of the Watsonville Area Trails Network that connects with the greater Watsonville Slough Trail System. Refer to the figures in **Attachment A**.

Project Description

The Middle Struve Slough Water Quality and Habitat Enhancement Project is a multi-benefit ecosystem and watershed restoration project with the purpose of improving water quality through stormwater capture and infiltration; habitat restoration and enhancement; and wetland watershed protection measures.

The Project supports the overall goal of the City to develop habitat and water quality improvement projects within the Struve Slough watershed, which is listed as an impaired waterbody by the State of California due to present water quality concerns. Additionally, the Project aligns with the City's Climate Change Resiliency Measures and Climate Action Plan and provides for environmental education and green jobs training, as part of the youth-training program that is led by Watsonville Wetlands Watch and called the Climate Corps Leadership Institute.

The Project will provide a benefit to the impaired water quality of Middle Struve Slough by installing three (3) wetland detention ponds (12,245 square feet total) and two (2) stormwater detention basins (6,175 square feet total), and by restoring and enhancing approximately 4.5 acres of wetland, grassland, oak woodland, and riparian habitat. These project elements are described in detail in the 100% Design Plans (**Attachment A**) and the Habitat Enhancement Plan (**Attachment B**), and summarized below.

- Removal of invasive plants (Himalayan blackberry, poison hemlock, Harding grass and other invasive weeds) and replacement with native wetland and riparian vegetation.
- Removal of invasive plants and grasses on the upland slopes and replacement with native grassland vegetation.
- Creation of two (2) catchment basins on the upper, non-wetland slopes on the east and west embankments of Middle Struve Slough. The eastern catchment basin will replace an existing ephemeral channel used to direct water from a storm drain west of Pennsylvania Drive into the slough. The western basin will be fed by a new storm-drain system and outfall extending from Hope Drive to the west.
- Creation of three (3) seasonal to semi-permanent wetland depressions within Middle Struve Slough to increase hydroperiod and enhance habitat functions and values in the slough. These features are situated primarily in areas supporting invasive Himalayan blackberry and will be planted witha suite of herbaceous native wetland vegetation.

The Project will improve climate change resiliency for sensitive wildlife species dependent on coastal freshwater wetlands through the habitat restoration and enhancement, and by planting approximately ten (10) trees along the east side of the project area along the adjacent roadway to improve air quality and buffer noise from the habitat area.

The Project will also benefit the community of Watsonville by providing environmental education and interpretive signage along an approximately 400-foot trail and elevated board walk that would pass through the project area. The bilingual interpretative signage and educational materials will describe the slough ecosystem, pollution prevention, stormwater management, and healthy water resources

Schedule and Hours

Project implementation is planned to occur during the dry season (May – September of 2022). Construction would occur during daylight hours, generally between 7:00 am and 7:00 pm, Monday through Friday, and between 10:00 am and 4:00 pm on Saturday.

Construction Limits and Staging

Construction activities would occur adjacent to and within the Middle Struve Slough. The project area would be accessed from Pennsylvania Drive to the west and from Clifford Avenue to the north for equipment and material unloading. Traffic control would be provided by the contractor at all times when accessing the project area.

Equipment and materials staging would occur within the following three (3) areas: one (1) in the southwest portion of the project area adjacent to Pennsylvania Drive, one (1) in the east portion of the project area at the end of Hope Drive, and one (1) in the north portion of the project area at the end of Clifford Avenue. Following project implementation, all affected areas within the Project area, including the project access area from Pennsylvania Avenue and three (3) staging area, would be returned to pre-project conditions and normal use.

Construction Activities and Equipment

Planned construction activities include grading three (3) wetland depressions, two (2) catchment basins, one (1) spoils placement area, and one (1) fiber roll on the east side of the project area. Typical construction equipment would likely include haul trucks, scrapers and graders. The three (3) wetland depressions would be graded to a depth of 2.5 feet to 3 feet below grade. The two (2) stormwater catchment basins would be graded to a depth of 3 feet to 5 feet below grade.

The planned boardwalk is approximately 400 feet long and would be elevated over the wetland area to enhance public access and protect the wetland area. The depth of piers for the elevated boardwalk have not yet been determined, but are estimated to be approximately 3 feet to 4 feet below grade.

Construction activities include dewatering parts of Middle Struve Slough to install the piers or footers for the elevated boardwalk trail, as well as for grading the wetland depressions and stormwater catchment basins. Construction activities would occur only during the dry season (May – September) and would require no precipitation events one (1) week prior to the start of construction.

Best Management Practices (BMPs)

The 100% design plans (**Attachment A**) include Erosion Control Measures, Earth Work Notes, and a Water Diversion Plan to ensure implementation of BMPs during construction and upon project completion to treat stormwater runoff prior to entering Middle Struve Slough.

The Water Diversion Plan, which may be required to facilitate construction and reduce potential impacts to water quality downstream of project activities, includes the installation of a temporary sealed diversion dam to capture and divert stream flow upstream of the project site.

Additionally, the City or construction contractor shall ensure that a qualified archaeological monitor will be present during construction of the stormwater catchment basins, which involve grading to a depth of 3-5 feet, and use of the Inadvertent Discoveries Protocol under CEQA, which include consulting with local Tribal members if archaeological resources or human remains are discovered.

Additional Information

Habitat Enhancement Plan

As described above in the Project Description, the Habitat Enhancement Plan developed for the Project by Watsonville Wetlands Watch in October 2021 (**Attachment B**) would enhance and restore wildlife habitat, improve water quality, enhance public access and education, and to provide a demonstration of urban greening, habitat restoration and stormwater treatment that is replicable throughout the City and region.

Restoration and enhancement of wildlife habitat would be achieved by the removal of the following invasive species: Himalayan blackberry (1.22 acres) and ruderal herbaceous vegetation (0.75 acres and 0.41 acres) to restore native wet meadow habitat and native oak woodland habitat and enhance willow riparian forest (1.14 acres). Following construction activities, native plants will be planted, based on the list of native plants identified in Appendix B of Habitat Enhancement Plan.

Post construction monitoring and adaptive management measures would ensure that the project is performing to the established goals and objectives of the Habitat Enhancement plan. A Wetland and Riparian Area Monitoring Plan (WRAMP) framework will be utilized in order to evaluate project performance in achieving project objectives, which include quantitative and qualitative techniques to assess species success and survival within the project area. If the performance metric is not met two years after restoration, additional maintenance and adaptive measures will be utilized. These might include increased invasive plant control measures, such as hand weeding, flame torch weeding, or herbicide application, scraping of the soil surface to promote growth of new plant species or additional installation of native seed or container stock. Annual reporting will be completed by December 31st of each year or as required by project permits. Annual reporting is anticipated to include photo monitoring, a description and discussion of work performed, qualitative monitoring data, the results of quantitative monitoring, and a description of any adaptive management actions performed.

Biological Resources Report

A Biotic Assessment for the Project was completed in October 2021 by Kelli Camara of Camara Environmental Consulting (**Attachment C**). Middle Struve Slough is a seasonal wetland that supports a mixture of freshwater wetlands, willow riparian, ruderal grassland, as well as a previously restored grassland and a wet meadow habitat.

Vegetation communities include: emergent freshwater marsh, willow riparian forest, ruderal wet meadow, ruderal herbaceous vegetation, and ruderal grassland habitats. Common wildlife that may inhabit or forage within the project area include: gopher snake (*Pituophis melanoleucus*), red-tailed hawk (*Buteo jamaicensis*), American robin (*Turdus migratorius*), California ground squirrel (*Spermophilus beecheyi*), California meadow vole (*Microtus californicus*), Botta's pocket gopher (*Thomomys bottae*), and deer.

Wetland Delineation Report

A Wetland Delineation Report was completed for Middle Struve Slough in April 2021 by Justin Davilla of Ecosystems West Consulting Group (**Attachment D**). A field assessment of the project area was conducted to determine the extent of potential wetlands subject to jurisdiction under Sections 401 and 404 of the Clean Water Act, and the Porter Cologne Water Quality Act. The field assessment identified four (4) potential Section 404 jurisdictional wetlands within the project area. These areas met the criteria for hydrophytic wetland vegetation, hydric soils, and wetland hydrology. The potential wetlands include: blackberry scrub-shrub wetland (0.94 acres), mixed willow thicket scrub-shrub wetland (0.68 acres), freshwater emergent wetland (0.12 acres) and one (1) potential 'other waters' of the U.S. which includes a perennial, unvegetated open-water channel of Middle Struve Slough.

Cultural Resources Report

A Phase I Cultural Resources Inventory was conducted in August 2021 by Albion Environmental, to assess the project area at Middle Struve Slough (**Attachment E**). The study included the following: (1) archival and background research, (2) a search of records at the California Historical Resources Information System's Northwest Information Center (NWIC); (3) a pedestrian survey of the proposed Project Area; and (4) a technical report describing the findings of the investigation. The NWIC search indicated that no archaeological resources have been previously identified within the project area, and one (1) resource has been recorded within a ¼ - mile radius of the Project Area. There has previously been one (1) archaeological study conducted within the project area.

Although visual inspection of the project area surface revealed no evidence of archaeological deposits of historic-era artifacts, the center of the project area (within and adjacent to the Middle Struve Slough) was not assessed due to standing water and blackberry bushes. Construction of the wetland depressions and stormwater catchment basins would require grading to a depth of 3 feet to 5 feet, which would have a moderate to high sensitivity of potentially containing buried archaeological deposits. Albion recommends that a qualified archaeologist be present during grading to a depth of 3-5 feet and use of the Inadvertent Discoveries Protocol under CEQA.

CEQA Categorical Exemption

Qualifications for a Categorical Exemption

The CEQA Guidelines Section 15300 includes a list of classes of projects that have been determined not to have a significant effect on the environment and thus are exempt from the provisions of CEQA, if the specified exceptions to using the exemption do not apply. Implementation of the Middle Struve Slough Water Quality and Habitat Improvement project described above falls within Class 33, Small Habitat Restoration Projects. Per CEQA Guidelines Section 15333 (c), Class 33, Small Habitat Restoration Projects:

> "Class 33 consists of consists of projects not to exceed five (5) acres in size to assure the maintenance, restoration, enhancement, or protection of habitat for fish, plants, or wildlife provided that:
>
> (a) There would be no significant adverse impact on endangered, rare or threatened species or their habitat pursuant to section 15065,
> (b) There are no hazardous materials at or around the project site that may be disturbed or removed, and
> (c) The project will not result in impacts that are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

(d) Examples of small restoration projects may include, but are not limited to:
   1) revegetation of disturbed areas with native plant species;
   2) wetland restoration, the primary purpose of which is to improve conditions for waterfowl or other species that rely on wetland habitat;
   3) stream or river bank revegetation, the primary purpose of which is to improve habitat for amphibians or native fish;
   4) projects to restore or enhance habitat that are carried out principally with hand labor and not mechanized equipment;
   5) stream or river bank stabilization with native vegetation or other bioengineering techniques, the primary purpose of which is to reduce or eliminate erosion and sedimentation; and
   6) culvert replacement conducted in accordance with published guidelines of the Department of Fish and Game or NOAA Fisheries, the primary purpose of which is to improve habitat or reduce sedimentation."

The Middle Struve Slough Water Quality and Habitat Enhancement Project includes addressing historic habitat loss and degradation by creating wetland depressions and stormwater catchment basins, and by enhancing a wetland and riparian corridor and restoring approximately 4.5 acres of wetland, grassland, oak woodland and riparian habitat. Because the habitat restoration activities and water quality enhancements included within the Project do not exceed five (5) acres in size, the project is considered Categorically Exempt from CEQA, and will be discussed further below.

Exceptions to Using a Categorical Exemption

CEQA Guidelines Section 15300.2, Exceptions, identifies the following exceptions to using a Categorical Exemption. Based on an examination of the project and supporting information, the project would not result in any impacts to the environment that would cause an exception to applying the Class 33, Small Habitat Restoration, Categorical Exemption.

(a) Location. Classes 3, 4, 5, 6, and 11 are qualified by consideration of where the project is to be located – a project that is ordinarily insignificant in its impact on the environment may in a particularly sensitive environment be significant.

Exception (a) does not apply because the project falls within the Class 33, Small Habitat Restoration Project, exemption (not Classes 3, 4, 5, 6 or 11). Although Middle Struve Slough could be considered a 'particularly sensitive environment', the purpose of the project to restore wetland habitat and improve water quality within the Middle Struve Slough. Therefore, the project would be providing a positive benefit to the Middle Struve Slough wetland environment.

(b) Cumulative Impact. All exemptions for these classes are inapplicable when the cumulative impact of successive projects of the same type in the same place, over time is significant.

Although the City and Watsonville Wetlands Watch are planning similar water quality improvements and habitat restoration in Upper Struve Slough, exception (b) does not apply because the work would occur in a different portion of the watershed (and not in the same place over time), and because these projects result in a net benefit and no adverse cumulative impacts. The project would enhance the water quality and coastal wetland habitat of the Middle Struve Slough, as well as provide access to this natural resource to the Watsonville community. Further, BMPs would be implemented throughout project construction to avoid and minimize potential impacts on environmental resources and the community in the project area.

(c) Significance Effects. A categorical exemption shall not be used for any activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.

Exception (c) does not apply because there is not a reasonable possibility that the project would have a significant effect on the environment due to unusual circumstances. Project effects would be typical construction-related effects (e.g., dust, noise) and would be temporary. As described above, the project construction specifications would include implementation of several BMPs and environmental protection measures to avoid and minimize

potential environmental impacts throughout construction. These include measures related to reducing dust, protecting water quality near storm drainages, and providing access. Once constructed, the project would result in beneficial effects and no significant adverse effects from operation.

Construction of wetland depressions would expand and enhance existing wetland habitat areas that are currently dominated with non-native vegetation, and the construction of stormwater catchment basins would provide treatment and filtration of stormwater runoff prior to entering Middle Struve Slough. Overall, the project would result in beneficial effects to enhance the water quality and coastal wetland habitat of the Middle Struve Slough, as well as provide access to this natural resource to the Watsonville community.

(d) Scenic Highways. A categorical exemption shall not be used for a project which may result in damage to scenic resources, including but not limited to, trees, historic buildings, rock outcroppings, or similar resources within a highway officially designated as a state scenic highway. This does not apply to improvements which are required as mitigation by an adopted negative declaration or certified EIR.

Exception (d) does not apply because the project would not affect any scenic highways or result in damage to scenic resources within a state scenic highway. The proposed water quality and habitat enhancement project would not damage or alter any scenic resources, including trees, rock outcroppings, or historic buildings within a designated state scenic highway.

(e) Hazardous Waste Sites. A categorical exemption shall not be used for a project located on a site which is included on any list compiled pursuant to Section 65962.5 of the Government Code.

Exception (e) does not apply because the project area is not on any list compiled pursuant to Government Code Section 65962.5 (Cortese List). The EnvirStor and GeoTracker databases were checked on October 25, 2021; and there are no hazardous waste sites located within 1,000 feet of the project area (**Attachment F**)

(f) Historical Resources. A categorical exemption shall not be used for a project which may cause a substantial adverse change in the significance of a historical resource.

Exception (f) does not apply because the project area (locations of the planned improvements) does not include any historic resources and is not part of the Watsonville Historic District. Further, project implementation would be entirely within the vicinity of the vegetated area immediately adjacent to the Middle Struve Slough and would not affect any structures. Further, an archaeological monitor would be present during construction activities that involve excavation 3-5 feet deep and implement standard protocol for any inadvertent discovery of archaeological or historical resources. Therefore, the project would not cause substantial adverse changes in the significance of a historical resource.

Conclusion

The Middle Struve Slough Water Quality and Habitat Improvement project is a multi-benefit ecosystem and watershed restoration project that improves water quality through implementation of wetland and stormwater detention ponds, habitat restoration, and watershed protection measures. These improvements constitute a complete project and function independently of any other improvements, and they would result in a net beneficial impact to the environment.

Additional project benefits include climate change resiliency and increasing public access and environmental education through the creation of an approximately 400-foot elevated board walk that will pass through the project area. For the reasons stated above, this project is categorically exempt from CEQA, based on CEQA Guidelines Section 15333, Small Habitat Restoration Projects (Class 33).

References

Albion Environmental. 2021. Phase I Cultural Resources Inventory for Middle Struve Slough, Watsonville. October. (Attachment E)

California Department of Toxic Substances Control. 2019. Database query of EnviroStor for toxic waste sites in Watsonville, CA. Completed October 2021. https://www.envirostor.dtsc.ca.gov. (Attachment F)

California Department of Transportation (Caltrans). 2017. Scenic Highways. https://dot.ca.gov/-/media/dot-media/programs/design/documents/od-county-scenic-hwys-2015-a11y.pdf. https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways.

Camara Environmental Consulting. 2021. Biotic Assessment for the Middle Struve Slough Habitat and Water Quality Improvement Project. October 25, 2021. (Attachment C)

EcoSystems West Consulting Group. 2021. Delineation of Aquatic Resources Subject to State and Federal Jurisdiction for the Middle Struve Slough Stormwater and Wetland Enhancement Project Area. April. (Attachment D)

Santa Cruz County, 2011 Edition. Construction Site Stormwater Pollution Control BMP Manual. Santa Cruz County, CA.

State of California Water Resources Control Board. 2015. Database query of GeoTracker for toxic waste sites in Watsonville, CA. Completed October 2021. https://www.geotracker.waterboards.ca.gov (Attachment F)

Waterways Consulting. 2021. Middle Struve Slough Habitat and Water Quality Improvement Project 100% Admin Draft Design Submittal. September 24, 2021. (Attachment A)

Watsonville Wetlands Watch. 2021. Middle Struve Slough Habitat and Water Quality Improvement Project Habitat Enhancement Plan. October. (Attachment B)

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Attachment A. 100% Design Plans for the Middle Struve Slough Habitat and Water Quality Improvement Project

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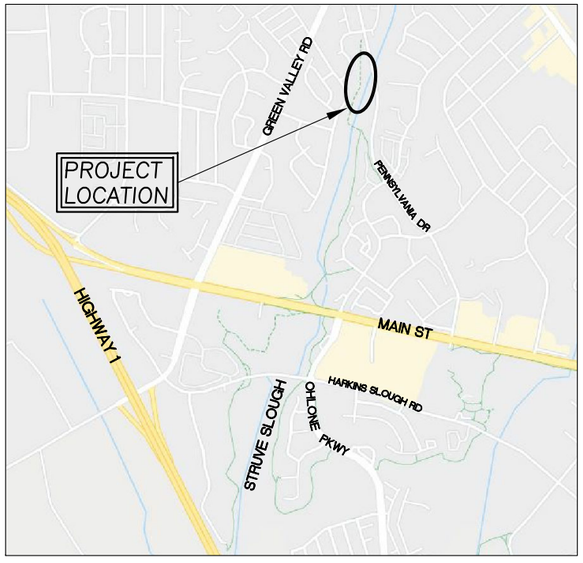
MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT

100% ADMIN. DRAFT DESIGN SUBMITTAL



VICINITY MAP
N.T.S. (GOOGLE)

REGIONAL MAP
N.T.S. (GOOGLE)

GENERAL NOTES

1. TOPOGRAPHIC MAPPING WAS PERFORMED BY:
   WATERWAYS CONSULTING, INC.
   509A SWIFT STREET
   SANTA CRUZ, CA 95060
   SURVEY DATE; JANUARY 24, 2020.
2. ELEVATION DATUM: GPS TIES TO NAVD88 USING THE LEICA GEOSYSTEMS SMARTNET GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) NETWORK.
3. BASIS OF BEARINGS: GPS TIES TO NAD83 CALIFORNIA STATE PLANE, ZONE 3 USING THE LEICA GEOSYSTEMS SMARTNET GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) NETWORK.
4. AERIAL PHOTO SOURCE:
   MICROSOFT CORP.
5. CONTOUR INTERVAL IS ONE FOOT. ELEVATIONS AND DISTANCES SHOWN ARE IN DECIMAL FEET.
6. THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES ARE NOT SHOWN HEREON.
7. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE 2018 EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").
8. THESE DESIGNS ARE INCOMPLETE WITHOUT THE FINAL STAMPED TECHNICAL SPECIFICATIONS PREPARED BY WATERWAYS CONSULTING, INC. REFER TO TECHNICAL SPECIFICATIONS FOR DETAILS NOT SHOWN HEREON.

ABBREVIATIONS

AVG.	AVERAGE
CC	CONCRETE
CY	CUBIC YARDS
DIA.	DIAMETER
E	EXISTING
EG	EXISTING GROUND
ELEV.	ELEVATION
DI	DRAINAGE INLET
FG	FINISHED GRADE
FT	FEET
INV	INVERT
MIN	MINIMUM
N	NEW
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
RC	RELATIVE COMPACTION
RSP	ROCK SLOPE PROTECTION
SPK	SPIKE
SQ.FT.	SQUARE FOOT
T	TREE
T.B.D.	TO BE DETERMINED
TYP	TYPICAL
UNK	UNKNOWN
WSE	WATER SURFACE ELEVATION
YR	YEAR

TREE SPECIES

BUC	BUCKEYE
DF	DOUGLAS FIR
O	OAK
T	TREE (SPECIES UNKNOWN)
W	WILLOW

SECTION AND DETAIL CONVENTION

SECTION OR DETAIL IDENTIFICATION (NUMBER OR LETTER) — 5 / C3 — SHEET REFERENCE

PROJECT DESCRIPTION

THESE DRAWINGS PROVIDE 100% LEVEL DESIGN DETAILS FOR THE CREATION OF WETLAND DEPRESSIONS AND STORMWATER CATCHMENT BASINS WITHIN AND ADJACENT TO A PORTION OF STRUVE SLOUGH IN WATSONVILLE, CALIFORNIA.

WETLAND DEPRESSIONS WILL BE EXCAVATED TO EXPAND AND ENHANCE EXISTING WETLAND AREAS THAT ARE CURRENTLY DOMINATED WITH NON-NATIVE BLACKBERRY BRAMBLES. STORMWATER CATCHMENT BASINS WILL BE CONSTRUCTED AT THE OUTFALL OF TWO STORMDRAIN NETWORKS TO PROVIDE FILTRATION AND TREATMENT OF SUBURBAN RUNOFF BEFORE IT ENTERS STRUVE SLOUGH.

SHEET INDEX

** CALL BEFORE YOU DIG **

CONTACT UNDERGROUND SERVICE ALERT (USA)
PRIOR TO ANY CONSTRUCTION WORK 1-800-227-2600

WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH:(831)421-9291 // FAX:(888)819-6847
WWW.WATWAYS.COM

DRAFT
NOT FOR CONSTRUCTION

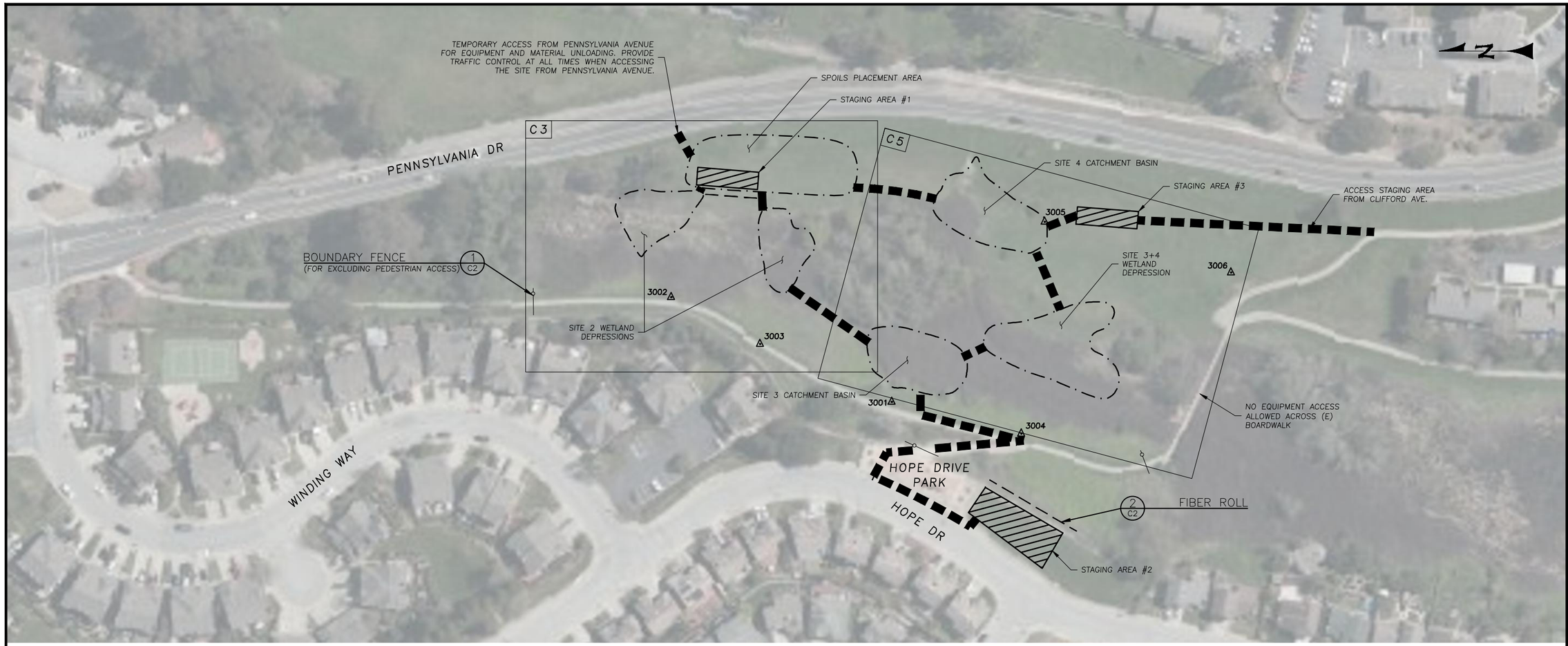
PREPARED AT THE REQUEST OF:
CITY OF WATSONVILLE

COVER

MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT
100% ADMIN. DRAFT DESIGN SUBMITTAL

DESIGNED BY:	B.M.Z.
DRAWN BY:	K.P.B.
CHECKED BY:	B.M.Z.
DATE:	9/24/2021
JOB NO.:	19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 — 1"



ACCESS AND STAGING AREA NOTES

1. USE ONLY THE APPROVED ACCESS POINTS, AS SHOWN ON THE DRAWINGS. STOCKPILE MATERIALS WITHIN AN EXISTING FLAT AND PREVIOUSLY DISTURBED AREA.
2. THE ACCESS PLAN SHOWN ON THE DRAWINGS IS SCHEMATIC. SUBMIT A SITE ACCESS PLAN FOR APPROVAL BY THE ENGINEER, PRIOR TO MOBILIZATION.
3. CONTAIN THE DOWNSLOPE PERIMETER OF STAGING OR STOCKPILE AREAS WITH FIBER ROLLS.
4. STORE, MAINTAIN AND REFUEL ALL EQUIPMENT AND MATERIALS IN A DESIGNATED PORTION OF A STAGING AREA.

OVERVIEW AND ACCESS PLAN

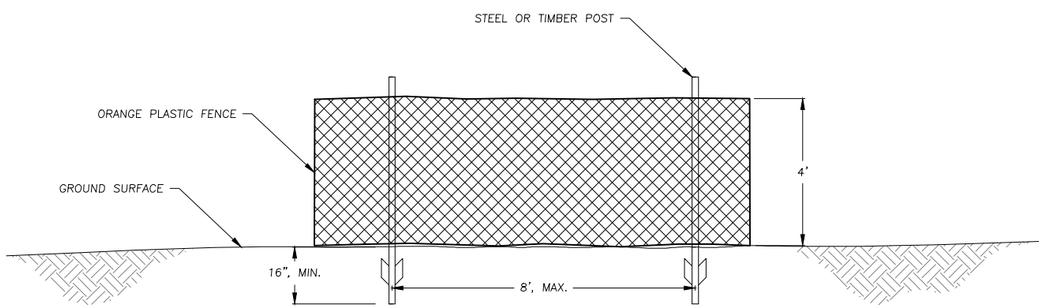
SCALE: 1" = 60'

CONTROL POINTS

POINT #	DESCRIPTION	ELEV	NORTHING	EASTING
3001	SPK	30.02	1797944.76	6188567.72
3002	SPK	26.11	1798197.65	6188687.68
3003	RBR	28.93	1798095.87	6188634.11
3004	SPK	28.39	1797796.34	6188531.32
3005	RBR	25.02	1797769.51	6188774.06
3006	RBR	26.91	1797555.87	6188715.96

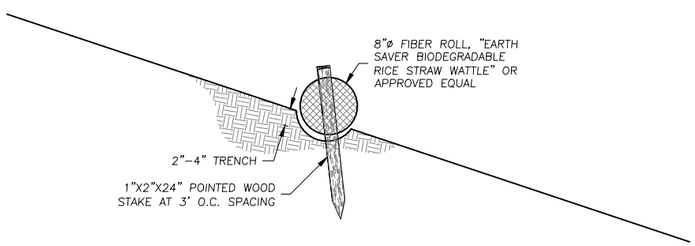
LEGEND

- PROPOSED BOUNDARY FENCE
- STAGING AREA
- TEMPORARY ACCESS ROUTE
- LIMITS OF GRADING
- PROPOSED FIBER ROLL



BOUNDARY FENCE

SCALE: 1" = 2' — 1 C2,C5



FIBER ROLL

SCALE: 1" = 1' — 2 C2,C3,C4

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DRAFT

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PREPARED AT THE REQUEST OF:
CITY OF WATSONVILLE

OVERVIEW AND ACCESS PLAN

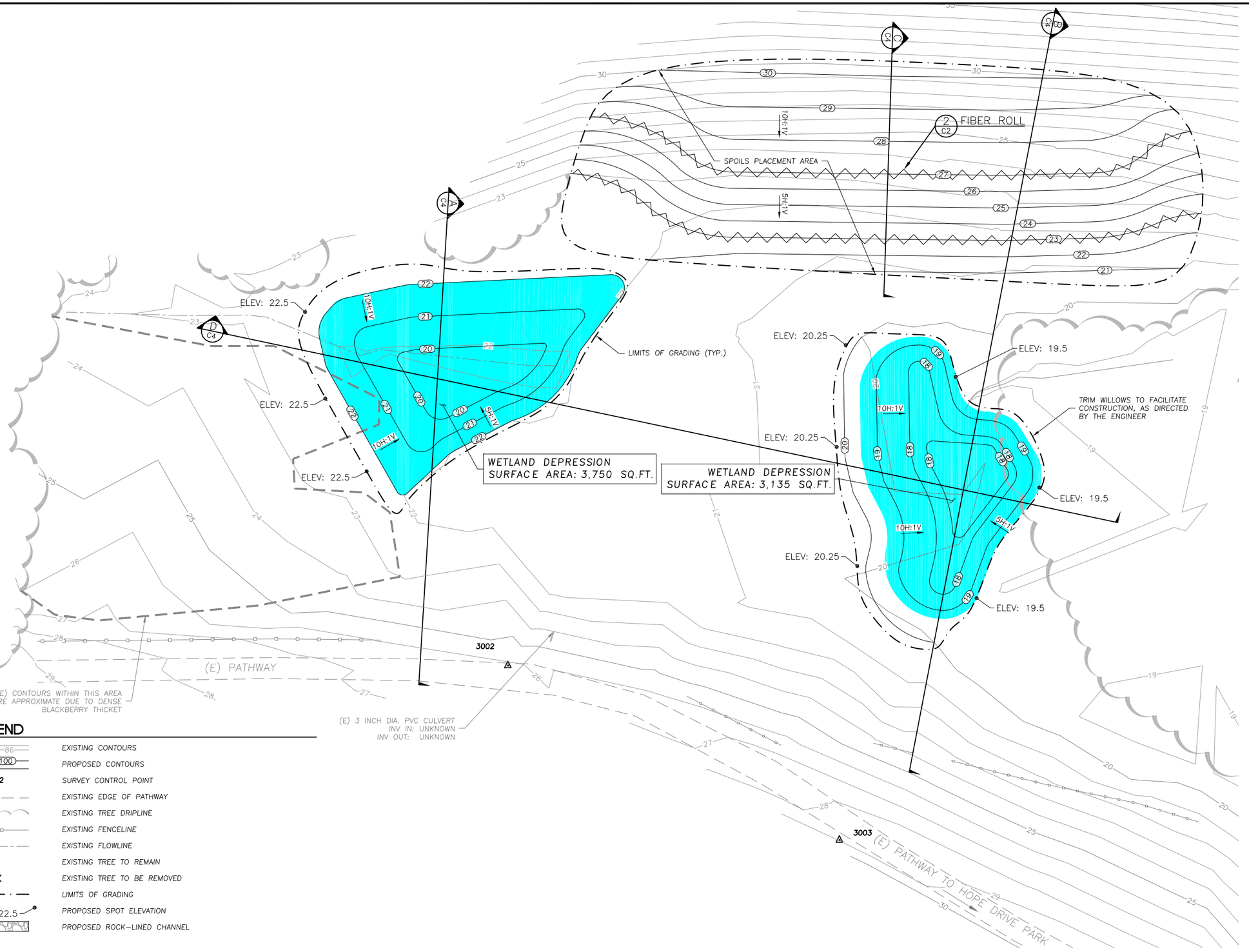
MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT

100% ADMIN. DRAFT DESIGN SUBMITTAL

DESIGNED BY:	B.M.Z.
DRAWN BY:	K.P.B.
CHECKED BY:	B.M.Z.
DATE:	9/24/2021
JOB NO.:	19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

0 1"



LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- SURVEY CONTROL POINT
- EXISTING EDGE OF PATHWAY
- EXISTING TREE DRIPLINE
- EXISTING FENCELINE
- EXISTING FLOWLINE
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED
- LIMITS OF GRADING
- ELEV: 22.5 — PROPOSED SPOT ELEVATION
- PROPOSED ROCK-LINED CHANNEL

SITE 2 GRADING AND IMPROVEMENTS PLAN

SCALE: 1" = 15'

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PREPARED AT THE REQUEST OF:
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SITE 2 GRADING AND IMPROVEMENTS PLAN

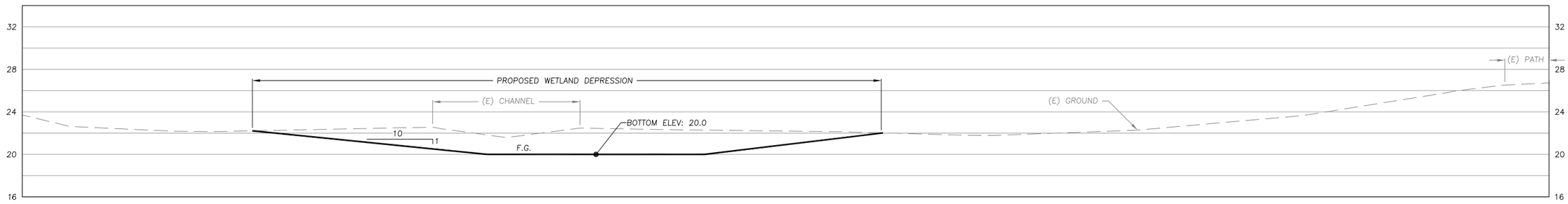
MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT

100% ADMIN. DRAFT DESIGN SUBMITTAL

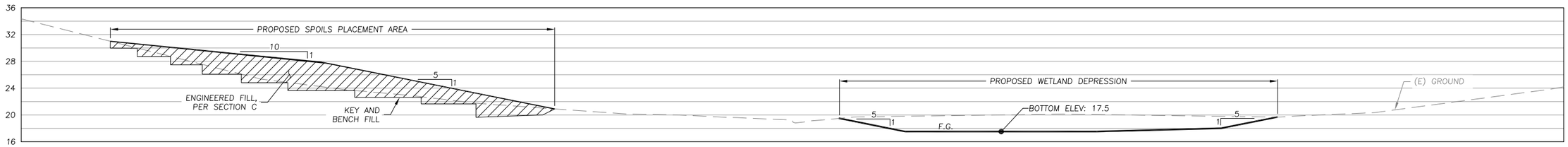
DESIGNED BY:	B.M.Z.
DRAWN BY:	K.P.B.
CHECKED BY:	B.M.Z.
DATE:	9/24/2021
JOB NO.:	19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

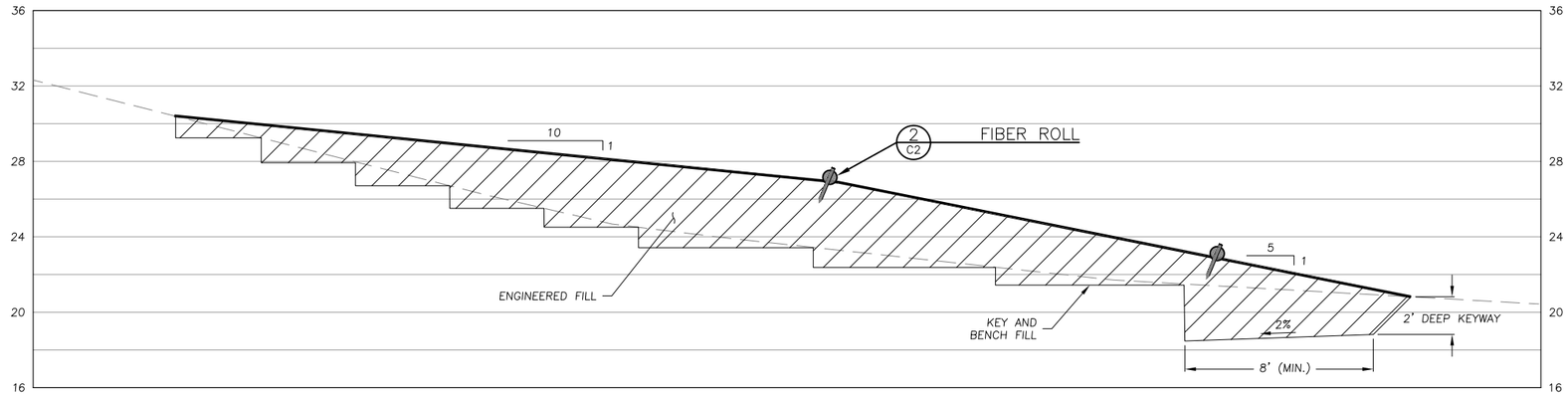
0 1"



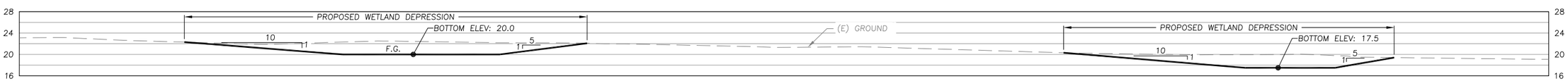
SECTION
SCALE: 1" = 5' (A / C3)



SECTION
SCALE: 1" = 8' (B / C3)



TYPICAL SPOILS PLACEMENT SECTION
SCALE: 1" = 4' (C / C3)



SECTION
SCALE: 1" = 10' (D / C3)

WATERWAYS CONSULTING INC.
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NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
CITY OF WATSONVILLE

SITE 2
PROFILE AND SECTIONS

MIDDLE STRUVE SLOUGH
HABITAT AND WATER QUALITY
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0 1"

CONFORM ROCK TO CULVERT AS DIRECTED BY THE ENGINEER

(E) 18 INCH DIA. HDPE CULVERT SLEEVED WITH PVC
INV IN: UNKNOWN
INV OUT: 28.6

(E) LIMITS OF SACKED CONCRETE AND CONCRETE RUBBLE

PROTECT (E) TOYON

TOYON

3005

SITE 4 CATCHMENT BASIN
SURFACE AREA: 3,150 SQ.FT.

SPILLWAY CREST
ELEV: 22.0

ROCK-LINED CHANNEL (TYP.)

SITE 4 PROFILE 2/C6

CONFORM ROCK TO EXISTING GRADE

LIMITS OF GRADING (TYP.)

2BUC

(E) MULTISTEM BUCKEYE TO BE REMOVED

1/C2 BOUNDARY FENCE

PROTECT (E) MULTISTEM BUCKEYE

(E) PEDESTRIAN BOARDWALK
DECK ELEVATION: 17.3

WETLAND DEPRESSION
SURFACE AREA: 5,630 SQ.FT.

WILLOWS MAY BE CLEARED TO FACILITATE THE WORK. ALL WILLOWS TO BE TRIMMED SHALL BE FLAGGED FOR APPROVAL BY THE ENGINEER PRIOR TO ANY CLEARING (TYP)

1/C6 SITE 3 PROFILE

CONFORM ROCK TO EXISTING GRADE

SPILLWAY CREST
ELEV: 22.0

SITE 3 CATCHMENT BASIN
SURFACE AREA: 3,025 SQ.FT.

TAPER ROCK-LINED CHANNEL BOTTOM WIDTH FROM 6 FT. AT THE CONCRETE BOX TO 4 FT. OVER A DISTANCE OF 6 FT., AS DIRECTED BY THE ENGINEER.

(E) 6.5 FT X 6.5 FT CONCRETE BOX WITH ENERGY DISSIPATION BLOCK AND STEEL LID

(E) 14 INCH DIA. CONCRETE CULVERT
INV IN: UNKNOWN
INV OUT: 24.5

(E) PATHWAY

3004

SITE 3 AND SITE 4 GRADING AND IMPROVEMENT PLAN

SCALE: 1" = 15'

LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- SURVEY CONTROL POINT
- EXISTING EDGE OF PATHWAY
- EXISTING TREE DRIPLINE
- EXISTING FENCELINE
- EXISTING FLOWLINE
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED
- LIMITS OF GRADING
- PROPOSED SPOT ELEVATION (ELEV: 22.5)
- PROPOSED ROCK-LINED CHANNEL

NOTE:
SECTIONS F AND G HAVE BEEN EXTENDED BEYOND THE LIMITS SHOWN TO INCLUDE PENNSYLVANIA AVENUE ABOVE THE SITE 4 CATCHMENT BASIN AND THE PAVED TRAIL ABOVE THE SITE 3 CATCHMENT BASIN. SEE THE OVERVIEW AND ACCESS PLAN ON SHEET C2 FOR THE POSITION OF THE ROAD AND TRAIL RELATIVE TO THE BASINS.

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SITES 3 + 4 GRADING AND IMPROVEMENTS PLAN

MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT

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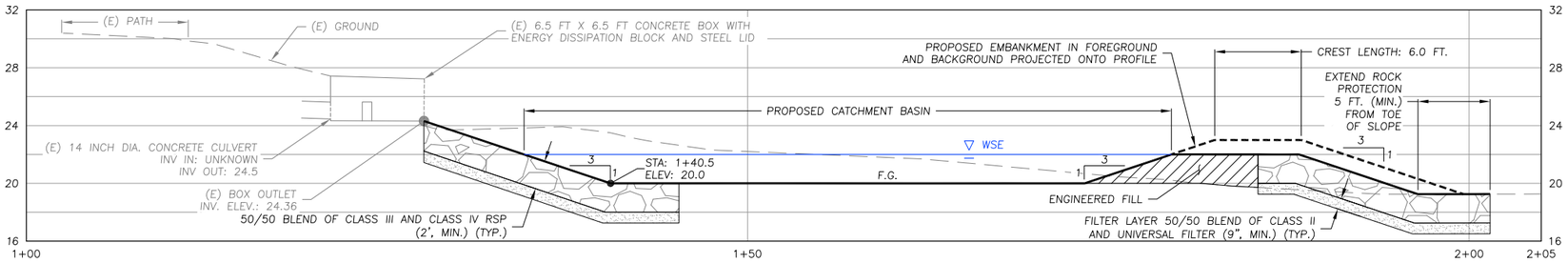
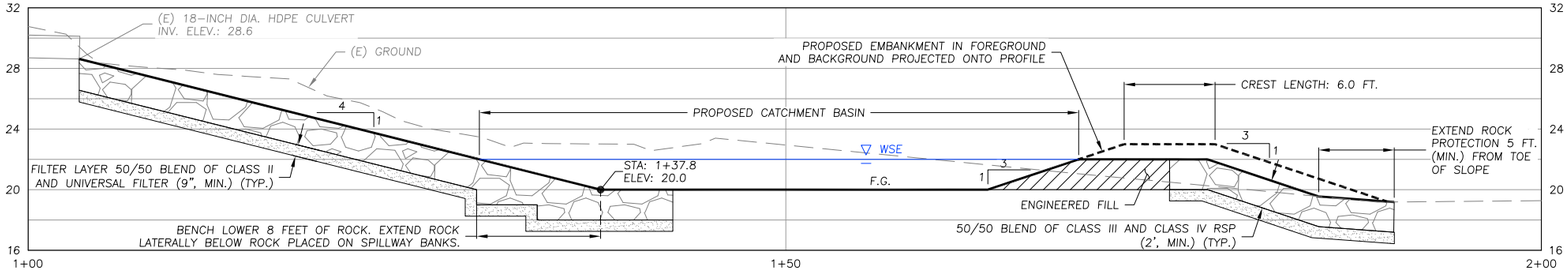
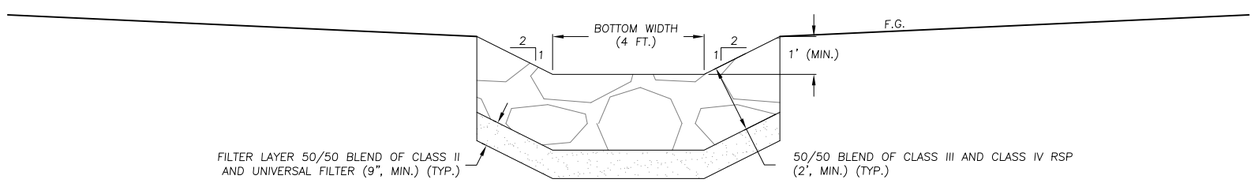
0 1"



SITE 3 PROFILE (1 / C5)
SCALE: 1" = 5'



SITE 4 PROFILE (2 / C5)
SCALE: 1" = 5'



TYPICAL ROCK-LINED CHANNEL SECTION (E / C5)
SCALE: 1" = 2'

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SITE 3+4
PROFILES AND SECTIONS
(1 OF 2)

MIDDLE STRUVE SLOUGH
HABITAT AND WATER QUALITY
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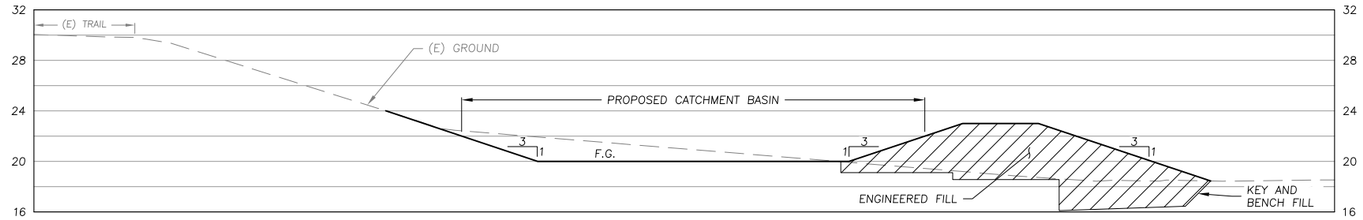
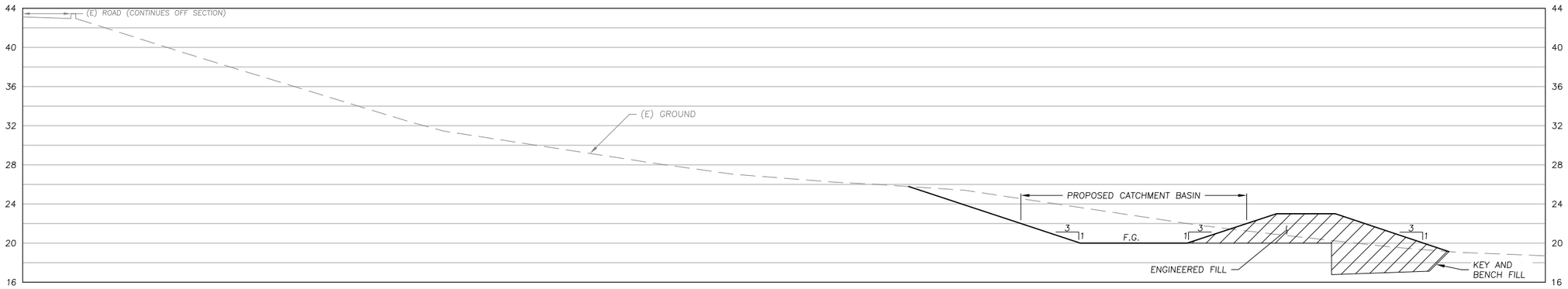
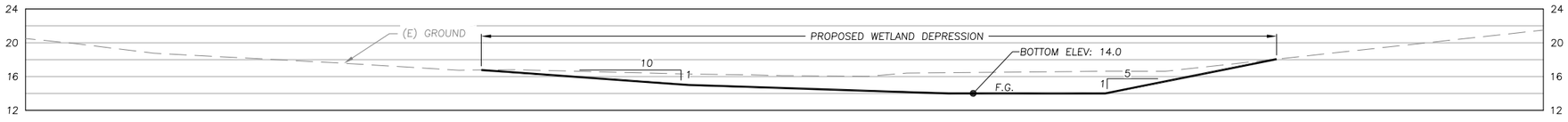


SITE 3 SECTION (F / C5)
SCALE: 1" = 6'



SITE 4 SECTION (G / C5)
SCALE: 1" = 6'



SECTION (H / C5)
SCALE: 1" = 8'

SECTION (I / C5)
SCALE: 1" = 8'

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SITE 3+4 PROFILES AND SECTIONS (2 OF 2)

MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT

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0 1"

C7 | 7 OF 10

DIVERSION AND DEWATERING PLAN
SCALE: 1" = 60'

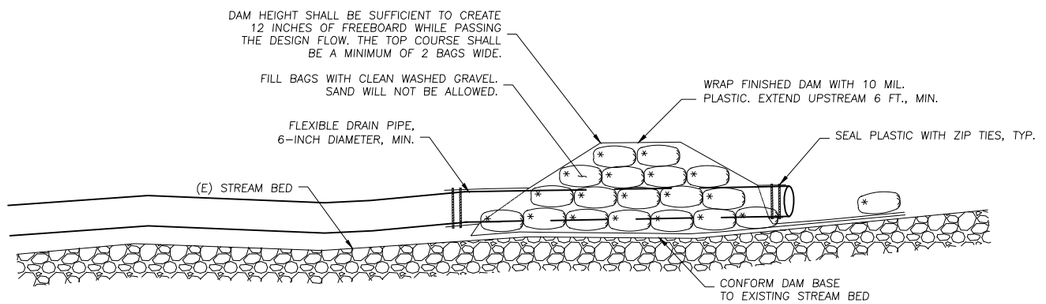
DIVERSION NOTES

REQUIREMENTS FOR DIVERSION AND DEWATERING ARE PROVIDED BELOW. THE CONTRACTOR IS RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE DIVERSION SYSTEM, AND ANY REQUIRED MODIFICATIONS TO ENSURE PROPER FUNCTION OF THE DIVERSION AND DEWATERING FACILITIES THROUGH CONSTRUCTION.

1. GENERAL
   - 1.1. DEWATER THE PROJECT SITE AS REQUIRED TO FACILITATE CONSTRUCTION AND TO REDUCE POTENTIAL IMPACTS TO WATER QUALITY DOWNSTREAM OF THE PROJECT SITE.
   - 1.2. IMPLEMENT DIVERSION AND DEWATERING MEASURES IN COMPLIANCE WITH PROJECT PERMIT REQUIREMENTS.
   - 1.3. CONFIRM THAT A FAVORABLE LONG TERM WEATHER FORECAST (1 WEEK, MIN.) IS OBSERVED PRIOR TO PLACEMENT OF DIVERSION STRUCTURES.
   - 1.4. DIVERT FLOW ONLY WHEN THE DIVERSION CONSTRUCTION IS OTHERWISE COMPLETE. FOLLOWING THE ENGINEER'S APPROVAL OF THE COMPLETED WORK, REMOVE DIVERSION BEGINNING AT THE DOWNSTREAM LIMIT, IN AN UPSTREAM DIRECTION.

2. DIVERSION SYSTEM
   - 2.1. INSTALL A TEMPORARY, SEALED DAM CONSTRUCTED USING GRAVEL FILLED BAGS TO CAPTURE AND DIVERT STREAM FLOW UPSTREAM OF THE PROJECT SITE. THE DAM AND METHOD OF SEALING SHALL BE PLACED AT AN APPROPRIATE DEPTH TO CAPTURE SUBSURFACE STREAM FLOW, AS NEEDED TO DEWATER THE STREAMBED. GRAVEL SHALL BE WASHED PRIOR TO PLACEMENT IN BAGS. THE USE OF SAND WILL NOT BE ALLOWED. NO OTHER DIVERSION METHOD SHALL BE USED WITHOUT AUTHORIZATION OF THE ENGINEER. IF AN ALTERNATE DIVERSION METHOD IS PREFERRED BY THE CONTRACTOR, THE CONTRACTOR SHALL SUBMIT A PLAN TO THE ENGINEER FOR APPROVAL, DETAILING THE DESIRED DIVERSION METHOD.
   - 2.2. THE DIVERSION STRUCTURE SHALL BE CONSTRUCTED AS SHOWN ON DETAIL 1, THIS SHEET OR AS DIRECTED BY THE ENGINEER IN THE FIELD.
   - 2.3. IN THE EVENT OF A SIGNIFICANT STORM, THE CONTRACTOR SHALL BE PREPARED TO TAKE NECESSARY MEASURES TO INSURE SAFE PASSAGE OF STORM WATER FLOW THROUGH THE PROJECT AREA, WITHOUT DAMAGE TO EXISTING STRUCTURES, OR INTRODUCTION OF EXCESSIVE SEDIMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY EROSION CONTROL B.M.P.'S.

3. DEWATERING OF CONSTRUCTION AREAS
   - 3.1. SUPPLY ALL NECESSARY PUMPS, PIPING, FILTERS, SHORING, AND OTHER TOOLS AND MATERIALS NECESSARY FOR DEWATERING. IF A PUMPED SYSTEM IS RELIED UPON TO ENSURE DOWNSTREAM WATER QUALITY, A BACKUP PUMP OF EQUAL CAPACITY SHALL BE PROVIDED AT ALL TIMES AND THE PUMP MUST BE CONTINUOUSLY MONITORED.
   - 3.2. DEWATERING ACTIVITIES WHICH MAY BE REQUIRED FOR CONSTRUCTION PURPOSES SHALL COMPLY WITH WATER QUALITY STANDARDS ISSUED BY THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD.
   - 3.3. DISCHARGE OF WATER FROM THE DEWATERED CONSTRUCTION SITE, EITHER BY GRAVITY OR PUMPING, SHALL BE PERFORMED IN A MANNER THAT PREVENTS EXCESSIVE TURBIDITY FROM ENTERING THE RECEIVING WATERWAYS AND PREVENTS SCOUR AND EROSION OUTSIDE OF THE CONSTRUCTION SITE. PUMPED WATER SHOULD BE PRE-FILTERED WITH A GRAVEL PACK AROUND SUMPS FOR SUBSURFACE FLOWS AND A SILT FENCE AROUND PUMPS FOR SURFACE FLOW. PUMPED WATER SHALL BE DISCHARGED INTO ISOLATED LOCAL DEPRESSIONS, FILTER BAGS, SETTLING (BAKER) TANKS, OR TEMPORARY SEDIMENT BASINS, AS NECESSARY TO MEET WATER QUALITY REQUIREMENTS. WHERE WATER TO BE DISCHARGED INTO THE SLOUGH WILL CREATE EXCESSIVE TURBIDITY, THE WATER SHALL BE ROUTED THROUGH A SEDIMENT INTERCEPTOR OR OTHER FACILITIES TO REMOVE SEDIMENT FROM WATER.



NOTE: CONTRACTOR MAY USE ALTERNATE DAM DETAIL, SUBJECT TO APPROVAL OF THE ENGINEER AND THE PERMITTING AGENCIES.

DIVERSION DAM PROFILE
SCALE: 1" = 5'

LEGEND

- PROPOSED TEMPORARY DIVERSION PIPE
- LIMITS OF GRADING

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DIVERSION AND DEWATERING PLAN

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BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 — 1"

C8

SEEDING AND REVEGETATION NOTES:

1. SEED AND MULCH ALL AREAS DISTURBED DURING CONSTRUCTION.
2. SEED MIX AND REVEGETATION DETAILS TO BE PROVIDED BY OTHERS.

HABITAT ENHANCEMENT AND PUBLIC ACCESS IMPROVEMENT AREA OVERVIEW

SCALE: 1" = 40'

LEGEND

- LIMITS OF GRADING
- OAK WOODLAND HABITAT RESTORATION
- RIPARIAN HABITAT RESTORATION
- WET MEADOW HABITAT RESTORATION
- WETLAND HABITAT RESTORATION
- WETLAND EXCAVATION AREA
- SEDIMENT CATCHMENT BASIN CONSTRUCTION AREA
- STREET TREE BUFFER

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HABITAT ENHANCEMENT AND PUBLIC ACCESS IMPROVEMENT AREA OVERVIEW

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0 1"

GENERAL NOTES

1. NOTIFY THE ENGINEER AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THE ENGINEER OR A DESIGNATED REPRESENTATIVE SHALL OBSERVE THE CONSTRUCTION PROCESS, AS NECESSARY TO ENSURE PROPER INSTALLATION PROCEDURES.

2. EXISTING UNDERGROUND UTILITY LOCATIONS:

   A. CALL UNDERGROUND SERVICE ALERT (1-800-642-2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.

   B. PRIOR TO BEGINNING WORK, CONTACT ALL UTILITIES COMPANIES WITH REGARD TO WORKING OVER, UNDER, OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.

   C. EXISTING UTILITY LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.

   D. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION.

   E. PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.

   F. TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.

   G. UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.

   H. UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.

3. IF DISCREPANCIES ARE DISCOVERED BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL LAWS, ORDINANCES, CODES, REQUIREMENTS AND STANDARDS WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.

5. ALL TESTS, INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN OFFICIAL INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE REQUIRED TESTS AND INSPECTIONS ARE PERFORMED.

6. PROJECT SCHEDULE: PRIOR TO COMMENCEMENT OF WORK, SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL A DETAILED CONSTRUCTION SCHEDULE. DO NOT BEGIN ANY CONSTRUCTION WORK UNTIL THE PROJECT SCHEDULE AND WORK PLAN IS APPROVED BY THE ENGINEER. ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL. PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.

9. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL. NEITHER THE PROFESSIONAL ACTIVITIES OF CONSULTANT NOR THE PRESENCE OF CONSULTANT OR HIS OR HER EMPLOYEES OR SUB-CONSULTANTS AT A CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR AND ITS SUBCONTRACTORS OF THEIR RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE HEALTH OR SAFETY REQUIREMENTS OF ANY REGULATORY AGENCY OR OF STATE LAW.

10. MAINTAIN A CURRENT, COMPLETE, AND ACCURATE RECORD OF ALL AS-BUILT DEVIATIONS FROM THE CONSTRUCTION AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS, FOR THE PURPOSE OF PROVIDING THE ENGINEER OF RECORD WITH A BASIS FOR THE PREPARATION OF RECORD DRAWINGS.

11. MAINTAIN THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. STORE ALL MATERIALS WITHIN APPROVED STAGING AREAS.

12. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL PERMIT CONDITIONS, LAWS, ORDINANCES, CODES, REQUIREMENTS AND STANDARDS, WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.

13. PROVIDE, AT CONTRACTOR'S SOLE EXPENSE, ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.

14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT, UNLESS OTHERWISE SPECIFIED.

15. FIELD INSPECTIONS AND OR THE PROVISION OF CONSTRUCTION STAKES DO NOT RELIEVE THE CONTRACTOR OF THEIR SOLE RESPONSIBILITY FOR ESTABLISHING ACCURATE CONSTRUCTED LINES AND GRADES, AS SPECIFIED.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF ALL SURVEY MONUMENTS OR PROPERTY CORNERS. DISTURBED MONUMENTS SHALL BE RESTORED BACK TO THEIR ORIGINAL LOCATION AND SHALL BE CERTIFIED BY A REGISTERED CIVIL ENGINEER OR LAND SURVEYOR AT THE SOLE EXPENSE OF THE CONTRACTOR.

EARTHWORK NOTES

1. ALL GRADING SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE SANTA CRUZ COUNTY GRADING ORDINANCE.

2. GRADING SUMMARY:

SITE 2 WETLANDS		
TOTAL CUT VOLUME	=	360 CY
TOTAL FILL VOLUME	=	0 CY
SITE 3 CATCHMENT BASIN		
TOTAL CUT VOLUME	=	225 CY
TOTAL FILL VOLUME	=	250 CY
SITE 4 CATCHMENT BASIN		
TOTAL CUT VOLUME	=	525 CY
TOTAL FILL VOLUME	=	200 CY
SITE 3+4 WETLAND		
TOTAL CUT VOLUME	=	330 CY
TOTAL FILL VOLUME	=	0 CY
TOTAL PROJECT		
TOTAL CUT VOLUME	=	1,440 CY
TOTAL FILL VOLUME	=	450 CY
NET CUT VOLUME	=	990 CY

THE ABOVE QUANTITIES ARE APPROXIMATE IN-PLACE VOLUMES CALCULATED AS THE DIFFERENCE BETWEEN EXISTING GROUND AND THE PROPOSED FINISH GRADE, PREPARED FOR PERMITTING PURPOSES ONLY. EXISTING GROUND IS DEFINED BY THE TOPOGRAPHIC CONTOURS AND/OR SPOT ELEVATIONS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF WORK TO BE CONSTRUCTED. THE QUANTITIES HAVE NOT BEEN FACTORED TO INCLUDE ALLOWANCES FOR BULKING, CLEARING AND GRUBBING, SUBSIDENCE, SHRINKAGE, OVER EXCAVATION, AND RECOMPACTION, UNDERGROUND UTILITY AND SUBSTRUCTURE SPOILS AND CONSTRUCTION METHODS.

THE CONTRACTOR SHALL PERFORM AN INDEPENDENT EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING BID PRICES FOR EARTHWORK. THE BID PRICE SHALL INCLUDE COSTS FOR ANY NECESSARY IMPORT AND PLACEMENT OF EARTH MATERIALS OR THE EXPORT AND PROPER DISPOSAL OF EXCESS OR UNSUITABLE EARTH MATERIALS.

3. PRIOR TO COMMENCING WORK, PROTECT ALL SENSITIVE AREAS TO REMAIN UNDISTURBED WITH TEMPORARY FENCING, AS SHOWN ON THE DRAWINGS, AS SPECIFIED, OR AS DIRECTED BY THE ENGINEER.

4. DO NOT DISTRURB AREAS OUTSIDE OF THE DESIGNATED LIMITS OF DISTURBANCE, UNLESS AUTHORIZED IN WRITING BY THE ENGINEER. THE COST OF ALL ADDITIONAL WORK ASSOCIATED WITH RESTORATION AND REVEGETATION OF DISTURBED AREAS OUTSIDE THE DESIGNATED LIMITS OF DISTURBANCE, AS SHOWN ON THE DRAWINGS, SHALL BE BORNE SOLELY BY THE CONTRACTOR.

5. DISPOSE OF ALL EXCESS SOIL ON SITE AT THE SPOILS PLACEMENT AREA IN ACCORDANCE WITH THESE NOTES AND THE TECHNICAL SPECIFICATIONS.

6. CLEARING AND GRUBBING, SUBGRADE PREPARATION AND EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 17 & 19 OF THE STANDARD SPECIFICATIONS, THESE DRAWINGS, AND THE TECHNICAL SPECIFICATIONS.

7. PRIOR TO STARTING WORK ON THE PROJECT, SUBMIT FOR ACCEPTANCE BY THE ENGINEER A HAZARDOUS MATERIALS CONTROLS AND SPILL PREVENTION PLAN. INCLUDE PROVISIONS FOR PREVENTING HAZARDOUS MATERIALS FROM CONTAMINATING SOIL OR ENTERING WATER COURSES, AND ESTABLISH A SPILL PREVENTION AND COUNTERMEASURE PLAN.

9. UNLESS AUTHORIZED BY THE GEOTECHNICAL ENGINEER, THE FOLLOWING MATERIALS SHALL NOT BE INCORPORATED INTO THE WORK:

   A. ORGANIC MATERIALS SUCH AS PEAT, MULCH, ORGANIC SILT OR SOD.
   B. SOILS CONTAINING EXPANSIVE CLAYS.
   C. MATERIAL CONTAINING EXCESSIVE MOISTURE.
   D. POORLY GRADED COURSE MATERIAL
   E. PARTICLE SIZES IN EXCESS OF 6 INCHES.
   F. MATERIAL WHICH WILL NOT ACHIEVE SPECIFIED DENSITY OR BEARING.

10. FINE GRADING ELEVATIONS, CONFORMS, AND SLOPES NOT CLEARLY SHOWN ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO DIRECT DRAINAGE TO PROTECTED DRAINAGE CONTROL STRUCTURES OR NATURAL WATERWAYS IN A MANNER THAT SUPPORTS THE INTENT OF THE DESIGN. ALL FINAL GRADING SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

11. THE TOP 6" OF SUBGRADE UNDER ALL PAVED SURFACES SUBJECT TO VEHICULAR USE SHALL BE COMPACTED TO A MINIMUM OF 95% RELATIVE COMPACTION, IN ACCORDANCE WITH ASTM-D1557. ALL OTHER FILL TO BE COMPACTED TO A MINIMUM OF 90% MAXIMUM DENSITY AS DETERMINED BY ASTM-D1557 AND SO CERTIFIED BY TESTS AND REPORTS FROM THE CIVIL ENGINEER IN CHARGE OF THE GRADING CERTIFICATION.

12. SPREAD FILL MATERIAL IN LIFTS OF APPROXIMATELY 8 INCHES, MOISTENED OR DRIED TO NEAR OPTIMUM MOISTURE CONTENT AND RECOMPACTED. THE MATERIALS FOR ENGINEERED FILL SHALL BE APPROVED BY A REGISTERED CIVIL ENGINEER. ANY IMPORTED MATERIALS MUST BE APPROVED BEFORE BEING BROUGHT TO THE SITE. THE MATERIALS USED SHALL BE FREE OF ORGANIC MATTER AND OTHER DELETERIOUS MATERIALS.

13. ALL CONTACT SURFACES BETWEEN ORIGINAL GROUND AND RECOMPACTED FILL SHALL BE EITHER HORIZONTAL OR VERTICAL. ALL ORGANIC MATERIAL SHALL BE REMOVED AND THE REMAINING SURFACE SCARIFIED TO A DEPTH OF AT LEAST 12 INCHES, UNLESS DEEPER EXCAVATION IS REQUIRED BY THE ENGINEER.

14. REGULATORY AGENCIES MAY REQUIRE A FINAL GRADING COMPLIANCE LETTER. WE CAN ONLY OFFER THIS LETTER IF WE ARE CALLED TO THE SITE TO OBSERVE AND TEST, AS NECESSARY, ANY GRADING AND EXCAVATION OPERATIONS FROM THE START OF CONSTRUCTION. WE CANNOT PREPARE A LETTER IF WE ARE NOT AFFORDED THE OPPORTUNITY OF OBSERVATION FROM THE BEGINNING OF THE GRADING OPERATION. THE CONTRACTOR MUST BE MADE AWARE OF THIS AND EARTHWORK TESTING AND OBSERVATION MUST BE SCHEDULED ACCORDINGLY. PLEASE CONTACT OUR OFFICE: (831) 421-9291.

EROSION CONTROL NOTES

1. THE EROSION CONTROL PLAN SHOWN IS INTENDED FOR THE SUMMER CONSTRUCTION SEASON (APRIL 15TH TO OCTOBER 15TH). IF THE DRAINAGE FEATURES SHOWN ON THESE DRAWINGS ARE NOT COMPLETED AND DISTURBED AREAS STABILIZED BY OCTOBER 1ST, CONSULT THE ENGINEER FOR ADDITIONAL RAINY SEASON EROSION CONTROL MEASURES.

2. PRIOR TO COMMENCING WORK, PROTECT AREAS TO REMAIN UNDISTURBED WITH ESA FENCING, AS SHOWN ON THE DRAWINGS. ADDITIONAL FENCING MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER.

3. UTILIZE ONLY THE APPROVED HAUL ROADS AND ACCESS POINTS (AS SHOWN ON THE DRAWINGS) FOR TRANSPORT OF MATERIALS AND EQUIPMENT.

4. BETWEEN OCTOBER 15 AND APRIL 15, PROTECT EXPOSED SOIL FROM EROSION AT ALL TIMES. DURING CONSTRUCTION, SUCH PROTECTION MAY CONSIST OF MULCHING AND/OR PLANTING OF NATIVE VEGETATION OF ADEQUATE DENSITY. BEFORE COMPLETION OF THE PROJECT, STABILIZE ALL EXPOSED SOIL ON DISTURBED SLOPES AGAINST EROSION.

5. MAINTAIN A STANDBY CREW FOR EMERGENCY WORK AT ALL TIMES DURING THE RAINY SEASON (OCTOBER 15 THROUGH APRIL 15). STOCKPILE NECESSARY MATERIALS AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES.

6. CONSTRUCT TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THIS PLAN AND/OR AS DIRECTED BY THE ENGINEER TO CONTROL DRAINAGE WHICH HAS BEEN AFFECTED BY GRADING AND/OR TRENCHING OPERATIONS.

7. INCORPORATE ADEQUATE DRAINAGE PROCEDURES DURING THE CONSTRUCTION PROCESS TO ELIMINATE EXCESSIVE PONDING AND EROSION.

8. CONSTRUCT AND MAINTAIN EROSION CONTROL MEASURES TO PREVENT THE DISCHARGE OF EARTHEN MATERIALS FROM DISTURBED AREAS UNDER CONSTRUCTION AND FROM COMPLETED CONSTRUCTION AREAS.

9. INSTALL ALL PROTECTIVE DEVICES AT THE END OF EACH WORK DAY WHEN THE FIVE-DAY RAIN PROBABILITY EQUALS OR EXCEEDS 50 PERCENT AS DETERMINED FROM THE NATIONAL WEATHER SERVICE FORECAST OFFICE: WWW.SRH.NOAA.GOV.

10. AFTER EACH RAINSTORM, REMOVE ALL SILT AND DEBRIS FROM SEDIMENT CONTROL DEVICES.

11. THE EROSION CONTROL DEVICES ON THIS PLAN ARE A SCHEMATIC REPRESENTATION OF WHAT MAY BE REQUIRED. EROSION CONTROL DEVICES MAY BE RELOCATED, DELETED, OR ADDITIONAL ITEMS MAY BE REQUIRED DEPENDING ON THE ACTUAL SOIL CONDITIONS ENCOUNTERED, AT THE DISCRETION OF THE ENGINEER.

12. MAINTAIN ALL EROSION CONTROL DEVICES AND MODIFY THEM AS SITE PROGRESS DICTATES.

13. MONITOR THE EROSION CONTROL DEVICES DURING STORMS AND MODIFY THEM IN ORDER TO PREVENT PROGRESS OF ANY ONGOING EROSION.

14. CLEAN DAILY ANY EROSION OR DEBRIS SPILLING ONTO A PUBLIC STREET.

15. CONTACT THE ENGINEER IN THE EVENT THAT THE EROSION CONTROL PLAN AS DESIGNED REQUIRES ANY SUBSTANTIAL REVISIONS.

16. IMPLEMENT ALL REQUIRED BMP'S PRIOR TO COMMENCING SITE DISTURBING ACTIVITIES.

DUST CONTROL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS DUST CONTROL, THROUGHOUT THE CONSTRUCTION, IN ACCORDANCE WITH THE PERMIT CONDITIONS OF APPROVAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REGULAR CLEANING OF ALL MUD, DIRT, DEBRIS, ETC., FROM ANY AND ALL ADJACENT ROADS AND SIDEWALKS, AT LEAST ONCE EVERY 24 HOURS WHEN OPERATIONS ARE OCCURRING.

2. ALL DISTURBED AREAS, INCLUDING UNPAVED ACCESS ROADS OR STORAGE PILES, NOT BEING ACTIVELY UTILIZED FOR CONSTRUCTION PURPOSES, SHALL BE EFFECTIVELY STABILIZED OF DUST EMISSIONS USING WATER, CHEMICAL STABILIZER/SUPPRESSANT, OR VEGETATIVE GROUND COVER.

3. ALL GROUND-DISTURBING ACTIVITIES (E.G., CLEARING, GRUBBING, SCRAPING, AND EXCAVATION) SHALL BE EFFECTIVELY CONTROLLED OF FUGITIVE DUST EMISSIONS UTILIZING APPLICATION OF WATER OR BY PRE-SOAKING.

4. ALL MATERIALS TRANSPORTED OFFSITE SHALL BE COVERED OR EFFECTIVELY WETTED TO LIMIT DUST EMISSIONS.

5. FOLLOWING THE ADDITION OF MATERIALS TO, OR THE REMOVAL OF MATERIALS FROM, THE SURFACES OF OUTDOOR STORAGE PILES, SAID PILES SHALL BE EFFECTIVELY STABILIZED OF FUGITIVE DUST EMISSIONS UTILIZING SUFFICIENT WATER OR CHEMICAL STABILIZER/SUPPRESANT.

6. ONSITE VEHICLE SPEED ON UNPAVED SURFACES SHALL BE LIMITED TO 5 MPH.

7. DISTURBED AREAS SHALL BE SEEDED PRIOR TO OCTOBER 15TH OR EARLIER AS REQUIRED BY THE APPLICABLE PERMIT CONDITIONS.

WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH:(831)421-9291 // FAX:(888)819-6847
WWW.WATWAYS.COM

DRAFT

NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
CITY OF WATSONVILLE

GENERAL NOTES

MIDDLE STRUVE SLOUGH
HABITAT AND WATER QUALITY
IMPROVEMENT PROJECT

100% ADMIN. DRAFT DESIGN
SUBMITTAL

DESIGNED BY:	B.M.Z.
DRAWN BY:	K.P.B.
CHECKED BY:	B.M.Z.
DATE:	9/24/2021
JOB NO.:	19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C10

10 OF 10

Attachment B. Habitat Enhancement Plan for the Middle Struve Slough Habitat and Water Quality Improvement Project

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Middle Struve Slough Habitat and Water Quality Improvement Project

Habitat Enhancement Plan

Prepared for the City of Watsonville

Watsonville Wetlands Watch
Contact: Jonathan Pilch
Executive Director, Watsonville Wetlands Watch
500 Harkins Slough Road
Watsonville California
95076

October 2021

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Project Overview

The Middle Struve Slough Water Quality and Habitat Improvement project is located in the City of Watsonville in Southern Santa Cruz County in the Pajaro River Watershed. This project will provide a large suite of environmental and social benefits for the Watsonville community. It is located within a branch of the Watsonville Slough System, an approximately 800 acre freshwater wetland system, which is one of the State's largest remaining freshwater coastal wetlands. Construction of this project will result in the restoration and enhancement of coastal wetlands and watershed habitat, stormwater capture, flood attenuation, and water quality improvement, improved access to nature, parks, and trails for Watsonville residents, greenhouse gas capture and implementation of climate change resiliency measures, and extensive environmental education and green jobs training and development for Watsonville residents.

This project is a multi-benefit ecosystem and watershed restoration project that improves water quality through implementation of habitat restoration and watershed protection measures. The project will address habitat loss and environmental degradation within the Watsonville Slough System through the enhancement of an 1,800 foot linear wetland and riparian corridor and restoration of approximately 4.5 acres of wetland, grassland, oak woodland and riparian habitat. This work will occur in a watershed that has been highly impaired through historic intensive farming and draining of the wetlands and by more recent urban development. Despite historic watershed degradation, the slough system sustains 270 resident and migratory bird species, and 23 native plants and animals that are State and federally listed as threatened, endangered, or species of concern.

The habitat restoration and enhancement project was designed with funding from a grant to the City of Watsonville and Watsonville Wetlands Watch from the California Department of Water Resources Disadvantaged Communities Planning Grants Program, administered by the Regional Water Management Foundation at the Community Foundation of Santa Cruz County. Struve Slough, where proposed work will occur, is 303(d) listed, as impaired by pH, dissolved oxygen, chlorophyll-a, toxicity, turbidity, E. coli bacteria, and fecal coliform bacteria. In order to address this impairment, this project will implement two water quality treatment basins to improve urban run-off prior to entering into the slough and enhance and restore wetland function and habitat.

Additional project benefits include climate change resiliency and atmospheric carbon sequestration. Implementation will improve climate change resiliency for sensitive wildlife species dependent on coastal freshwater wetlands and will install approximately 10 trees along the adjacent roadway, which will buffer noise from the habitat area, improve air quality and improve carbon sequestration in the City's urban forest. Implementation will also attenuate peak flows and reduce the impacts of flooding and erosion associated with increased storm strength projected with climate change.

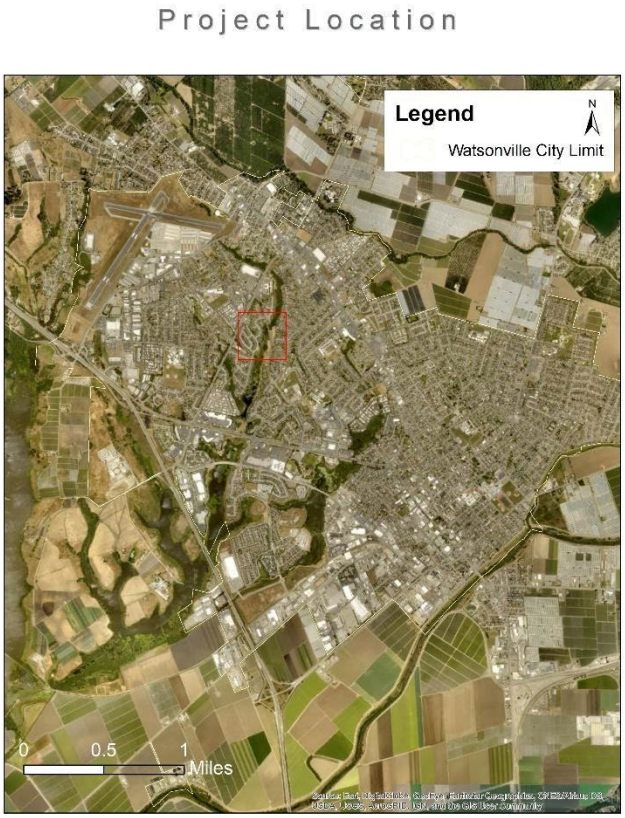
Project implementation will benefit residents of the City of Watsonville, a State recognized disadvantaged community, and is located within the ½ mile buffer of disadvantaged and severely disadvantaged community census tracts that are located along the interconnected impaired waterway. In addition to water quality benefits for residents, the project will enhance public access and environmental education through the creation of an approximately 400 foot trail and elevated board walk that will pass through the project site.

Project implementation will focus on maximizing community benefits through involvement of the public in each stage of the watershed restoration process as well as providing youth education and green jobs training for Watsonville youth. This work will be led by Watsonville Wetlands Watch who runs a youth paid job-training program, called the Climate Corps Leadership Institute that provides paid stipends for youth to develop leadership skills and work in local watershed restoration and climate resiliency projects. Watsonville Wetlands Watch staff and the Climate Corps interns will lead watershed restoration work with the community. Native plantings, site preparation, and watershed restoration work will be done through community based events. This will enable the project to provide robust bi-lingual community engagement and watershed education for youth and community members, leading to long-term investment in project success, maintenance, and care.

Project Location

The Middle Struve Slough habitat enhancement area is bordered by upper Pennsylvania Avenue, Winding Way, and Hope Park in a residential area. It is located along the Upper Struve Slough Trail, a bicycle and pedestrian trail that is a part of the Watsonville Area Trails Network, a 9 mile trail network that circumnavigates the Watsonville Slough System. Project activities are located upstream of an active and recent habitat restoration efforts along Struve Slough and downstream of a planned wetland enhancement project planned to be initiated in the fall of 2022.

Figure 1. Middle Struve Slough Habitat and Water Quality Improvement Project Location



Historic and Existing Conditions

Historic Conditions

The area in which habitat enhancement work is planned was located within the unincorporated areas of Santa Cruz County until the 1960s, when it was annexed into the City of Watsonville. Beginning in the second half of the nineteen century, the slough system, including the Middle Struve Slough, area was drained for agricultural use. The drainage canal used to drain the slough is still present today as a remnant feature of this past land use. Through the process of cultivating the wetland areas for row crops and its use for grazing the wetlands and surrounding areas the native plant communities were largely lost. As farming stopped in parts of the slough system, such as the Middle Struve Slough area, invasive plants moved into the disturbed soils. In 2004, a public access trail was constructed within the project area and surrounding areas as a way to provide public access to the wetland habitat areas. In

2007, the City of Watsonville and Watsonville Wetlands Watch developed a habitat stewardship program for the wetland trail network and began vegetation management and habitat stewardship for this area along with the surrounding wetland trail network.

Existing Habitat Conditions

Struve Slough is a seasonal wetland that supports a mixture of freshwater wetlands, willow riparian, ruderal grassland, and previously restored grassland and wet meadow habitat. The slough emerges from a spring located just above Airport Boulevard and extends down to the confluence with Watsonville Slough in the center of the slough system, just about the railroad crossing and above the confluence with Harkins Slough. The Middle Struve Slough project is located approximately 4,000 downstream of the spring. In its higher extents, from the top of Struve Slough to the project location, the slough maintains a cross section of natural vegetation that varies from approximately 25 feet to 200 feet and is largely confined by urban development on either side of the wetland and riparian areas. Below the project location, the slough widens to approximately 450' or greater.

Vegetation Communities

Vegetation communities on site include emergent freshwater marsh, willow riparian forest, ruderal wet meadow, ruderal herbaceous vegetation, and ruderal grassland habitats. These have been characterized in the wetland delineation report, prepared by Ecosystems West, for the project in the following ways.

Table 1. Vegetation Communities

Vegetation Type	**Plant Alliance**	**State Ranking**	**California Code**
Emergent Freshwater Marsh	*Typha latifolia* Herbaceous Alliance	S5	52.050.00
Ruderal Wet Meadow	*Rubus armeniacus* - *Sesbania punicea* - *Ficus carica* Shrubland Semi-Natural Alliance	SNR	63.906.00
Willow Riparian Forest	*Salix lasiolepis* Shrubland Alliance	S4	61.201.00
Ruderal Herbaceous	*Conium maculatum* - *Foeniculum vulgare* Herbaceous Semi-Natural Alliance	SNA	45.556.00
Ruderal Non-native Grasslands	*Lolium perenne* Herbaceous Semi-Natural Alliance	SNA	41.321.00

Emergent freshwater marsh

Emergent freshwater marsh habitat is located within the remnant drainage channel on site. Due to their being lower than the surrounding landscape, these areas retain water for longer periods into the summer months. They are dominated primarily by cattail, *Typha latifolia*, and other emergent marsh plant species, such as water smartweed, *polygonum ssp.,* and pacific oenanthe, *Oenanthe saramatosa*.

Ruderal wet meadow

Ruderal wet meadows include seasonally flooded areas outside of the freshwater emergent marsh. These areas are dominated almost entirely by large and dense stands of Himalayan blackberry, *Rubus armeniacus*.

Willow riparian forest

Willow riparian forest is situated in the northern and central portion of the project area. In the northern project area, where the flowing channel is riverine with a distinct bed and bank and lack of emergent herbaceous vegetation. This habitat type is comprised of mature trees with mostly closed canopy and relatively undeveloped understory of herbaceous plants and sub-shrubs. The overstory is comprised of Pacific willow, *Salix lasiandra*, blue and red gum eucalyptus, *Eucalyptus globulus, E. camaldulensis*, Monterey pine, *Pinus radiata*, and glossy privet, *Ligustrum lucidum*. The herbaceous understory is primarily Himalayan blackberry, English Ivy, *Hedera* spp., flatsedge, C*yperus eragrostis*, and creeping bedstraw, *Galium aparine*. Significant amounts of trampling, refuse and other impacts are associated with a transient encampment in this wooded area. The riparian forest habitat located within the central portions of the project site includes Arroyo willow, *Salix lasiolepis*, with an understory of Himalyan blackberry.

Ruderal herbaceous vegetation

Ruderal herbaceous vegetation is dominated by aggressive, opportunistic species including fennel, *Foeniculum vulgare*, cheeseweed, *Malva parviflora*, wild radish, *Raphanus sativus*, black mustard, *Brassica nigra*, iceplant, *Carpobrotus edulis*, and poison hemlock, *Conium maculatum*. Ruderal herbaceous vegetation is located on either side of the paved trail accessing Hill Park and the hillslope along the west side of the slough. Due to the proximity to roads, trails, and other ongoing disturbances, ruderal areas tend to persist over time and succession to other natural communities and wildlife habitat is limited.

Ruderal non-native grasslands

Ruderal non-native grasslands are primarily situated east of Middle Struve Slough between the basin floor and Pennsylvania Avenue. The ruderal grasslands are highly disturbed by regular mowing, litter, and invasive weeds. As a result, very few native species are present and none of the indicator species of native coastal prairie, such as California oatgrass, *Danthonia californica*, or purple needlegrass, *Stipa pulchra*, are not present. Ruderal non-native grassland occurs on nearly-level to moderate hillslope throughout the majority of the eastern portion of the project area along Pennsylvania Avenue. The non-native grassland is dominated by dense monospecific patches of Harding grass, *Phalaris aquatica*, particularly at the ecotone between wetland areas. Other commonly occurring species found higher up the slope extending to the east towards Pennsylvania Drive include wild oats *Avena* spp., Italian

ryegrass, *Festuca perennis*, brome grasses, *Bromus hordeaceus*, *B. diandrus*, barley, *Hordeum murinum* ssp. *leporinum*, six-weeks fescue *Festuca bromoides*, cutleaf geranium, *Geranium dissectum*, poision hemlock, *Conium maculatum,* dock, *Rumex spp*, and filarees, *Erodium* spp.. Because the area is frequently mowed, the grassland generally does not support shrubs or trees including coyote brush, *Baccharis piluaris* although they would be expected to colonize this area under an altered management regime. A large percentage of plant species identified within this habitat type are listed as invasive weeds with “moderate to high ecological impacts” by the California Invasive Plant Council (Cal-IPC) (2020).

Figure 2. Map of Middle Struve Slough, Vegetation Communities Map

Figure 3. Middle Struve Slough, Plant Species Composition Map, Spring 2019

Hydrology and Water Quality Conditions

Hydrology

The Project Area is situated within the Struve Slough watershed, a subwatershed of the Watsonville Slough System and greater Pajaro River watershed. The natural hydrological sources for the Project Area are direct precipitation and the groundwater fed spring at the upper end of Struve Slough, surface runoff directed into the site through stormdrain outfalls, and subsurface sheet flow from adjacent uplands. Southerly flows through the slough system are largely conveyed through a narrow meandering channel situated at the low point of the basin originating in Upper Struve Slough at its terminus immediately east of Airport Boulevard.

Water Quality Sampling

Water quality samples from Upper Struve Slough were collected for analysis by the City of Watsonville utilities laboratory and Monterey Bay Analytical Services on November 28, 2018, January 17, 2019, and February 15, 2019 from two locations in order to develop an improved understanding of baseline conditions and support project designs. The "top" sampling location is located adjacent to the headwall in the upper focus area past the Willow (*Salix spp*.), English Ivy (*Hedera helix*), *Prunus spp.*section. The "bottom" sampling location is located at the foot bridge just south of the Hope Park trail entrance. The parameters tested include nitrogen,TKN (total Kjeidahl nitrogen), phosphorous, total coliform, E. coli, turbidity, ammonia-nitrogen, and total suspended solids (TSS) (Table 2). November 2018 was when the first significant rain occurred for that rain year. The first set of samples was collected on November 28, 2018. The last significant rainfall of the 2018 to 2019 rainfall occurred in February 2019 and the last sample set was collected on February 13, 2019.

As a part of a community science monitoring program for the Watsonville Slough System, Watsonville Wetlands Watch developed a water quality parameter threshold list to indicate relative wetland health based on the Canadian Council of Ministers of the Environment Water Quality Index Calculator. These thresholds will be referred to in this section as a point of general reference of what values may be healthy for a wetland. Phosphorous exceeded the wet season threshold of 0.3 mg/L at the bottom location on January 17, 2019 (0.37 mg/L) and at the top location on February 13, 2019 (0.31 mg/L). There was no significant trend between top and bottom sites, reflecting that there is no demonstrated treatment capacity within the existing flow path. Turbidity exceeded the WWW threshold of 25 NTU both sites on November 28, 2018 and January 17, 2019. Turbidity was very low for both sites on February 13, 2019. TSS were highest in February with 44.5 mg/L at the top location and 39.6 mg/L at the bottom. Turbidity and TSS were higher at top sites than bottom sites, demonstrating that there is some treatement capacity for suspended solids within the existing wetland habitat. Nitrate levels did not exceed the WWW wet season threshold of 8 µg/L on any day at either location. No trend was found between top and bottom sites. Ammonia was not detected for the last two sample days and did not exceed threshold for this parameter.

E. coli was exceptionally high for all samples. E. coli was highest on the first sampling day corresponding to the first major rain. The values for the top site was 24200 MPN/100 mL bottle and 14100 MPN/100 mL bottle at the bottom site. The WWW threshold for E. coli is 126 MPN/100 mL bottle. Total coliform followed the same trend with 173000 MPN/ 100 mL bottle at the top location and 199000 MPN/ 100 mL

bottle. There was no trend in concentrations of E. coli or total coliform between the top site and bottom site.

No trends were found between top and bottom site concentrations of phosphorous, nitrate, ammonia, E. coli, or total coliform. Implementation of new restoration and treatment methods is anticipated to improve water quality flowing from the top to bottom site. The results of the water quality analysis support the value of creating best management practices that can slow, treat and intercept run-off prior to its entering Struve Slough, along with enhancement to the wetland areas that will enhance the natural abilities of these areas to reduce sediment delivery downstream and uptake nutrients.

Table 2. Water quality data including monthly rainfall. Data marked "ND" refers to not detected.

Date	Location	Rainfall	Total Coliform	E. coli	Turbidity	TSS (mg/L)
11/28/19	Top	3.70	173000	24200	47	30.6
01/17/19	Top	5.23	25950	6488	49.5	10.4
02/13/19	Top	7.38	24200	3870	1.6	44.5
11/28/19	Bottom	3.70	199000	14100	31	17.2
01/17/19	Bottom	5.23	17330	3076	46.7	9.1
02/13/19	Bottom	7.38	24200	6130	1.4	39.6

Date	Location	Rainfall	Nitrate (N)	Total Kjeidahl N (mg/L)	Phosphorous (mg/L)	Ammonia-Nitrogen
11/28/19	Top	3.70	0.5	0.9	0.02	0.081
01/17/19	Top	5.23	3.8	1.1	0.3	ND
02/13/19	Top	7.38	-	0.9	0.31	ND
11/28/19	Bottom	3.70	0.5	0.8	0.03	<0.05
01/17/19	Bottom	5.23	3.4	0.9	0.37	ND
02/13/19	Bottom	7.38	-	0.8	0.28	ND

Community Input into Project Design

In order to receive public input and comments to inform the design and implementation of the Middle Struve Slough Water Quality and Habitat Enhancement Project, the Watsonville Wetlands Watch and the City of Watsonville held two public tours of the project site. The first group in attendance consisted

of 13 students from Pajaro Valley High School, enrolled in the Green Careers Summer Institute, held on July 3, 2019. A second public meeting was held on Saturday August 24th, 2019 and included a mixture of local high school students, people from the surrounding neighborhood, local and County-wide residents who responded to flyers and publicity for the public tour. In total, 38 members of the public were in attendance for this public tour. Additional tours were provided to youth and community members throughout 2020 and 2021, however the numbers were limited to smaller group sizes due to public health concerns. In total over 150 community members were engaged during project tours through the community outreach process. Community input and feedback was provided in the following subject areas: trail signage and education, enhancements for wildlife, water quality and trash control, recreation, safety concerns, and enhancements to the nearby Hope Park, located at the nearest trailhead into the Middle Struve Slough area.

Trail Signage, Education, and Interpretation Opportunities

Participants showed interest in having more information displayed along trails as well as along Pennsylvania Avenue to support the public's understanding of the project area and value of the wetland areas. Some interpretive signs mentioned include signs that explain the purpose of the different ponds, information about plants and animal species, natural history, and the possibility of using a phone application to have a virtual tour to navigate through the area without physical signage. Tour participants voiced concern about vandalism of signs. In addition to more signs and self-guided tours, participants were also interested in having a nature center-like gathering space with interpretation materials offering tours for the public.

Enhancements for Wildlife

Tour participants viewing birds within Struve Slough, August 24th

The audiences were enthusiastic about how Watsonville Wetlands Watch might improve wildlife habitat. When the audience learned about Watsonville Wetlands Watch's plan to remove the large patches of non-native blackberry, there were concerns about the flowers being food sources for butterflies and the plant providing a protective barrier against cats. Some suggested planting native blackberry to replace it. Many participants expressed an interest in planting new native trees to provide shade, divide the wildlife area from area for human use, and provide bird habitat which could aid in rodent control. Some people suggested planting Cottonwoods because they are beneficial for perching birds. However, it was also suggested that lower branches on trees be pruned to ensure a better view of surroundings as a safety measure. To improve habitat for various species, our audience suggested having more open water for foraging, creating mudflats for shorebirds, adding nesting boxes for birds, and timber for pond turtles.

Water Quality and Trash Control

Many of the participants were concerned about trash that ends up on the trails and in the wetlands. Members of the group expressed the need for more trash cans and recycling bins along the trail and that it is important for the trash cans to have lids and be wildlife-proof. Participants also suggested signs to help prevent littering, educating the public about the effects of littering, and providing bags for pet waste. In addition to these enhancements, participants were interested in involving school groups to care for trails including litter pick-ups, weeding, and other maintenance practices.

To improve water quality at Middle Struve Slough, participants suggested using different methods of filtering water at culverts and drainages including filtration with native plants and trash catchment devices.

Recreation

Related to recreational activities members of the public shared a variety of diverging opinions that were considered in order to balance recreational desires with habitat restoration goals. Some members of the public suggested turning the open space near the ponds into a place with a picnic area, drinking fountains, an amphitheater, concrete benches, and a natural playground or work-out station. To further utilize the open grass space, some participants were interested in having events to increase more positive activity. Some suggested hosting an Adopt-a-Trail event with family friendly activities. There was some opposition to those suggestions by members of the group concerned about the human impacts on wildlife and water quality. At this time, the only recreation feature integrated into the project design is a small boardwalk through the wetland that will provide an immersive experience into the restored wetland. However, additional recreational features could be considered as a part of future projects to enhance the trail user experience.

Watsonville Wetlands Watch Restoration and Water Quality Technician, Xochitl Garcia shares water quality data with tour participants, July 3, 2019

Safety and other concerns

Multiple participants that having lighting would make using the trails feel safer later in the day and near sunset. At this time, no lighting is planned, however down-ward facing motion detection lights along a few locations on the trail within the vicinity of the project site might be a way to enhance trail user safety while not overly impacting wildlife use of the wetland.

Generally participants expressed that they would feel safer on the trails with a greater level of visibility. Participants said they'd feel safer with widened trails, with low branches of trees pruned for visibility, and with the removal of tall plants such as Poison Hemlock.

Integrating Hope Park into the Restoration Project

Hope Park is the City's park located at the trailhead nearest to the upper Struve Slough restoration project site. Participants were asked to provide feedback into natural enhancements to the park and ways to better integrate the park into the trails network. Participants were in favor adding a natural playground to Hope Park built with all natural materials as opposed to plastics. The topic of adding educational materials was also very popular. The ideas included adding material related to trash education, a bird call machine, and a children's garden for children to learn about native plants. Participants commented that adding more trees to the park would be beneficial for shade but some wanted it only at the edges of the grass space in order to keep it open for sports and games. A native habitat demonstration garden was felt to be a nice way to tie in the park to the wetland and trails system as was habitat restoration on the slopes below the park as a way to tie in the open spaces to the park environment.

Summary of Project Elements that Integrate Community Feedback

Community input provided valuable comments into the project design process. Elements that were included within the project's habitat restoration plan include, use of taller trees for raptor perching and to provide a buffer between the project site and Pennsylvania Avenue, installation of a short pedestrian boardwalk to improve public access and education within the restored wetland, integration of habitat restoration work adjacent to Hope Park, and habitat management to enhance line of site and reduce visual barriers through the removal of invasive plants. Other public comments, such as the desire to see greater public engagement during the restoration process are planned to performed during project implementation.

Habitat Enhancement Goals, Objectives and Methods

Goals and objectives were developed for the project in order to enhance and restore wildlife habitat, improve water quality, enhance public access and education, and to provide a demonstration of urban greening, habitat restoration and stormwater treatment that is replicable throughout the City and region. All native plantings will use plant material grown from parent stock grown or collected within the Watsonville Slough System watershed. A native plant list for outplanting is located within Appendix A. of this document.

Goal 1 Restore and Enhance Wildlife Habitat

Objective 1.1 Improve seasonal wetland habitat through the creation of 0.45 acres of restored wetland depressions

Due to the nature of previous channelization of Struve Slough within the project area, the hydrology has been greatly modified to allow for agricultural use of the wetland area, prior to the 1960's when the area was annexed into the City and urban development was built around Struve Slough. In order to improve wetland characteristics, 3 wetland depressions have been designed that will enhance topographic complexity within the wetlands and increase diversity of wetland habitat and plant communities. Creation of wetland depressional areas will enhance and diversify wetland plant communities by increasing topographic complexity and provide opportunities for the development of improved habitat features such as mud flats and emergent marsh habitat throughout the season. No re-vegetation or planting is necessary within the graded wetland depressions, however the edges will be seeded with native plant species and covered with a weed free straw mulch to prevent erosion.

Objective 1.2 Remove approximately 1.22 acres of Himalayan blackberry and restore native wet meadow habitat

Seasonally flooded wet meadow habitat is dominated by monotypical stands of Himalayan blackberry. Himalayan blackberry should be removed through seasonally timed mowing, initiated in the fall to avoid the nesting season. Following re-growth, re-sprouting canes will be treated with an herbicide approved for use under these conditions by a licensed applicator. During wetland grading activities, the entire area where blackberry is growing will scraped with a tractor or other grading equipment to a depth of a maximum 1-2 inches in order to reduce the re-growth of blackberry. Following 1 -2 seasons of treatment, areas outside of the inundation zones will be tilled to prepare them for planting. A weed free biodegradable mulch layed down over the soil surface and native plants will be planted within the wood chip mulch. Areas within the inundation zone may either be planted in mid summer in wood chip mulch so as to establish prior to inundation using wood chip mulch or planted during winter months without mulch, as wood chip mulch is likely to be picked up by moving water and displaced. In some areas, natural recruitment of native plants is expected to occur, reducing the need to install native container plants within areas where winter time inundation is expected. Additional treatment methods of control and removal of Himalayan blackberry that may be effective and may be utilized include sheet mulching with a biodegradable material, such as burlap and cardboard, or till of the area followed by hand removal of blackberry burls.

Areas where soil will be placed following excavation of wetland depressions, will be used to establish native wetland meadow habitat. These areas will be covered with a biodegradable, weed-free, wood chip mulch and then planted into with native wet meadow species that are rhizamatous and will spread throughout the areas in which soil will be placed.

Objective 1.3 Remove 0.75 acres of ruderal herbaceous vegetation and restore native wetland meadow habitat

Ruderal herbaceous vegetation includes areas outside of the Himalayan blackberry thickets, where invasive plants such as poison hemlock, and wild radish. Following this, areas will be covered by biodegradable weed-free wood chip mulch prior to the onset of rains. Once rains have saturated the soil to the depth of 4-8", native wet meadow plants will be planted throughout these areas in order to establish native wet meadow habitat.

Objective 1.4 Remove 0.41 acres of ruderal herbaceous vegetation and restore native oak woodland habitat

Approximately 0.41 acres has been identified for the restoration of native oak woodland habitat. Vegetation growing in these locations is dominated by invasive plants such as poison hemlock, wild radish, and iceplant. Given the Iceplant will be removed by hand and hauled off site. All other invasive plant species will be moved in the late summer or fall, following seed set. Following this, areas will be covered by biodegradable weed-free wood chip mulch prior to the onset of rains. Once rains have saturated the soil to the depth of 4-8", native oak woodland plants will be planted throughout these areas in order to establish native oak woodland habitat areas. In order to not create locations where people can hide or camp, oak trees will be planted to closer than 30' on center.

Objective 1.5 Enhance 1.14 acres of willow riparian forest through invasive plant removal

Willow riparian forest habitat has an understory of Himalayan blackberry, English ivy, Privot and other species. Himalayan blackberry and English ivy should be removed using a combination of hand removal, herbicide application as described in objective 1.2 above, or sheet mulching. Privot will be removed through cutting of the trees with a hand saw or chain saw and then using a plastic covering of the truck to suppress re-sprout of the invasive trees. No re-vegetation is expected to be needed within the willow riparian forest areas.

Objective 1.6 Enhance seasonal wetland through the placement of logs for wildlife use

Western pond turtles may occur utilize the habitat areas following restoration. Large logs may be utilized to enhance basking habitat for this species within the seasonal depressions following grading work if suitable material is identified, or during the maintenance or adaptive management phase of the project.

Goal 2 Improve Water Quality

Objective 2.1 Construct 2 sediment catchment basins at culvert outfalls within the project area.

Sediment catchment basins have been designed to reduce sediment inputs into Struve Slough from upstream urban run-off within the watershed drainage of the project. Periodic removal of accumulated sediment in accordance with the basin operations and maintenance plans will reduce sediment and nutrient delivery into Struve Slough, thereby improving water quality in adjacent and downstream wetlands.

Objective 3 Enhance Public Access

Objective 3.1 Construct an approximately 650 linear foot board walk trail

In order to enhance the trail user experience, a 650 linear foot board walk trail will be constructed at the souther most portion of the project area. This trail is designed to allow trail users to walk through and near the enhanced wetland community while elevated above the habitat enhancement area in order to limit impacts to the vegetation. The purpose of the trail is to expand opportunities for local residents to learn about wetland restoration, habitat enhancement, cultural uses of the wetlands, local wildlife, and stewardship actions that they can take to help local wetlands.

Objective 3.2 Install interpretive signage

Interpretive signage will be placed throughout the project area to highlight the educational themes of the project. The design for interpretive signage will incorporate traditional uses of the wetlands, habitat stewardship information, and information on wetland ecology and local wildlife in English, Spanish, and other language as appropriate.

Figure 4. Habitat Restoration and Enhancement Features

Site Maintenance and Stewardship

Maintenance During the Establishment Period

Maintenance activities after seeding or planting are required to ensure the successful establishment of plant material. Maintenance during the establishment period is expected to last 2-3 years following planting of native plants and will be extended if the performance measures are not met. Maintenance practices will emphasize hand removal of non-native and invasive species by project staff and volunteers, but will also include mowing, flame torch weeding, targeted herbicide treatments and string trimming/weed whacking.

Irrigation: Supplemental irrigation to native plants will be utilized as determined to be needed. Given the use of wood chip mulch and planting during the rainy season, it is expected that native plants will need irrigation on the day of planting and then once per month following planting. On a year of average to above average rainfall, little supplemental irrigation is expected to be needed. An irrigation system is not planned to be installed, outside of hose connections for hand-watering. If determined to be necessary, any installed irrigation, will be removed prior to the project's completion date.

Hand-removal: Due to the extensive use of biodegradable wood chip mulch, weed pressure is expected to be fairly minimal. Non-native and invasive weeds growing within the wood chip mulch will be removed by hand during the spring months by project staff or community volunteers. Non-native plants removed through hand removal can be piled on site to decompose.

Flame-torch Weeding: Flame torch weeding can eliminate dicot species (forbs) while preserving monocot species (grasses) due to the relative position and growth of meristem tissue. A flame torch weeder or hand torch may be used after early rains for control of broadleaf weeds, such as bristly ox-tongue (*Helmenothica echoides*) and bull thistle (*Circium vulgare*) growing within the wood chip mulch areas or other restoration and enhancement areas.

Herbicide Application: Use of a broadleaf herbicide as a maintenance practice may be used within the areas in which Himalayan blackberry is growing. Herbicides may be used for up to two years following planting, with exceptions determined by the adaptive management process described below in this section.

All herbicides would be applied in strict accordance with the label. Herbicides used at the site would typically include selective post-emergent herbicides that control broadleaf weeds at a variety of plant growth stages and are approved for use near or over water bodies (though herbicide applications would not occur over water at any time during the project). Broadleaf herbicides are used to control woody and herbaceous broadleaf plants but are ineffective on grasses. For this project, herbicides will only be used on re-sprouting Himalayan blackberry if determined to be needed.

It is anticipated that 2-3 treatments per year for the first two years would be sufficient to accomplish the project goals. However additional applications may be used, though no greater than four applications will be made per year. The application would typically be made with a backpack sprayer, however may be applied by a tractor mounted boom sprayer if determined to be most efficient.

Mowing: As most of the plant species planned for planting are perennial, mowing will promote root development over vegetative growth, favoring perennial plants not reliant on annual seed set and

reducing mowing needs in subsequent years. Some non-native plants are considered compatible with the goals of the re-vegetation effort, including non-native annual grasses and non-invasive, non-native forb species. Weed whacking may be used in lieu of mowing when treatment areas are small in size or inaccessible by mowing equipment, and would typically be limited to two treatments per year. Work would be conducted outside of the nesting season or in areas determined to be clear of nesting birds from a nesting survey on site, to prevent impacts to wildlife.

Replanting: If determined to be beneficial for the habitat establishment or if determined to be necessary to meet project performance standards, supplemental native plants may be planted within the identified planting areas. Native plants will be grown from watershed specific parent material from the Watsonville Slough System and will be those suitable to meet the habitat establishment type goal.

Long-term Maintenance and Stewardship

The City is responsible for long-term maintenance and site stewardship. The City contracts with Watsonville Wetlands Watch to support management of the wetland trail system and habitat areas within the trails network and to engage community volunteers in these stewardship efforts. This project area will be incorporated into this maintenance and stewardship area.

The over-arching goal for management of the project area is to restore a mosaic of functional and self-maintaining wetlands and uplands and provide these enhancements in a self-sustaining (low maintenance) fashion. The project was designed for minimal ongoing management, during the maintenance and adaptive management phase, to both contain future maintenance costs and support wildlife.

Beyond the establishment period, vegetation maintenance and management of the site will focus on the long-term viability of native habitats with actions that support the growth habit of desirable vegetation and control priority invasive plant species. Mowing native plants with a tolerance for this will aid in the long-term viability of native plant populations, as this can reduce non-native and invasive plant cover as well as invigorate the growth of the native plants.

Maintenance of water quality treatment basins is important to their long-term function and to reduce impacts to the wetland and habitat areas. This will be performed in accordance with the operations and maintenance specifications for those facilities.

Success Criteria and Monitoring

Monitoring Methodology

The following monitoring protocol will evaluate project performance in achieving project objectives, consistent with the Wetland and Riparian Area Monitoring Plan (WRAMP) framework.

Quantitative and qualitative monitoring techniques will be used to evaluate progress towards project goals and inform adaptive management.

Quantitative monitoring will include:

-plant species and ground surface cover measurements
-California Rapid Assessment Method (CRAM) measurements of overall habitat condition

Qualitative vegetation monitoring will include:
-species richness and presence/absence of planted native plant species;
-approximation of species survival;
-photo monitoring

Additional monitoring techniques may include hydrologic monitoring of water stage, water quality monitoring associated, bird population surveys with volunteers, and assessments of trash or other human disturbances in the project area.

The Level 2 rapid assessment (CRAM) and the quantitative vegetation surveys (Level 3) will take place once before the project commences to establish baseline conditions, immediately after construction to re-establish initial baseline conditions (just CRAM), and then again in year 3 to document if the habitat is meeting performance metrics and to inform adaptive management actions.

Vegetation monitoring will be stratified by habitat type, including wetland, wet meadow, riparian, oak woodland, and grassland. Fixed transects will be established within each habitat type and surveyed using the point-intercept method, as well as a 1 meter belt transect to document overall species richness. Vegetative sampling methodologies for this project were developed with methodologies supported by the United States Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, and the Nature Conservancy (Elizinga, Salzer, Willoughby, Gibbs, 2001) and also reflect effective practices identified by Watsonville Wetlands Watch over many years of vegetative monitoring in the Watsonville Slough System.

Several invasive species have been identified on the site, and efforts will be made to reduce or eliminate them. However, we expect that many will persist in spite of these efforts, particularly the more common invasive species that are found throughout the surrounding area. Thus, our goals for invasive species management emphasize achievable goals that align with habitat enhancement goals for the project. A list of the common invasive species is found below in Table 3. The performance criteria for invasive species presence is such that invasive plants occupy no greater than 25% for all of the habitat types. Project implementation methods are designed to exceed this threshold.

Table 3. Invasive species monitoring list

Common Name	**Scientific Name**
Mustard	*Brassica nigra*
Iceplant	*Carpobrotus edulis*
Poison Hemlock	*Conium maculatum*
Fennel	*Foeniculum vulgare*
English Ivy	*Hedera helix*

Privet	*Ligustrum lucidum*
Cheeseweed	*Malva parviflora*
Harding Grass	*Phalaris aquatica*
Radish	*Raphanus sativus*
Himalayan Blackberry	*Rubus armeniacus*

Performance Criteria

The project will increase native cover through outplantings, weed management, and habitat creation. In addition to native plant installation, natural recruitment is expected for wetland-adapted native plants to the wet areas that will be created or enhanced. Native cover targets are adjusted for the expectations of each habitat type (Table 2).

Table 4. Performance metrics for vegetation and ground surface

Habitat Type	**Native Cover**	**Species Richness**	**Invasive Plants**	**Bare Ground**
	Performance Metric	**Performance Metric**	**Performance Metric**	**Performance Metric**
Wetland	50%	1 or greater	<25%	N/A
Wet Meadow	50%	7	<25%	<25%
Riparian	50%	7	<25%	<25%
Oak Woodland	50%	7	<25%	<25%
Grassland	15%	3 or greater	<25%	<25%

CRAM surveys will document the overall habitat condition. The method assesses the wetland based on four categories called Attributes, which are scored independently and combined into an overall Index score. The Buffer and Landscape Attribute measures the abundance of surrounding wetlands and the size and condition of the buffer. This project will not affect the amount of wetlands in the nearby landscape or the size of the buffer, but it will improve the condition of the buffer. Therefore, a modest improvement in this Attribute is expected (Table 5). The Hydrology Attribute is concerned with hydromodification in the upstream watershed and the movements of water within the wetland. This project will not affect these aspects of the wetland, so no change is expected. The Physical Structure of the wetland will be improved through creation of new ponds and placement of habitat features such as basking logs for turtles, so an increase in condition is expected. The project will address invasive plants in the wetland and improve both the diversity and cover of native plants, so the Biotic Structure should

substantially improve. The restoration actions will combine into an overall functional lift for the wetland and that will be documented by a significant increase in the overall CRAM Index score.

Table 5. Performance metrics for CRAM surveys

CRAM Category	**Performance Metric**
Index Score	Increase by more than 10 points
Buffer and Landscape	Increase by more than 5 points
Hydrology	N/A
Physical Structure	Increase by more than 10 points
Biotic Structure	Increase by more than 11 points

Adaptive Management

Adaptive management is a critical component of the design and implementation to ensure that the project objectives are met. Native vegetative cover and native species richness is important to support high quality habitat that sustains the desired conditions within each restored vegetative community over time. Established native cover will reduce invasive plant species growth and persistence and support wildlife habitat.

If the performance metric is not met two years after restoration, additional maintenance and adaptive measures will be utilized. These might include increased invasive plant control measures, such as hand weeding, flame torch weeding, or herbicide application, scraping of the soil surface to promote growth of new plant species or additional installation of native seed or container stock. If invasive plant removal or other vegetation management methods are utilized, monitoring will be conducted each year after the performance metric is complete until the performance metric is met. If maintenance actions include re-vegetation, additional performance monitoring will follow for at least 2 years after installation of native seed or container stock for the habitat area in which this practice was utilized. Once the performance metric is achieved monitoring may be terminated and no further actions may be taken. Additional vegetation management may be conducted, at the discretion of the owner, to enhance the habitat above and beyond the performance metrics.

Reporting

Annual reporting will be completed by December 31 of each year or as required by project permits. Annual reporting is anticipated to include photo monitoring, a description and discussion of work performed, qualitative monitoring data, the results of quantitative monitoring, and a description of any adaptive management actions performed.

Appendix A.

Engineering and Construction Designs, 100% Administrative Draft

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Appendix B.

Table 1. Native Plant Species List for Planting

Species	
Acer negundo	Box elder
Achillea millefolium	Yarrow
Apocynum cannabinum	Dogbane
Arctostaphylos hookerii	Monterey carpet manzanita
Arctostaphylos pajaroensis	Pajaro manzanita
Artemisia californica	California sagebrush
Artemisia douglasiana	Mugwort
Asclepias fasicularis	Narrow-leafed milkweed
Baccharis glutinosa	Marsh baccharis
Calochortus sp.	Wine-cup lily
Carex barbarae	Santa Barabara sedge
Carex densa	Dense sedge
Carex obnupta	Slough sedge
Carex pellita	Wooley sedge
Carex tumulicola	Hill-dweller sedge
Chlorogalum pomeridianum	Soaproot
Clarkia purpurea	Wine-cup clarkia
Clinepodium douglasii	Yerba buena
Cornus sericea	Dogwood
Corylus cornuta	California hazelnut
Danthonia californica	California oatgrass
Drymocallis anserina	Cinquifoil
Drymocallis glandulosa	Sticky cinquifoil

Eleocharis macrostachya	Spikerush
Elymus glaucus	Blue wild rye
Elymus triticoides	Creeping wild rye
Epilobium canum	California fuscia
Epilobium densiflorum	Dense flowered boidsvaldia
Equisetum arvense	Horsetail fern
Eriogonum nudum	Naked buckwheat
Eschscholzia californica	California poppy
Euthamia occidentalis	Marsh goldenrod
Festuca rubra	Red fescue
Frangula californica	Coffeeberry
Gaultheria shalon	Salal
Grindelia stricta	Marsh gumplant
Helenium puberulum	Sneezeweed
Hercalanuem maximum	Cow parsnip
Heteromeles arbutifolia	Toyon
Holodiscus discolor	Oceanspray
Hordeum brachyantherum	Meadow barley
Horkelia californica	Wavy-leafed horkelia
Iris douglasiana	Douglaus iris
Juncus balticus	Baltic rush
Juncus effusus	Bog rush
Juncus mexicanus	Mexican rush
Juncus occidentalis	Western rush
Juncus patens	Spreading rush
Juncus phaeocephalus	Brown-headed rush

Juncus xiphioides	Iris-leaf rush
Lonicera hispidula	Honeysuckle
Lonicera involucrata	Twinberry
Lotus scoparius	Deerweed
Lupinus arboreus	Yellow bush lupine
Myrica californica	Wax myrtle
Oenanthe saramatosa	Pacific Oenanthe
Oenothera hookeri	Evening primrose
Prunella vulgaris	Self-heal
Quercus agrifolia	Coast live oak
Ranunculus californica	California buttercup
Ribes divaricatum	Spreading gooseberry
Ribes sanguineum	Fusica flowered gooseberry
Rosa californica	California wild rose
Rubus ursinus	California blackberry
Rumex salicifolius	Golden dock
Saix lasiolepis	Arroyo willow
Salix laevigata	Red willow
Salvia mellifera	Black sage
Salvia spathacea	Hummingbird sage
Sambucus caerulea	Elderberry
Sanicula crassicaulis	Pacific black snakeroot
Scrophularia californica	California figwort
Sisyrinchium bellum	Blue-eyed grass
Stachys ajugoides	Hedgenettle
Stipa lepida	Slender leafed needlegrass

Stipa pulchra	Purple needlegrass
Symphocarpos albus	Snowberry
Symphyotrichum chilense	California aster
Vaccinium ovatum	Huckleberry
Verbena lasiostachys	Western vervian
Veronica americana	American brooklime

Attachment C. Biotic Assessment for the Middle Struve Slough Habitat and Water Quality Improvement Project

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Biotic assessment for the Middle Struve Slough Habitat and Water Quality Improvement Project

BIOTIC REPORT

Prepared for:

City of Watsonville
250 Main Street
Watsonville, CA 95076

On behalf of:

Watsonville Wetlands Watch
500 Harkins Slough Road
Watsonville, California 95076

Report Prepared by:

Camara Environmental Consulting
Kelli Camara
PO Box 427
Capitola, CA 95010

October 25, 2021

1.0 INTRODUCTION

This report documents and evaluates the biotic resources for the proposed project site. This report (a) characterizes and maps the major plant communities within the proposed project area, (b) identifies sensitive biotic resources, including habitats, plant, and wildlife species of concern, and (c) evaluates the potential effects of the proposed project activities on sensitive biotic resources and recommended measures to avoid or reduce such impacts.

1.1 Proposed Project

The proposed project is located in Middle Struve Slough located in the City of Watsonville (Figure 1) and bound by Pennsylvania Drive to the north and east, Hope Drive to the west, and an existing paved bicycle and pedestrian trail that is part of the Watsonville Area Trails Network to the south (Figure 2).

The 9.84-acre parcel, and surrounding sloughs, was drained for agricultural use, until it was annexed to the City of Watsonville in the 1960's. The drainage canal, used to drain the slough, is still present today as a remnant feature of this past land use. Struve Slough is a seasonal wetland that supports a mixture of freshwater wetlands, willow riparian, ruderal grassland, and previously restored grassland and wet meadow habitat (Figure 3). Middle Struve Slough is supported by direct precipitation, from a spring located just above Airport Boulevard, surface runoff directed into the slough through stormdrain outfalls from the surrounding residential neighborhood, and sheet flow from adjacent uplands. It hosts a number of non-native plant species due to historical farming and grazing operations.

In addition, Watsonville Slough is designated as an impaired waterbody by the State of California due to current water quality concerns. Water quality samples, collected from Middle Struve Slough by the City of Watsonville in 2018 and 2019, showed high turbidity and E. coli levels within this stream reach.

Degraded through historic intensive farming and draining and by more recent surrounding urban development, the City of Watsonville, in partnership with Watsonville Wetlands Watch, proposes an approximately 4.5-acre multi-benefit ecosystem project to improve water quality through implementation of habitat restoration and watershed protection measures. The project will address habitat loss and environmental degradation within the Watsonville Slough System through the enhancement of 1,800 lf of wetland and riparian corridor and restoration of approximately 4.5 acres of wetland, grassland, oak woodland and riparian habitat (Appendix A, Designs; Figure 4). Additional project benefits include climate change resiliency and atmospheric carbon sequestration. All disturbed areas will be revegetated with plant material from parent stock grown or collected within the Watsonville Slough System watershed. Excavation is anticipated to occur during the summer and early fall of 2022 between August 15 and October 15. Revegetation would occur between October 15, 2022, and March 31, 2023.

Figure 1. Property Location.
Middle Struve Slough Habitat and Water Quality Improvement Project

Figure 2. Project Location.
Middle Struve Slough Habitat and Water Quality Improvement Project

Legend

Project Location

Figure 3. Vegetation Communities (Watsonville Wetlands Watch 2021)
Middle Struve Slough Habitat and Water Quality Improvement Project

storm flows, and demonstrate habitat restoration and stormwater treatment that is replicable throughout the City of Watsonville and Santa Cruz County. Specific design elements for stormwater and wetland enhancement include the following (Appendix A, Designs, Figure 4).

- Creation of three seasonal wetland depressions (0.45 acres) to increase hydroperiod, restore topographic variability to improve habitat functions and values, and treat water quality impairments. These features are situated primarily in areas currently supporting invasive Himalayan blackberry.

- Creation of two sediment catchment basins (0.33 acres) on the upper, non-wetland slopes to the east and west of Middle Struve Slough. The western basin will be fed by an existing storm-drain system and outfall extending from Hope Drive to the west. The eastern catchment basin will replace an existing ephemeral channel used to direct water directly from a storm drain west of Pennsylvania Drive into the slough.

- Removal of 1.22 acres of Himalayan blackberry and restore native wet meadow habitat to increase native habitat and improve heterogeneity.

- Removal of 0.75 acres of ruderal herbaceous vegetation, specifically poison hemlock and wild radish, and restore native wetland meadow habitat.

- Removal of 0.41 acres of ruderal herbaceous vegetation, specifically poison hemlock, wild radish, and ice plant, and restore oak woodland habitat.

- Remove an understory of Himalayan blackberry, English ivy, Privot and other species within the 1.14-acre willow riparian forest.

- Restore 0.27 acres of grassland habitat in spoil disposal area.

- Install ten (10) Coast live oak (*Quercus agrifolia*) or other shade tree approved as street trees with landscape efficiency by the City of Watsonville, along approximately 1000 lf adjacent to Pennsylvania Drive to buffer the wildlife habitat from street and residential noise, improve air quality and improve carbon sequestration in the City urban forest.

- Place large logs, if suitable material is identified during project activities, or can be obtained during the maintenance or adaptive management phase of the project, to provide basking sites for the Southwestern Pond turtle.

- Create an additional 650 lf of public access trail at the southern end of the project area and an elevated board walk over areas that are seasonally inundated.

- Placement of four (4) bilingual interpretative signage and educational materials describing the slough ecosystem, pollution prevention, stormwater management, and healthy water resources, including three (3) in upland habitat and one (1) near the elevated board walk.

To complete these restoration actions and achieve the established success criteria, the following will be completed during construction, revegetation, monitoring and maintenance:

- Construct up to three (3) 8-ft wide temporary access roads, from Pennsylvania Avenue, from Clifford Avenue and from Hope Drive. Existing trails will be used, where feasible.

- Install coffer dam upstream of project area with gravity-fed bypass pipe. Install “tee” fitting on diversion pipe outlet.

- Clear and grub wetland depression and catchment basin areas to remove existing vegetation, which will be left on-site within the ruderal upland areas to dry.

- Scrape the Himalayan blackberry area to a depth of 1-2 inches.

- Excavate approximately 750 cubic yards (cyd) to install two (2) catchment basins.

- Excavate approximately 690 cubic yards (cyd) to construct three (3) season wetlands.

- Place spoils in a 12,000 sq ft area of upland habitat, install fiber rolls, and revegetate to restore native grassland habitat.

- Excavate a 4-ft bottom width/ 8-ft top width channel to direct stormflow into the catchment basin and install 50/50 blend of class III and IV RSP (2-ft min) on top of a 9-inch layer of 50/50 blend of class II and universal filter RSP to convey flow from the existing 18-inch HDPE culvert, inlet to eastern catchment basin (site 3).

- Install 50/50 blend of class III and IV RSP (2-ft min) on top of a 9-inch layer of 50/50 blend of class II and universal filter RSP as an energy dissipater outlet from western catchment basin (site 3).

- Excavate a 4-ft bottom width/ 8-ft top width channel to direct stormflow into the catchment basin and install 50/50 blend of class III and IV RSP (2-ft min) on top of a 9-inch layer of 50/50 blend of class II and universal filter RSP to convey flow from the existing 14-inch concrete culvert, inlet to eastern catchment basin (site 4).

- Install 50/50 blend of class III and IV RSP (2-ft min) on top of a 9-inch layer of 50/50 blend of class II and universal filter RSP as an energy dissipater outlet from western catchment basin (site 4).

- Revegetate all rock rip rap with native vegetation.

- Continue Himalayan blackberry removal through seasonally timed mowing, sheet mulching with biodegradable material (burlap or cardboard), herbicide treatment, and/or hand removal.

- Rototill Himalayan blackberry areas after 1-2 years of treatment, mulch and revegetate.

- Scrape ruderal herbaceous vegetation, roto till prior to mulching with biodegradable weed-free wood chips and revegetate.

- Remove iceplant through hand pulling and dispose of properly off-site.

- Fell non-native Privet with a hand saw or chain saw. Plastic will be placed on top of the stumps to suppress re-sprouts. Plastic will be removed after one (1) season.

- Place up to three (3) logs, approximately 10- ft in length and up to 36-inches in circumference.

- Removal of approximately 300 lf of barbed wire and split rail wood fencing existing on-site.

- Revegetate all disturbed areas, with the following exceptions. No revegetation or planting is necessary within the graded wetland depressions, however the edges will be seeded with native plant species and covered with a weed free straw mulch to prevent erosion. No vegetation will be planted in the catchment basins to facilitate on-going maintenance.

- Irrigate native plants the day of planting and then once per month following planting, as needed, and dependent on rainfall.

- Conduct maintenance of plantings 2-3 x/ year during the establishment period (2-3 years), using hand removal mowing, flame torch weeding, targeted herbicide treatments and string trimming/weed whacking.

The proposed improvements were designed detain stormwater flow and deepen wetland habitat to support wildlife use. The logs will provide basking and perching sites and a diverse stratum of vegetation based on topography will provide shallow depth areas for amphibian egg-laying, waterfowl food sources, and a mix of open water and vegetated areas for cover from predators. No structures are anticipated to support perennial water, and thus should not need to be drained to control non-native predators, such as bullfrogs.

The City of Watsonville will provide a qualified biologist who will be present during dewatering, vegetation clearing and surface excavation and on-going maintenance activities. The biologist will remain on-call and or on-site until the project is completed to ensure no adverse effects to listed species. The City of Watsonville will be responsible for long-term maintenance and site stewardship.

1.2 Intended Use of this Report

The findings presented in this biotic report are intended for the use of the City of Watsonville and Watsonville Wetlands Watch in evaluating the proposed project. The findings presented in this report are for information purposes only; they are not intended to represent the interpretation of any State, Federal or County law or ordinance pertaining to permitting actions within sensitive habitat or endangered species. The interpretation of such laws and/or ordinances is the responsibility of the applicable governing body.

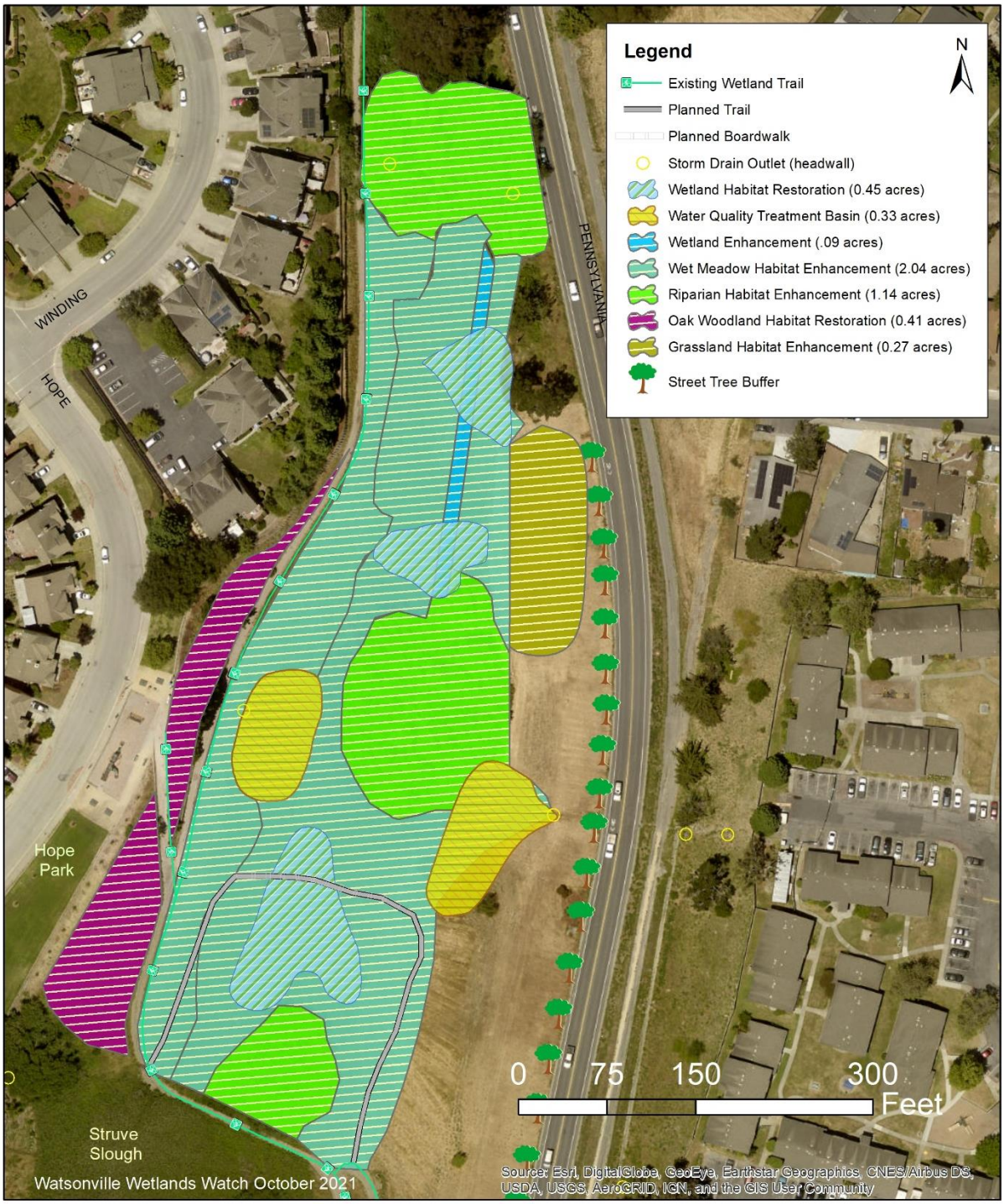

Figure 4. Habitat Restoration and Enhancement Locations (Watsonville Wetlands Watch 2021).

Middle Struve Slough Habitat and Water Quality Improvement Project

2.0 EXISTING BIOTIC RESOURCES

2.1 Methodology

The biotic resources of the project site were assessed through literature review and field observations. Site observations were made on September 10, 2021, by Kelli Camara.

Vegetation mapping of the project site was completed by Watsonville Wetlands Watch, as documented in *Middle Struve Slough Habitat and Water Quality Improvement Project Habitat Enhancement Plan (October 2021)* (Appendix B). The major plant communities within the project area, based on the classification system developed by *California Terrestrial Natural Communities (*California Department of Fish and Game, 2003 and 2007) and *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995) and as amended to reflect site conditions, were identified during the field surveys. Modifications to the classification system's nomenclature were made, as necessary, to accurately describe the site's resources. The plant communities were mapped onto an aerial image (Figure 3). All plant species observed were recorded and identified to a level sufficient to determine their rarity; all species observed are listed in the narrative section of this report (Figure 5). Plant nomenclature follows The *Jepson Manual Vascular Plants of California* (2012); the *An Annotated Checklist of the Vascular Plants of Santa Cruz County, California* (CNPS, 2013) was also reviewed.

To assess the potential occurrence of special status biotic resources, two electronic databases were accessed to determine recorded occurrences of sensitive communities and species. Information was obtained for the Watsonville West Quad from the California Native Plant Society's (CNPS) Electronic Inventory (2021), and the California Department of Fish & Wildlife (CDFW) California Natural Diversity Database (CNDDB) (CDFW, 2021) for a 5-mile radius centered on the project area.

This report summarizes the findings of the biotic assessment for the proposed project. The potential impacts of the proposed project on sensitive biological resources are discussed below. Measures to reduce significant impacts to a level of less-than-significant are recommended, as applicable.

2.2 Environmental Setting

2.2.1 Geographic Setting

The proposed project is situated within the Struve Slough watershed, a subwatershed of the Watsonville Slough System and greater Pajaro River watershed (Figure 1). Struve Slough is one of the six (6) branches of the Watsonville Slough System, an approximately 800-acre wetland complex that comprises one of the State's largest remaining freshwater wetlands. Struve Slough emerges from a spring just above its intersection with Airport Blvd and travels 4000 lf downstream, through a series of culverts, before reaching the 9.84-acre city-owned property, which is surrounded by surrounded residential, agricultural, and open space areas (Figure 2).

Beginning in the second half of the nineteen century, the slough system, including the Middle Struve Slough area, was drained for agricultural use. Through the process of cultivating the wetland areas for row crops and its use for grazing, the wetlands and surrounding native plant communities were largely

lost. As farming stopped in parts of the slough system, such as the Middle Struve Slough area, invasive plants moved into the disturbed soils (WWW 2021).

This reach is comprised of gentle to moderate slopes dominated by ruderal non-native grassland transitioning into a flat to slightly concave bottom comprising a degraded segment of Struve Slough (Ecosystems West 2021). The northern portion is dominated by mature mixed riparian forest and several mature mixed willow thickets occur within the lowland basin. The majority of Middle Struve Slough is dominated by a dense monospecific stand of Himalayan blackberry. A low-flow semi- permanent to perennial channel that bisects this reach of the slough, a remnant from historic draining, is comprised almost entirely of native, emergent wetland plants except where it is situated within the riparian forest to the north (Figure 3). No other watercourses with defined bed or bank features were observed with the project area.

Middle Struve Slough is a seasonal wetland that supports a mixture of freshwater wetlands, willow riparian, ruderal grassland, and previously restored grassland and wet meadow habitat (Figure 3). It is supported by direct precipitation, from the spring located upstream, surface runoff directed into the slough through stormdrain outfalls from the surrounding neighborhood, and sheet flow from adjacent uplands. Drainage of the watershed area within the Struve Slough watershed is approximately 845 acres, with approximately 47% impervious (Balance Hydrologics 2014). Total runoff measured during the WY2012-2013 within the Watsonville Slough System was 106-acre feet, with an effective run-off coefficient of 0.06. Measured peak flow during the same water year was 19 cfs, however because the Struve Slough gauging station was located significantly below the study design area, it is felt that other gauging stations within the slough system which have more direct urban influences provide a better comparison for design criteria. Based on this work, it is assumed that any structures associated with best management practices for stormwater improvement should be built to accommodate at minimum 80 cfs and 136 cf/sq mile.

A paved pedestrian footpath runs along the western perimeter of the slough before turning east and transitioningto a boardwalk over the wetted channel along the southern portion of the project area and continuing south towards Main Street.The property is surrounded by high-density urban residential development. Elevations range from approximately 20 to 60 feet above mean level.

From the project area, Struve Slough continues south, through additional surrounding residential area and heavy commercial use, with a branch extending northeast under Green Valley Rd. and the main branch continuing south through a series of culverts until the confluence with West Struve Slough and Watsonville Slough and eventually towards the mouth of the Pajaro River where the slough system enters Monterey Bay.

Struve Slough is 303(d) listed, impaired by pH, dissolved oxygen, chlorophyll-a, toxicity, turbidity, E. coli bacteria, and fecal coliform bacteria. Water quality samples, collected from Middle Struve Slough by the City of Watsonville in 2018 and 2019, showed high turbidity and E. coli levels within this stream reach.

The City of Watsonville, in partnership with Watsonville Wetlands Watch, proposes a multi-benefit ecosystem project to improve water quality through implementation of habitat restoration and watershed protection measures. The project will address habitat loss and environmental degradation within the Watsonville Slough System through the enhancement of an 1,800 lf of wetland and riparian corridor and

restoration of approximately 4.5 acres of wetland, grassland, oak woodland and riparian habitat (Appendix A, Designs; Figure 4). Additional project benefits include climate change resiliency and atmospheric carbon sequestration. All disturbed areas will be revegetated with plant material from parent stock grown or collected within the Watsonville Slough System watershed. Excavation is anticipated to occur during the summer and early fall of 2022 between August 15 and October 15. Revegetation will occur during the winter rains, October 15, 2022, to March 31, 2023.

The Santa Cruz County Soil Survey (USDA, 1980) identifies four (4) soil types within the Project area, as follows:

- 103- Aquents, flooded
- 123- Cropley silty clay, 2 to 9 percent slopes
- 135- Elkhorn sandy loam, 15 to 30 percent slopes
- 174- Tierra-Watsonville complex, 15 to 30 percent slopes

Vegetation communities on site include emergent freshwater marsh, willow riparian forest, ruderal wet meadow, ruderal herbaceous vegetation, and ruderal grassland habitats. These have been characterized in the wetland delineation report, prepared by Ecosystems West (Appendix C). Each vegetation type, its California vegetation code, and state ranking (rarity, is listed in Table 1. The distribution of vegetation types within the project area is depicted on Figure 5.

Table 1. Vegetation Types at Project Site

Vegetation Type	Plant Alliance	State Ranking	California Code
Emergent Freshwater Marsh	Cattail Marshes - *Typha latifolia* Herbaceous Alliance	S5	52.050.00
Ruderal Wet Meadow	*Rubus armeniacus* *Sesbania punicea* *Ficus carica* Shrubland Semi-Natural Alliance	None	63.906.00
Willow Riparian Forest	Arroyo Willow Thickets - *Salix lasiolepis* Shrubland Alliance	S4	61.201.00
Ruderal Herbaceous	Poison Hemlock or Fennel Patches - *Conium maculatum* *Foeniculum vulgare* Herbaceous Semi-Natural Alliance	None	45.556.00
Ruderal Non-native Grasslands	Perennial Ryegrass - *Lolium perenne* Herbaceous Semi-Natural Alliance	None	41.321.00

1 – California vegetation code as per CDFG/CNDDB (2010); 2- Vegetation types are ranked between S1 and S5. For vegetation types with ranks of S1-S3, all associations within the type are considered to be highly imperiled.

Figure 5. Plant Species Composition Map, Spring 2019 (Watsonville Wetlands Watch, 2021).

Middle Struve Slough Habitat and Water Quality Improvement Project

2.2.2 Vegetation and Wildlife Habitats

Ruderal Wet meadow

This portion of the property was drained for agricultural production in the beginning in the second half of the nineteenth century, until the 1960's. Ruderal wet meadows, include seasonally flooded areas outside of the freshwater emergent marsh. This area is dominated by large and dense stands of Himalayan blackberry (*Rubus armeniacus*). The character of the blackberry, which dominates the project area, is depicted in Photo 1.

Photo 1. Ruderal Wet Meadow dominated by Himalayan blackberry.

Himalayan blackberry provides limited forage, nesting sites, and cover for a variety of wildlife. It provides a food source, berries, during the summer months and protection from predators for small mammals. Common wildlife species expected to inhabit the ruderal wet meadow at this site, include raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), vole (*Microtus californicus*), gopher snake (*Pituophis melanoleucus*), Pacific treefrog *(Hyla regilla),* western aquatic garter snake (*Thamnophis couchii*), passerine bird species and raptors.

Himalayan blackberry shades out smaller, native herbaceous species, creating a monoculture and reducing native plant and wildlife diversity. Extensive stands can limit animals' access to water. The habitat would be improved by exposing open water for migratory birds as foraging grounds and open water basking habitat for Southwestern Pond turtles and open water habitat for California red-legged Frog. Replacing it with native plantings will also improve water quality through improved filtering of urban runoff.

Arroyo Willow Thickets -Willow Riparian

Willow riparian forest is situated in the northern and central portion of the project area. In the northern project area, where the flowing channel is riverine with a distinct bed and bank and lack of emergent herbaceous vegetation, this habitat type is comprised of mature trees with mostly closed canopy and relatively undeveloped understory of herbaceous plants and sub-shrubs. The overstory is comprised of native Pacific willow (*Salix lasiandra*), and the following non-natives, including blue and red gum eucalyptus *(Eucalyptus globules* and *E. camaldulensis*), Monterey pine (*Pinus radiata*), and glossy privet (*Ligustrum lucidum*). The herbaceous understory is primarily Himalayan blackberry, English Ivy (*Hedera* spp.), flatsedge (C*yperus eragrostis*), and creeping bedstraw (*Galium aparine*). Significant amounts of trampling, refuse and other impacts are associated with a transient encampment in this wooded area. The riparian forest habitat located within the central portions of the project site includes Arroyo willow (*Salix lasiolepis*), with an understory of Himalayan blackberry.

The character of the Arroyo Willow Thicket is depicted in Photo 2.

Photo 2. Willow Riparian Habitat in the northern portion of the property.

Riparian habitat along the sloughs may be used by a diversity of wildlife species for food, water, escape cover, nesting, and thermal cover. The willow thickets provide a buffer for wildlife from adjacent urban and residential uses. Common wildlife species that are expected to inhabit the riparian habitat include Pacific treefrog *(Hyla regilla),* western aquatic garter snake (*Thamnophis couchii*), Wilson's warbler *(Wilsonia pusilla),* Bewick's wren (*Thryomanes bewickii*), several swallows, raccoon (*Procyon lotor*),Virginia opossum (*Didelphis virginiana*), California myotis (*Myotis californicus*), gopher snake (*Pituophis melanoleucus*) (Swanson Hydrology & Geomorphology 2003).

The privet tree produces berries that are eaten by thrushes and other birds and provides cover for small birds and other animals. However, the non-native tree and understory species limit the quality of habitat. The habitat is further degraded by significant amounts of trampling, refuse and other impacts are associated with a transient encampment in this wooded area.

Poison Hemlock or Fennel Patches – Ruderal Herbaceous

Ruderal herbaceous vegetation, located on either side of the paved trail accessing Hill Park and the hillslope along the west side of the slough, is dominated by aggressive, opportunistic species including fennel (*Foeniculum vulgare*), cheeseweed (*Malva parviflora*), wild radish (*Raphanus sativus*), black mustard (*Brassica nigra*), iceplant (*Carpobrotus edulis*), and poison hemlock (*Conium maculatum*). Due to the proximity to roads, trails, and other ongoing disturbances, ruderal areas tend to persist over time and succession to other natural communities and wildlife habitat is limited.

The character of the Poison Hemlock and Fennel Patches is depicted in Photo 3.

Photo 3. Poison Hemlock and Fennel Patches dominated by aggressive, opportunistic species.

The value of the ruderal herbaceous vegetation at this site is moderated by the relatively small habitat size, predominance of non-native plants, regular mowing, and public access. The grasses and forbs provide seeds for wildlife forage, and the presence of small mammals attracts predators such as snakes and hawks. Common wildlife that may inhabit or forage in the grassland habitat at this site includes gopher snake (*Pituophis melanoleucus*), red-tailed hawk *(Buteo jamaicensis)*, American robin (*Turdus migratorius*), white-crowned sparrow (*Zonotrichia leucophrys*), American goldfinch (*Carduelis tristis*), California meadow vole (*Microtus californicus*), Botta's pocket gopher (*Thomomys bottae*), and deer.

Perennial Ryegrass – Ruderal Non-Native Grasslands

Ruderal non-native grasslands are primarily situated east of Middle Struve Slough between the basin floor and Pennsylvania Avenue. The ruderal grasslands are highly disturbed by regular mowing, litter, and invasive weeds. As a result, very few native species are present and none of the indicator species of native coastal prairie, such as California oatgrass (*Danthonia californica*), or purple needlegrass (*Stipa pulchra*), are not present. Ruderal non-native grassland occurs on nearly-level to moderate hillslope throughout the majority of the eastern portion of the project area along Pennsylvania Avenue. The non-native grassland is dominated by dense monospecific patches of Harding grass (*Phalaris aquatica*), particularly at the ecotone between wetland areas. Other commonly occurring species found higher up the slope extending to the east towards Pennsylvania Drive include wild oats (*Avena* spp), Italian ryegrass (*Festuca perennis*), brome grasses (*Bromus hordeaceus, B. diandrus*, barley, *Hordeum murinum* ssp. *Leporinum*), six-weeks fescue (*Festuca bromoides*), cutleaf geranium (*Geranium dissectum*), poision hemlock (*Conium maculatum*), dock (*Rumex spp*), and filarees (*Erodium* spp).

The character of the Perennial Ryegrass habitat is depicted in Photo 4.

Photo 4. Perennial Ryegrass habitat.

Grasslands provide an important foraging resource for a wide variety of wildlife species and habitat for small burrowing mammals. The grasses and forbs produce an abundance of seeds and attract numerous insects, providing food for granivorous and insectivorous wildlife. Sparrows, rabbits and rodents are commonly found in this habitat. Consequently, grasslands are valuable foraging sites for raptors such as hawks and owls, and other predators including coyote, fox, skunk and snakes. Aerial foraging species flying over grasslands include bats and swallows.

Common wildlife species that utilize grassland habitat in the watershed include western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis melanoleucus*), house finch *(Carpodacus mexicanus)*,

western meadowlark *(Sturnella neglecta)*, cliff swallow *(Hirundo pyrrhonota)*, red-tailed hawk *(Buteo jamaicensis)*, California ground squirrel *(Spermophilus beecheyi)*, and Botta's pocket gopher (*Thomomys bottae*) (Swanson Hydrology & Geomorphology 2003).

Because the area is frequently mowed, the grassland generally does not support shrubs or trees including coyote brush (*Baccharis piluaris*) although they would be expected to colonize this area under an altered management regime. A large percentage of plant species identified within this habitat type are listed as invasive weeds with "moderate to high ecological impacts" by the California Invasive Plant Council (Cal-IPC) (2020).

Cattail Marshes - Emergent Freshwater Marsh

Emergent freshwater marsh habitat is located within the remnant drainage channel on site. This area is lower than the surrounding landscape, and thus retains water for a longer period of time, often into the summer months. This area is dominated by cattail (*Typha latifolia*), with other native, emergent marsh plant species, such as water smartweed (*polygonum ssp)*, and pacific oenanthe (*Oenanthe saramatosa*).

The character of the Emergent Freshwater Marsh is depicted in Photo 5.

Photo 5. Emergent Freshwater Marsh habitat dominated by broadleaf cattail.

The freshwater marshes provide important cover, foraging and breeding areas for a variety of wildlife species. The marshes are important to resident wildlife and also support migrating species by providing plentiful food, cover and open water-resting areas, critical for species' success in reaching their breeding/wintering grounds, and provide natural movement and dispersal corridors for resident wildlife. Broadleaf cattail provides nesting sites for red-winged blackbirds, ducks and geese and the seeds are food

for ducks, finches and bitterns. Wildlife from adjacent upland habitats are attracted to the marsh areas for drinking water and foraging opportunities.

Common native wildlife species that are known to utilize the freshwater marsh habitat of the Watsonville Sloughs Watershed include Pacific tree frog *(Hyla regilla)*, western toad (*Bufo boreas*), western aquatic garter snake (*Thamnophis couchii*), green heron (*Butorides striatus*), black crowned night-heron (*Nycticorax nycticorax*), mallard *(Anas platyrhynchos)*, ruddy duck *(Oxyura jamaicensis)*, cinnamon teal (*Anas cyanoptera*), northern shoveler (*Anas clypeata*), gadwall (*Anas strepera*), American coot (*Fulica americana*), Virginia rail (*Rallus limicola*), red-winged blackbird *(Agelaius phoeniceus)*, black phoebe *(Sayornis nigricans)*, cliff swallow *(Hirundo pyrrhonota)*, raccoon (*Procyon lotor*),Virginia opossum (*Didelphis virginiana*), and several species of bats (Swanson Hydrology & Geomorphology 2003).

The wildlife value of the current freshwater emergent wetland at this site is low because of its size and close proximity to urban and residential development. In addition, the density of broadleaf cattails limits open water habitat limits the use by the California red-legged frog, the lack of basking habitat limits use by the Southwestern pond turtle, a. The cattail habitat, limited in this region, is beneficial to tri-colored blackbird. Many of these could use this marsh for nesting and cover. However, the project will improve the quality and quantity of habitat for these species.

2.3 Sensitive Biotic Resources

Regulated Habitats

The project is located within the City of Watsonville. Based on City of Watsonville Water Municipal Code, the project will be subject to the following codes:

3.532 Erosion and sediment control plan requirement.
All projects, regardless of size, shall develop and submit a site-specific erosion and sediment control plan when applying for a grading or building permit. The plan must meet the requirements of the City of Watsonville erosion control standards. The director may require implementation of specific BMPs as part of the erosion and sediment control plan.

6-3.534 Construction requirements.
Any project subject to the State construction general permit (CGP) shall comply with all provisions of said permit. Proof of compliance with the CGP is required prior to obtaining a grading or building permit.

7-6.152 Riparian corridor.
“Riparian corridor” shall mean those areas which fall into one of the following three (3) categories:

(a) An area extending fifty (50') feet, measured horizontally, from each side of a perennial stream. Distance shall be measured from the top of the existing bankfull flowline;

(b) An area extending thirty (30') feet, measured horizontally, from each side of an intermittent stream. Distance shall be measured from the top of the existing bankfull flowline; or

(c) An area extending thirty (30') feet from the high-water mark of a marsh or a natural body of standing water.

California Department of Fish and Wildlife (CDFW) is a trustee agency that has jurisdiction under Section 1600 et seq. of the CDFW Code. Under Sections 1600-1603 of the California Fish and Game Code, CDFW regulates all diversions, obstructions, or changes to the natural flow or bed, channel or bank of any river, stream or lake which supports fish or wildlife. CDFW also regulates alterations to ponds and impoundments. CDFW jurisdictional limits typically extend to the top of bank or to the edge of riparian habitat if such habitat extends beyond top of bank (outer drip line), whichever is greater. In addition, CDFW regulates the take of state special status species. The proposed project is within CDFW's jurisdiction for disturbance to bed and bank of Struve Slough.

Water quality in California is governed by the Porter-Cologne Water Quality Control Act and certification authority under Section 401 of the Clean Water Act, as administered by the Regional Water Quality Control Board (RWQCB). The Section 401 water quality certification program allows the State to ensure that activities requiring a Federal permit or license comply with State water quality standards. Water quality certification must be based on a finding that the proposed discharge will comply with water quality standards which are in the regional board's basin plans. The Porter-Cologne Act requires any person discharging waste or proposing to discharge waste in any region that could affect the quality of the waters of the state to file a report of waste discharge. The RWQCB issues a permit or waiver that includes implementing water quality control plans that take into account the beneficial uses to be protected. Waters of the State subject to RWQCB regulation extend to the top of bank, as well as isolated water/wetland features and saline waters. Should there be no Section 404 nexus (i.e., isolated feature not subject to USACE jurisdiction), a report of waste discharge (ROWD) is filed with the RWQCB. The RWQCB interprets waste to include fill placed into water bodies. The proposed project is located within RWQCB jurisdiction.

The US Army Corps of Engineers (USACE) regulates activities within waters of the United States pursuant to congressional acts: Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act (1977, as amended). Section 10 of the Rivers and Harbors Act requires a permit for any work in, over, or under navigable waters of the United States. Navigable waters are defined as those waters subject to the ebb and flow of the tide to the Mean High Water mark (tidal areas) or below the Ordinary High Water mark (freshwater areas). The placement of fill in Waters of the US and impacts to jurisdictional wetlands is regulated. Based on *Delineation of Aquatic Resources Subject to State and Federal Jurisdiction for the Middle Struve Slough Stormwater and Wetland Enhancement Project Area* (Ecosystems West 2021), there are four (4) potential Section 404 jurisdictional wetlands (1.64 acres).

The US Fish and Wildlife Service (Service) is responsible for the protection of federally listed species under the Endangered Species Act. The proposed project is potentially within the Service's jurisdiction for take of the California red-legged frog (*Rana draytonii*) (CRLF) and their habitat.

Critical habitat is defined in Section 3(5)A of the ESA as the specific portions of the geographic area occupied by the species in which physical or biological features essential to the conservation of the species are found and that may require special management considerations or protection. Specific areas outside of the geographic area occupied by the species may also be included in critical habitat designations upon a determination that such areas are essential for the conservation of the species. Critical habitat was designated for CRLF on March 13, 2001 (66 FR 14625) and re-designated on March 17, 2010 (75 FR 12816). The project area is not in designated critical habitat for CRLF.

2.3.2 Sensitive Habitats

Sensitive habitats are defined by local, State, or Federal agencies as those habitats that support special status species, provide important habitat values for wildlife, represent areas of unusual or regionally restricted habitat types, and/or provide high biological diversity.

CDFW classifies and ranks the State's natural communities to assist in determining the level of rarity and imperilment. Vegetation types are ranked between S1 and S5. For vegetation types with ranks of S1-S3, all associations within the type are considered to be highly imperiled. If a vegetation alliance is ranked as S4 or S5, these alliances are generally considered common enough to not be of concern; however, it does not mean that certain associations contained within them are not rare (CDFW, 2007 and 2010). The proposed project does not support habitat with imperiled status (See Table 1).

2.3.3 Special-Status Plant Species

Plant species of concern include those listed by either the Federal or State resource agencies as well as those identified as rare by CNPS (List 1B). The search of the CNPS and CNDDB inventories identified the special status plant species with potential to occur in the project area. No special-status plant species were observed within the project area due to the lack of suitable attributes for special status species within the greater project region. The project area lacks specialized micro habitats conducive to the occurrence of special status plant species. For annual species that were not detectable during the survey period, the species presence/absence evaluation was based on habitat suitability, as described in Table 2.

Table 2. Special Status Plant Species and Their Predicted Occurrence Within the Project Area, October 2021.

Scientific Name	Common Name	Status	General Habitat	Habitat Present/ Absent	Rationale
Chorizanthe pungens var. pungens	Monterey spineflower	FT CNPS List 1B.2	Oak woodland, chaparral, scrub; sandy substrate	A	High levels of thatch; not observed, presumed absent
Cordylanthus rigidus ssp. Littoralis	seaside bird's-beak	CE CNPS List 1B.1	Elevated marine terraces with sandy soils; maritime chaparral; edges of oak woodland	A	No suitable habitat; not observed, presumed absent
Holocarpha macradenia	Santa Cruz tarplant	FT CE CNPS List 1B.1	Coastal prairie and grasslands with sandy soil types	A	No suitable habitat; not observed, presumed absent
Piperia yadonii	Yadon's rein orchid	FE CNPS List 1B.1	Chaparral, coastal bluff scrub	A	No suitable habitat; not observed, presumed absent
Gilia tenuiflora ssp. arenaria	Monterey Gilia	FE, ST, 1B.2	Coastal dunes and inland maritime chaparral	A	No suitable habitat; not observed, presumed absent
Plagiobothrys diffuses	San Francisco Popcorn Flower	SE, 1B.1	Sparsely vegetated, mesic sites in coastal prairies or serpentine grasslands	A	No suitable habitat; not observed, presumed absent
Chorizanthe robusta var. robusta	Robust spineflower	FE, 1B.1	Sandy soils in coastal habitats	A	No suitable habitat; not observed, presumed absent

2.3.4 Special-Status Wildlife Species

Special status wildlife species include those listed, proposed or candidate species by either the Federal or the State resource agencies as well as those identified as State species of special concern. In addition, all raptor nests are protected by Fish and Game Code, and all migratory bird nests are protected by the Federal Migratory Bird Treaty Act. Special status wildlife species were evaluated for their potential presence in the project area as described in Table 3 below.

The project area is located on Struve Slough, one of the 6 branches of the Watsonville Slough System, the largest and most significant wetland habitat between Pescadero Marsh (San Mateo County) and Elkhorn Slough (Monterey County). The Watsonville Sloughs Wetland Complex is considered the most robust and important coastal freshwater wetland system between Elkhorn Slough to the south and Pescadero Marsh to the north. The sloughs support a large suite of rare, threatened, and endangered native plant and animal wildlife species, play a critical role as a component of the Pacific flyway, and serve valuable ecosystem services such as flood protection despite historic and recent land use patterns that have left the wetlands as well as the uplands significantly impaired from a biological perspective (RCDSCC 2012).

This site is further impaired by homeless activity concentrated in the understory of willows and prunus trees in the upper most part of the project area. Encampments can affect water quality of the slough by introducing litter and E. coli from human waste. The disturbance created by human encampments can also create unsuitable habitat for wildlife. Domestic pets also likely contribute to high levels of E. coli. Dogs roaming off leash can also disturb wildlife and aid in the spread of invasive plants (WWW 2019).

Despite these anthropogenic impacts, the project site could support Tri-colored blackbird, Southwestern Pond turtle and California red-legged Frog.

Table 3. Special Status Wildlife Species and Their Predicted Occurrence Within the Project Area, October 2021.

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	Habitat Preference and Potential for Occurrence in Project Impact Areas
Agelaius tricolor	tricolored blackbird	None	None	SSC	**MODERATE.** Found in **m**arshes, grasslands, and wetlands adjacent to grasslands. Suitable habitat is present at the project site.
Ambystoma californiense	California tiger salamander	Threatened	Threatened	None	**LOW**. Ephemeral wetlands and adjacent grasslands. Suitable habitat is present at the project site.
Ambystoma macrodactylum croceum	Santa Cruz long-toed salamander	Endangered	Endangered	None	**LOW**. Ephemeral wetlands and adjacent grassland. Suitable habitat is present at the project site.
Charadrius alexandrinus nivosus	western snowy plover	Threatened	None	SSC	**LOW.** Found in coastal beaches**.** Suitable habitat is not present at the project site.
Emys marmorata	Southwestern pond turtle	None	None	SCC	**MODERATE.** Found in aquatic habitats with exposed areas for basking. Suitable habitat is present at the project site**.**
Eucyclogobius newberryi	tidewater goby	Endangered	None	SCC	**LOW.** Found in coastal lagoons and brackish water zones. Suitable habitat is not present at the project site.

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	Habitat Preference and Potential for Occurrence in Project Impact Areas
Rana draytonii	California red-legged frog	Threatened	None	SCC	**MODERATE.** Found in creeks, ponds, marshes, springs adjacent to upland habitat. Suitable habitat is present at the project site.
Riparia riparia	bank swallow	None	Threatened	None	**LOW**. Found nesting in vertical banks adjacent to rivers, streams, and other water bodies. Suitable habitat is not present at the project site.
Taxidea taxus	American Badger	None	None	SCC	**LOW.** Found in dry, open grasslands, fields and pastures**.** Suitable habitat is present at the project site.
Rana boylii	Foothill Yellow-legged Frog	None	Candidate Threatened	SCC	**LOW.** Found in streams and rivers with rocky substrate and open, sunny banks, in forests, chaparral, and woodlands. Suitable habitat is not present at the project site.
Anniella pulchra	Northern California legless lizard	None	None	SCC	**LOW.** Found in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Suitable habitat is not present at the project site.
Aneides flavipunctatus niger	Santa Cruz Black Salamander	None	None	SCC	**LOW.** Found in mixed deciduous woodland, coniferous forests, coastal grasslands, near streams and under damp logs. Suitable habitat is present at the project site.
Oncorhynchus mykiss irideus	Steelhead SCCC	Threatened	None	None	**LOW.** Found in freshwater rivers and streams. No known anadromy on Struve Slough.
Bombus occidentalis	Western bumblebee	None	Candidate Endangered	None	**LOW.** Found in a wide variety of natural, agricultural, urban, and rural habitats. . Suitable habitat is present at the project site.

3.0 IMPACTS AND MITGIATION

3.1 Impact Criteria

The thresholds of significance presented in Appendix G of the CEQA Guidelines were used to evaluate project impacts and to determine if implementation of the proposed project would pose significant impacts to biological resources. For this analysis, significant impacts are those that substantially affect, either directly or through habitat modifications:

- A species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW, USFWS, or NMFS;
- Riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- Federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

3.2 Environmental Impacts and Mitigation Measures

The proposed project was evaluated for its potential direct and indirect impacts to biotic resources. Impacts to sensitive habitats/resources were considered potentially significant.

3.2.1 Environmental Impacts

a) Special Status Plant Species: No special status species have been recorded for the project area and none were observed during surveys on April 8, June 10 and July 27, 2021(Pilch pers. comm.). An evaluation of site habitats and growing conditions concluded that there is very low potential for species status species to occur on site. No impact to species status plant species will occur because no individuals of these species were observed.

b) Special Status Animal Species: Nesting birds (protected by the MBTA), specifically tri-colored black bird may occur within the project area. The project may result in indirect impacts (ie mortality or nest abandonment) and/or indirect impacts (ie. temporary changes in foraging patterns or territories, noise disturbance, winter roost abandonment, etc). Temporarily displaced birds would move to other suitable roosting and foraging habitat during construction. However, However, scheduling construction after nesting season (August 15 – October 15), and implementation of other avoidance and minimization

measures, described below will minimize these effects to sensitive wildlife species. Mowing, revegetation, and other non-construction related maintenance activities could also temporarily displace birds. The avoidance and minimization measures, described below will minimize these effects to sensitive wildlife species.

For Southwestern Pond turtle, there is a potential for injury or mortality of turtles moving through the site, due to being crushed by vehicles, humans, or construction equipment associated with project activities. The avoidance and minimization measures, described below will minimize these effects to sensitive wildlife species.

For California red-legged frog, implementation of project activities would temporarily disturb aquatic and upland that could support the species. To avoid potential impacts to the species, all construction activities will occur before the onset of winter rains (October 15). The avoidance and minimization measures, described below will minimize these effects to sensitive wildlife species.

c) Sensitive Habitats: The proposed project is within CDFW's jurisdiction for disturbance to bed and bank of Struve Slough and result in impacts to and fill of wetlands and Waters of the US, per the jurisdiction of the California Regional Water Quality Control Board. And Army Corps of Engineers regarding jurisdiction.

d) Water Quality: Construction activities may temporarily alter water quality. Impacts could include increases in downstream turbidity and sedimentation levels and accidental spills of hazardous materials during construction activities. However, dewatering prior to the onset of construction activities and implementation of other avoidance and minimization measures described below, will minimize these effects to downstream habitat. Short-term increases in turbidity during post-construction re-watering and subsequent higher flow events during the first winter storms post-construction may also occur, but the levels and duration of sedimentation and turbidity increases associated with the activities are expected to be comparable to background winter storm event conditions and are not expected to rise to the levels that would cause harm to aquatic species.

3.2.2 Recommended Measures

The following avoidance and minimization measures will be implemented for all activities:

1. If removal of vegetation occurs during the bird nesting season (February 1 to August 1), a nesting bird survey will be conducted by a qualified biologist. The survey will be conducted within the vegetation scheduled for removal and a 300-foot buffer no more than two weeks prior to construction activities. If no active nests are found within the vegetation, no further mitigation is necessary. If active nests (i.e., nests in the egg laying, incubating, nestling or fledgling stages) are found within 300-feet of proposed activities, then the following steps would be implemented:

   a. If active nests are found within 300 feet of the disturbance footprint for raptor (birds of prey) species or 100 feet of the disturbance footprint for all other bird species, no-disturbance buffers should be established at a distance sufficient to minimize disturbance based on the nest location, topography, cover, the nesting pair's tolerance to disturbance, and the

type/duration of potential disturbance. Work within no-disturbance buffers should be rescheduled to occur after the young have fledged as determined by a qualified biologist.

b. If rescheduling of work is infeasible and no-disturbance buffers cannot be maintained, a qualified biologist should be on site to monitor active nests for signs of disturbance. If it is determined that project-related activities are resulting in nest disturbance, work should cease immediately and the California Department of Fish and Wildlife (CDFW) and USFWS should be contacted for further guidance.

c. Construction activities conducted outside of the breeding season (i.e., August 2nd to January 29th) would not require preconstruction nesting bird surveys or establishment of no-disturbance buffers.

2. Immediately prior to the onset of construction activities and vegetation disturbance, a qualified biologist would conduct a pre-construction survey to determine the presence or absence of western pond turtle. If turtles are present, the following measure would be implemented:

   a. The construction contractor or project sponsor would install protective temporary fencing, or Wildlife Exclusion Fencing to prevent the migration of western pond turtles into the work area. The placement and installation of the fencing would be approved by a qualified biologist prior to commencement of construction activities. Wildlife Exclusion Fencing would be designed not to impede the movement of wildlife to and from the slough and would be maintained for the duration of construction, and would be removed following completion of the project.

3. A Service-approved biologist will conduct a pre-construction survey of the project site no sooner than 48 hours prior to onset of work activities. If any life stage of California red-legged frog is found and an individual(s) is likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to move the individual(s) from the site before work activities begin. The Service-approved biologist will relocate such California red-legged frog(s) the shortest distance possible to a location that contains suitable habitat and that will not be affected by activities associated with the project. The Service-approved biologist will maintain detailed records of any California red-legged frog(s) that is relocated (e.g., size, coloration, any distinguishing features, and photographs) to assist in determining whether a translocated individual(s) is returning to the original point of capture.

4. On any day that ground-disturbing activities, mowing or weed whacking, or herbicide spraying are planned to occur, a Service-approved biologist will conduct a survey for California red-legged frogs in potentially affected areas before the work begins. If any life stage of California red- legged frog is found and an individual(s) is likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to move the individual(s) from the site before work activities begin. The Service-approved biologist will relocate such California red-legged frog(s) the shortest distance possible to a location that contains suitable habitat and that will not be affected by activities associated with the project. The Service-approved biologist will maintain detailed records of any California red-legged frog(s) that is relocated (e.g., size,

coloration, any distinguishing features, and photographs) to assist in determining whether a translocated individual(s) is returning to the original point of capture.

5. Prior to the start of work, an educational program regarding the sensitivity of potential species, and their habitat will be conducted for all personnel. The educational program will include visual materials on species identification, procedures to follow when encountering any covered species in the work area, penalties for take, and all work restrictions within the project area.

6. A chain of command for field crews and other on-site personnel will be established prior to commencement of all activities. This program will establish the biological monitors and the persons in charge of, and responsible for, all facets of project implementation. The specific chain-of-command will be defined at the pre-activity meeting to be held immediately prior to the initiation of work.

7. Biological monitors will have the full responsibility and authority of stopping work activities, if any crews or personnel are not complying with the provisions outlined in this document and/or conditions in any other authorization from the Service and/or CDFW.

8. Only biological monitors specifically authorized by the Service and CDFW to handle covered species will be allowed to handle, transport, and relocate individuals of these species. When transporting individuals, precautions will be taken to ensure that the animals are not over-stressed and are maintained in safety. Such measures include: keeping animals in a cool, dark, and safe location, providing adequate hydration, maintaining a stable cool temperature to avoid over-heating, and ensuring holding tanks are kept clean to prevent the spread of disease.

9. Biological monitors will check for any covered species under vehicles and equipment that are parked for more than 30 minutes.

10. To maintain safety and limit the chance of take or habitat disturbance, communication systems consisting of a simple system of hand signals or handheld radios will be utilized to ensure proper communication between the monitors, truck drivers, equipment operators, and field personnel to use during habitat enhancement and related activities.

11. Both the Service and CDFW will be notified immediately if any of the covered species are injured or killed during the course of any project related activity. All other incidental observations will be reported in the daily field monitoring forms or notes.

12. Ground-disturbing construction activities, herbicide applications, mowing and weedwhacking will only occur during the period from May 1 through October 31 provided that standing water has been absent from the site for at least 30 days.

In addition, the following measures to protect wildlife and water quality will be employed:

1. Construction activities will occur outside the bird nesting season (February 1 to August 15) and before the rainy season (October 15th).

2. All disturbance during construction will be kept to a minimum to avoid additional impacts to sensitive habitats.

3. All inactive areas (defined as a five-day period) will have all necessary soil stabilization practices in place two days after identification of inactivity and/or before a rain event, whichever comes first.

4. Erosion control and sediment detention devices have been incorporated into the project design and will be in place prior to October 1 and the onset of rains for the purposes of minimizing fine sediment and sediment/water slurry input to flowing water, and of detaining water to retain sediment on-site. These devices will be placed at all locations where the likelihood of sediment input exists. Sediment collected in these devices will be disposed of away from the collection site and outside riparian areas and flood hazard areas.

5. Spoils and grubbed material will be disposed of on-site, and will avoid sensitive upland, wetland and riparian habitats. The material will be stabilized with biodegradable straw wattles or other materials.

6. The use and/or storage of petroleum-powered equipment (if applicable) will be accomplished in a manner to prevent the potential release of petroleum materials into US Waters and Waters of the State. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

7. All excavation and grading activities will be scheduled for, and will occur during, dry weather periods.

8. A contained area will be designated for equipment storage, short-term maintenance, and refueling and will be located at least 100-feet from all water bodies.

9. Vehicles will be inspected for leaks and repaired immediately.

10. Leaks, drips and other will must be cleaned up immediately to avoid soil, surface water or groundwater contamination.

11. Major vehicle maintenance and washing will be done in a manner that protects the environment (at a minimum on a paved surface where all wash water, drippings, runoff, etc. is collected and properly disposed, and preferably offsite).

12. All spent fluids (including motor oil, radiator coolant, and/or other fluids) and used vehicle batteries will be collected, stored, and recycled as hazardous waste off site.

13. All questionable motor oil, coolant, transmission fluid, and hydraulic fluid hoses, fittings, and/or seals on construction equipment will be replaced. All mechanical equipment will be inspected on a daily basis to ensure there are no motor oil, transmission fluid, hydraulic fluid, and/or coolant leaks. All leaks will be repaired in the equipment staging area or other suitable location (away from watercourses) prior to resumption of construction activity.

14. All exposed/disturbed areas and access roads left barren of vegetation as a result of the construction activities shall be restored by seeding, mulching and/or replanting.

15. All mowing activities will occur in the fall to avoid nesting bird season.

16. Use of broadleaf herbicides will be applied in strict accordance with the label, approved for use near or over water bodies (though herbicide applications would not occur over water at any time during the project).

17. Herbicide applications will not occur in wind conditions exceeding 7 miles per hour or when rain is forecasted within 72 hours of treatment.

18. Sprayers, chemicals, and mixing equipment for herbicides will be contained in nontip, leak-proof containers at all times, except when contents are being used or accessed.

19. Only enough herbicide will be mixed for the immediate application; however, if there is excess, the herbicide will be disposed of according to Environmental Protection Agency and California Department of Pesticide Regulation regulations.

CHAPTER 4

Literature Cited and References

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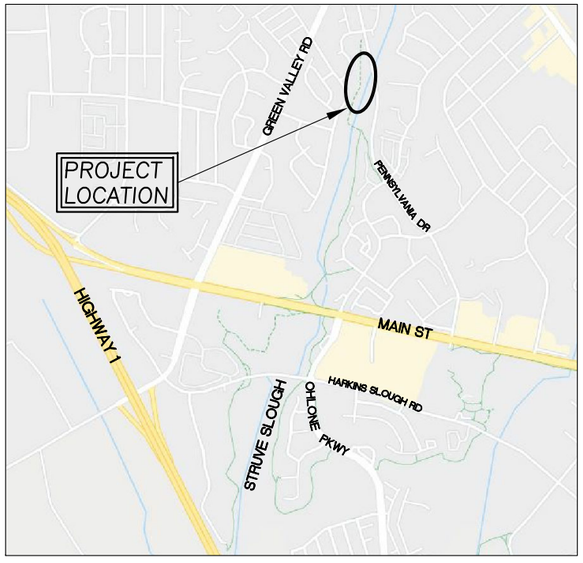
APPENDIX A

MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT

100% ADMIN. DRAFT DESIGN SUBMITTAL



VICINITY MAP
N.T.S. (GOOGLE)

REGIONAL MAP
N.T.S. (GOOGLE)

GENERAL NOTES

1. TOPOGRAPHIC MAPPING WAS PERFORMED BY:
   WATERWAYS CONSULTING, INC.
   509A SWIFT STREET
   SANTA CRUZ, CA 95060
   SURVEY DATE; JANUARY 24, 2020.
2. ELEVATION DATUM: GPS TIES TO NAVD88 USING THE LEICA GEOSYSTEMS SMARTNET GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) NETWORK.
3. BASIS OF BEARINGS: GPS TIES TO NAD83 CALIFORNIA STATE PLANE, ZONE 3 USING THE LEICA GEOSYSTEMS SMARTNET GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) NETWORK.
4. AERIAL PHOTO SOURCE:
   MICROSOFT CORP.
5. CONTOUR INTERVAL IS ONE FOOT. ELEVATIONS AND DISTANCES SHOWN ARE IN DECIMAL FEET.
6. THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES ARE NOT SHOWN HEREON.
7. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE 2018 EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").
8. THESE DESIGNS ARE INCOMPLETE WITHOUT THE FINAL STAMPED TECHNICAL SPECIFICATIONS PREPARED BY WATERWAYS CONSULTING, INC. REFER TO TECHNICAL SPECIFICATIONS FOR DETAILS NOT SHOWN HEREON.

ABBREVIATIONS

AVG.	AVERAGE
CC	CONCRETE
CY	CUBIC YARDS
DIA.	DIAMETER
E	EXISTING
EG	EXISTING GROUND
ELEV.	ELEVATION
DI	DRAINAGE INLET
FG	FINISHED GRADE
FT	FEET
INV	INVERT
MIN	MINIMUM
N	NEW
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
RC	RELATIVE COMPACTION
RSP	ROCK SLOPE PROTECTION
SPK	SPIKE
SQ.FT.	SQUARE FOOT
T	TREE
T.B.D.	TO BE DETERMINED
TYP	TYPICAL
UNK	UNKNOWN
WSE	WATER SURFACE ELEVATION
YR	YEAR

TREE SPECIES

BUC	BUCKEYE
DF	DOUGLAS FIR
O	OAK
T	TREE (SPECIES UNKNOWN)
W	WILLOW

SECTION AND DETAIL CONVENTION

SECTION OR DETAIL IDENTIFICATION (NUMBER OR LETTER) — 5 / C3 — SHEET REFERENCE

PROJECT DESCRIPTION

THESE DRAWINGS PROVIDE 100% LEVEL DESIGN DETAILS FOR THE CREATION OF WETLAND DEPRESSIONS AND STORMWATER CATCHMENT BASINS WITHIN AND ADJACENT TO A PORTION OF STRUVE SLOUGH IN WATSONVILLE, CALIFORNIA.

WETLAND DEPRESSIONS WILL BE EXCAVATED TO EXPAND AND ENHANCE EXISTING WETLAND AREAS THAT ARE CURRENTLY DOMINATED WITH NON-NATIVE BLACKBERRY BRAMBLES. STORMWATER CATCHMENT BASINS WILL BE CONSTRUCTED AT THE OUTFALL OF TWO STORMDRAIN NETWORKS TO PROVIDE FILTRATION AND TREATMENT OF SUBURBAN RUNOFF BEFORE IT ENTERS STRUVE SLOUGH.

SHEET INDEX

** CALL BEFORE YOU DIG **

CONTACT UNDERGROUND SERVICE ALERT (USA)
PRIOR TO ANY CONSTRUCTION WORK 1-800-227-2600

WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH:(831)421-9291 // FAX:(888)819-6847
WWW.WATWAYS.COM

DRAFT
NOT FOR CONSTRUCTION

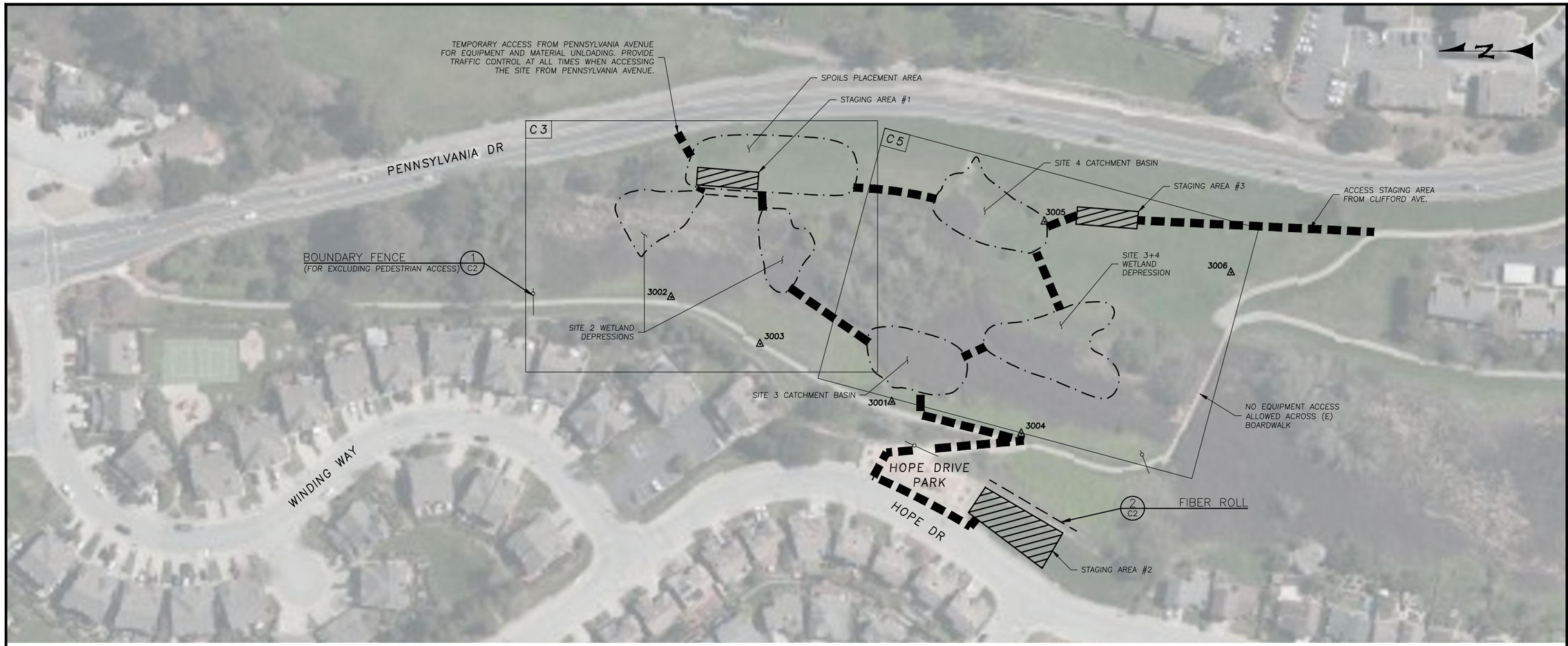
PREPARED AT THE REQUEST OF:
CITY OF WATSONVILLE

COVER

MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT
100% ADMIN. DRAFT DESIGN SUBMITTAL

DESIGNED BY:	B.M.Z.
DRAWN BY:	K.P.B.
CHECKED BY:	B.M.Z.
DATE:	9/24/2021
JOB NO.:	19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 — 1"



ACCESS AND STAGING AREA NOTES

1. USE ONLY THE APPROVED ACCESS POINTS, AS SHOWN ON THE DRAWINGS. STOCKPILE MATERIALS WITHIN AN EXISTING FLAT AND PREVIOUSLY DISTURBED AREA.
2. THE ACCESS PLAN SHOWN ON THE DRAWINGS IS SCHEMATIC. SUBMIT A SITE ACCESS PLAN FOR APPROVAL BY THE ENGINEER, PRIOR TO MOBILIZATION.
3. CONTAIN THE DOWNSLOPE PERIMETER OF STAGING OR STOCKPILE AREAS WITH FIBER ROLLS.
4. STORE, MAINTAIN AND REFUEL ALL EQUIPMENT AND MATERIALS IN A DESIGNATED PORTION OF A STAGING AREA.

OVERVIEW AND ACCESS PLAN

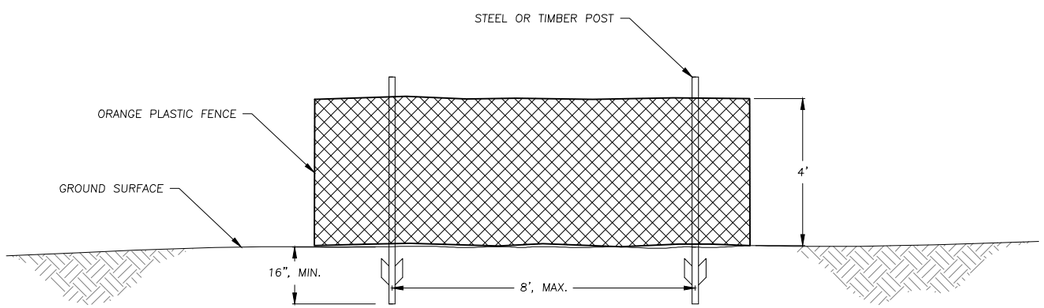
SCALE: 1" = 60'

CONTROL POINTS

POINT #	DESCRIPTION	ELEV	NORTHING	EASTING
3001	SPK	30.02	1797944.76	6188567.72
3002	SPK	26.11	1798197.65	6188687.68
3003	RBR	28.93	1798095.87	6188634.11
3004	SPK	28.39	1797796.34	6188531.32
3005	RBR	25.02	1797769.51	6188774.06
3006	RBR	26.91	1797555.87	6188715.96

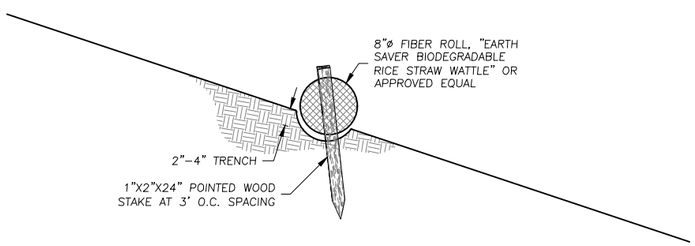
LEGEND

- PROPOSED BOUNDARY FENCE
- STAGING AREA
- TEMPORARY ACCESS ROUTE
- LIMITS OF GRADING
- PROPOSED FIBER ROLL



BOUNDARY FENCE

SCALE: 1" = 2' — 1 C2,C5



FIBER ROLL

SCALE: 1" = 1' — 2 C2,C3,C4

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PREPARED AT THE REQUEST OF:
CITY OF WATSONVILLE

OVERVIEW AND ACCESS PLAN

MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT

100% ADMIN. DRAFT DESIGN SUBMITTAL

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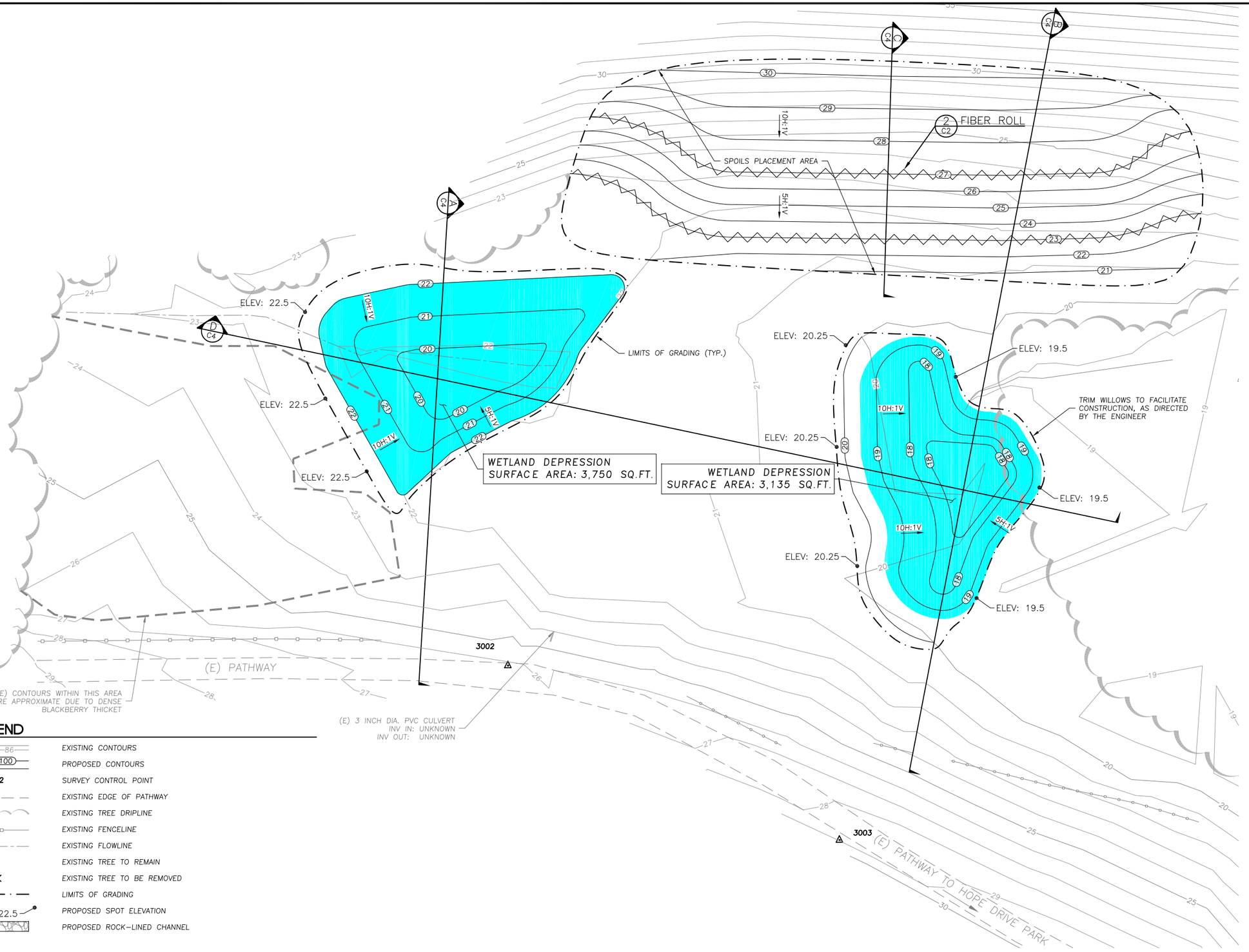

LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- SURVEY CONTROL POINT
- EXISTING EDGE OF PATHWAY
- EXISTING TREE DRIPLINE
- EXISTING FENCELINE
- EXISTING FLOWLINE
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED
- LIMITS OF GRADING
- ELEV: 22.5 — PROPOSED SPOT ELEVATION
- PROPOSED ROCK-LINED CHANNEL

SITE 2 GRADING AND IMPROVEMENTS PLAN

SCALE: 1" = 15'

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SITE 2 GRADING AND IMPROVEMENTS PLAN

MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT

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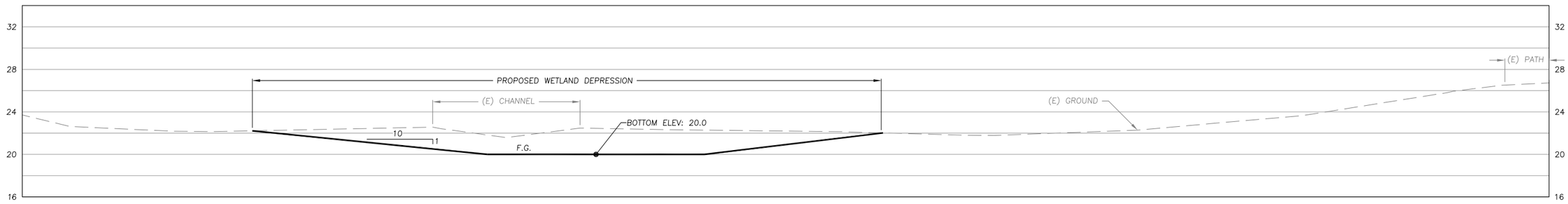
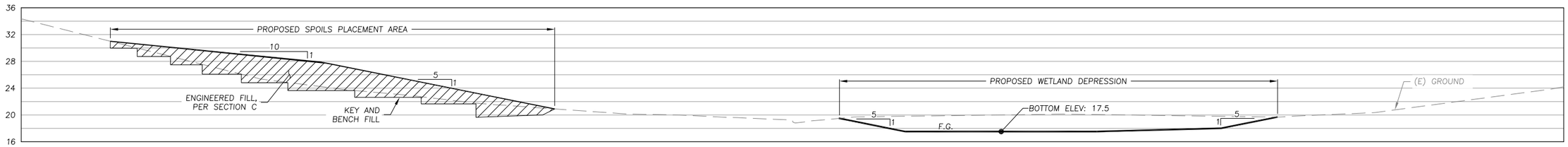
DATE:	9/24/2021
JOB NO.:	19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

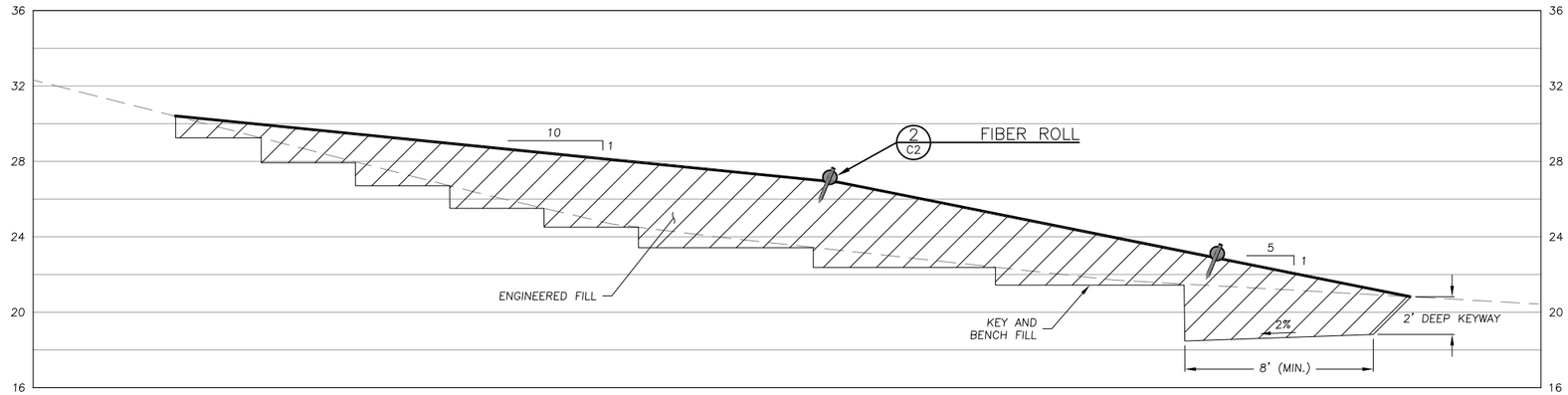
0 1"



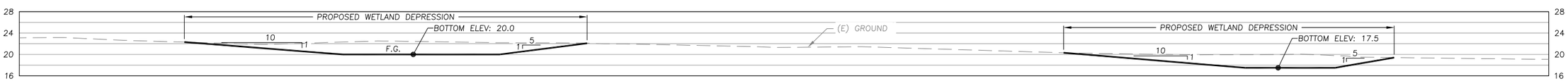
SECTION
SCALE: 1" = 5' (A / C3)



SECTION
SCALE: 1" = 8' (B / C3)



TYPICAL SPOILS PLACEMENT SECTION
SCALE: 1" = 4' (C / C3)



SECTION
SCALE: 1" = 10' (D / C3)

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PREPARED AT THE REQUEST OF:
CITY OF WATSONVILLE

SITE 2
PROFILE AND SECTIONS

MIDDLE STRUVE SLOUGH
HABITAT AND WATER QUALITY
IMPROVEMENT PROJECT

100% ADMIN. DRAFT DESIGN SUBMITTAL

DESIGNED BY:	B.M.Z.
DRAWN BY:	K.P.B.
CHECKED BY:	B.M.Z.
DATE:	9/24/2021
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BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

CONFORM ROCK TO CULVERT AS DIRECTED BY THE ENGINEER

(E) 18 INCH DIA. HDPE CULVERT SLEEVED WITH PVC
INV IN: UNKNOWN
INV OUT: 28.6

(E) LIMITS OF SACKED CONCRETE AND CONCRETE RUBBLE

PROTECT (E) TOYON

TOYON

3005

SITE 4 CATCHMENT BASIN
SURFACE AREA: 3,150 SQ.FT.

SPILLWAY CREST
ELEV: 22.0

ROCK-LINED CHANNEL (TYP.)

SITE 4 PROFILE 2/C6

CONFORM ROCK TO EXISTING GRADE

LIMITS OF GRADING (TYP.)

2BUC

(E) MULTISTEM BUCKEYE TO BE REMOVED

1/C2 BOUNDARY FENCE

PROTECT (E) MULTISTEM BUCKEYE

(E) PEDESTRIAN BOARDWALK
DECK ELEVATION: 17.3

WETLAND DEPRESSION
SURFACE AREA: 5,630 SQ.FT.

WILLOWS MAY BE CLEARED TO FACILITATE THE WORK. ALL WILLOWS TO BE TRIMMED SHALL BE FLAGGED FOR APPROVAL BY THE ENGINEER PRIOR TO ANY CLEARING (TYP)

1/C6 SITE 3 PROFILE

CONFORM ROCK TO EXISTING GRADE

SPILLWAY CREST
ELEV: 22.0

SITE 3 CATCHMENT BASIN
SURFACE AREA: 3,025 SQ.FT.

TAPER ROCK-LINED CHANNEL BOTTOM WIDTH FROM 6 FT. AT THE CONCRETE BOX TO 4 FT. OVER A DISTANCE OF 6 FT., AS DIRECTED BY THE ENGINEER.

(E) 6.5 FT X 6.5 FT CONCRETE BOX WITH ENERGY DISSIPATION BLOCK AND STEEL LID

(E) 14 INCH DIA. CONCRETE CULVERT
INV IN: UNKNOWN
INV OUT: 24.5

(E) PATHWAY

3004

SITE 3 AND SITE 4 GRADING AND IMPROVEMENT PLAN

SCALE: 1" = 15'

LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- SURVEY CONTROL POINT
- EXISTING EDGE OF PATHWAY
- EXISTING TREE DRIPLINE
- EXISTING FENCELINE
- EXISTING FLOWLINE
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED
- LIMITS OF GRADING
- PROPOSED SPOT ELEVATION (ELEV: 22.5)
- PROPOSED ROCK-LINED CHANNEL

NOTE:
SECTIONS F AND G HAVE BEEN EXTENDED BEYOND THE LIMITS SHOWN TO INCLUDE PENNSYLVANIA AVENUE ABOVE THE SITE 4 CATCHMENT BASIN AND THE PAVED TRAIL ABOVE THE SITE 3 CATCHMENT BASIN. SEE THE OVERVIEW AND ACCESS PLAN ON SHEET C2 FOR THE POSITION OF THE ROAD AND TRAIL RELATIVE TO THE BASINS.

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SITES 3 + 4 GRADING AND IMPROVEMENTS PLAN

MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT

100% ADMIN. DRAFT DESIGN SUBMITTAL

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DRAWN BY:	K.P.B.
CHECKED BY:	B.M.Z.
DATE:	9/24/2021
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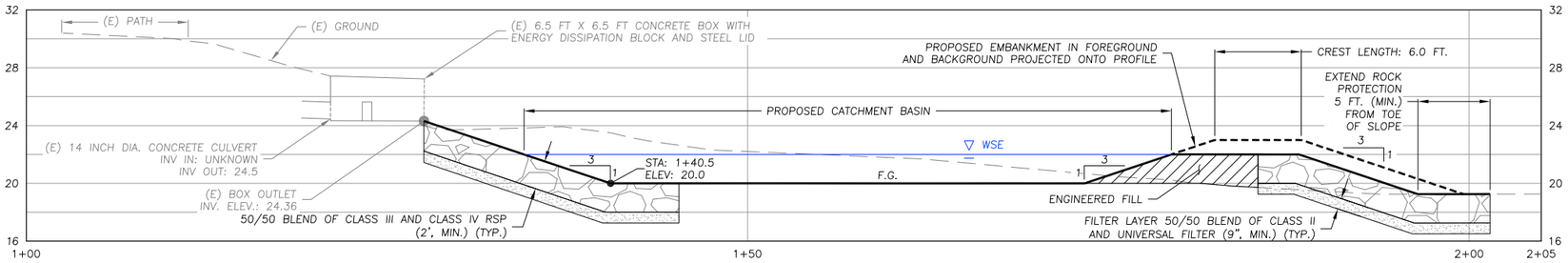
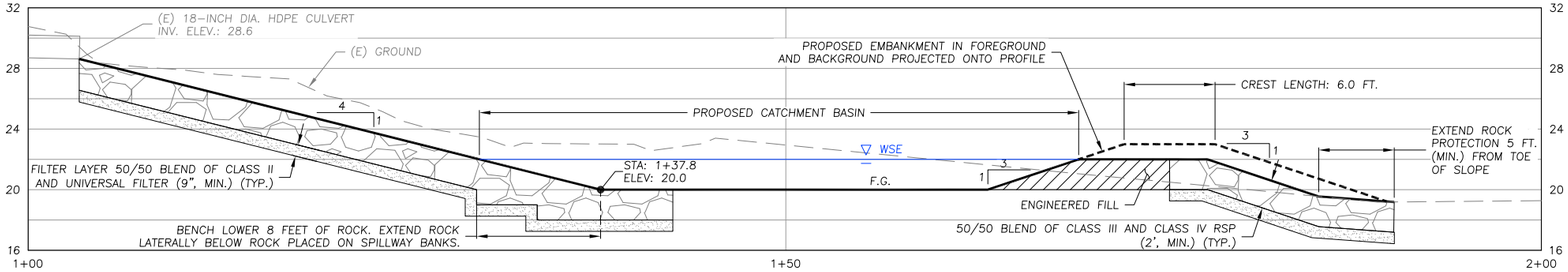
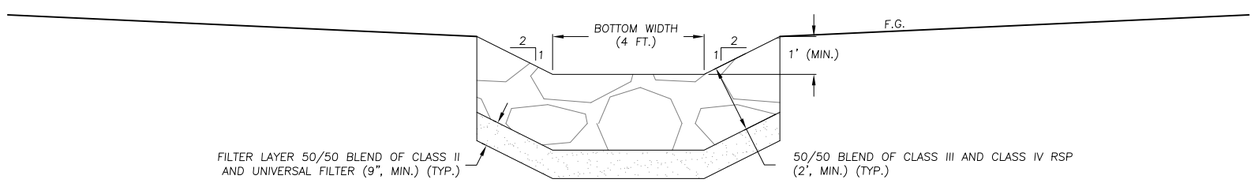
0 1"



SITE 3 PROFILE (1 / C5)
SCALE: 1" = 5'



SITE 4 PROFILE (2 / C5)
SCALE: 1" = 5'



TYPICAL ROCK-LINED CHANNEL SECTION (E / C5)
SCALE: 1" = 2'

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SITE 3+4
PROFILES AND SECTIONS
(1 OF 2)

MIDDLE STRUVE SLOUGH
HABITAT AND WATER QUALITY
IMPROVEMENT PROJECT

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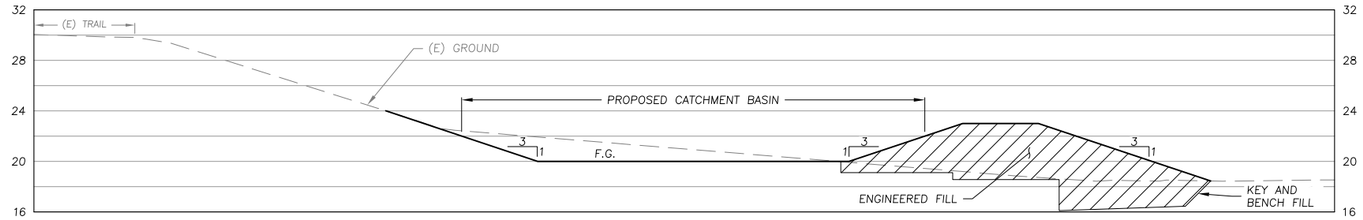
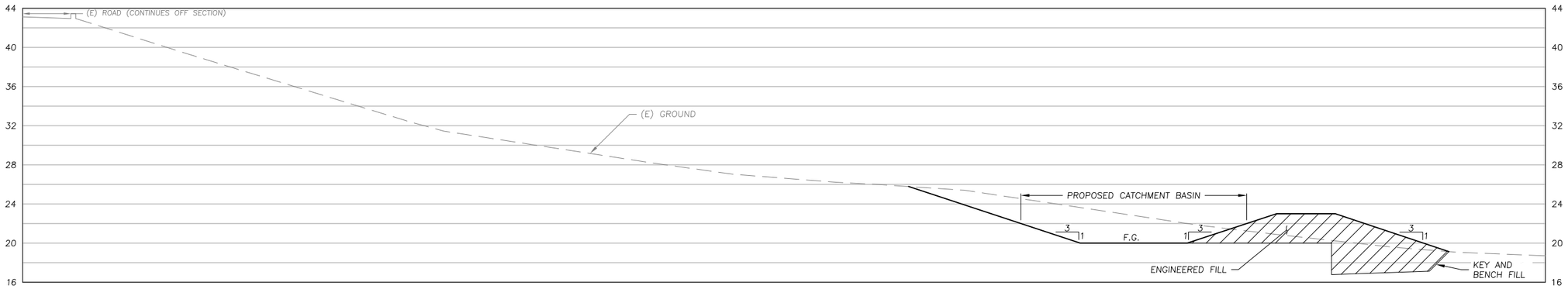
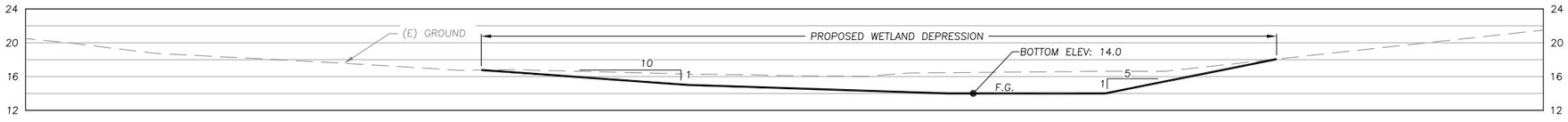


SITE 3 SECTION (F / C5)
SCALE: 1" = 6'



SITE 4 SECTION (G / C5)
SCALE: 1" = 6'



SECTION (H / C5)
SCALE: 1" = 8'

SECTION (I / C5)
SCALE: 1" = 8'

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SITE 3+4 PROFILES AND SECTIONS (2 OF 2)

MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT

100% ADMIN. DRAFT DESIGN SUBMITTAL

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0 1"

C7 | 7 OF 10

DIVERSION AND DEWATERING PLAN
SCALE: 1" = 60'

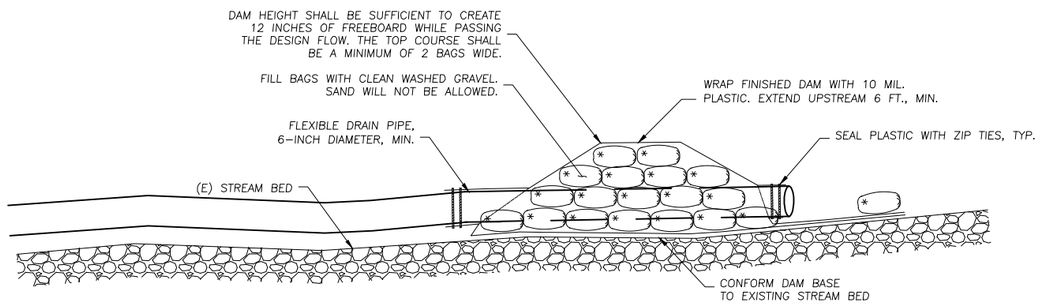
DIVERSION NOTES

REQUIREMENTS FOR DIVERSION AND DEWATERING ARE PROVIDED BELOW. THE CONTRACTOR IS RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE DIVERSION SYSTEM, AND ANY REQUIRED MODIFICATIONS TO ENSURE PROPER FUNCTION OF THE DIVERSION AND DEWATERING FACILITIES THROUGH CONSTRUCTION.

1. GENERAL
   - 1.1. DEWATER THE PROJECT SITE AS REQUIRED TO FACILITATE CONSTRUCTION AND TO REDUCE POTENTIAL IMPACTS TO WATER QUALITY DOWNSTREAM OF THE PROJECT SITE.
   - 1.2. IMPLEMENT DIVERSION AND DEWATERING MEASURES IN COMPLIANCE WITH PROJECT PERMIT REQUIREMENTS.
   - 1.3. CONFIRM THAT A FAVORABLE LONG TERM WEATHER FORECAST (1 WEEK, MIN.) IS OBSERVED PRIOR TO PLACEMENT OF DIVERSION STRUCTURES.
   - 1.4. DIVERT FLOW ONLY WHEN THE DIVERSION CONSTRUCTION IS OTHERWISE COMPLETE. FOLLOWING THE ENGINEER'S APPROVAL OF THE COMPLETED WORK, REMOVE DIVERSION BEGINNING AT THE DOWNSTREAM LIMIT, IN AN UPSTREAM DIRECTION.

2. DIVERSION SYSTEM
   - 2.1. INSTALL A TEMPORARY, SEALED DAM CONSTRUCTED USING GRAVEL FILLED BAGS TO CAPTURE AND DIVERT STREAM FLOW UPSTREAM OF THE PROJECT SITE. THE DAM AND METHOD OF SEALING SHALL BE PLACED AT AN APPROPRIATE DEPTH TO CAPTURE SUBSURFACE STREAM FLOW, AS NEEDED TO DEWATER THE STREAMBED. GRAVEL SHALL BE WASHED PRIOR TO PLACEMENT IN BAGS. THE USE OF SAND WILL NOT BE ALLOWED. NO OTHER DIVERSION METHOD SHALL BE USED WITHOUT AUTHORIZATION OF THE ENGINEER. IF AN ALTERNATE DIVERSION METHOD IS PREFERRED BY THE CONTRACTOR, THE CONTRACTOR SHALL SUBMIT A PLAN TO THE ENGINEER FOR APPROVAL, DETAILING THE DESIRED DIVERSION METHOD.
   - 2.2. THE DIVERSION STRUCTURE SHALL BE CONSTRUCTED AS SHOWN ON DETAIL 1, THIS SHEET OR AS DIRECTED BY THE ENGINEER IN THE FIELD.
   - 2.3. IN THE EVENT OF A SIGNIFICANT STORM, THE CONTRACTOR SHALL BE PREPARED TO TAKE NECESSARY MEASURES TO INSURE SAFE PASSAGE OF STORM WATER FLOW THROUGH THE PROJECT AREA, WITHOUT DAMAGE TO EXISTING STRUCTURES, OR INTRODUCTION OF EXCESSIVE SEDIMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY EROSION CONTROL B.M.P.'S.

3. DEWATERING OF CONSTRUCTION AREAS
   - 3.1. SUPPLY ALL NECESSARY PUMPS, PIPING, FILTERS, SHORING, AND OTHER TOOLS AND MATERIALS NECESSARY FOR DEWATERING. IF A PUMPED SYSTEM IS RELIED UPON TO ENSURE DOWNSTREAM WATER QUALITY, A BACKUP PUMP OF EQUAL CAPACITY SHALL BE PROVIDED AT ALL TIMES AND THE PUMP MUST BE CONTINUOUSLY MONITORED.
   - 3.2. DEWATERING ACTIVITIES WHICH MAY BE REQUIRED FOR CONSTRUCTION PURPOSES SHALL COMPLY WITH WATER QUALITY STANDARDS ISSUED BY THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD.
   - 3.3. DISCHARGE OF WATER FROM THE DEWATERED CONSTRUCTION SITE, EITHER BY GRAVITY OR PUMPING, SHALL BE PERFORMED IN A MANNER THAT PREVENTS EXCESSIVE TURBIDITY FROM ENTERING THE RECEIVING WATERWAYS AND PREVENTS SCOUR AND EROSION OUTSIDE OF THE CONSTRUCTION SITE. PUMPED WATER SHOULD BE PRE-FILTERED WITH A GRAVEL PACK AROUND SUMPS FOR SUBSURFACE FLOWS AND A SILT FENCE AROUND PUMPS FOR SURFACE FLOW. PUMPED WATER SHALL BE DISCHARGED INTO ISOLATED LOCAL DEPRESSIONS, FILTER BAGS, SETTLING (BAKER) TANKS, OR TEMPORARY SEDIMENT BASINS, AS NECESSARY TO MEET WATER QUALITY REQUIREMENTS. WHERE WATER TO BE DISCHARGED INTO THE SLOUGH WILL CREATE EXCESSIVE TURBIDITY, THE WATER SHALL BE ROUTED THROUGH A SEDIMENT INTERCEPTOR OR OTHER FACILITIES TO REMOVE SEDIMENT FROM WATER.



NOTE: CONTRACTOR MAY USE ALTERNATE DAM DETAIL, SUBJECT TO APPROVAL OF THE ENGINEER AND THE PERMITTING AGENCIES.

DIVERSION DAM PROFILE
SCALE: 1" = 5'

LEGEND

- PROPOSED TEMPORARY DIVERSION PIPE
- LIMITS OF GRADING

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MIDDLE STRUVE SLOUGH HABITAT AND WATER QUALITY IMPROVEMENT PROJECT

100% ADMIN. DRAFT DESIGN SUBMITTAL

DIVERSION AND DEWATERING PLAN

DESIGNED BY:	B.M.Z.
DRAWN BY:	K.P.B.
CHECKED BY:	B.M.Z.
DATE:	9/24/2021
JOB NO.:	19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 — 1"

C8

SEEDING AND REVEGETATION NOTES:

1. SEED AND MULCH ALL AREAS DISTURBED DURING CONSTRUCTION.
2. SEED MIX AND REVEGETATION DETAILS TO BE PROVIDED BY OTHERS.

HABITAT ENHANCEMENT AND PUBLIC ACCESS IMPROVEMENT AREA OVERVIEW

SCALE: 1" = 40'

LEGEND

- LIMITS OF GRADING
- OAK WOODLAND HABITAT RESTORATION
- RIPARIAN HABITAT RESTORATION
- WET MEADOW HABITAT RESTORATION
- WETLAND HABITAT RESTORATION
- WETLAND EXCAVATION AREA
- SEDIMENT CATCHMENT BASIN CONSTRUCTION AREA
- STREET TREE BUFFER

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HABITAT ENHANCEMENT AND PUBLIC ACCESS IMPROVEMENT AREA OVERVIEW

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0 1"

GENERAL NOTES

1. NOTIFY THE ENGINEER AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THE ENGINEER OR A DESIGNATED REPRESENTATIVE SHALL OBSERVE THE CONSTRUCTION PROCESS, AS NECESSARY TO ENSURE PROPER INSTALLATION PROCEDURES.

2. EXISTING UNDERGROUND UTILITY LOCATIONS:

   A. CALL UNDERGROUND SERVICE ALERT (1-800-642-2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.

   B. PRIOR TO BEGINNING WORK, CONTACT ALL UTILITIES COMPANIES WITH REGARD TO WORKING OVER, UNDER, OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.

   C. EXISTING UTILITY LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.

   D. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION.

   E. PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.

   F. TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.

   G. UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.

   H. UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.

3. IF DISCREPANCIES ARE DISCOVERED BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL LAWS, ORDINANCES, CODES, REQUIREMENTS AND STANDARDS WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.

5. ALL TESTS, INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN OFFICIAL INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE REQUIRED TESTS AND INSPECTIONS ARE PERFORMED.

6. PROJECT SCHEDULE: PRIOR TO COMMENCEMENT OF WORK, SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL A DETAILED CONSTRUCTION SCHEDULE. DO NOT BEGIN ANY CONSTRUCTION WORK UNTIL THE PROJECT SCHEDULE AND WORK PLAN IS APPROVED BY THE ENGINEER. ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL. PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.

9. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL. NEITHER THE PROFESSIONAL ACTIVITIES OF CONSULTANT NOR THE PRESENCE OF CONSULTANT OR HIS OR HER EMPLOYEES OR SUB-CONSULTANTS AT A CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR AND ITS SUBCONTRACTORS OF THEIR RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE HEALTH OR SAFETY REQUIREMENTS OF ANY REGULATORY AGENCY OR OF STATE LAW.

10. MAINTAIN A CURRENT, COMPLETE, AND ACCURATE RECORD OF ALL AS-BUILT DEVIATIONS FROM THE CONSTRUCTION AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS, FOR THE PURPOSE OF PROVIDING THE ENGINEER OF RECORD WITH A BASIS FOR THE PREPARATION OF RECORD DRAWINGS.

11. MAINTAIN THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. STORE ALL MATERIALS WITHIN APPROVED STAGING AREAS.

12. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL PERMIT CONDITIONS, LAWS, ORDINANCES, CODES, REQUIREMENTS AND STANDARDS, WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.

13. PROVIDE, AT CONTRACTOR'S SOLE EXPENSE, ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.

14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT, UNLESS OTHERWISE SPECIFIED.

15. FIELD INSPECTIONS AND OR THE PROVISION OF CONSTRUCTION STAKES DO NOT RELIEVE THE CONTRACTOR OF THEIR SOLE RESPONSIBILITY FOR ESTABLISHING ACCURATE CONSTRUCTED LINES AND GRADES, AS SPECIFIED.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF ALL SURVEY MONUMENTS OR PROPERTY CORNERS. DISTURBED MONUMENTS SHALL BE RESTORED BACK TO THEIR ORIGINAL LOCATION AND SHALL BE CERTIFIED BY A REGISTERED CIVIL ENGINEER OR LAND SURVEYOR AT THE SOLE EXPENSE OF THE CONTRACTOR.

EARTHWORK NOTES

1. ALL GRADING SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE SANTA CRUZ COUNTY GRADING ORDINANCE.

2. GRADING SUMMARY:

SITE 2 WETLANDS		
TOTAL CUT VOLUME	=	360 CY
TOTAL FILL VOLUME	=	0 CY
SITE 3 CATCHMENT BASIN		
TOTAL CUT VOLUME	=	225 CY
TOTAL FILL VOLUME	=	250 CY
SITE 4 CATCHMENT BASIN		
TOTAL CUT VOLUME	=	525 CY
TOTAL FILL VOLUME	=	200 CY
SITE 3+4 WETLAND		
TOTAL CUT VOLUME	=	330 CY
TOTAL FILL VOLUME	=	0 CY
TOTAL PROJECT		
TOTAL CUT VOLUME	=	1,440 CY
TOTAL FILL VOLUME	=	450 CY
NET CUT VOLUME	=	990 CY

THE ABOVE QUANTITIES ARE APPROXIMATE IN-PLACE VOLUMES CALCULATED AS THE DIFFERENCE BETWEEN EXISTING GROUND AND THE PROPOSED FINISH GRADE, PREPARED FOR PERMITTING PURPOSES ONLY. EXISTING GROUND IS DEFINED BY THE TOPOGRAPHIC CONTOURS AND/OR SPOT ELEVATIONS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF WORK TO BE CONSTRUCTED. THE QUANTITIES HAVE NOT BEEN FACTORED TO INCLUDE ALLOWANCES FOR BULKING, CLEARING AND GRUBBING, SUBSIDENCE, SHRINKAGE, OVER EXCAVATION, AND RECOMPACTION, UNDERGROUND UTILITY AND SUBSTRUCTURE SPOILS AND CONSTRUCTION METHODS.

THE CONTRACTOR SHALL PERFORM AN INDEPENDENT EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING BID PRICES FOR EARTHWORK. THE BID PRICE SHALL INCLUDE COSTS FOR ANY NECESSARY IMPORT AND PLACEMENT OF EARTH MATERIALS OR THE EXPORT AND PROPER DISPOSAL OF EXCESS OR UNSUITABLE EARTH MATERIALS.

3. PRIOR TO COMMENCING WORK, PROTECT ALL SENSITIVE AREAS TO REMAIN UNDISTURBED WITH TEMPORARY FENCING, AS SHOWN ON THE DRAWINGS, AS SPECIFIED, OR AS DIRECTED BY THE ENGINEER.

4. DO NOT DISTRURB AREAS OUTSIDE OF THE DESIGNATED LIMITS OF DISTURBANCE, UNLESS AUTHORIZED IN WRITING BY THE ENGINEER. THE COST OF ALL ADDITIONAL WORK ASSOCIATED WITH RESTORATION AND REVEGETATION OF DISTURBED AREAS OUTSIDE THE DESIGNATED LIMITS OF DISTURBANCE, AS SHOWN ON THE DRAWINGS, SHALL BE BORNE SOLELY BY THE CONTRACTOR.

5. DISPOSE OF ALL EXCESS SOIL ON SITE AT THE SPOILS PLACEMENT AREA IN ACCORDANCE WITH THESE NOTES AND THE TECHNICAL SPECIFICATIONS.

6. CLEARING AND GRUBBING, SUBGRADE PREPARATION AND EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 17 & 19 OF THE STANDARD SPECIFICATIONS, THESE DRAWINGS, AND THE TECHNICAL SPECIFICATIONS.

7. PRIOR TO STARTING WORK ON THE PROJECT, SUBMIT FOR ACCEPTANCE BY THE ENGINEER A HAZARDOUS MATERIALS CONTROLS AND SPILL PREVENTION PLAN. INCLUDE PROVISIONS FOR PREVENTING HAZARDOUS MATERIALS FROM CONTAMINATING SOIL OR ENTERING WATER COURSES, AND ESTABLISH A SPILL PREVENTION AND COUNTERMEASURE PLAN.

9. UNLESS AUTHORIZED BY THE GEOTECHNICAL ENGINEER, THE FOLLOWING MATERIALS SHALL NOT BE INCORPORATED INTO THE WORK:

   A. ORGANIC MATERIALS SUCH AS PEAT, MULCH, ORGANIC SILT OR SOD.
   B. SOILS CONTAINING EXPANSIVE CLAYS.
   C. MATERIAL CONTAINING EXCESSIVE MOISTURE.
   D. POORLY GRADED COURSE MATERIAL
   E. PARTICLE SIZES IN EXCESS OF 6 INCHES.
   F. MATERIAL WHICH WILL NOT ACHIEVE SPECIFIED DENSITY OR BEARING.

10. FINE GRADING ELEVATIONS, CONFORMS, AND SLOPES NOT CLEARLY SHOWN ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO DIRECT DRAINAGE TO PROTECTED DRAINAGE CONTROL STRUCTURES OR NATURAL WATERWAYS IN A MANNER THAT SUPPORTS THE INTENT OF THE DESIGN. ALL FINAL GRADING SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

11. THE TOP 6" OF SUBGRADE UNDER ALL PAVED SURFACES SUBJECT TO VEHICULAR USE SHALL BE COMPACTED TO A MINIMUM OF 95% RELATIVE COMPACTION, IN ACCORDANCE WITH ASTM-D1557. ALL OTHER FILL TO BE COMPACTED TO A MINIMUM OF 90% MAXIMUM DENSITY AS DETERMINED BY ASTM-D1557 AND SO CERTIFIED BY TESTS AND REPORTS FROM THE CIVIL ENGINEER IN CHARGE OF THE GRADING CERTIFICATION.

12. SPREAD FILL MATERIAL IN LIFTS OF APPROXIMATELY 8 INCHES, MOISTENED OR DRIED TO NEAR OPTIMUM MOISTURE CONTENT AND RECOMPACTED. THE MATERIALS FOR ENGINEERED FILL SHALL BE APPROVED BY A REGISTERED CIVIL ENGINEER. ANY IMPORTED MATERIALS MUST BE APPROVED BEFORE BEING BROUGHT TO THE SITE. THE MATERIALS USED SHALL BE FREE OF ORGANIC MATTER AND OTHER DELETERIOUS MATERIALS.

13. ALL CONTACT SURFACES BETWEEN ORIGINAL GROUND AND RECOMPACTED FILL SHALL BE EITHER HORIZONTAL OR VERTICAL. ALL ORGANIC MATERIAL SHALL BE REMOVED AND THE REMAINING SURFACE SCARIFIED TO A DEPTH OF AT LEAST 12 INCHES, UNLESS DEEPER EXCAVATION IS REQUIRED BY THE ENGINEER.

14. REGULATORY AGENCIES MAY REQUIRE A FINAL GRADING COMPLIANCE LETTER. WE CAN ONLY OFFER THIS LETTER IF WE ARE CALLED TO THE SITE TO OBSERVE AND TEST, AS NECESSARY, ANY GRADING AND EXCAVATION OPERATIONS FROM THE START OF CONSTRUCTION. WE CANNOT PREPARE A LETTER IF WE ARE NOT AFFORDED THE OPPORTUNITY OF OBSERVATION FROM THE BEGINNING OF THE GRADING OPERATION. THE CONTRACTOR MUST BE MADE AWARE OF THIS AND EARTHWORK TESTING AND OBSERVATION MUST BE SCHEDULED ACCORDINGLY. PLEASE CONTACT OUR OFFICE: (831) 421-9291.

EROSION CONTROL NOTES

1. THE EROSION CONTROL PLAN SHOWN IS INTENDED FOR THE SUMMER CONSTRUCTION SEASON (APRIL 15TH TO OCTOBER 15TH). IF THE DRAINAGE FEATURES SHOWN ON THESE DRAWINGS ARE NOT COMPLETED AND DISTURBED AREAS STABILIZED BY OCTOBER 1ST, CONSULT THE ENGINEER FOR ADDITIONAL RAINY SEASON EROSION CONTROL MEASURES.

2. PRIOR TO COMMENCING WORK, PROTECT AREAS TO REMAIN UNDISTURBED WITH ESA FENCING, AS SHOWN ON THE DRAWINGS. ADDITIONAL FENCING MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER.

3. UTILIZE ONLY THE APPROVED HAUL ROADS AND ACCESS POINTS (AS SHOWN ON THE DRAWINGS) FOR TRANSPORT OF MATERIALS AND EQUIPMENT.

4. BETWEEN OCTOBER 15 AND APRIL 15, PROTECT EXPOSED SOIL FROM EROSION AT ALL TIMES. DURING CONSTRUCTION, SUCH PROTECTION MAY CONSIST OF MULCHING AND/OR PLANTING OF NATIVE VEGETATION OF ADEQUATE DENSITY. BEFORE COMPLETION OF THE PROJECT, STABILIZE ALL EXPOSED SOIL ON DISTURBED SLOPES AGAINST EROSION.

5. MAINTAIN A STANDBY CREW FOR EMERGENCY WORK AT ALL TIMES DURING THE RAINY SEASON (OCTOBER 15 THROUGH APRIL 15). STOCKPILE NECESSARY MATERIALS AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES.

6. CONSTRUCT TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THIS PLAN AND/OR AS DIRECTED BY THE ENGINEER TO CONTROL DRAINAGE WHICH HAS BEEN AFFECTED BY GRADING AND/OR TRENCHING OPERATIONS.

7. INCORPORATE ADEQUATE DRAINAGE PROCEDURES DURING THE CONSTRUCTION PROCESS TO ELIMINATE EXCESSIVE PONDING AND EROSION.

8. CONSTRUCT AND MAINTAIN EROSION CONTROL MEASURES TO PREVENT THE DISCHARGE OF EARTHEN MATERIALS FROM DISTURBED AREAS UNDER CONSTRUCTION AND FROM COMPLETED CONSTRUCTION AREAS.

9. INSTALL ALL PROTECTIVE DEVICES AT THE END OF EACH WORK DAY WHEN THE FIVE-DAY RAIN PROBABILITY EQUALS OR EXCEEDS 50 PERCENT AS DETERMINED FROM THE NATIONAL WEATHER SERVICE FORECAST OFFICE: WWW.SRH.NOAA.GOV.

10. AFTER EACH RAINSTORM, REMOVE ALL SILT AND DEBRIS FROM SEDIMENT CONTROL DEVICES.

11. THE EROSION CONTROL DEVICES ON THIS PLAN ARE A SCHEMATIC REPRESENTATION OF WHAT MAY BE REQUIRED. EROSION CONTROL DEVICES MAY BE RELOCATED, DELETED, OR ADDITIONAL ITEMS MAY BE REQUIRED DEPENDING ON THE ACTUAL SOIL CONDITIONS ENCOUNTERED, AT THE DISCRETION OF THE ENGINEER.

12. MAINTAIN ALL EROSION CONTROL DEVICES AND MODIFY THEM AS SITE PROGRESS DICTATES.

13. MONITOR THE EROSION CONTROL DEVICES DURING STORMS AND MODIFY THEM IN ORDER TO PREVENT PROGRESS OF ANY ONGOING EROSION.

14. CLEAN DAILY ANY EROSION OR DEBRIS SPILLING ONTO A PUBLIC STREET.

15. CONTACT THE ENGINEER IN THE EVENT THAT THE EROSION CONTROL PLAN AS DESIGNED REQUIRES ANY SUBSTANTIAL REVISIONS.

16. IMPLEMENT ALL REQUIRED BMP'S PRIOR TO COMMENCING SITE DISTURBING ACTIVITIES.

DUST CONTROL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS DUST CONTROL, THROUGHOUT THE CONSTRUCTION, IN ACCORDANCE WITH THE PERMIT CONDITIONS OF APPROVAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REGULAR CLEANING OF ALL MUD, DIRT, DEBRIS, ETC., FROM ANY AND ALL ADJACENT ROADS AND SIDEWALKS, AT LEAST ONCE EVERY 24 HOURS WHEN OPERATIONS ARE OCCURRING.

2. ALL DISTURBED AREAS, INCLUDING UNPAVED ACCESS ROADS OR STORAGE PILES, NOT BEING ACTIVELY UTILIZED FOR CONSTRUCTION PURPOSES, SHALL BE EFFECTIVELY STABILIZED OF DUST EMISSIONS USING WATER, CHEMICAL STABILIZER/SUPPRESSANT, OR VEGETATIVE GROUND COVER.

3. ALL GROUND-DISTURBING ACTIVITIES (E.G., CLEARING, GRUBBING, SCRAPING, AND EXCAVATION) SHALL BE EFFECTIVELY CONTROLLED OF FUGITIVE DUST EMISSIONS UTILIZING APPLICATION OF WATER OR BY PRE-SOAKING.

4. ALL MATERIALS TRANSPORTED OFFSITE SHALL BE COVERED OR EFFECTIVELY WETTED TO LIMIT DUST EMISSIONS.

5. FOLLOWING THE ADDITION OF MATERIALS TO, OR THE REMOVAL OF MATERIALS FROM, THE SURFACES OF OUTDOOR STORAGE PILES, SAID PILES SHALL BE EFFECTIVELY STABILIZED OF FUGITIVE DUST EMISSIONS UTILIZING SUFFICIENT WATER OR CHEMICAL STABILIZER/SUPPRESANT.

6. ONSITE VEHICLE SPEED ON UNPAVED SURFACES SHALL BE LIMITED TO 5 MPH.

7. DISTURBED AREAS SHALL BE SEEDED PRIOR TO OCTOBER 15TH OR EARLIER AS REQUIRED BY THE APPLICABLE PERMIT CONDITIONS.

WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH:(831)421-9291 // FAX:(888)819-6847
WWW.WATWAYS.COM

DRAFT

NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
CITY OF WATSONVILLE

GENERAL NOTES

MIDDLE STRUVE SLOUGH
HABITAT AND WATER QUALITY
IMPROVEMENT PROJECT

100% ADMIN. DRAFT DESIGN
SUBMITTAL

DESIGNED BY:	B.M.Z.
DRAWN BY:	K.P.B.
CHECKED BY:	B.M.Z.
DATE:	9/24/2021
JOB NO.:	19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C10

10 OF 10

APPENDIX B

Middle Struve Slough Habitat and Water Quality Improvement Project

Habitat Enhancement Plan

Prepared for the City of Watsonville

Watsonville Wetlands Watch
Contact: Jonathan Pilch
Executive Director, Watsonville Wetlands Watch
500 Harkins Slough Road
Watsonville California
95076

October 2021

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List of Maps and Figures

Project Overview

The Middle Struve Slough Water Quality and Habitat Improvement project is located in the City of Watsonville in Southern Santa Cruz County in the Pajaro River Watershed. This project will provide a large suite of environmental and social benefits for the Watsonville community. It is located within a branch of the Watsonville Slough System, an approximately 800 acre freshwater wetland system, which is one of the State's largest remaining freshwater coastal wetlands. Construction of this project will result in the restoration and enhancement of coastal wetlands and watershed habitat, stormwater capture, flood attenuation, and water quality improvement, improved access to nature, parks, and trails for Watsonville residents, greenhouse gas capture and implementation of climate change resiliency measures, and extensive environmental education and green jobs training and development for Watsonville residents.

This project is a multi-benefit ecosystem and watershed restoration project that improves water quality through implementation of habitat restoration and watershed protection measures. The project will address habitat loss and environmental degradation within the Watsonville Slough System through the enhancement of an 1,800 foot linear wetland and riparian corridor and restoration of approximately 4.5 acres of wetland, grassland, oak woodland and riparian habitat. This work will occur in a watershed that has been highly impaired through historic intensive farming and draining of the wetlands and by more recent urban development. Despite historic watershed degradation, the slough system sustains 270 resident and migratory bird species, and 23 native plants and animals that are State and federally listed as threatened, endangered, or species of concern.

The habitat restoration and enhancement project was designed with funding from a grant to the City of Watsonville and Watsonville Wetlands Watch from the California Department of Water Resources Disadvantaged Communities Planning Grants Program, administered by the Regional Water Management Foundation at the Community Foundation of Santa Cruz County. Struve Slough, where proposed work will occur, is 303(d) listed, as impaired by pH, dissolved oxygen, chlorophyll-a, toxicity, turbidity, E. coli bacteria, and fecal coliform bacteria. In order to address this impairment, this project will implement two water quality treatment basins to improve urban run-off prior to entering into the slough and enhance and restore wetland function and habitat.

Additional project benefits include climate change resiliency and atmospheric carbon sequestration. Implementation will improve climate change resiliency for sensitive wildlife species dependent on coastal freshwater wetlands and will install approximately 10 trees along the adjacent roadway, which will buffer noise from the habitat area, improve air quality and improve carbon sequestration in the City's urban forest. Implementation will also attenuate peak flows and reduce the impacts of flooding and erosion associated with increased storm strength projected with climate change.

Project implementation will benefit residents of the City of Watsonville, a State recognized disadvantaged community, and is located within the ½ mile buffer of disadvantaged and severely disadvantaged community census tracts that are located along the interconnected impaired waterway. In addition to water quality benefits for residents, the project will enhance public access and environmental education through the creation of an approximately 400 foot trail and elevated board walk that will pass through the project site.

Project implementation will focus on maximizing community benefits through involvement of the public in each stage of the watershed restoration process as well as providing youth education and green jobs training for Watsonville youth. This work will be led by Watsonville Wetlands Watch who runs a youth paid job-training program, called the Climate Corps Leadership Institute that provides paid stipends for youth to develop leadership skills and work in local watershed restoration and climate resiliency projects. Watsonville Wetlands Watch staff and the Climate Corps interns will lead watershed restoration work with the community. Native plantings, site preparation, and watershed restoration work will be done through community based events. This will enable the project to provide robust bi-lingual community engagement and watershed education for youth and community members, leading to long-term investment in project success, maintenance, and care.

Project Location

The Middle Struve Slough habitat enhancement area is bordered by upper Pennsylvania Avenue, Winding Way, and Hope Park in a residential area. It is located along the Upper Struve Slough Trail, a bicycle and pedestrian trail that is a part of the Watsonville Area Trails Network, a 9 mile trail network that circumnavigates the Watsonville Slough System. Project activities are located upstream of an active and recent habitat restoration efforts along Struve Slough and downstream of a planned wetland enhancement project planned to be initiated in the fall of 2022.

Figure 1. Middle Struve Slough Habitat and Water Quality Improvement Project Location

Historic and Existing Conditions

Historic Conditions

The area in which habitat enhancement work is planned was located within the unincorporated areas of Santa Cruz County until the 1960s, when it was annexed into the City of Watsonville. Beginning in the second half of the nineteen century, the slough system, including the Middle Struve Slough, area was drained for agricultural use. The drainage canal used to drain the slough is still present today as a remnant feature of this past land use. Through the process of cultivating the wetland areas for row crops and its use for grazing the wetlands and surrounding areas the native plant communities were largely lost. As farming stopped in parts of the slough system, such as the Middle Struve Slough area, invasive plants moved into the disturbed soils. In 2004, a public access trail was constructed within the project area and surrounding areas as a way to provide public access to the wetland habitat areas. In 2007, the City of Watsonville and Watsonville Wetlands Watch developed a habitat stewardship program for the wetland trail network and began vegetation management and habitat stewardship for this area along with the surrounding wetland trail network.

Existing Habitat Conditions

Struve Slough is a seasonal wetland that supports a mixture of freshwater wetlands, willow riparian, ruderal grassland, and previously restored grassland and wet meadow habitat. The slough emerges from a spring located just above Airport Boulevard and extends down to the confluence with Watsonville Slough in the center of the slough system, just about the railroad crossing and above the confluence with Harkins Slough. The Middle Struve Slough project is located approximately 4,000 downstream of the spring. In its higher extents, from the top of Struve Slough to the project location, the slough maintains a cross section of natural vegetation that varies from approximately 25 feet to 200 feet and is largely confined by urban development on either side of the wetland and riparian areas. Below the project location, the slough widens to approximately 450’ or greater.

Vegetation Communities

Vegetation communities on site include emergent freshwater marsh, willow riparian forest, ruderal wet meadow, ruderal herbaceous vegetation, and ruderal grassland habitats. These have been characterized in the wetland delineation report, prepared by Ecosystems West, for the project in the following ways.

Vegetation Type	**Plant Alliance**	**State Ranking**	**California Code**
Emergent Freshwater Marsh	*Typha latifolia* Herbaceous Alliance	S5	52.050.00
Ruderal Wet Meadow	*Rubus armeniacus* -	SNR	63.906.00

	Sesbania punicea - *Ficus carica* Shrubland Semi-Natural Alliance		
Willow Riparian Forest	*Salix lasiolepis* Shrubland Alliance	S4	61.201.00
Ruderal Herbaceous	*Conium maculatum* - *Foeniculum vulgare* Herbaceous Semi-Natural Alliance	SNA	45.556.00
Ruderal Non-native Grasslands	*Lolium perenne* Herbaceous Semi-Natural Alliance	SNA	41.321.00

Emergent freshwater marsh

Emergent freshwater marsh habitat is located within the remnant drainage channel on site. Due to their being lower than the surrounding landscape, these areas retain water for longer periods into the summer months. They are dominated primarily by cattail, *Typha latifolia*, and other emergent marsh plant species, such as water smartweed, *polygonum ssp.,* and pacific oenanthe, *Oenanthe saramatosa*.

Ruderal wet meadow

Ruderal wet meadows include seasonally flooded areas outside of the freshwater emergent marsh. These areas are dominated almost entirely by large and dense stands of Himalayan blackberry, *Rubus armeniacus*.

Willow riparian forest

Willow riparian forest is situated in the northern and central portion of the project area. In the northern project area, where the flowing channel is riverine with a distinct bed and bank and lack of emergent herbaceous vegetation. This habitat type is comprised of mature trees with mostly closed canopy and relatively undeveloped understory of herbaceous plants and sub-shrubs. The overstory is comprised of Pacific willow, *Salix lasiandra*, blue and red gum eucalyptus, *Eucalyptus globulus, E. camaldulensis*, Monterey pine, *Pinus radiata*, and glossy privet, *Ligustrum lucidum*. The herbaceous understory is primarily Himalayan blackberry, English Ivy, *Hedera* spp., flatsedge, C*yperus eragrostis*, and creeping bedstraw, *Galium aparine*. Significant amounts of trampling, refuse and other impacts are associated with a transient encampment in this wooded area. The riparian forest habitat located within the central portions of the project site includes Arroyo willow, *Salix lasiolepis*, with an understory of Himalyan blackberry.

Ruderal herbaceous vegetation

Ruderal herbaceous vegetation is dominated by aggressive, opportunistic species including fennel, *Foeniculum vulgare*, cheeseweed, *Malva parviflora*, wild radish, *Raphanus sativus*, black mustard, *Brassica nigra*, iceplant, *Carpobrotus edulis*, and poison hemlock, *Conium maculatum*. Ruderal herbaceous vegetation is located on either side of the paved trail accessing Hill Park and the hillslope along the west side of the slough. Due to the proximity to roads, trails, and other ongoing disturbances, ruderal areas tend to persist over time and succession to other natural communities and wildlife habitat is limited.

Ruderal non-native grasslands

Ruderal non-native grasslands are primarily situated east of Middle Struve Slough between the basin floor and Pennsylvania Avenue. The ruderal grasslands are highly disturbed by regular mowing, litter, and invasive weeds. As a result, very few native species are present and none of the indicator species of native coastal prairie, such as California oatgrass, *Danthonia californica*, or purple needlegrass, *Stipa pulchra*, are not present. Ruderal non-native grassland occurs on nearly-level to moderate hillslope throughout the majority of the eastern portion of the project area along Pennsylvania Avenue. The non-native grassland is dominated by dense monospecific patches of Harding grass, *Phalaris aquatica*, particularly at the ecotone between wetland areas. Other commonly occurring species found higher up the slope extending to the east towards Pennsylvania Drive include wild oats *Avena* spp., Italian ryegrass, *Festuca perennis*, brome grasses, *Bromus hordeaceus*, *B. diandrus*, barley, *Hordeum murinum* ssp. *leporinum*, six-weeks fescue *Festuca bromoides*, cutleaf geranium, *Geranium dissectum*, poision hemlock, *Conium maculatum,* dock, *Rumex spp*, and filarees, *Erodium* spp.. Because the area is frequently mowed, the grassland generally does not support shrubs or trees including coyote brush, *Baccharis piluaris* although they would be expected to colonize this area under an altered management regime. A large percentage of plant species identified within this habitat type are listed as invasive weeds with “moderate to high ecological impacts” by the California Invasive Plant Council (Cal-IPC) (2020).

Figure 2. Map of Middle Struve Slough, Vegetation Communities Map

Figure 3. Middle Struve Slough, Plant Species Composition Map, Spring 2019

Hydrology and Water Quality Conditions

Hydrology

The Project Area is situated within the Struve Slough watershed, a subwatershed of the Watsonville Slough System and greater Pajaro River watershed. The natural hydrological sources for the Project Area are direct precipitation and the groundwater fed spring at the upper end of Struve Slough, surface runoff directed into the site through stormdrain outfalls, and subsurface sheet flow from adjacent uplands. Southerly flows through the slough system are largely conveyed through a narrow meandering channel situated at the low point of the basin originating in Upper Struve Slough at its terminus immediately east of Airport Boulevard.

Water Quality Sampling

Water quality samples from Upper Struve Slough were collected for analysis by the City of Watsonville utilities laboratory and Monterey Bay Analytical Services on November 28, 2018, January 17, 2019, and February 15, 2019 from two locations in order to develop an improved understanding of baseline conditions and support project designs. The "top" sampling location is located adjacent to the headwall in the upper focus area past the Willow (*Salix spp*.), English Ivy (*Hedera helix*), *Prunus spp.*section. The "bottom" sampling location is located at the foot bridge just south of the Hope Park trail entrance. The parameters tested include nitrogen,TKN (total Kjeidahl nitrogen), phosphorous, total coliform, E. coli, turbidity, ammonia-nitrogen, and total suspended solids (TSS) (Table 2). November 2018 was when the first significant rain occurred for that rain year. The first set of samples was collected on November 28, 2018. The last significant rainfall of the 2018 to 2019 rainfall occurred in February 2019 and the last sample set was collected on February 13, 2019.

As a part of a community science monitoring program for the Watsonville Slough System, Watsonville Wetlands Watch developed a water quality parameter threshold list to indicate relative wetland health based on the Canadian Council of Ministers of the Environment Water Quality Index Calculator. These thresholds will be referred to in this section as a point of general reference of what values may be healthy for a wetland. Phosphorous exceeded the wet season threshold of 0.3 mg/L at the bottom location on January 17, 2019 (0.37 mg/L) and at the top location on February 13, 2019 (0.31 mg/L). There was no significant trend between top and bottom sites, reflecting that there is no demonstrated treatment capacity within the existing flow path. Turbidity exceeded the WWW threshold of 25 NTU both sites on November 28, 2018 and January 17, 2019. Turbidity was very low for both sites on February 13, 2019. TSS were highest in February with 44.5 mg/L at the top location and 39.6 mg/L at the bottom. Turbidity and TSS were higher at top sites than bottom sites, demonstrating that there is some treatement capacity for suspended solids within the existing wetland habitat. Nitrate levels did not exceed the WWW wet season threshold of 8 µg/L on any day at either location. No trend was found between top and bottom sites. Ammonia was not detected for the last two sample days and did not exceed threshold for this parameter.

E. coli was exceptionally high for all samples. E. coli was highest on the first sampling day corresponding to the first major rain. The values for the top site was 24200 MPN/100 mL bottle and 14100 MPN/100 mL bottle at the bottom site. The WWW threshold for E. coli is 126 MPN/100 mL bottle. Total coliform followed the same trend with 173000 MPN/ 100 mL bottle at the top location and 199000 MPN/ 100 mL bottle. There was no trend in concentrations of E. coli or total coliform between the top site and bottom site.

No trends were found between top and bottom site concentrations of phosphorous, nitrate, ammonia, E. coli, or total coliform. Implementation of new restoration and treatment methods is anticiated to improve water quality flowing from the top to bottom site. The results of the water quality analysis support the value of creating best management practices that can slow, treat and intercept run-off prior to its entering Struve Slough, along with enhancement to the wetland areas that will enhance the natural abilities of these areas to reduce sediment delivery downstream and uptake nutrients.

Table 2. Lab data from the Upper Struve focus including monthly rainfall. Data marked "ND" refers to not detected.

Date	Location	Rainfall	Total Coliform	E. coli	Turbidity	TSS (mg/L)
11/28/19	Top	3.70	173000	24200	47	30.6
01/17/19	Top	5.23	25950	6488	49.5	10.4
02/13/19	Top	7.38	24200	3870	1.6	44.5
11/28/19	Bottom	3.70	199000	14100	31	17.2
01/17/19	Bottom	5.23	17330	3076	46.7	9.1
02/13/19	Bottom	7.38	24200	6130	1.4	39.6

Date	Location	Rainfall	Nitrate (N)	Total Kjeidahl N (mg/L)	Phosphorous (mg/L)	Ammonia-Nitrogen
11/28/19	Top	3.70	0.5	0.9	0.02	0.081
01/17/19	Top	5.23	3.8	1.1	0.3	ND
02/13/19	Top	7.38	-	0.9	0.31	ND
11/28/19	Bottom	3.70	0.5	0.8	0.03	<0.05
01/17/19	Bottom	5.23	3.4	0.9	0.37	ND
02/13/19	Bottom	7.38	-	0.8	0.28	ND

Community Input into Project Design

In order to receive public input and comments to inform the design and implementation of the Middle Struve Slough Water Quality and Habitat Enhancement Project, the Watsonville Wetlands Watch and the City of Watsonville held two public tours of the project site. The first group in attendance consisted of 13 students from Pajaro Valley High School, enrolled in the Green Careers Summer Institute, held on

July 3, 2019. A second public meeting was held on Saturday August 24th, 2019 and included a mixture of local high school students, people from the surrounding neighborhood, local and County-wide residents who responded to flyers and publicity for the public tour. In total, 38 members of the public were in attendance for this public tour. Additional tours were provided to youth and community members throughout 2020 and 2021, however the numbers were limited to smaller group sizes due to public health concerns. In total over 150 community members were engaged during project tours through the community outreach process. Community input and feedback was provided in the following subject areas: trail signage and education, enhancements for wildlife, water quality and trash control, recreation, safety concerns, and enhancements to the nearby Hope Park, located at the nearest trailhead into the Middle Struve Slough area.

Trail Signage, Education, and Interpretation Opportunities

Participants showed interest in having more information displayed along trails as well as along Pennsylvania Avenue to support the public's understanding of the project area and value of the wetland areas. Some interpretive signs mentioned include signs that explain the purpose of the different ponds, information about plants and animal species, natural history, and the possibility of using a phone application to have a virtual tour to navigate through the area without physical signage. Tour participants voiced concern about vandalism of signs. In addition to more signs and self-guided tours, participants were also interested in having a nature center-like gathering space with interpretation materials offering tours for the public.

Enhancements for Wildlife

Tour participants viewing birds within Struve Slough, August 24th

The audiences were enthusiastic about how Watsonville Wetlands Watch might improve wildlife habitat. When the audience learned about Watsonville Wetlands Watch's plan to remove the large patches of non-native blackberry, there were concerns about the flowers being food sources for butterflies and the plant providing a protective barrier against cats. Some suggested planting native blackberry to replace it. Many participants expressed an interest in planting new native trees to provide shade, divide the wildlife area from area for human use, and provide bird habitat which could aid in rodent control. Some people suggested planting Cottonwoods because they are beneficial for perching birds. However, it was also suggested that lower branches on trees be pruned to ensure a better view of surroundings as a safety measure. To improve habitat for various species, our audience suggested having more open water for foraging, creating mudflats for shorebirds, adding nesting boxes for birds, and timber for pond turtles.

Water Quality and Trash Control

Many of the participants were concerned about trash that ends up on the trails and in the wetlands. Members of the group expressed the need for more trash cans and recycling bins along the trail and that it is important for the trash cans to have lids and be wildlife-proof. Participants also suggested signs to help prevent littering, educating the public about the effects of littering, and providing bags for pet waste. In addition to these enhancements, participants were interested in involving school groups to care for trails including litter pick-ups, weeding, and other maintenance practices.

To improve water quality at Middle Struve Slough, participants suggested using different methods of filtering water at culverts and drainages including filtration with native plants and trash catchment devices.

Watsonville Wetlands Watch Restoration and Water Quality Technician, Xochitl Garcia shares water quality data with tour participants, July 3, 2019

Recreation

Related to recreational activities members of the public shared a variety of diverging opinions that were considered in order to balance recreational desires with habitat restoration goals. Some members of the public suggested turning the open space near the ponds into a place with a picnic area, drinking fountains, an amphitheater, concrete benches, and a natural playground or work-out station. To further utilize the open grass space, some participants were interested in having events to increase more positive activity. Some suggested hosting an Adopt-a-Trail event with family friendly activities. There was some opposition to those suggestions by members of the group concerned about the human impacts on wildlife and water quality. At this time, the only recreation feature integrated into the project design is a small boardwalk through the wetland that will provide an immersive experience into the restored wetland. However, additional recreational features could be considered as a part of future projects to enhance the trail user experience.

Safety and other concerns

Multiple participants that having lighting would make using the trails feel safer later in the day and near sunset. At this time, no lighting is planned, however down-ward facing motion detection lights along a few locations on the trail within the vicinity of the project site might be a way to enhance trail user safety while not overly impacting wildlife use of the wetland.

Generally participants expressed that they would feel safer on the trails with a greater level of visibility. Participants said they'd feel safer with widened trails, with low branches of trees pruned for visibility, and with the removal of tall plants such as Poison Hemlock.

Integrating Hope Park into the Restoration Project

Hope Park is the City's park located at the trailhead nearest to the upper Struve Slough restoration project site. Participants were asked to provide feedback into natural enhancements to the park and ways to better integrate the park into the trails network. Participants were in favor adding a natural playground to Hope Park built with all natural materials as opposed to plastics. The topic of adding educational materials was also very popular. The ideas included adding material related to trash education, a bird call machine, and a children's garden for children to learn about native plants. Participants commented that adding more trees to the park would be beneficial for shade but some wanted it only at the edges of the grass space in order to keep it open for sports and games. A native habitat demonstration garden was felt to be a nice way to tie in the park to the wetland and trails system as was habitat restoration on the slopes below the park as a way to tie in the open spaces to the park environment.

Summary of Project Elements that Integrate Community Feedback

Community input provided valuable comments into the project design process. Elements that were included within the project's habitat restoration plan include, use of taller trees for raptor perching and to provide a buffer between the project site and Pennsylvania Avenue, installation of a short pedestrian boardwalk to improve public access and education within the restored wetland, integration of habitat restoration work adjacent to Hope Park, and habitat management to enhance line of site and reduce visual barriers through the removal of invasive plants. Other public comments, such as the desire to see greater public engagement during the restoration process are planned to performed during project implementation.

Habitat Enhancement Goals, Objectives and Methods

Goals and objectives were developed for the project in order to enhance and restore wildlife habitat, improve water quality, enhance public access and education, and to provide a demonstration of urban greening, habitat restoration and stormwater treatment that is replicable throughout the City and region. All native plantings will use plant material grown from parent stock grown or collected within the Watsonville Slough System watershed. A native plant list for outplanting is located within Appendix A. of this document.

Goal 1 Restore and Enhance Wildlife Habitat

Objective 1.1 Improve seasonal wetland habitat through the creation of 0.45 acres of restored wetland depressions

Due to the nature of previous channelization of Struve Slough within the project area, the hydrology has been greatly modified to allow for agricultural use of the wetland area, prior to the 1960's when the area was annexed into the City and urban development was built around Struve Slough. In order to improve wetland characteristics, 3 wetland depressions have been designed that will enhance topographic complexity within the wetlands and increase diversity of wetland habitat and plant communities. Creation of wetland depressional areas will enhance and diversify wetland plant communities by increasing topographic complexity and provide opportunities for the development of improved habitat features such as mud flats and emergent marsh habitat throughout the season. No re-

vegetation or planting is necessary within the graded wetland depressions, however the edges will be seeded with native plant species and covered with a weed free straw mulch to prevent erosion.

Objective 1.2 Remove approximately 1.22 acres of Himalayan blackberry and restore native wet meadow habitat

Seasonally flooded wet meadow habitat is dominated by monotypical stands of Himalayan blackberry. Himalayan blackberry should be removed through seasonally timed mowing, initiated in the fall to avoid the nesting season. Following re-growth, re-sprouting canes will be treated with an herbicide approved for use under these conditions by a licensed applicator. During wetland grading activities, the entire area where blackberry is growing will scraped with a tractor or other grading equipment to a depth of a maximum 1-2 inches in order to reduce the re-growth of blackberry. Following 1 -2 seasons of treatment, areas outside of the inundation zones will be tilled to prepare them for planting. A weed free biodegradable mulch layed down over the soil surface and native plants will be planted within the wood chip mulch. Areas within the inundation zone may either be planted in mid summer in wood chip mulch so as to establish prior to inundation using wood chip mulch or planted during winter months without mulch, as wood chip mulch is likely to be picked up by moving water and displaced. In some areas, natural recruitment of native plants is expected to occur, reducing the need to install native container plants within areas where winter time inundation is expected. Additional treatment methods of control and removal of Himalayan blackberry that may be effective and may be utilized include sheet mulching with a biodegradable material, such as burlap and cardboard, or till of the area followed by hand removal of blackberry burls.

Areas where soil will be placed following excavation of wetland depressions, will be used to establish native wetland meadow habitat. These areas will be covered with a biodegradable, weed-free, wood chip mulch and then planted into with native wet meadow species that are rhizamatous and will spread throughout the areas in which soil will be placed.

Objective 1.3 Remove 0.75 acres of ruderal herbaceous vegetation and restore native wetland meadow habitat

Ruderal herbaceous vegetation includes areas outside of the Himalayan blackberry thickets, where invasive plants such as poison hemlock, and wild radish. Following this, areas will be covered by biodegradable weed-free wood chip mulch prior to the onset of rains. Once rains have saturated the soil to the depth of 4-8”, native wet meadow plants will be planted throughout these areas in order to establish native wet meadow habitat.

Objective 1.4 Remove 0.41 acres of ruderal herbaceous vegetation and restore native oak woodland habitat

Approximately 0.41 acres has been identified for the restoration of native oak woodland habitat. Vegetation growing in these locations is dominated by invasive plants such as poison hemlock, wild radish, and iceplant. Given the Iceplant will be removed by hand and hauled off site. All other invasive plant species will be moved in the late summer or fall, following seed set. Following this, areas will be covered by biodegradable weed-free wood chip mulch prior to the onset of rains. Once rains have saturated the soil to the depth of 4-8”, native oak woodland plants will be planted throughout these

areas in order to establish native oak woodland habitat areas. In order to not create locations where people can hide or camp, oak trees will be planted to closer than 30' on center.

Objective 1.5 Enhance 1.14 acres of willow riparian forest through invasive plant removal

Willow riparian forest habitat has an understory of Himalayan blackberry, English ivy, Privot and other species. Himalayan blackberry and English ivy should be removed using a combination of hand removal, herbicide application as described in objective 1.2 above, or sheet mulching. Privot will be removed through cutting of the trees with a hand saw or chain saw and then using a plastic covering of the truck to suppress re-sprout of the invasive trees. No re-vegetation is expected to be needed within the willow riparian forest areas.

Objective 1.6 Enhance seasonal wetland through the placement of logs for wildlife use

Western pond turtles may occur utilize the habitat areas following restoration. Large logs may be utilized to enhance basking habitat for this species within the seasonal depressions following grading work if suitable material is identified, or during the maintenance or adaptive management phase of the project.

Goal 2 Improve Water Quality

Objective 2.1 Construct 2 sediment catchment basins at culvert outfalls within the project area.

Sediment catchment basins have been designed to reduce sediment inputs into Struve Slough from upstream urban run-off within the watershed drainage of the project. Periodic removal of accumulated sediment in accordance with the basin operations and maintenance plans will reduce sediment and nutrient delivery into Struve Slough, thereby improving water quality in adjacent and downstream wetlands.

Objective 3 Enhance Public Access

Objective 3.1 Construct an approximately 650 linear foot board walk trail

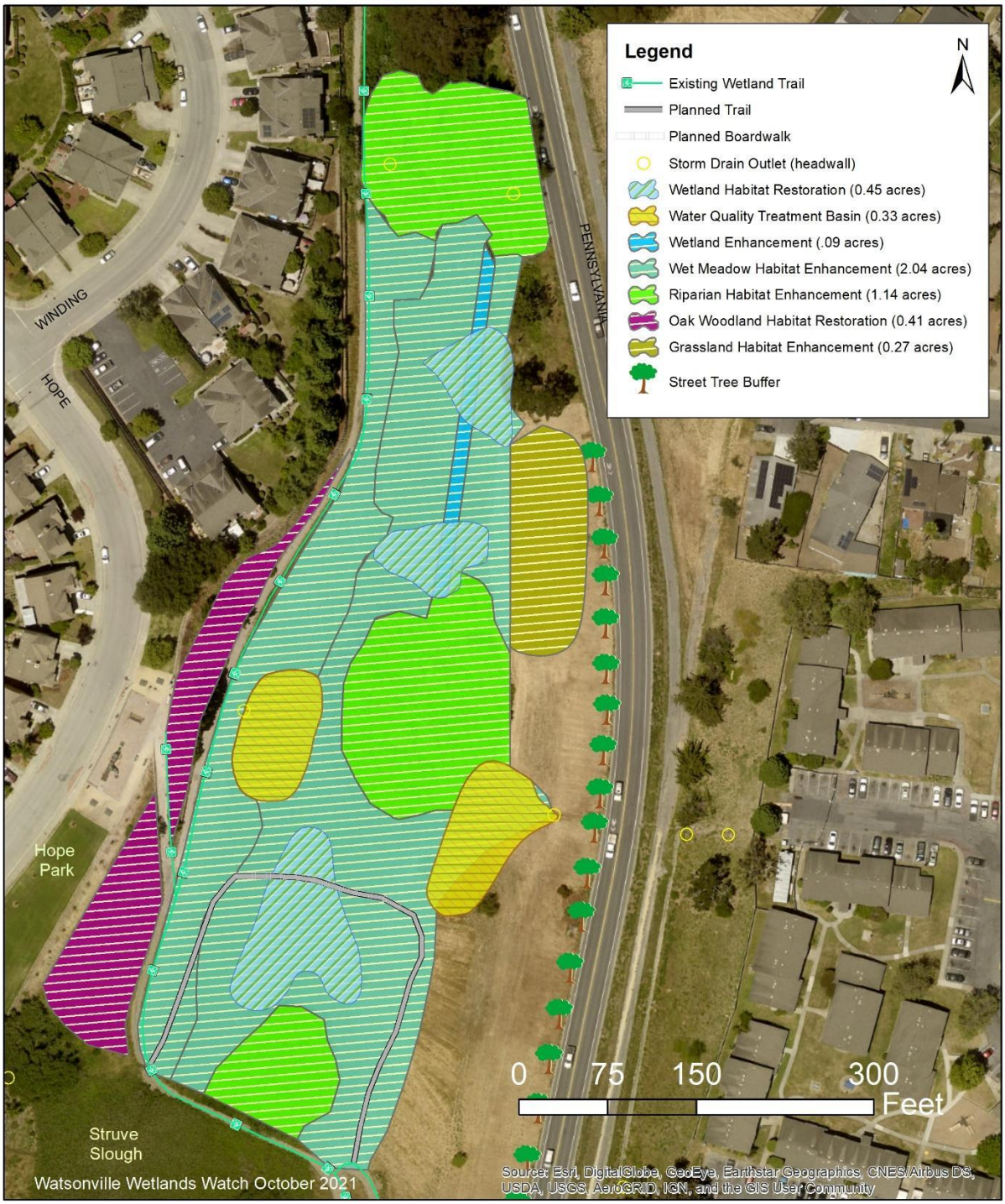
In order to enhance the trail user experience, a 650 linear foot board walk trail will be constructed at the souther most portion of the project area. This trail is designed to allow trail users to walk through and near the enhanced wetland community while elevated above the habitat enhancement area in order to limit impacts to the vegetation. The purpose of the trail is to expand opportunities for local residents to learn about wetland restoration, habitat enhancement, cultural uses of the wetlands, local wildlife, and stewardship actions that they can take to help local wetlands.

Objective 3.2 Install interpretive signage

Interpretive signage will be placed throughout the project area to highlight the educational themes of the project. The design for interpretive signage will incorporate traditional uses of the wetlands, habitat stewardship information, and information on wetland ecology and local wildlife in English, Spanish, and other language as appropriate.

Figure 4. Habitat Restoration and Enhancement Locations

Middle Struve Slough Water Quality and Habitat Improvement Project Habitat Enhancement Features



Site Maintenance and Stewardship

Maintenance During the Establishment Period

Maintenance activities after seeding or planting are required to ensure the successful establishment of plant material. Maintenance during the establishment period is expected to last 2-3 years following planting of native plants and will be extended if the performance measures are not met. Maintenance practices will emphasize hand removal of non-native and invasive species by project staff and volunteers, but will also include mowing, flame torch weeding, targeted herbicide treatments and string trimming/weed whacking.

Irrigation: Supplemental irrigation to native plants will be utilized as determined to be needed. Given the use of wood chip mulch and planting during the rainy season, it is expected that native plants will need irrigation on the day of planting and then once per month following planting. On a year of average to above average rainfall, little supplemental irrigation is expected to be needed. An irrigation system is not planned to be installed, outside of hose connections for hand-watering. If determined to be necessary, any installed irrigation, will be removed prior to the project's completion date.

Hand-removal: Due to the extensive use of biodegradable wood chip mulch, weed pressure is expected to be fairly minimal. Non-native and invasive weeds growing within the wood chip mulch will be removed by hand during the spring months by project staff or community volunteers. Non-native plants removed through hand removal can be piled on site to decompose.

Flame-torch Weeding: Flame torch weeding can eliminate dicot species (forbs) while preserving monocot species (grasses) due to the relative position and growth of meristem tissue. A flame torch weeder or hand torch may be used after early rains for control of broadleaf weeds, such as bristly ox-tongue (*Helmenothica echoides*) and bull thistle (*Circium vulgare*) growing within the wood chip mulch areas or other restoration and enhancement areas.

Herbicide Application: Use of a broadleaf herbicide as a maintenance practice may be used within the areas in which Himalayan blackberry is growing. Herbicides may be used for up to two years following planting, with exceptions determined by the adaptive management process described below in this section.

All herbicides would be applied in strict accordance with the label. Herbicides used at the site would typically include selective post-emergent herbicides that control broadleaf weeds at a variety of plant growth stages and are approved for use near or over water bodies (though herbicide applications would not occur over water at any time during the project). Broadleaf herbicides are used to control woody and herbaceous broadleaf plants but are ineffective on grasses. For this project, herbicides will only be used on re-sprouting Himalayan blackberry if determined to be needed.

It is anticipated that 2-3 treatments per year for the first two years would be sufficient to accomplish the project goals. However additional applications may be used, though no greater than four applications will be made per year. The application would typically be made with a backpack sprayer, however may be applied by a tractor mounted boom sprayer if determined to be most efficient.

Mowing: As most of the plant species planned for planting are perennial, mowing will promote root development over vegetative growth, favoring perennial plants not reliant on annual seed set and reducing mowing needs in subsequent years. Some non-native plants are considered compatible with the goals of the re-vegetation effort, including non-native annual grasses and non-invasive, non-native

forb species. Weed whacking may be used in lieu of mowing when treatment areas are small in size or inaccessible by mowing equipment, and would typically be limited to two treatments per year. Work would be conducted outside of the nesting season or in areas determined to be clear of nesting birds from a nesting survey on site, to prevent impacts to wildlife.

Replanting: If determined to be beneficial for the habitat establishment or if determined to be necessary to meet project performance standards, supplemental native plants may be planted within the identified planting areas. Native plants will be grown from watershed specific parent material from the Watsonville Slough System and will be those suitable to meet the habitat establishment type goal.

Long-term Maintenance and Stewardship

The City is responsible for long-term maintenance and site stewardship. The City contracts with Watsonville Wetlands Watch to support management of the wetland trail system and habitat areas within the trails network and to engage community volunteers in these stewardship efforts. This project area will be incorporated into this maintenance and stewardship area.

The over-arching goal for management of the project area is to restore a mosaic of functional and self-maintaining wetlands and uplands and provide these enhancements in a self-sustaining (low maintenance) fashion. The project was designed for minimal ongoing management, during the maintenance and adaptive management phase, to both contain future maintenance costs and support wildlife.

Beyond the establishment period, vegetation maintenance and management of the site will focus on the long-term viability of native habitats with actions that support the growth habit of desirable vegetation and control priority invasive plant species. Mowing native plants with a tolerance for this will aid in the long-term viability of native plant populations, as this can reduce non-native and invasive plant cover as well as invigorate the growth of the native plants.

Maintenance of water quality treatment basins is important to their long-term function and to reduce impacts to the wetland and habitat areas. This will be performed in accordance with the operations and maintenance specifications for those facilities.

Success Criteria and Monitoring

Monitoring Methodology

The following monitoring protocol will evaluate project performance in achieving project objectives, consistent with the Wetland and Riparian Area Monitoring Plan (WRAMP) framework.

Quantitative and qualitative monitoring techniques will be used to evaluate progress towards project goals and inform adaptive management.

Quantitative monitoring will include:

- -plant species and ground surface cover measurements
- -California Rapid Assessment Method (CRAM) measurements of overall habitat condition

Qualitative vegetation monitoring will include:

-species richness and presence/absence of planted native plant species;
-approximation of species survival;
-photo monitoring

Additional monitoring techniques may include hydrologic monitoring of water stage, water quality monitoring associated, bird population surveys with volunteers, and assessments of trash or other human disturbances in the project area.

The Level 2 rapid assessment (CRAM) and the quantitative vegetation surveys (Level 3) will take place once before the project commences to establish baseline conditions, immediately after construction to re-establish initial baseline conditions (just CRAM), and then again in year 3 to document if the habitat is meeting performance metrics and to inform adaptive management actions.

Vegetation monitoring will be stratified by habitat type, including wetland, wet meadow, riparian, oak woodland, and grassland. Fixed transects will be established within each habitat type and surveyed using the point-intercept method, as well as a 1 meter belt transect to document overall species richness. Vegetative sampling methodologies for this project were developed with methodologies supported by the United States Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, and the Nature Conservancy (Elizinga, Salzer, Willoughby, Gibbs, 2001) and also reflect effective practices identified by Watsonville Wetlands Watch over many years of vegetative monitoring in the Watsonville Slough System.

Several invasive species have been identified on the site, and efforts will be made to reduce or eliminate them. However, we expect that many will persist in spite of these efforts, particularly the more common invasive species that are found throughout the surrounding area. Thus, our goals for invasive species management emphasize achievable goals that align with habitat enhancement goals for the project. A list of the common invasive species is found below in Table 3. The performance criteria for invasive species presence is such that invasive plants occupy no greater than 25% for all of the habitat types. Project implementation methods are designed to exceed this threshold.

Table 3. Invasive species list

Common Name	**Scientific Name**
Mustard	*Brassica nigra*
Iceplant	*Carpobrotus edulis*
Poison Hemlock	*Conium maculatum*
Fennel	*Foeniculum vulgare*
English Ivy	*Hedera helix*
Privet	*Ligustrum lucidum*
Cheeseweed	*Malva parviflora*
Harding Grass	*Phalaris aquatica*
Radish	*Raphanus sativus*
Himalayan Blackberry	*Rubus armeniacus*

Performance Criteria

The project will increase native cover through outplantings, weed management, and habitat creation. In addition to native plant installation, natural recruitment is expected for wetland-adapted native plants to the wet areas that will be created or enhanced. Native cover targets are adjusted for the expectations of each habitat type (Table 2).

Table 4. Performance Metrics for Vegetation and Ground Surface

Habitat Type	**Native Cover**	**Species Richness**	**Invasive Plants**	**Bare Ground**
	Performance Metric	**Performance Metric**	**Performance Metric**	**Performance Metric**
Wetland	50%	1 or greater	<25%	N/A
Wet Meadow	50%	7	<25%	<25%
Riparian	50%	7	<25%	<25%
Oak Woodland	50%	7	<25%	<25%
Grassland	15%	3 or greater	<25%	<25%

CRAM surveys will document the overall habitat condition. The method assesses the wetland based on four categories called Attributes, which are scored independently and combined into an overall Index score. The Buffer and Landscape Attribute measures the abundance of surrounding wetlands and the size and condition of the buffer. This project will not affect the amount of wetlands in the nearby landscape or the size of the buffer, but it will improve the condition of the buffer. Therefore, a modest improvement in this Attribute is expected (Table 5). The Hydrology Attribute is concerned with hydromodification in the upstream watershed and the movements of water within the wetland. This project will not affect these aspects of the wetland, so no change is expected. The Physical Structure of the wetland will be improved through creation of new ponds and placement of habitat features such as basking logs for turtles, so an increase in condition is expected. The project will address invasive plants in the wetland and improve both the diversity and cover of native plants, so the Biotic Structure should substantially improve. The restoration actions will combine into an overall functional lift for the wetland and that will be documented by a significant increase in the overall CRAM Index score.

Table 5. Performance Metrics for CRAM surveys

CRAM Category	**Performance Metric**
Index Score	Increase by more than 10 points
Buffer and Landscape	Increase by more than 5 points
Hydrology	N/A
Physical Structure	Increase by more than 10 points
Biotic Structure	Increase by more than 11 points

Adaptive Management

Adaptive management is a critical component of the design and implementation to ensure that the project objectives are met. Native vegetative cover and native species richness is important to support high quality habitat that sustains the desired conditions within each restored vegetative community over time. Established native cover will reduce invasive plant species growth and persistence and support wildlife habitat.

If the performance metric is not met two years after restoration, additional maintenance and adaptive measures will be utilized. These might include increased invasive plant control measures, such as hand weeding, flame torch weeding, or herbicide application, scraping of the soil surface to promote growth of new plant species or additional installation of native seed or container stock. If invasive plant removal or other vegetation management methods are utilized, monitoring will be conducted each year after the performance metric is complete until the performance metric is met. If maintenance actions include re-vegetation, additional performance monitoring will follow for at least 2 years after installation of native seed or container stock for the habitat area in which this practice was utilized. Once the performance metric is achieved monitoring may be terminated and no further actions may be taken. Additional vegetation management may be conducted, at the discretion of the owner, to enhance the habitat above and beyond the performance metrics.

Reporting

Annual reporting will be completed by December 31 of each year or as required by project permits. Annual reporting is anticipated to include photo monitoring, a description and discussion of work performed, qualitative monitoring data, the results of quantitative monitoring, and a description of any adaptive management actions performed.

Appendix A.

Engineering and Construction Designs, 100% Administrative Draft

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Appendix B.

Table 1. Native Plant Species List for Planting

Species	
Acer negundo	Box elder
Achillea millefolium	Yarrow
Apocynum cannabinum	Dogbane
Arctostaphylos hookerii	Monterey carpet manzanita
Arctostaphylos pajaroensis	Pajaro manzanita
Artemisia californica	California sagebrush
Artemisia douglasiana	Mugwort
Asclepias fasicularis	Narrow-leafed milkweed
Baccharis glutinosa	Marsh baccharis
Calochortus sp.	Wine-cup lily
Carex barbarae	Santa Barabara sedge
Carex densa	Dense sedge
Carex obnupta	Slough sedge
Carex pellita	Wooley sedge
Carex tumulicola	Hill-dweller sedge
Chlorogalum pomeridianum	Soaproot
Clarkia purpurea	Wine-cup clarkia
Clinepodium douglasii	Yerba buena
Cornus sericea	Dogwood
Corylus cornuta	California hazelnut
Danthonia californica	California oatgrass
Drymocallis anserina	Cinquifoil
Drymocallis glandulosa	Sticky cinquifoil
Eleocharis macrostachya	Spikerush
Elymus glaucus	Blue wild rye
Elymus triticoides	Creeping wild rye
Epilobium canum	California fuscia
Epilobium densiflorum	Dense flowered boidsvaldia
Equisetum arvense	Horsetail fern
Eriogonum nudum	Naked buckwheat
Eschscholzia californica	California poppy
Euthamia occidentalis	Marsh goldenrod
Festuca rubra	Red fescue
Frangula californica	Coffeeberry
Gaultheria shalon	Salal
Grindelia stricta	Marsh gumplant

Helenium puberulum	Sneezeweed
Hercalanuem maximum	Cow parsnip
Heteromeles arbutifolia	Toyon
Holodiscus discolor	Oceanspray
Hordeum brachyantherum	Meadow barley
Horkelia californica	Wavy-leafed horkelia
Iris douglasiana	Douglaus iris
Juncus balticus	Baltic rush
Juncus effusus	Bog rush
Juncus mexicanus	Mexican rush
Juncus occidentalis	Western rush
Juncus patens	Spreading rush
Juncus phaeocephalus	Brown-headed rush
Juncus xiphioides	Iris-leaf rush
Lonicera hispidula	Honeysuckle
Lonicera involucrata	Twinberry
Lotus scoparius	Deerweed
Lupinus arboreus	Yellow bush lupine
Myrica californica	Wax myrtle
Oenanthe saramatosa	Pacific Oenanthe
Oenothera hookeri	Evening primrose
Prunella vulgaris	Self-heal
Quercus agrifolia	Coast live oak
Ranunculus californica	California buttercup
Ribes divaricatum	Spreading gooseberry
Ribes sanguineum	Fusica flowered gooseberry
Rosa californica	California wild rose
Rubus ursinus	California blackberry
Rumex salicifolius	Golden dock
Saix lasiolepis	Arroyo willow
Salix laevigata	Red willow
Salvia mellifera	Black sage
Salvia spathacea	Hummingbird sage
Sambucus caerulea	Elderberry
Sanicula crassicaulis	Pacific black snakeroot
Scrophularia californica	California figwort
Sisyrinchium bellum	Blue-eyed grass
Stachys ajugoides	Hedgenettle
Stipa lepida	Slender leafed needlegrass
Stipa pulchra	Purple needlegrass
Symphocarpos albus	Snowberry
Symphyotrichum chilense	California aster
Vaccinium ovatum	Huckleberry

Verbena lasiostachys	Western vervian
Veronica americana	American brooklime

APPENDIX C

DELINEATION OF AQUATIC RESOURCES SUBJECT TO STATE AND FEDERAL JURISDICTION FOR THE MIDDLE STRUVE SLOUGH STORMWATER AND WETLAND ENHANCEMENT PROJECT AREA WATSONVILLE, SANTA CRUZ COUNTY, CALIFORNIA

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April 2021

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1 INTRODUCTION

The Middle Struve Slough Stormwater and Wetland Enhancement Project Area (Project Area) covers approximately 5.9 acres of property encompassing and immediately adjacent to Middle Struve Slough in the City of Watsonville, Santa Cruz County, California. The Project Area is bounded by Pennsylvania Drive to the north and east, Hope Drive to the west, and an existing paved footpath to the south (**Figure 1**).

On May 1 and June 8 and 12, 2020, staff senior ecologist Justin Davilla of Ecosystems West Consulting Group conducted a routine wetland delineation of the Project Area to determine the extent of potential aquatic resources subject to jurisdiction under Sections 401 and 404 of the Clean Water Act, and the Porter Cologne Water Quality Act. This report presents the results of this delineation.

1.1 Project Description

The Middle Struve Slough Stormwater and Wetland Enhancement Project will implement a series of measures to improve water quality associated with urban run-off and restore and enhance natural habitat within the Struve Slough watershed (Figure 2). Project work will entail construction of several best management practices to treat stormwater run-off prior to it entering Struve Slough as well as implementation of a wetland, riparian, and upland habitat enhancement and restoration plan. Struve Slough is one of the six fingers of the Watsonville Slough System complex, located at the southern end of Santa Cruz County within the City of Watsonville and surrounding residential, agricultural, and open space areas.

Specific design elements for stormwater and wetland enhancement include the following:

- Creation of two catchment basins on the upper, non-wetland slopes on the east and west embankments of Middle Struve Slough. The eastern catchment basin will replace an existing ephemeral channel used to direct water from a storm drain west of Pennsylvania Drive into the slough. The western basin will be fed by a new storm-drain system and outfall extending from Hope Drive to the west.
- Creation of three seasonal to semi-permanent wetland depressions within Middle Struve Slough to increase hydroperiod and enhance habitat functions and values in the slough. These features are situated primarily in areas supporting invasive Himalayan blackberry and will be planted with a suite of herbaceous native wetland vegetation.
- Removal of Himalayan blackberry and other invasive weeds and replacement with native wetland and riparian vegetation.
- Removal of invasive poison hemlock and Harding grass on the upland slopes and replace with non-native grassland vegetation.
- Placement of bilingual interpretative signage and educational materials describing the slough ecosystem, pollution prevention, stormwater management, and healthy water resources.

1.2 Driving Directions to the Middle Struve Project Area

The proposed Project is located in Watsonville, California east of Highway 1, and extending from Pennsylvania Drive in the north to a pedestrian footpath bisecting the slough at the same latitude as Firethorne Way to the south. The Project Area is primarily accessed from the paved trail system extending from Hope Drive Park to the west. Due to lack of available parking and sidewalks, access from Pennsylvania Drive to the north and east is not recommended.

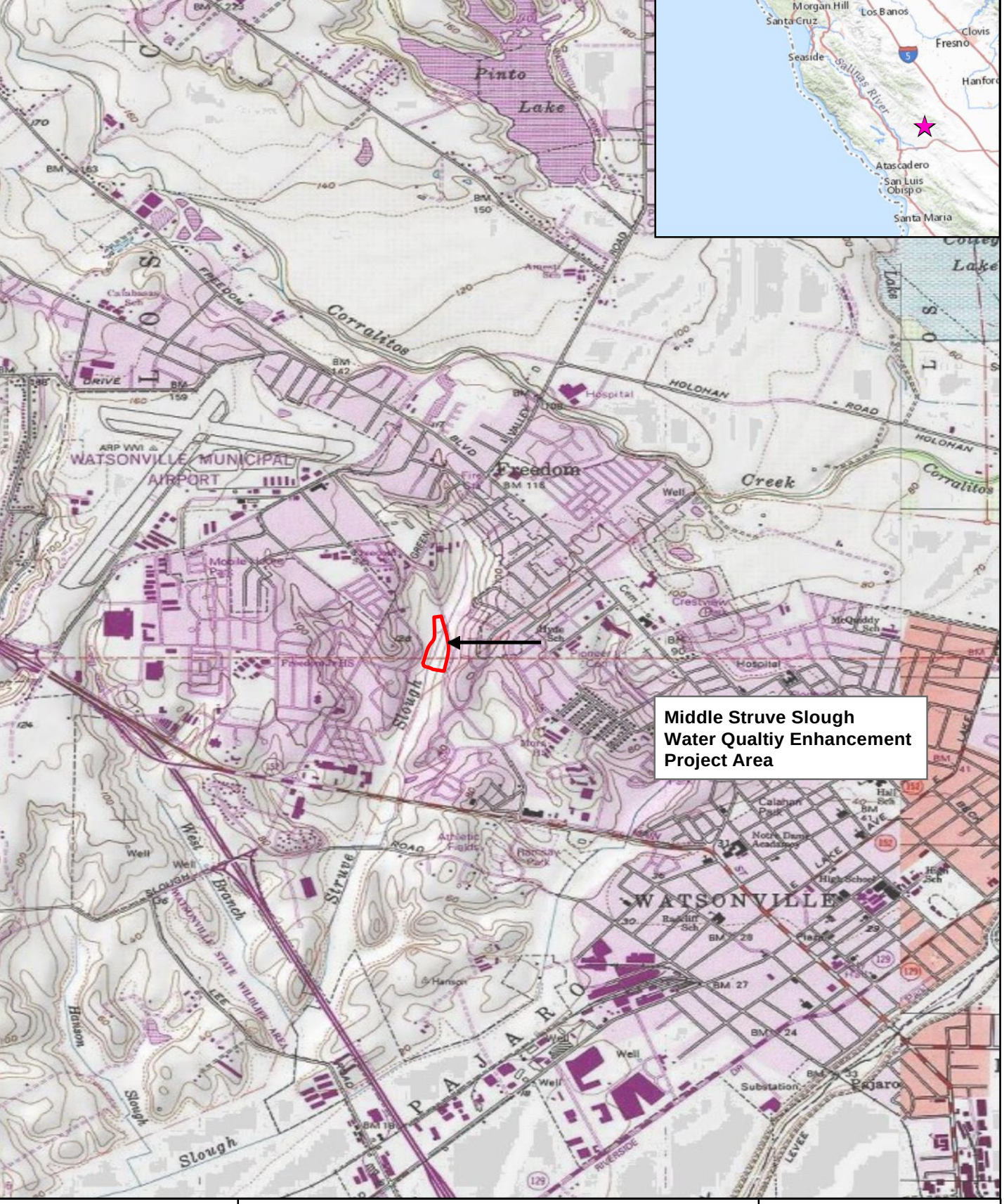


Figure 1.

Middle Struve Slough Water Quality Enhancement Project Area. Watsonville,Santa Cruz County, California

0 0.25 0.5 1 Miles

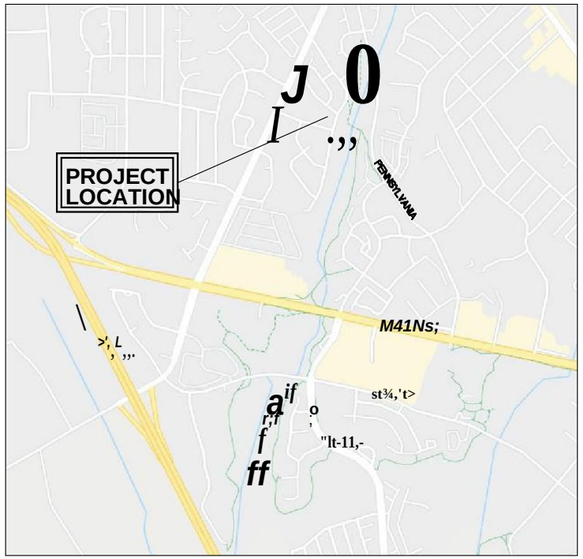
1 inch = 0.5 mile

N
W E
S

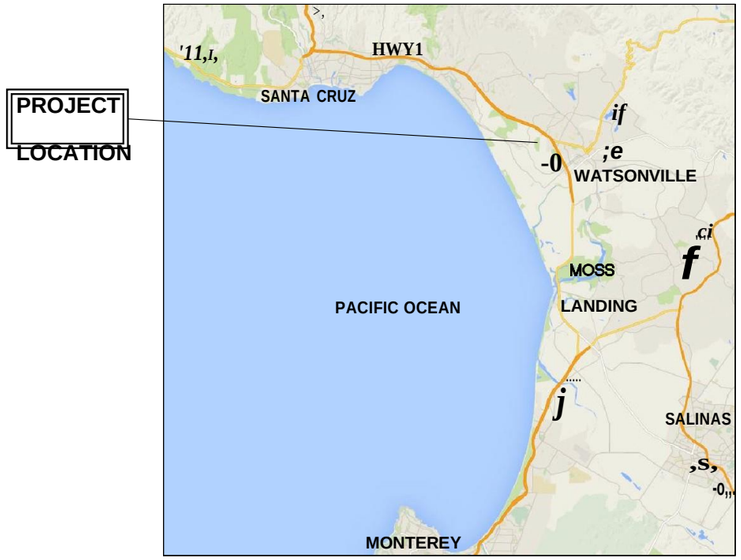
ECOSYSTEMS WEST CONSULTING GROUP

STRUVE SLOUGH WATER QUALITY ENHANCEMENTS PROJECT

SITES 2, 3, AND 4
30% DESIGN SUBMITTAL



VICINITY MAP
N.T.S. (GOOGLE)



REGIONAL MAP
N.T.S. (GOOGLE)

GENERAL NOTES

1. TOPOGRAPHIC MAPPING WAS PERFORMED BY:
   WATERWAYS CONSULTING, INC.
   509A SWIFT STREIT
   SANTA CRUZ, CA 95060
   SURVEY DATE; JANUARY 24, 2020.
2. ELEVATION DATUM: GPS TIES TO NAVD88 USING THE LE/CA GEOSYSTEMS SMARTNET GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) NETWORK.
3. BASIS OF BEARINGS: GPS TIES TO NAD83 CALIFORNIA STATE PLANE, ZONE 3 USING THE LE/CA GEOSYSTEMS SMARTNET GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) NETWORK.
4. AERIAL PHOTO SOURCE:
   MICROSOFT CORP.
5. CONTOUR INTERVAL IS ONE FOOT. ELEVATIONS AND DISTANCES SHOWN ARE IN DECIMAL FEIT
6. THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES ARE NOT SHOWN HEREON.
7. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE 2018 EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").
8. THESE DESIGNS ARE INCOMPLETE WITHOUT THE FINAL STAMPED TECHNICAL SPECIFICATIONS PREPARED BY WATERWAYS CONSULTING, INC. REFER TO TECHNICAL SPECIFICATIONS FOR DETAILS NOT SHOWN HEREON.

*** CALL BEFORE YOU DIG ***
CONTACT UNDERGROUND SERVICE ALERT (USA)
PRIOR TO ANY CONSTRUCTION WORK 1-800-227-2600

ABBREVIATIONS

AVG.	AVERAGE
CC	CONCRETE
CY	CUBIC YARDS
DIA.	DIAMETER
E	EXISTING
EG	EXISTING GROUND
ELEV.	ELEVATION
DI	DRAINAGE INLET
FG	FINISHED GRADE
FT	FEET
/NV	INVERT
MIN	MINIMUM
N	NEW
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
RC	RELATIVE COMPACTION
RSP	ROCK SLOPE PROTECTION
SPK	SPIKE
SQ.FT.	SQUARE FOOT
T	TREE
T.B.D.	TO BE DETERMINED
TYP	TYPICAL
UNK	UNKNOWN
WSE	WATER SURFACE ELEVATION
YR	YEAR

TREE SPECIES

BUC	BUCKEYE
OF	DOUGLAS FIR
0	OAK
T	TREE (SPECIES UNKNOWN)
W	WILLOW

SECTION AND DETAIL CONVENTION

SECTION OR DETAIL IDENTIFICATION (NUMBER OR LETTER) — 5 / C3 — SHEET REFERENCE

PROJECT DESCRIPTION

THESE DRAWINGS PROVIDE 30% LEVEL DESIGN DETAILS FOR THE CREATION OF WETLAND DEPRESSIONS AND STORMWATER CATCHMENT BASINS WITHIN AND ADJACENT TO A PORTION OF STRUVE SLOUGH IN WATSONVILLE, CALIFORNIA.

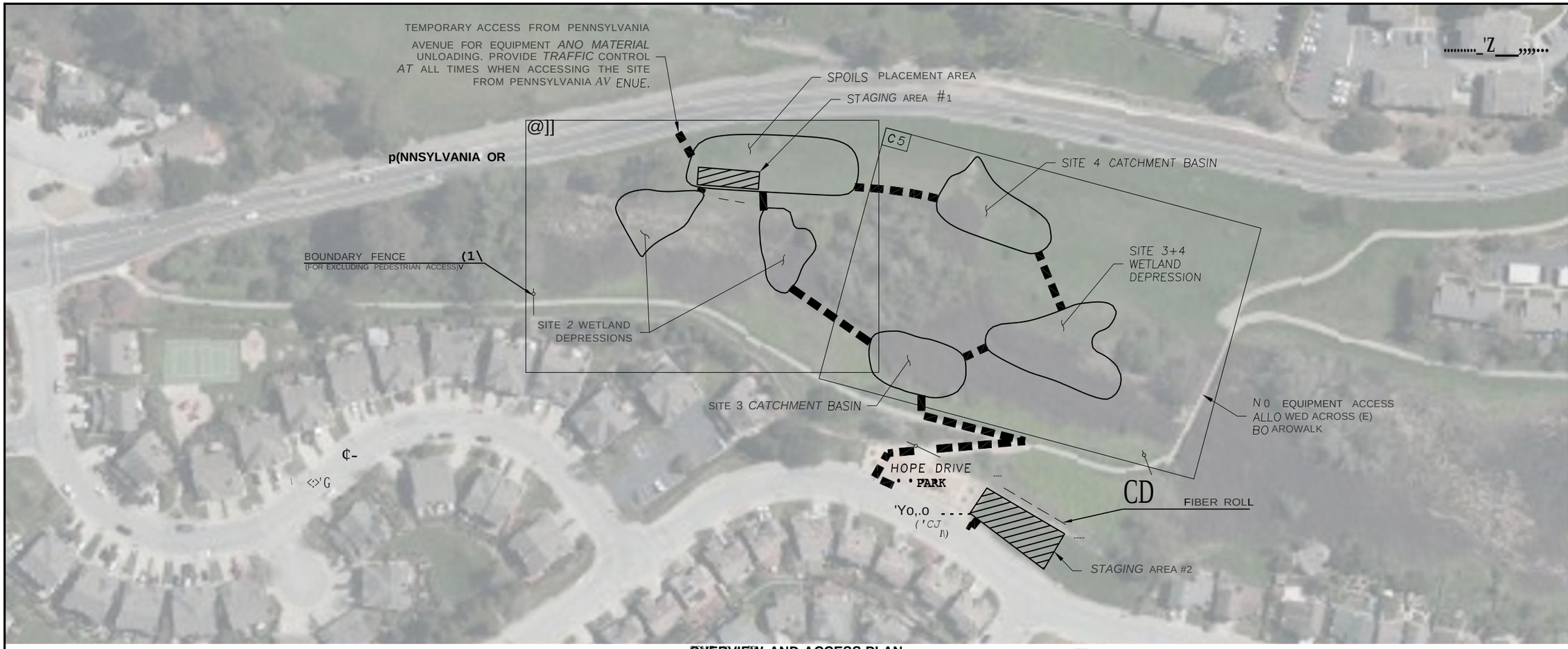
WETLAND DEPRESSIONS WILL BE EXCAVATED TO EXPAND AND ENHANCE EXISTING WETLAND AREAS THAT ARE CURRENTLY DOMINATED WITH NON-NATIVE BLACKBERRY BRAMBLES. STORMWATER CATCHMENT BASINS WILL BE CONSTRUCTED AT THE OUTFALL OF TWO STORMDRAIN NETWORKS TO PROVIDE FILTRATION AND TREATMENT OF SUBURBAN RUNOFF BEFORE IT ENTERS STRUVE SLOUGH.

SHEET INDEX

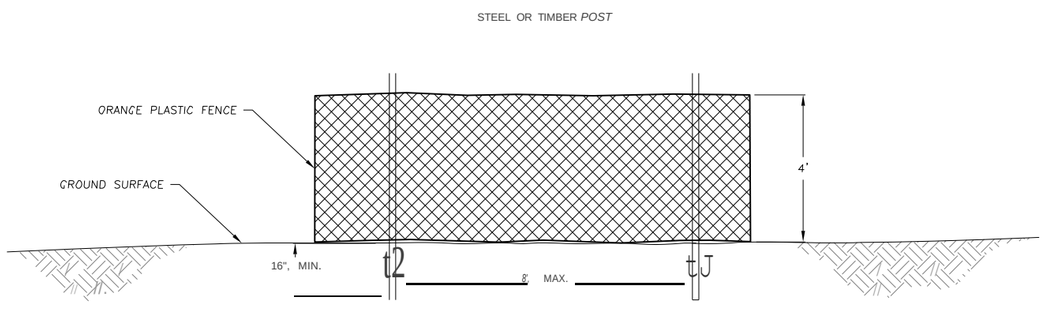
DESIGNED BY: B.M.Z
DRAWN BY: K.P.B.
CHECKED BY: B.M.Z
DATE: 1/29/2020
JOB NO.: 19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

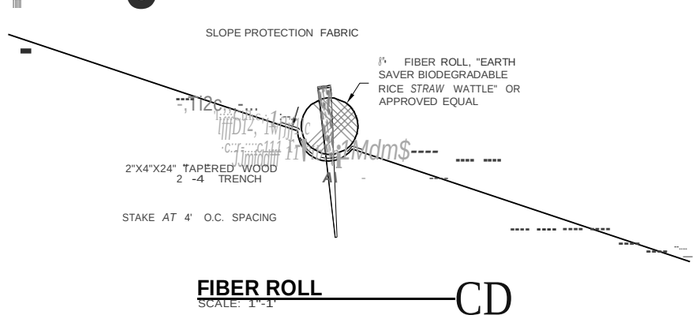
C1



OVERVIEW AND ACCESS PLAN



BOUNDARY FENCE
SCALE: 1"=2'



FIBER ROLL
SCALE: 1"=1'

ACCESS AND STAGING AREA NOTES

1. USE ONLY THE APPROVED ACCESS POINTS, AS SHOWN ON THE DRAWINGS. STOCKPILE MATERIALS WITHIN AN EXISTING FLAT AND PREVIOUSLY DISTURBED AREA.
2. THE ACCESS PLAN SHOWN ON THE DRAWINGS IS SCHEMATIC. SUBMIT A SITE ACCESS PLAN FOR APPROVAL BY THE ENGINEER, PRIOR TO MOBILIZATION.
3. CONTAIN THE DOWNSLOPE PERIMETER OF STAGING OR STOCKPILE AREAS WITH FIBER ROLLS.
4. STORE, MAINTAIN AND REFUEL ALL EQUIPMENT AND MATERIALS IN A DESIGNATED PORTION OF A STAGING AREA.

LEGEND

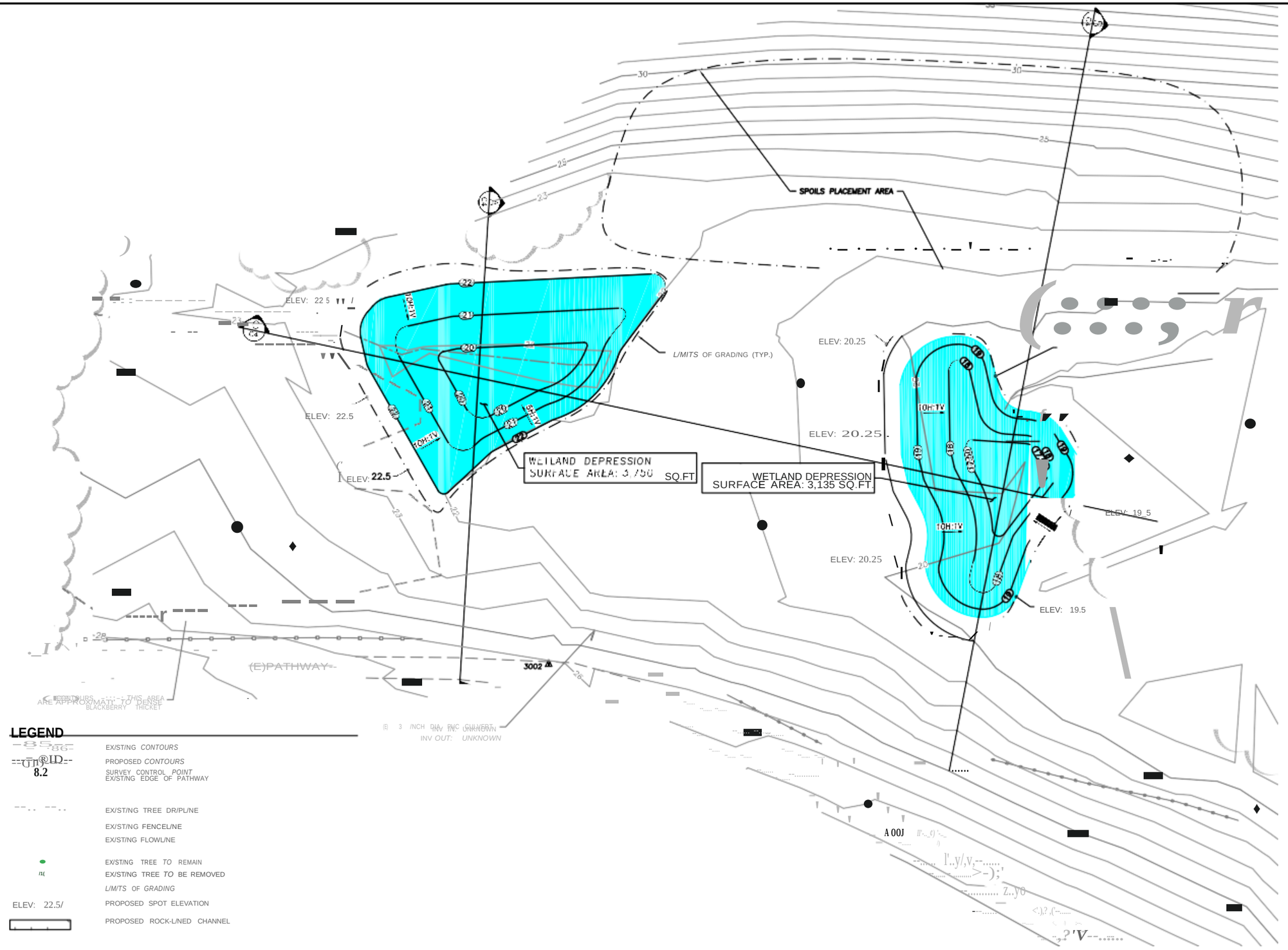
- PROPOSED BOUNDARY FENCE
- STAGING AREA
- TEMPORARY ACCESS ROUTE
- LIMITS OF GRADING
- PROPOSED FIBER ROLL

DESIGNED BY: B.M.Z
DRAWN BY: K.P.B.
CHECKED BY: B.M.Z
DATE: 1/29/2020
JOB NO.: 19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

1"

C2



LEGEND

85 86	EX/ST/NG *CONTOURS*
8.2	PROPOSED *CONTOURS*
	SURVEY CONTROL *POINT*
	EX/ST/NG EDGE OF PATHWAY
	EX/ST/NG TREE DR/PL/NE
	EX/ST/NG FENCEL/NE
	EX/ST/NG FLOWL/NE
	EX/ST/NG TREE *TO* REMAIN
	EX/ST/NG TREE *TO* BE REMOVED
	L/MITS OF GRADING
ELEV: 22.5/	PROPOSED SPOT ELEVATION
	PROPOSED ROCK-L/NED CHANNEL

SITE 2 GRADING AND IMPROVEMENTS PLAN

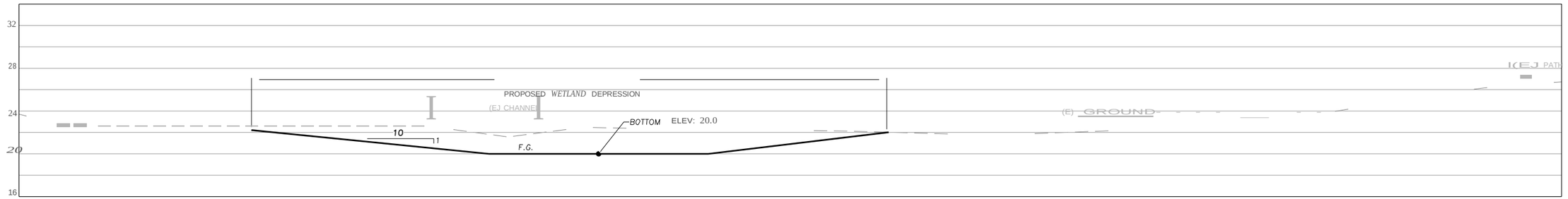
SCALE: 1" = 15'

DESIGNED BY: B.M.Z.
DRAWN BY: K.P.B.
CHECKED BY: B.M.Z.
DATE: 1/29/2020
JOB NO.: 19-005

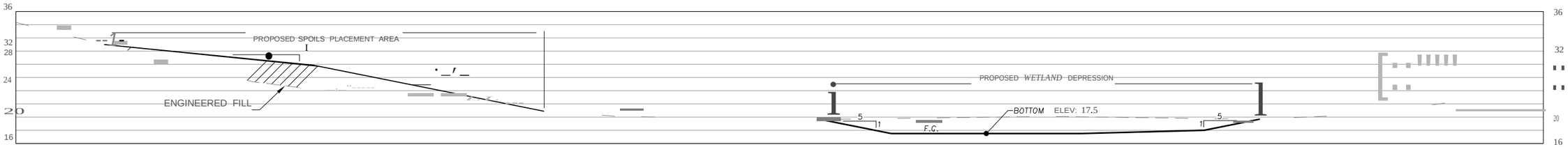
BAR *IS* ONE *INCH* ON ORIGINAL *DRAWING*, ADJUST SCALES FOR REDUCED PLOTS.

0 1"

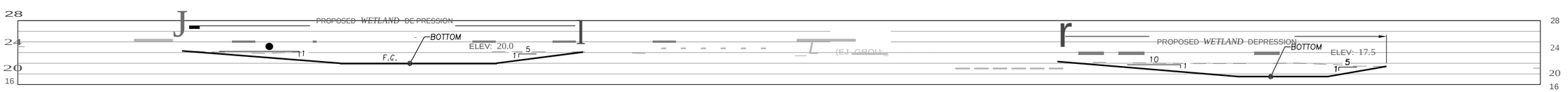
C3



SECTION Ⓒ
SCALE: 1" = 5'



SECTION Ⓡ
SCALE: 1" = 8'

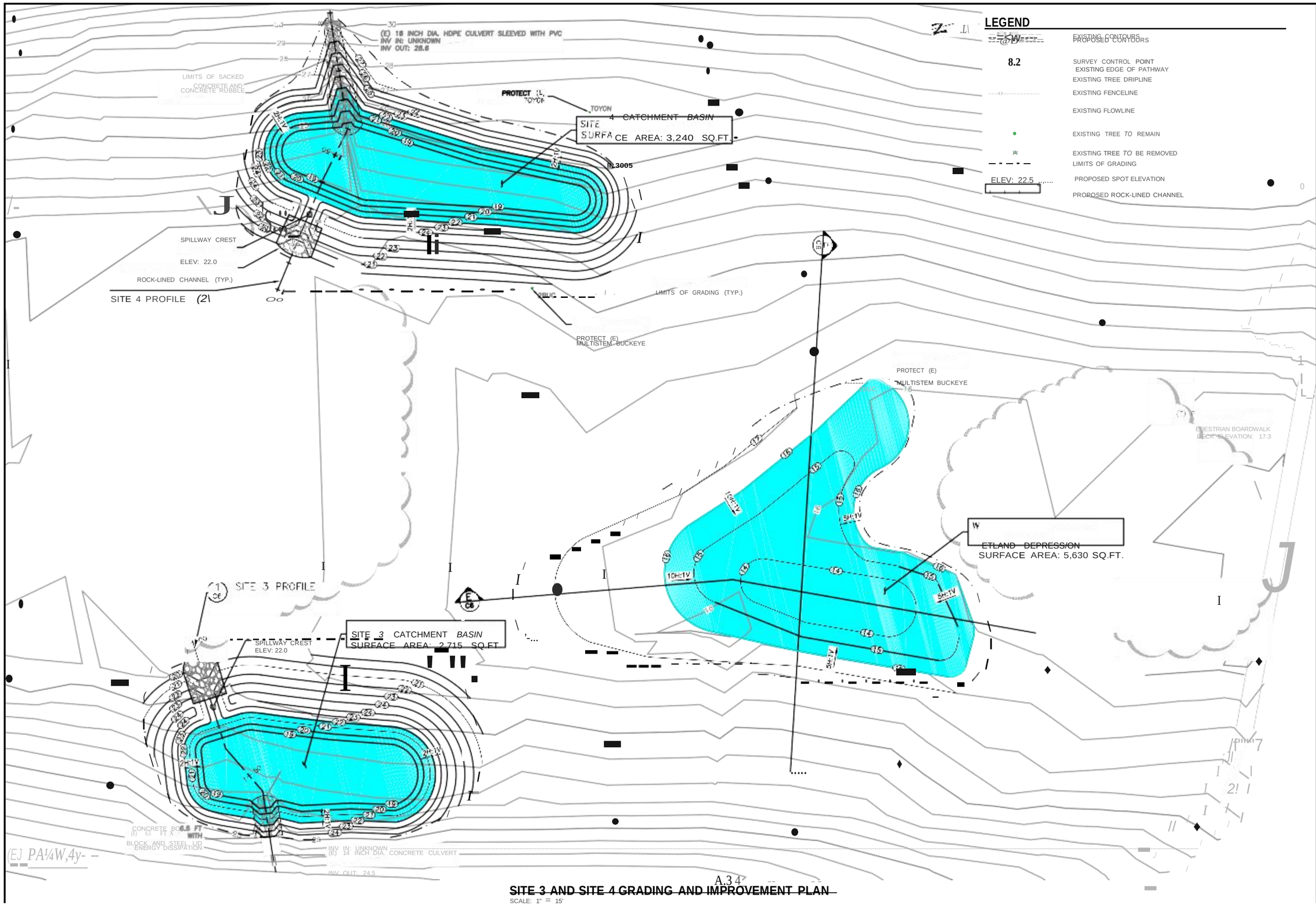


SECTION Ⓡ
SCALE: 1" = 10'

DESIGNED BY: B.M.Z.
DRAWN BY: K.P.B.
CHECKED BY: B.M.Z
DATE: 1/29/2020
JOB NO.: 19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

C4



LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- 8.2 — SURVEY CONTROL POINT
- EXISTING EDGE OF PATHWAY
- EXISTING TREE DRIPLINE
- EXISTING FENCELINE
- EXISTING FLOWLINE
- EXISTING TREE *TO* REMAIN
- EXISTING TREE *TO* BE REMOVED
- LIMITS OF GRADING
- ELEV: 22.5 — PROPOSED SPOT ELEVATION
- PROPOSED ROCK-LINED CHANNEL

SITE 3 AND SITE 4 GRADING AND IMPROVEMENT PLAN

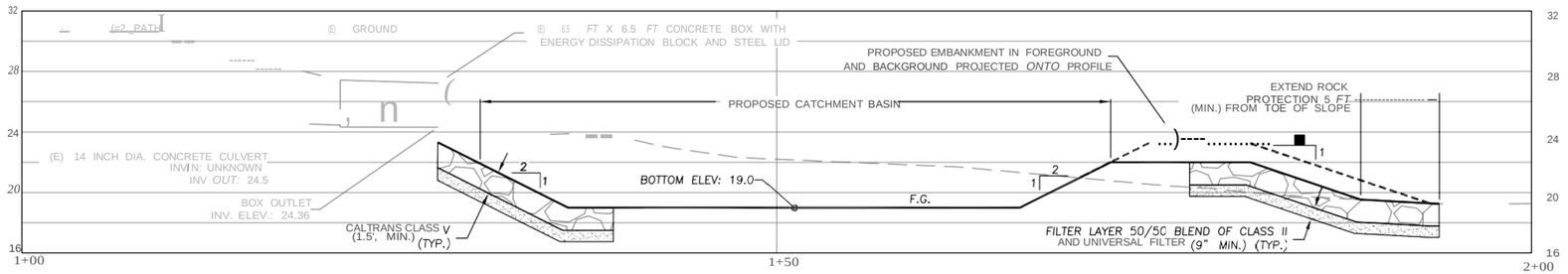
SCALE: 1" = 15'

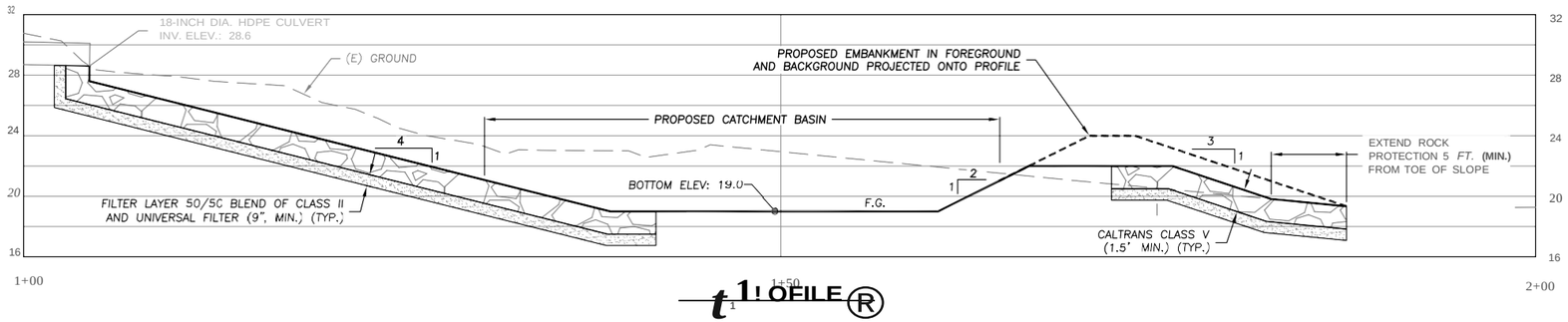
A.3 4

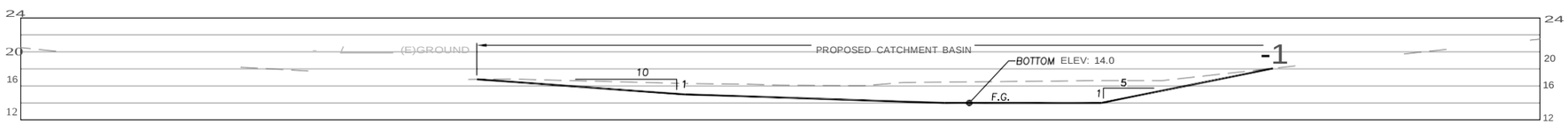
DESIGNED BY: B.M.Z.
DRAWN BY: K.P.B.
CHECKED BY: B.M.Z.
DATE: 1/29/2020
JOB NO.: 19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, *ADJUST* SCALES FOR REDUCED PLOTS.

C5


32
28
24
20
16
1+00
1+50
2+00
(E) GROUND
6.5 FT X 6.5 FT CONCRETE BOX WITH ENERGY DISSIPATION BLOCK AND STEEL LID
PROPOSED EMBANKMENT IN FOREGROUND AND BACKGROUND PROJECTED ONTO PROFILE
PROPOSED CATCHMENT BASIN
EXTEND ROCK PROTECTION 5 FT. (MIN.) FROM TOE OF SLOPE
(E) 14 INCH DIA. CONCRETE CULVERT
INVIN: UNKNOWN
INV OUT: 24.5
BOX OUTLET
INV. ELEV.: 24.36
BOTTOM ELEV: 19.0
F.G.
CALTRANS CLASS V (1.5' MIN.) (TYP.)
FILTER LAYER 50/50 BLEND OF CLASS II AND UNIVERSAL FILTER (9" MIN.) (TYP.)


32
28
24
20
16
1+00
1+50
2+00
18-INCH DIA. HDPE CULVERT
INV. ELEV.: 28.6
(E) GROUND
PROPOSED EMBANKMENT IN FOREGROUND AND BACKGROUND PROJECTED ONTO PROFILE
PROPOSED CATCHMENT BASIN
EXTEND ROCK PROTECTION 5 FT. (MIN.) FROM TOE OF SLOPE
BOTTOM ELEV: 19.0
F.G.
FILTER LAYER 50/50 BLEND OF CLASS II AND UNIVERSAL FILTER (9", MIN.) (TYP.)
CALTRANS CLASS V (1.5' MIN.) (TYP.)


24
20
16
12
(E)GROUND
PROPOSED CATCHMENT BASIN
BOTTOM ELEV: 14.0
F.G.
10
5


20
16
12
PROPOSED CATCHMENT BASIN
(E) GROUND
BOTTOM ELEV: 14.0
10
5

GENERAL NOTES

1. NOTIFY THE ENGINEER AT LEAST *48* HOURS PRIOR TO CONSTRUCTION. THE ENGINEER OR A DESIGNATED REPRESENTATIVE SHALL OBSERVE THE CONSTRUCTION PROCESS, AS NECESSARY TO ENSURE PROPER INSTALLATION PROCEDURES.

2. EXISTING UNDERGROUND UTILITY LOCATIONS:

   A. CALL UNDERGROUND SERVICE ALERT (1-800-642-2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.

   8. PRIOR TO BEGINNING WORK, CONTACT ALL UTILITIES COMPANIES WITH REGARD TO WORKING OVER, UNDER, OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.

   C. EXISTING UTILITY LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.

   D. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION.

   E. PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.

   F. TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.

   G. UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.

   H. UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.

3. IF DISCREPANCIES ARE DISCOVERED BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL LAWS, ORDINANCES, CODES, REQUIREMENTS, AND STANDARDS WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.

5. ALL TESTS, INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN OFFICIAL INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE REQUIRED TESTS AND INSPECTIONS ARE PERFORMED.

6. PROJECT SCHEDULE: PRIOR TO COMMENCEMENT OF WORK, SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL A DETAILED CONSTRUCTION SCHEDULE. DO NOT BEGIN ANY CONSTRUCTION *WORK* UNTIL THE PROJECT SCHEDULE AND *WORK* PLAN IS APPROVED BY THE ENGINEER. ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER SO THAT THE QUALITY OF *WORK* CAN BE CHECKED FOR APPROVAL. PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.

9. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL. NEITHER THE PROFESSIONAL ACTIVITIES OF CONSULTANT NOR THE PRESENCE OF CONSULTANT OR HIS OR HER EMPLOYEES OR SUB-CONSULTANTS AT A CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR AND ITS SUBCONTRACTORS OF THEIR RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE HEALTH OR SAFETY REQUIREMENTS OF ANY REGULATORY AGENCY OR OF STATE LAW.

10. MAINTAIN A CURRENT, COMPLETE, AND ACCURATE RECORD OF ALL AS-BUILT DEVIATIONS FROM THE CONSTRUCTION AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS, FOR THE PURPOSE OF PROVIDING THE ENGINEER OF RECORD WITH A BASIS FOR THE PREPARATION OF RECORD DRAWINGS.

11. MAINTAIN THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. STORE ALL MATERIALS WITHIN APPROVED STAGING AREAS.

12. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL PERMIT CONDITIONS, LAWS, ORDINANCES, CODES, REQUIREMENTS ANO STANDARDS, WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION ANO THE MATERIALS USED IN THE CONSTRUCTION.

13. PROVIDE, AT CONTRACTOR'S SOLE EXPENSE, ALL MATERIALS, LABOR ANO EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS ANO REQUIREMENTS.

14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING ANO LAYOUT, UNLESS OTHERWISE SPECIFIED.

15. FIELD INSPECTIONS ANO OR THE PROVISION OF CONSTRUCTION STAKES DO NOT RELIEVE THE CONTRACTOR OF THEIR SOLE RESPONSIBILITY FOR ESTABLISHING ACCURATE CONSTRUCTED LINES ANO GRADES, AS SPECIFIED.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION ANO PRESERVATION OF ALL SURVEY MONUMENTS OR PROPERTY CORNERS. DISTURBED MONUMENTS SHALL BE RESTORED BACK TO THEIR ORIGINAL LOCATION ANO SHALL BE CERTIFIED BY A REGISTERED CIVIL ENGINEER OR LAND SURVEYOR AT THE SOLE EXPENSE OF THE CONTRACTOR.

EARTHWORK NOTES

1. ALL GRADING SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE SANTA CRUZ COUNTY GRADING ORDINANCE.

2. GRADING SUMMARY:

SITE 2 WETLANDS			
TOTAL CUT VOLUME	=	360	CY
TOTAL FILL VOLUME	=	0	CY
SITE 3 CATCHMENT BASIN			
TOTAL CUT VOLUME	=	225	CY
TOTAL FILL VOLUME	=	250	CY
SITE 4 CATCHMENT BASIN			
TOTAL CUT VOLUME	=	525	CY
TOTAL FILL VOLUME	=	200	CY
SITE 3+4 WETLAND			
TOTAL CUT VOLUME	=	330	CY
TOTAL FILL VOLUME	=	0	CY
TOTAL PROJECT			
TOTAL CUT VOLUME	=	1,440	CY
TOTAL FILL VOLUME	=	450	CY
NET CUT VOLUME	=	990	CY

THE ABOVE QUANTITIES ARE APPROXIMATE IN-PLACE VOLUMES CALCULATED AS THE DIFFERENCE BETWEEN EXISTING GROUND AND THE PROPOSED FINISH GRADE, PREPARED FOR PERMITTING PURPOSES ONLY. EXISTING GROUND IS DEFINED BY THE TOPOGRAPHIC CONTOURS ANO/OR SPOT ELEVATIONS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF WORK TO BE CONSTRUCTED. THE QUANTITIES HAVE NOT BEEN FACTORED TO INCLUDE ALLOWANCES FOR BULKING, CLEARING ANO GRUBBING, SUBSIDENCE, SHRINKAGE, OVER EXCAVATION, ANO RECOMPACTION, UNDERGROUND UTILITY AND SUBSTRUCTURE SPOILS AND CONSTRUCTION METHODS.

THE CONTRACTOR SHALL PERFORM AN INDEPENDENT EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING BID PRICES FOR EARTHWORK. THE BID PRICE SHALL INCLUDE COSTS FOR ANY NECESSARY IMPORT ANO PLACEMENT OF EARTH MATERIALS OR THE EXPORT ANO PROPER DISPOSAL OF EXCESS OR UNSUITABLE EARTH MATERIALS.

3. PRIOR TO COMMENCING WORK, PROTECT ALL SENSITIVE AREAS TO REMAIN UNDISTURBED WITH TEMPORARY FENCING, AS SHOWN ON THE DRAWINGS, AS SPECIFIED, OR AS DIRECTED BY THE ENGINEER.

4. 00 NOT OISTRURB AREAS OUTSIDE OF THE DESIGNATED LIMITS OF DISTURBANCE, UNLESS AUTHORIZED IN WRITING BY THE ENGINEER. THE COST OF ALL ADDITIONAL WORK ASSOCIATED WITH RESTORATION AND REVEGETATION OF DISTURBED AREAS OUTSIDE THE DESIGNATED LIMITS OF DISTURBANCE, AS SHOWN ON THE DRAWINGS, SHALL BE BORNE SOLELY BY THE CONTRACTOR.

5. DISPOSE OF ALL EXCESS SOIL ON SITE AT THE SPOILS PLACEMENT AREA IN ACCORDANCE WITH THESE NOTES ANO THE TECHNICAL SPECIFICATIONS.

6. CLEARING ANO GRUBBING, SUBGRAOE PREPARATION ANO EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 17 & 19 OF THE STANDARD SPECIFICATIONS, THESE DRAWINGS, ANO THE TECHNICAL SPECIFICATIONS.

7. PRIOR TO STARTING WORK ON THE PROJECT, SUBMIT FOR ACCEPTANCE BY THE ENGINEER A HAZARDOUS MATERIALS CONTROLS ANO SPILL PREVENTION PLAN. INCLUDE PROVISIONS FOR PREVENTING HAZARDOUS MATERIALS FROM CONTAMINATING SOIL OR ENTERING WATER COURSES, AND ESTABLISH A SPILL PREVENTION ANO COUNTERMEASURE PLAN.

9. UNLESS AUTHORIZED BY THE GEOTECHNICAL ENGINEER, THE FOLLOWING MATERIALS SHALL NOT BE INCORPORATED INTO THE WORK:

   A. ORGANIC MATERIALS SUCH AS PEAT, MULCH, ORGANIC SILT OR SOD.
   8. SOILS CONTAINING EXPANSIVE CLAYS.
   C. MATERIAL CONTAINING EXCESSIVE MOISTURE.
   0. POORLY GRADED COURSE MATERIAL
   E. PARTICLE SIZES IN EXCESS OF *6* INCHES.
   F. MATERIAL WHICH WILL NOT ACHIEVE SPECIFIED DENSITY OR BEARING.

10. FINE GRADING ELEVATIONS, CONFORMS, AND SLOPES NOT CLEARLY SHOWN ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO DIRECT DRAINAGE TO PROTECTED DRAINAGE CONTROL STRUCTURES OR NATURAL WATERWAYS IN A MANNER THAT SUPPORTS THE INTENT OF THE DESIGN. ALL FINAL GRADING SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

11. THE TOP *6"* OF SUBGRAOE UNDER ALL PAVED SURFACES SUBJECT TO VEHICULAR USE SHALL BE COMPACTED TO A MINIMUM OF 95% RELATIVE COMPACTION, IN ACCORDANCE WITH ASTM-D1557. ALL OTHER FILL TO BE COMPACTED TO A MINIMUM OF 90% MAXIMUM DENSITY AS DETERMINED BY ASTM-01557 ANO SO CERTIFIED BY TESTS ANO REPORTS FROM THE CIVIL ENGINEER IN CHARGE OF THE GRADING CERT/FICA TION.

12. SPREAD FILL MATERIAL IN LIFTS OF APPROXIMATELY *8* INCHES, MOISTENED OR DRIED TO NEAR OPTIMUM MOISTURE CONTENT ANO RECOMPACTED. THE MATERIALS FOR ENGINEERED FILL SHALL BE APPROVED BY A REGISTERED CIVIL ENGINEER. ANY IMPORTED MATERIALS MUST BE APPROVED BEFORE BEING BROUGHT TO THE SITE. THE MATERIALS USED SHALL BE FREE OF ORGANIC MATTER AND OTHER DELETERIOUS MATERIALS.

13. ALL CONTACT SURFACES BETWEEN ORIGINAL GROUND AND RECOMPACTED FILL SHALL BE EITHER HORIZONTAL OR VERTICAL. ALL ORGANIC MATERIAL SHALL BE REMOVED AND THE REMAINING SURFACE SCARIFIED TO A DEPTH OF AT LEAST 12 INCHES, UNLESS DEEPER EXCAVATION IS REQUIRED BY THE ENGINEER.

14. REGULATORY AGENCIES MAY REQUIRE A FINAL GRADING COMPLIANCE LETTER. WE CAN ONLY OFFER THIS LETTER IF WE ARE CALLED TO THE SITE TO OBSERVE AND TEST, AS NECESSARY, ANY GRADING AND EXCAVATION OPERATIONS FROM THE START OF CONSTRUCTION. WE CANNOT PREPARE A LETTER IF WE ARE NOT AFFORDED THE OPPORTUNITY OF OBSERVATION FROM THE BEGINNING OF THE GRADING OPERATION. THE CONTRACTOR MUST BE MADE AWARE OF THIS ANO EARTHWORK TESTING ANO OBSERVATION MUST BE SCHEDULED ACCORDINGLY. PLEASE CONTACT OUR OFFICE: (831) 421-9291.

EROSION CONTROL NOTES

1. THE EROSION CONTROL PLAN SHOWN IS INTENDED FOR THE SUMMER CONSTRUCTION SEASON (APRIL 15TH TO OCTOBER 15TH). IF THE DRAINAGE FEATURES SHOWN ON THESE DRAWINGS ARE NOT COMPLETED AND DISTURBED AREAS STABILIZED BY OCTOBER 1ST, CONSULT THE ENGINEER FOR ADDITIONAL RAINY SEASON EROSION CONTROL MEASURES.

2. PRIOR TO COMMENCING WORK, PROTECT AREAS TO REMAIN UNDISTURBED WITH ESA FENCING, AS SHOWN ON THE DRAWINGS. ADDITIONAL FENCING MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER.

3. UTILIZE ONLY THE APPROVED HAUL ROADS AND ACCESS POINTS (AS SHOWN ON THE DRAWINGS) FOR TRANSPORT OF MATERIALS AND EQUIPMENT.

4. BETWEEN OCTOBER 15 ANO APRIL 15, PROTECT EXPOSED SOIL FROM EROSION AT ALL TIMES. DURING CONSTRUCTION, SUCH PROTECTION MAY CONSIST OF MULCHING AND/OR PLANTING OF NATIVE VEGETATION OF ADEQUATE DENSITY. BEFORE COMPLETION OF THE PROJECT, STABILIZE ALL EXPOSED SOIL ON DISTURBED SLOPES AGAINST EROSION.

5. MAINTAIN A STANDBY CREW FOR EMERGENCY WORK AT ALL TIMES DURING THE RAINY SEASON (OCTOBER 15 THROUGH APRIL 15). STOCKPILE NECESSARY MATERIALS AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES.

6. CONSTRUCT TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THIS PLAN AND/OR AS DIRECTED BY THE ENGINEER TO CONTROL DRAINAGE WHICH HAS BEEN AFFECTED BY GRADING AND/OR TRENCHING OPERATIONS.

7. INCORPORATE ADEQUATE DRAINAGE PROCEDURES DURING THE CONSTRUCTION PROCESS TO ELIMINATE EXCESSIVE PONDING AND EROSION.

8. CONSTRUCT AND MAINTAIN EROSION CONTROL MEASURES TO PREVENT THE DISCHARGE OF EARTHEN MATERIALS FROM DISTURBED AREAS UNDER CONSTRUCTION AND FROM COMPLETED CONSTRUCTION AREAS.

9. INSTALL ALL PROTECTIVE DEVICES AT THE END OF EACH WORK DAY WHEN THE FIVE-DAY RAIN PROBABILITY EQUALS OR EXCEEDS 50 PERCENT AS DETERMINED FROM THE NATIONAL WEATHER SERVICE FORECAST OFFICE: WWW.SRH.NOAA.GOV.

10. AFTER EACH RAINSTORM, REMOVE ALL SILT AND DEBRIS FROM SEDIMENT CONTROL DEVICES.

11. THE EROSION CONTROL DEVICES ON THIS PLAN ARE A SCHEMATIC REPRESENTATION OF WHAT MAY BE REQUIRED. EROSION CONTROL DEVICES MAY BE RELOCATED, DELETED, OR ADDITIONAL ITEMS MAY BE REQUIRED DEPENDING ON THE ACTUAL SOIL CONDITIONS ENCOUNTERED, AT THE DISCRETION OF THE ENGINEER.

12. MAINTAIN ALL EROSION CONTROL DEVICES AND MODIFY THEM AS SITE PROGRESS DICTATES.

13. MONITOR THE EROSION CONTROL DEVICES DURING STORMS AND MODIFY THEM IN ORDER TO PREVENT PROGRESS OF ANY ONGOING EROSION.

14. CLEAN DAILY ANY EROSION OR DEBRIS SPILLING ONTO A PUBLIC STREET.

15. CONTACT THE ENGINEER IN THE EVENT THAT THE EROSION CONTROL PLAN AS DESIGNED REQUIRES ANY SUBSTANTIAL REVISIONS.

16. IMPLEMENT ALL REQUIRED BMP'S PRIOR TO COMMENCING SITE DISTURBING ACTIVITIES.

DUST CONTROL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS DUST CONTROL, THROUGHOUT THE CONSTRUCTION, IN ACCORDANCE WITH THE PERMIT CONDITIONS OF APPROVAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REGULAR CLEANING OF ALL MUD, DIRT, DEBRIS, ETC., FROM ANY AND ALL ADJACENT ROADS AND SIDEWALKS, AT LEAST ONCE EVERY 24 HOURS WHEN OPERATIONS ARE OCCURRING.

2. ALL DISTURBED AREAS, INCLUDING UNPAVED ACCESS ROADS OR STORAGE PILES, NOT BEING ACTIVELY UTILIZED FOR CONSTRUCTION PURPOSES, SHALL BE EFFECTIVELY STABILIZED OF DUST EMISSIONS USING WATER, CHEMICAL STABILIZER/SUPPRESSANT, OR VEGETATIVE GROUND COVER.

3. ALL GROUND-DISTURBING ACTIVITIES (E.G., CLEARING, GRUBBING, SCRAPING, AND EXCAVATION) SHALL BE EFFECTIVELY CONTROLLED OF FUGITIVE DUST EMISSIONS UTILIZING APPLICATION OF WATER OR BY PRE-SOAKING.

4. ALL MATERIALS TRANSPORTED OFFSITE SHALL BE COVERED OR EFFECTIVELY WETTED TO LIMIT DUST EMISSIONS.

5. FOLLOWING THE ADDITION OF MATERIALS TO, OR THE REMOVAL OF MATERIALS FROM, THE SURFACES OF OUTDOOR STORAGE PILES, SAID PILES SHALL BE EFFECTIVELY STABILIZED OF FUGITIVE DUST EMISSIONS UTILIZING SUFFICIENT WATER OR CHEMICAL STABILIZER/SUPPRESANT.

6. ONSITE VEHICLE SPEED ON UNPAVED SURFACES SHALL BE LIMITED TO 5 MPH.

7. DISTURBED AREAS SHALL BE SEEDED PRIOR TO OCTOBER 15TH OR EARLIER AS REQUIRED BY THE APPLICABLE PERMIT CONDITIONS.

DESIGNED BY: 8.M.Z
DRAWN BY: K.P.8.
CHECKED BY: 8.M.Z
DATE: 1/29/2020
JOB NO.: 19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

To safely access the Project Area travelling south on California State Route 1 (Hwy 1), exit Main Street and turn north (left) onto Green Valley Road. Traveling north on Highway 1, exit Green Valley Road/Harkins Slough Road and turn north (right) onto Green Valley Road. Approximately ½ mile past the Green Valley Road and Main Street intersection, turn east (right) onto Maranatha Road. Turn north (left) onto Hope Drive and park adjacent to Hope Drive Park to access the trail into the Middle Struve Slough Project Area.

2 REGULATORY SETTING

2.1 *Section 404 of the Clean Water Act*

Section 404 of the Clean Water Act gives the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps) regulatory and permitting authority regarding the discharge of dredged or fills material into "navigable waters of the United States." Section 502(7) of the Clean Water Act defines navigable waters as "waters of the United States, including territorial seas." Section 328 of Chapter 33 in the Code of Federal Regulations defines the term "waters of the United States" as it applies to the jurisdictional limits of the authority of the Corps under the Clean Water Act. A summary of this definition of "waters of the U.S." in 33 CFR 328.3 includes:

(1) waters used in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(2) interstate waters and wetlands;
(3) "other waters" such as lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    i. used by interstate or foreign travelers for recreational or other purposes; or
    ii. from which fish or shellfish are taken and sold in interstate or foreign commerce; or
    iii. Which are for industrial purpose by industries in interstate commerce;
(4) impoundments of waters otherwise defined as waters of the United States;
(5) tributaries of other waters;
(6) the territorial seas;
(7) wetlands adjacent to waters.

Therefore, for the purpose of determining Corps jurisdiction under the Clean Water Act, "navigable waters" as defined in the Clean Water Act are the same as "waters of the U.S." defined in the Code of Federal Regulations above.

The limits of Corps jurisdiction under Section 404 as given in 33 CFR Section 328.4 are as follows:

(a) *Territorial seas:* three nautical miles in a seaward direction from the baseline;
(b) *Tidal waters of the U.S.:*
    i. extending up to the high tide line or
    ii. up to the limit of adjacent non-tidal waters;
(c) *Non-tidal waters of the U.S.:* ordinary high-water mark or limit of adjacent wetlands;
(d) *Wetlands:* to the limit of the wetland.

Section 328.3 of the Federal Code of Regulations defines wetlands as:

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

The delineation study determined the presence or absence of wetland indicators used by the Corps in making a jurisdictional determination. The three criteria used to delineate wetlands are the presence of: (1) hydrophytic (water-loving) vegetation, (2) hydric soils, and (3) wetland hydrology. According to the Corps Manual, evidence of at least one positive wetland indicator from each parameter must be found in order to make a positive determination.

2.2 *Section 401 of the Clean Water Act*

Section 401 of the CWA requires that any activities licensed or permitted under Section 404 which may result in discharges into "navigable Waters of the U.S." meet state water quality standards. In California, Section 401 certification is the responsibility of the State Water Resource Control Board (SWRCB) and nine statewide Regional Water Quality Control Boards (RWQCBs) pursuant to California Water Code Section 13160 and to California Code of Regulations Title 23, Sections 3830-3869. A Section 401 water quality certification ensures the project appropriately controls or mitigates for any adverse impacts to effluent water that may reduce water quality below state and federal standards.

2.3 *California Department of Fish and Wildlife*

Jurisdictional authority of the California Department of Fish and Wildlife over relatively permanent bodies of standing or flowing water is established under Sections 1600-1616 or the Fish and Game Code, which pertains to activities that would disrupt the natural flow or alter the channel, bed, or bank of any lake, river, or stream. The Fish and Game Code stipulates that it is unlawful to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any lake, river, or stream without notifying CDFW, proposing mitigation, and if determined to be necessary by the Department, entering into a Lake and Streambed Alteration Agreement (LSAA). The lateral extent of the watercourse is defined by CDFW as the top of the bank represented by the physical break in slope or the outward extent of the contiguous riparian canopy for woody vegetation rooted below the top of bank, whichever is greater.

The Wetlands Resources Policy of the CDFW states that the Fish and Game Commission strongly discourages development in, or conversion of wetlands, unless at a minimum, project mitigation assures that there will be "no net loss" of either wetland habitat values or acreage. The CDFW is also responsible for commenting on projects requiring ACOE permits under the Fish and Wildlife Coordination Act of 1958.

3 METHODS

Prior to conducting field surveys, available reference materials were reviewed, including the 1980 Soil Survey of Santa Cruz County (USDA, Soil Conservation Service (SCS)/Natural Resources Conservation Service (NRCS)), USFW National Wetland Inventory Maps, USGS National Hydrography Dataset, the Watsonville West USGS 7.5' quadrangle map, and available current and historical aerial photographs of the site. A focused evaluation of indicators of wetlands and waters was performed in the Project Area on May 1 and June 8 and 12, 2020. Subsequent site visits were made to the site in late 2020 and early 2021

to determine the extent of surface and subsurface wetland hydrology as well as dynamic interannual shifts in annual plant assemblages in response to variable seasonal rainfall amounts and patterns. The methods used in this study to delineate jurisdictional wetlands and waters are based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Corps Manual; Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (Arid West Supplement 2008). The routine method for wetland delineation described in the Corps Manual and Arid West Regional Supplement was used to identify areas potentially subject to Corps Section 404 jurisdiction within the Project Area. A general description of the Project Area, including plant communities present, topography and current and historical land use practices was also produced during the delineation visit. The methods for evaluating the presence of wetlands and other waters of the U.S. employed during the site visit are described in detail below.

3.1 Potential Section 404 Wetlands

Data on vegetation, hydrology, and soils collected at sample points during the delineation site visit were recorded on standard Corps wetland determination data forms for the Arid West Region. In general, sample points for this delineation were selected based on relatively homogeneous plots approximately 100 square-feet in area. Once an area was determined to be a potential jurisdictional wetland, its boundaries were mapped using resource grade GPS equipment (Trimble GeoExplorer XH) and overlaid on a high resolution, orthorectified aerial photo. The acreage of potential jurisdictional wetlands was calculated using ArcGIS software. Wetland indicators described in the Corps Manual and Arid West Regional Supplement that were used to make wetland determinations at each sample point in the Project Area are summarized below.

Vegetation

Plant species identified on the property were assigned a wetland indicator status according to the U.S. Fish and Wildlife Service list of plant species that occur in wetlands (Lichvar 2016). This wetland classification system is based on the expected frequency of occurrence in wetlands as shown in **Table 1.**

Plant species with an indicator status of OBL, FACW, and/or FAC are classified as hydrophytic vegetation according to methodology outlined in the Corps Manual. For the Arid West Supplement, plus (+) and minus (–) modifiers of these classifications are no longer used. For example, plants previously identified in Reed (1986) as FAC–, FAC, and FAC+ are all considered FAC under the Arid West Supplement.

Table 1. Wetland Indicator Status Categories for Vascular Plants

INDICATOR STATUS	SYMBOL	FREQUENCY
OBLIGATE	OBL	greater than 99%
FACULTATIVE WETLAND	FACW	67-99%
FACULTATIVE	FAC	34-66%
FACULTATIVE UPLAND	FACU	1-33%
UPLAND (Not Listed)	UPL/NL	less than 1%
NO INDICATOR	NI	Undetermined

The Arid West Supplement applies a stepwise approach to determining dominance by hydrophytic vegetation. The first procedure (Indicator 1) is the dominance test where the hydrophytic vegetation criterion is met when greater than 50 percent of the dominant plant species have a wetland indicator status rated OBL, FACW, and/or FAC. Dominant plant species are those that contribute more to the

character of the plant community than other species. For the dominance test, the delineator must apply the 50/20 rule where dominant plants are those that individually or collectively account for 50 percent of the total areal coverage of vegetation in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total. If the plant community passes the dominance test, then the vegetation is considered hydrophytic and no additional procedures are required.

If the plant community fails the dominance test, but indicators of hydric soil and wetland hydrology are both present, the delineator must apply Indicator 2 referred to as the "Prevalence Index". To calculate the Prevalence Index, at least 80 percent of the vegetation on the sample plot must be accurately identified and have assigned wetland indicator statuses. The Prevalence Index is a weighted average wetland indicator status of all plants in sampling unit where each indicator status is given a numerical code (OBL=1, FACW=2, FAC=3, FACU=4, NL/UPL=5) and weighting is by abundance based on absolute percent cover. The Prevalence index is calculated using the following formula:

$$PI = \frac{A_{OBL}+2A_{FACW}+3A_{FAC}+4A_{FACU}+5A_{UPL}}{A_{OBL}+A_{FACW}+A_{FAC}+A_{FACU}+A_{UPL}}$$

The Prevalence Index ranges from 1 to 5 and an index less than or equal to 3.0 indicates that hydrophytic vegetation is present. If the plant community fails the Prevalence Index, the delineator proceeds to Indicator 3.

Indicator 3 refers to morphological adaptations made by plants species for life in wetlands. Common adaptations include, but are not limited to, adventitious roots, multi-stemmed trunks, tussocks, and buttressing tree species. Morphological adaptations must be observed on more than 50 percent of the individuals of a FACU species in areas with evidence of hydric soil and wetland hydrology. These species are reassigned as FAC and all other species retain their published indicator statuses. The delineator then recalculates the dominance test (Indicator 1) and the Prevalence Index (Indicator 2) using FAC as an indicator for those species with morphological adaptations. The vegetation is now considered hydrophytic if either test is satisfied.

Hydrology

The Corps jurisdictional wetland hydrology criterion is satisfied if an area is inundated or saturated for a period sufficient to create anoxic soil conditions during the growing season (minimum of 14 consecutive days in the Arid West Region). In the Arid West Supplement, wetland hydrology indicators are broken down into four groups. Group A consists of direct observation of surface water or saturated soils; Group B consists of evidence of recent inundation; Group C consists of evidence of current or recent soil saturation; Group D consists of characteristics that indicate contemporary rather than historical wet conditions. Within each group, evidence of wetland hydrology can include direct ("primary") indicators, such as visible inundation or saturation, drift lines, and surface sediment deposits (including algal mats) and oxidized root channels, or indirect ("secondary") indicators, such as drainage patterns, the FAC-neutral test and saturation visible on recent aerial imagery. One primary indicator is sufficient to conclude that wetland hydrology is present. In the absence of primary indicators, two or more secondary indicators must be present to conclude that an area has adequate wetland hydrology. Primary and secondary hydrology indicators were used to determine if areas surrounding each sample point in the Project Area satisfied the Corps' hydrology criterion.

Soils

The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as:

> *"A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part."*
> (Federal Register July 13, 1994)

Soils formed over long periods of time under wetland (anaerobic) conditions often possess characteristics that indicate they meet the definition of hydric soils. Nearly all hydric soils exhibit characteristic morphologies that result from repeated periods of saturation or inundation, or both, for more than a few days. Characteristic hydric soil indicators observable in the field include: organic histosols and histic epipedons; sulfidic material; aquic or peraquic moisture regime; reducing soil conditions; soil colors (gleyed soils or soils with mottles and/or low chroma matrix); and iron and manganese concretions. Hydric mineral soils in the vicinity of the Project Area generally have a characteristic low matrix chroma and distinct or prominent redoximorphic mottles. Chroma designations are determined by comparing a soil sample with a standard Munsell soil color chart (GretagMacbeth 2000). Soil profiles at each sample point in the Project Area were described to include horizon depths, color, redoximorphic features, and texture to determine if the soils satisfy the ACOE criteria for hydric soils. The NRCS manual *Field Indicators of Hydric Soils in the United States* (Version 8.2)(USDA, NRCS 2018) was also used as a guide for determining hydric soils in the Project Area.

3.2 Non-wetland "Other Waters" of the U.S.

Areas that are inundated for sufficient duration and depth to exclude growth of hydrophytic vegetation, such as lakes and ponds, or convey water, such as streams, are also subject to Section 404 jurisdiction. Within Santa Cruz County and the central California Coast, these "other waters" can include intermittent and ephemeral streams, as well as lakes, mudflats, playas, arroyos, and rivers. The Project Area was concurrently evaluated for the presence of "other waters" at the time of the delineation site visit.

Areas delineated as "other waters" are characterized by an ordinary high-water mark (OHWM), defined as:

> *...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*
> (33 CFR Part 328.3)

"Other waters" are identified in the field by the presence of a defined river or stream bed, a bank, and evidence of the flow of water, or by the absence of emergent vegetation in ponds or lakes. Corps jurisdiction of waters in non-tidal areas extends to the ordinary high water (OHW) mark. "Other waters" within the Project Area were either mapped using sub-meter accuracy GPS units, or digitized using GIS software based on USGS topographic maps and aerial photograph interpretation.

3.3 Difficult Wetland Situations in the Arid West Region

The Arid West Supplement includes guidance for identifying problematic wetlands where indicators may be missing due to natural processes or recent disturbances. It includes examples of problem areas and

atypical situations described in the 1987 Corps Manual, as well other more challenging situations. Problem area wetlands are defined in the Arid West Supplement as "naturally occurring wetland types that lack indicators of hydrophytic vegetation, hydric soil, or wetland hydrology periodically due to normal seasonal or annual variability, or permanently due to the nature of soils or plant species on the site." Atypical situations are wetlands in which vegetation, soil or hydrology indicators are absent due to recent human activities or natural events. Where applicable, guidance outlined in the Arid West Supplement regarding difficult situations was followed during the routine wetland delineation.

3.4 Areas Exempt from Section 404 Jurisdiction

Some areas that meet the technical criteria for wetlands or waters may not be jurisdictional under Section 404 of the Clean Water Act. Included in this category are some man-induced wetlands which are areas that have developed at least some characteristics of naturally occurring wetlands due to either intentional or incidental human activities. Examples of man-induced wetlands include, but are not limited to, irrigated wetlands, stock ponds, drainage ditches excavated entirely in uplands, and dredged material disposal areas.

In addition, some isolated wetlands and waters may also be considered outside of Corps jurisdiction as a result of the Supreme Court's decision in *Solid Waste Agency of Northern Cook County (SWANCC) v. United States Army Corps of Engineers* (531 U.S. 159 (2001)). Isolated wetlands and waters are those areas that do not have a surface or groundwater connection to, and are not adjacent to a navigable "Waters of the U.S.", and do not otherwise exhibit an interstate commerce connection. In the Supreme Court decision *Rapanos v. United States* (547 U.S. 715 (2006)), the Court recommended further restrictions on federal jurisdiction over wetlands and required that a "significant nexus" test be applied to those wetlands and waters which are not "navigable". A joint memorandum issued in December 2008 and formalized in April 2011 provides guidance to the Corps and EPA for implementing the Supreme Court's significant nexus test. The *Rapanos* and *SWANCC* decisions are applicable for potential wetlands considered to lack a direct connection or significant nexus with navigable waters.

In this guidance, non-tidal ditches are not considered jurisdictional features unless they have a clearly defined bed, bank and ordinary high water mark; connect directly to a traditional navigable water (TNW), and have one of the five following characteristics: (1) natural stream that has been altered; (2) ditches excavated in waters of the U.S., including wetlands; (3) ditches that have relatively permanent flowing or standing water; (4) ditches that connect two or more jurisdictional waters of the U.S.; or (5) ditches that drain natural bodies of water (including wetlands) into a tributary system of a TNW or interstate water. Moreover, natural or man-made swales are not considered tributaries; however, ditches and swales may be considered jurisdictional if they meet the regulatory definition of "wetlands" (i.e. three parameters).

Navigable Waters Protection Rule (WOTUS)

On October 22, 2019 the Department of Defense (DOD), EPA and USACE published a final rule to repeal the 2015 Clean Water Rule, defining "Waters of the U.S." (DOD et al. 2019). This 2015 Rule was never implemented due to the 2017 Presidential Executive Order entitled "Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the 'Waters of the United States' Rule." Along with the repeal of the 2015 Rule, the 2019 Final Rule re-codifies the regulatory text that existed prior to the 2015 Rule outlined in the 2008 *Rapanos* joint memorandum (effective December 23, 2019).

On December 11, 2018, the EPA and the Corps signed the Proposed Rule: Revised Definition of "Waters of the U.S." (WOTUS) to clarify federal authority under the Clean Water Act consistent with the February 2017 Executive Order (USACE et al. 2019). The proposed definition would replace the pre-2015 (*Rapanos*) regulations. The Public Comment period on the Proposed Navigable Waters Protection Rule (WOTUS) closed on April 15, 2019. The final WOTUS Rule was published in the Federal Register on April 21, 2020 and became effective on June 22, 2020.

The final WOTUS Rule reduced the types of wetlands and other waters considered jurisdictional pursuant to the Clean Water Act. Features excluded from ACOE jurisdictional under the final rule include the following:

- Wetlands lacking direct surface water connectivity with Traditional Navigable Waters (TNWs) or with intermittent or perennial tributaries with direct connectivity to TNWs;
- Groundwater, including groundwater drained through subsurface drainage systems;
- Ephemeral features that flow only in direct response to precipitation including ephemeral streams, swales, gullies, rills, and pools;
- Diffuse stormwater runoff and directional sheetflow over uplands;
- Ditches that are not TNWs, tributaries to TNWs, or that are not constructed in adjacent wetlands;
- Prior converted cropland;
- Artificially irrigated areas that would convert to upland if irrigation ceases;
- Artificial lakes and ponds that are not jurisdictional impoundments and that are constructed in uplands or non-jurisdictional waters;
- Water filled depressions incidental to mining or construction activity, and pits excavated for the purposes of obtaining fill, sand or gravel;
- Stormwater control features constructed in uplands or non-jurisdictional waters to convey, treat, infiltrate, or store stormwater runoff;
- Groundwater recharge, water reuse, and wastewater recycling structures constructed in uplands or non-jurisdictional waters;
- Waste (sewer) treatment systems.

Under the Navigable Waters Protection Rule, the jurisdictional status of a wetland or waterbody is informed by understanding hydrologic conditions in a “typical year”, or the normal periodic range of precipitation and other climatic variables for a specific location. The rule does not specify methods in determining typical conditions but the ACOE and other agencies will generally rely on the web-based antecedent precipitation tool (APT) for the most recently available 30-year record. The APT defines “normal” as within the 30th and 70th percentile of the 30-year data set; i.e., normal is defined as no less than 30% of years are drier, and no less than 30% are wetter.

3.5 Wetlands and Waters of the State

Under California State law, “waters of the state" pertain to “any surface water or groundwater, including saline waters, within the boundaries of the state.” As a result, water quality laws and permitting authority apply to both surface and groundwater. In the absence of a federal nexus, the Porter-Cologne Water Quality Act (2002) assigns overall responsibility for water rights and water quality protection to the SWRCB and directs the RWQCBs to develop and enforce water quality standards within their boundaries.

Following the 2001 U.S. Supreme Court *SWANCC* decision, the SWRCB released a legal memorandum confirming the State’s jurisdiction over isolated wetlands. The memorandum stated that under the

California Porter-Cologne Water Quality Control Act, discharges to wetlands and other "waters of the state" are subject to State regulation, including wetlands isolated from navigable waters or their tributaries and those features included in the 2020 WOTUS Rule. In general, the RWQCB regulates discharge into non-jurisdictional wetlands and waters in much the same way as they do for Federal jurisdictional waters, using Porter-Cologne rather than Section 404 authority (SWRCB 2001). In the absence of a federal permit requirement, impacts to waters of the state, including wetlands, requires Waste Discharge Requirements (WDR) authorization from the RWQCB (SWRCB 2004).

4 PROJECT AREA DESCRIPTION

The approximately 5.9-acre Study Area extends from a paved footpath bisecting Middle Struve Slough to the south to the intersection of Pennsylvania Drive and Winding Road to the north. The Project Area includes the natural concave basin of the historic slough and slopes up towards Hope Drive Park to the west and Pennsylvania Drive to the east. The Project Area includes the areas proposed for stormwater and wetland enhancement to this segment of the larger of the larger Struve Slough complex. (**Figure 2**).

The Project Area is comprised of gentle to moderate slopes dominated by ruderal non-native grassland invasive poison hemlock transitioning into a flat to slightly concave bottom comprising a degraded segment of Struve Slough. The northern portion of the Project Area is dominated by mature mixed riparian forest and several mature mixed willow thickets occur within the lowland basin. The majority of Middle Struve Slough is dominated by a dense monospecific stand of Himalayan blackberry. A low-flow semi-permanent to perennial channel bisects this reach of the slough, but is almost entirely vegetated with emergent wetland plants except where it is situated within the riparian forest to the north. A paved pedestrian footpath runs along the western perimeter of the slough before turning east and transitioning to a boardwalk over the wetted channel along the southern portion of the Project Area and continuing south towards Main Street. Struve Slough is one of six fingers of the larger Watsonville Sloughs complex. The Project Area is surrounded by high-density urban residential development. Elevations range from approximately 20 to 60 feet above mean level.

Vegetation

Three non-wetland vegetation community/habitat types are present in the vicinity of the Project Area as described by Ecosystems West: ruderal non-native grassland, non-wetland riparian forest, and ruderal/developed.

Within the Middle Struve Slough Project Area, **ruderal non-native grasslands** are primarily situated east of Middle Struve Slough between the basin floor and the Pennsylvania Avenue. The ruderal grasslands within the Study Area are highly disturbed by regular mowing, litter, invasive weed introductions, and off-trail hiking. As a result, very few native species were present and indicator species for native coastal prairie, such as California oatgrass (*Danthonia californica*) and purple needlegrass (*Stipa pulchra*), were not-observed nor expected to occur. Ruderal non-native grassland occurs on nearly-level to moderate hillslopes throughout the majority of the eastern portion of the Study Area along Pennsylvania Drive. The non-native grassland is dominated by dense monospecific patches of Harding grass (*Phalaris aquatica*), particularly at the ecotone between wetland areas comprised almost entirely of Himalayan blackberry (*Rubus armeniacus*) associated with the slough basin. Other commonly occurring species found higher up the slope extending to the east towards Pennsylvania Drive include wild oats (*Avena* spp.), Italian ryegrass (*Festuca perennis*), brome grasses (*Bromus hordeaceus*, *B. diandrus*), barley (*Hordeum murinum* ssp. *leporinum*), six-weeks fescue (*Festuca bromoides*), cutleaf geranium (*Geranium dissectum*), poision

hemlock (*Conium maculatum),* dock (*Rumex spp*), and filarees (*Erodium* spp.). Because the area is frequently mowed, the grassland generally does not support shrubs or trees including coyote brush (*Baccharis piluaris*) and coast live oak (*Quercus agrifolia*) although they would be expected to colonize this area under an altered management regime. A large percentage of plant species identified within this habitat type are listed as invasive weeds with "moderate to high ecological impacts" by the California Invasive Plant Council (Cal-IPC) (2020).

Non-wetland riparian forest is situated in the northernmost portion of the Study Area where the flowing channel is riverine with a distinct bed and bank and lack of emergent herbaceous vegetation. This habitat type is comprised of mature trees with mostly closed canopy and relatively undeveloped understory of herbaceous plants and sub-shrubs. The overstory is comprised of Pacific willow (*Salix lasiandra*), blue and red gum eucalyptus (*Eucalyptus globulus, E. camaldulensis*), Monterey pine (*Pinus radiata*), and glossy privet (*Ligustrum lucidum*). The herbaceous understory is primarily Himalayan blackberry, English Ivy (*Hedera* spp.), flatsedge (*Cyperus eragrostis*), and creeping bedstraw (*Galium aparine*). Significant amounts of trampling, refuse and other impacts are associated with a transient encampment in this wooded area.

Ruderal vegetation is dominated by aggressive, opportunistic species including fennel (*Foeniculum vulgare*), cheeseweed (*Malva parviflora*), wild radish (*Raphanus sativus*), black mustard (*Brassica nigra*), and poison hemlock. Ruderal habitat is located on either side of the paved trail accessing Hill Park and the hillslope along the west side of the slough. Due to the proximity to roads, trails, and other ongoing disturbances, ruderal areas tend to persist over time and succession to other natural communities and wildlife habitat is limited.

Hydrology

The Project Area is situated in the Pajaro HUC-8, Pajaro River HUC-10, and Watsonville Slough Frontal HUC-12 Watersheds (NRCS 2020). The principal natural hydrological sources for the Project Area are direct precipitation, surface runoff, and subsurface sheet flow from adjacent uplands. Southerly flows through the slough system are largely conveyed through a narrow meandering channel situated at the low point of the basin originating in Upper Struve Slough at its terminus immediately east of Airport Boulevard.

The 2019-2020 rainfall year was slightly below normal for the Watsonville area. Using the nearest NOAA weather station data in Santa Cruz County (Watsonville Waterworks Weather Station), seasonal totals were approximately 89 percent of normal (**Table 2**). Although below the 30-year average, seasonal rainfall is within the range of normal precipitation for a typical year.

Table 2. 2018 to 2020 seasonal rainfall totals (inches) compared to 30-year average for Watsonville, CA (NOAA Watsonville Waterworks weather station).

Rain year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
1981-2010 average	0.01	0.02	0.21	1.10	2.74	4.25	4.46	4.68	3.63	1.69	0.60	0.11	**23.50**
2018-2019	0.02	0.00	0.00	0.10	3.70	2.65	5.23	7.37	5.07	0.38	1.87	0.09	**27.38**
2019-2020	0.01	0.02	0.01	0.00	0.56	10.09	1.94	0.00	4.51	3.02	0.67	0.04	**20.87**

Soils

The Santa Cruz County Soil Survey (USDA 1980) identifies four soil map units within the Project Area (**Figure 3**). These soils types are described in detail below.

- 103- Aquents, flooded
- 123- Cropley silty clay, 2 to 9 percent slopes
- 135- Elkhorn sandy loam, 15 to 30 percent slopes
- 174- Tierra-Watsonville complex, 15 to 30 percent slopes

The Soil Survey descriptions of these mapping units are presented below and includes whether the soils are classified as hydric or not according to the Hydric Soils List for Santa Cruz County (NRCS 2020).

103- Aquents, flooded

The Aquents soil type occurs in permanently inundated areas, typically submerged beneath perennial lentic and lotic waterbodies. This soil type is typically mucky and often gleyed due to prolonged anaerobic/anoxic conditions. Aquents are not formally listed as hydric by the NRCS but due to its occurrence in permanently flooded area, it is considered a hydric soil type. Within the Project Area, Aquents are mapped as occurring beneath the formerly inundated portions of Middle Struve Slough.

123- Cropley silty clay, 2 to 9 percent slopes

Cropley silty clay is a very deep, moderately well drained soil formed in alluvium from mixed rock sources and found on alluvial fans, floodplains and in small basins. In natural areas this soil type supports grassland and scattered live oak woodland. Cropley clay is commonly used for irrigated row crops, pasture, and fruit trees. The surface layer is typically a very dark gray hard, sticky clay extending to approximately 11 inches. Below this surface layer, soils are dark gray to black with coarse, blocky structure and very fine tubular pores. The shrink-swell potential is very high with cracks up to 2.5 inches extending up to 25 inches deep during the dry summer and fall months. This soil type is considered a hydric soil type by the NRCS in Santa Cruz County. Within the Study Area, this soil type is limited to a band of non-native grassland along the eastern perimeter of the site but likely occurs in non-flooded areas mapped as Aquents due to changes in the historic hydrologic regime of the slough.

Figure 3.

Soils Mapped within Middle Struve Slough Wetland Enhancement Project Area

Study Area Boundary

103- Aquents, flooded

123- Cropley silty clay, 2-9% slopes

135- Elkhorn sandy loam, 15-30% slopes

174-Tierra-Watsonville complex, 15-30% slopes

N

W E

S

0 37.5 75 150

Feet

ECOSYSTEMS WEST CONSULTING GROUP

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye,

135 Elkhorn sandy loam- 15 to 30 percent slopes

Elkhorn sandy loam is a very deep, well-drained soil occurring in old alluvial fans and marine terraces. Elevations range from 20 to 800 feet and permeability is moderately slow. The surface layer is typically a very dark grayish brown or brown slightly acidic sandy loam about 21 inches thick. The subsoil extends to about 61 inches and is a pale brown and variegated light gray neutral sandy clay loam. This soil type is often depleted by erosion and rilling in cultivated and disturbed area. Effective rooting depth is 60 inches or more and the majority of areas supporting this soil type are cultivated for row crop agriculture and fruit orchards. This soil type also supports rangeland which is typically dominated by non-native grasses and forbs. Elkhorn slough is not classified as hydric by the NRCS but often contains inclusions of Watsonville loam, a hydric soil type. Within the Study Area, this soil type is limited to a small portion of non-wetland riparian forest in the northwest portion of the site but may also occur in areas mapped as Aquents due to changes in the historic hydrologic regime of the slough.

174 Tierra-Watsonville Complex- 15 to 30 percent slopes

Tierra-Watsonville Complex soils are comprised of approximately 55 percent Tierra sandy loam and 30 percent Watsonville loam. Also included in the complex are areas of Elkhorn sandy loam, Baywood sandy loam, Pfieffer gravelly loam, and Los Osos loam. This soil type is formed alluvial and marine terraces at elevations ranging from 20 to 1,200 feet.

The Tierra soil component is very deep and moderately well-drained with very slow permeability. The surface layer is a grayish brown and dark gray, slightly acidic sandy loam about 14 inches thick. Below this, the upper portion of the subsoil is a brown to light gray slightly acidic sandy clay and sandy clay loam approximately 23 inches thick. The lower part extends to a depth of 66 inches and is light gray and acidic clay and silty clay.

Watsonville loam is very deep and somewhat poorly drained with very slow permeability. Typically, the surface layer is a very dark grayish brown, slightly acidic loam about 12 inches thick. The subsurface layer is light a light gray, slightly acidic loam approximately 6 inches thick. The subsoil is about 21 inches thick and is pale brown and mixed light gray, slightly acidic clay. Below this, the substratum extends to 63 inches below the surface and is a mixed light gray, very pale brown and yellow slightly to medium acidic sandy clay loam.

Effective rooting depth is 60 inches or more and the majority of undeveloped areas supporting this soil type are used for range which is typically dominated by non-native grasses and forbs. Watsonville-Tierra complex is not classified as hydric by the NRCS but areas with higher prevalence of Watsonville loam, are considered hydric soil type. Within the Study Area, this soil type is limited to small areas of ruderal vegetation along the western perimeter of the site but may also occur in areas mapped as Aquents due to changes in the historic hydrologic regime of the slough.

5 RESULTS

Potential jurisdictional areas and sampling points are described in the following sections and shown on the enclosed map in **Appendix A**. Vegetation, soils, and hydrology data collected during the delineation site visit are reported on standard Arid West ACOE data forms presented in **Appendix B**. Photographs of representative sample points and wetland features are provided in **Appendix C**.

This report identifies all areas that met the 1987 ACOE Manual and Arid West Regional Supplement criteria as wetlands or possessed unvegetated, persistent open water with a discernable ordinary high-water

mark (OHWM) and could be classified as "other waters" of the United States. This delineation report provides the additional information necessary to make recommendations to the ACOE on those areas that are potentially jurisdictional and those which are not.

Wetland boundaries are typically determined in the field by the predominance of hydrophytic vegetation, evidence of wetland hydrology including soil saturation, ponding, the presence of organic muck, redoximorphic mottles and/or oxidized rhizospheres, and shifts in topographical (geomorphic) position.

5.1 Potential Section 404 Jurisdictional Wetlands

Four potential Section 404 jurisdictional wetlands were identified within the Middle Struve Slough Project Area. These areas met the criteria for hydrophytic wetland vegetation, hydric soils, and wetland hydrology at the time of the May and June 2020 wetland delineation field visits. When delineating wetland boundaries in the field, the transition between areas with still-green hydrophytic vegetation to areas dominated by desiccated, upland classified species were used to define the edge of the feature. Deep surface cracks in the clay soil were also used to distinguish the wetland boundaries. The 2020 delineation site visits were conducted during suitable phenological periods for identifying flowering plants to their infraspecific taxon and wetland indicator status. Furthermore, wetland hydrology indicators were clearly observed in this feature and generally consisted of Group A and B primary indicators including soil surface cracks and oxidized rhizospheres along living roots. Hydric soil development was supported by indicator F1 (loamy mucky mineral) or F6 (redox dark surface) comprised of low matrix chroma and distinct or prominent redox concentrations within the upper 12-inches of the profile.

Scrub-Shrub Wetlands

Blackberry Scrub-Shrub Wetland (BBW-1)(0.94 acres)

The majority of the Middle Struve Slough is dominated by an 0.94-acre contiguous thicket of invasive Himalayan blackberry (FAC) with very few other associated plants. At wetland sample points where blackberry was not ubiquitous, associated and co-dominant species include common rush (*Juncus patens*, FACW), willow dock (*Rumex salicifolius*, FACW), willowherb (*Epilobium ciliatum*, FACW), prickly ox tongue (*Helminthotheca echioides*, FAC), and hyssop loosestrife (*Lythrum hyssopifolium*, FACW). Himalayan blackberry is a viny, rhizomatous shrub that rapidly colonizes mesic, clayey soils. Within the Project Area, the nearly impenetrable blackberry thicket extends laterally on either side of the low-flow channel bisecting the slough in the low-lying and gently sloped portions of the basin. Occasionally, blackberry is mechanically cleared in Middle Struve Slough with the most recent removal occurring in July 2009. A component of the proposed Middle Struve Slough Stormwater and Wetland Enhancement includes removal of invasive Himalayan blackberry and replacement with native herbaceous wetland vegetation.

Mixed Willow Thicket Scrub-Shrub Wetlands (MWT-1, MWT-2)(0.58 acres)

Two closed canopy mixed willow thickets covering approximately 0.58 acres dominated by Pacific willow (*Salix lasiandra*, FACW) and arroyo willow (*Salix lasiolepis*, FACW) are situated along the slow-moving low-flow channel in the central and southernmost portion of the Project Area. The understory was relatively undeveloped but supported herbaceous species including flatsedge (*Cyperus eragrostis*, FACW), water parsley (*Oenanthe sarmentosa*, OBL), and curly dock (*Rumex crispus*, FAC). Willows are phreatophytes with deep taproots but require a year-round elevated water table for establishment and persistence. The principal source of hydrology is from the semi-permanently wetted channel, surface sheet flow from surrounding uplands, and elevated groundwater.

Herbaceous Wetlands

Freshwater Emergent Wetland (FEW-1)(0.12 acres)

Freshwater emergent wetlands occur in areas with persistent saturation or inundation in relatively still or slow-moving water bodies. This wetland type is characterized by vegetation that is submerged for a substantial portion of the growing season. These plant species typically occur in boggy areas or along the margins of ditches, ponds, lakes, creeks, and sloughs. Within the Project Area, freshwater emergent wetland is limited to the semi-permanently to permanently inundated low-flow channel in Middle Struve Slough. This slow-moving watercourse is almost entirely vegetated throughout this reach and supports dense emergent vegetation dominated by broadleaved cattail (*Typha latifolia;* OBL), water parsley, curly dock, and flatsedge. Within the area of the low-flow channel with prolonged inundation, soils are mucky and/or gleyed; however, at SP-5 near the edge of emergent vegetation, mineral soils exhibiting low chroma and evidence of prominent redoximorphic mottles were also observed in the profile. Freshwater emergent vegetation transitions abruptly into adjacent blackberry and mixed willow thicket wetlands where soil inundation is reduced at higher surrounding elevations.

5.2 Potential "Other Waters" of the U.S.

One potential non-wetland "other waters" of the U.S. is present within the Project Area. This includes the perennial, unvegetated open-water channel of Middle Struve Slough, as it flows into the subject property through a culvert beneath Pennsylvania Drive and contains a distinct bed and bank with an overstory of mixed willow riparian and eucalyptus trees. The channel reach is approximately 130 in length and 6 feet wide at the OHWM. The open water channel transitions abruptly into the freshwater cattail emergent wetland (FEW-1) as it exits the riparian forest to the south. The Struve Slough complex is connected via flood gate channels along the Pajaro River levee system to the Pacific Ocean, a Traditional Navigable Water (TNW).

5.3 Areas Potentially Exempt from CWA Sections 401 and 404 Jurisdiction

No areas identified by this delineation as 3-parameter wetlands are considered potentially exempt from jurisdiction under Sections 401 and 404 of the Clean Water Act. All wetlands and the open water segment of the Middle Struve Slough channel in the northernmost portion of the Project Area identified by this delineation are relatively permanent waters (RPWs) with direct connectivity to traditional navigable waters (TNWs), or are wetlands immediately adjacent to RPWs with direct surface hydrologic connectivity. These features are considered to be subject to regulatory permitting by the ACOE and RWQCB.

An 0.01-acre non-wetland ephemeral drainage originating at storm-drain/box culvert below Pennsylvania Drive in the central-eastern portion of the Project Area contains a distinct, albeit man-made, bed and bank. However, this ephemeral feature only conveys water into Middle Struve Slough during storm events. Upon enactment of the 2020 WOTUS Rule, ephemeral flowing watercourses are no longer considered jurisdictional Waters of the U.S. These features are still classified as Waters of the State and regulated by the RWQCB under the Porter Cologne Water Quality Act.

5.4 Difficult Situations in the Arid West Region

Blackberry is problematic as a vegetation wetland indicator in that it is equally likely to grow in wetlands and uplands. Due to the rhizomatous growth habitat and sharp thorns, it can be very difficult discern the transitional edge of a wetland dominated by this species. This is especially problematic in years with below average rainfall as hydrology indicators may be difficult to distinguish beyond soil characteristics (i.e. oxidized rhizospheres). To facilitate wetland delineation field efforts, a series of perpendicular transects

were cut into the blackberry bramble to properly situate sample points and demarcate the wetland edge. This delineation was especially problematic along the moderately sloped western edge of the slough. Transition between potential wetlands and uplands along the eastern edge were generally distinguishable by topographic landscape position and abrupt shifts in vegetative cover from FAC dominated plants to FACU and UPL classified species and at the time of the site visits. Nevertheless, the blackberry wetland (BBW-1) was delineated conservatively and may be depicted somewhat larger in area than would be observed if this feature were dominated by a different suite of plants.

5.5 Atypical Situations in the Arid West Region

Atypical situations include wetlands that are the result of unauthorized activities, natural events, or man-induced wetlands purposely or incidentally created by human activities. These include irrigated wetlands from agricultural runoff and impoundments (such as levees) that alter the natural hydrology of an area. No areas identified by this delineation are considered atypical.

5.6 Section 401 Water Quality Certification/Waste Discharge Requirement

A Section 401 Water Quality Certification would be required for any discharge into any Waters of the U.S., including wetlands, identified in this delineation. This certification is typically issued concurrently with a Section 404 Individual or Nationwide Permit pursuant to a verified wetland delineation and mitigation and monitoring plan (MMP) for impacts to wetlands and "other waters" subject to federal jurisdiction. In some instances, the RWQCB will seek additional protections and mitigation measures to ensure state and local water quality standards are upheld. For potential direct and indirect impacts to "waters of the state" or for exempt activities or projects with impacts too minimal in area to require a Section 404 permit, the RWQCB may require a Waste Discharge Requirement (WDR) order which functions like a permit and may include mitigation strategies, design modifications, and best management practices.

5.7 CDFW Lake and Streambed Alteration Agreement

Project activities below the break-in-bank of a flowing watercourse or within the dripline of a riparian corridor likely require a Section 1602 Lake and Streambed Alteration Agreement (LSAA) from the CDFW. Within the Project Area, any enhancements to the low-flow channel or removal of vegetation within the mixed riparian forest in the northern portion of the Project Area will require a Section 1602 notification to CDFW. Where required, a LSAA typically includes similar avoidance, minimization, and mitigation requirements of Section 401, 404, and/or WDR permits but may include additional mitigation measures including revegetation of non-wetland riparian vegetation, erosion control, and wildlife habitat protection and enhancement.

6 CONCLUSION

The Project Area contains four distinct features that met all three wetland indicators. These potential jurisdictional wetlands support a preponderance of hydrophytic vegetation with FAC, FACW, and OBL classified plants, hydric soils characterized by muck or low chroma soils with redoximorphic mottling, and wetland hydrology characterized by direct evidence of saturation or inundation, drainage patterns, soil surface cracks, topographical position, and oxidized root channels. Additionally, the unvegetated segment of the low-flow channel extending through the mixed riparian forest in the northern portion of the Project Area is considered potentially jurisdictional "other waters" of the U.S.

The five features identified by this delineation including the 3-parameter wetlands described above and the non-wetland riverine portion of the Middle Struve Slough channel are considered potentially jurisdictional under Sections 401 and 404 of the federal Clean Water Act as they relatively permanent waters (RPWs) or wetlands directly adjacent to and abutting RPWs with surface water connectivity to traditional navigable waters (TNWs). The ephemeral drainage extending from a culvert below Pennsylvania Drive is not subject to jurisdiction under Section 401 or 404 of the federal Clean Water Act but is regulated as Waters of the State under the Porter Cologne Water Quality Act. **Table 3** presents a summary of potentially jurisdictional wetlands and other waters identified by this delineation.

Table 3. Summary of Potential Jurisdictional Wetlands and Other Waters of the U.S. and State of California.

Wetland ID	NWI (Cowardian) Code	Potential Jurisdictional Regulatory Agency	Potential Jurisdictional Area (acres)
Scrub-Shrub Wetlands			
BBW-1	PSS3E	ACOE, RWQCB	0.94
MWT-1	PSS3E/F	ACOE, RWQCB	0.46
MWT-2	PSS3E/F	ACOE, RWQCB	0.12
Freshwater Emergent Wetland			
FEW-1	PEM1F/H	ACOE, RWQCB	0.12
Potential ACOE Jurisdictional Wetlands Total			**1.64 acres**
Non-Wetland "Other Waters" of the U.S.			
OW-1	R3UB1	ACOE, RWQCB, CDFW	0.02 acres
Potential ACOE Jurisdictional Other Waters Total			**0.02 acres**
Waters of the State			
ED-1	R4UB1	RWQCB	0.01 acres
Potential Jurisdictional Waters of the State			**0.01 acres**

The conclusions presented in this delineation are based on conditions observed at the time of the field visits conducted in May and June 2020 and subsequent site visits in winter 2020 and spring 2021 to confirm contemporary conditions reflect the results of this delineation.

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Appendix A. Map of Potential Jurisdictional Wetlands and Waters of the U.S. for the Middle Struve Slough Wetland Enhancement Project Area

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Potential Jurisdictional Wetlands and Other Warter of the U.S.

Middle Struve Slough Stormwater and Wetland Enhancement Project Area

Study Area Boundary

Map Reference Points

Storm Drain Culvert

Sample Points

Upland

Wetland

Potential Jurisdictional Waters

Freshwater Emergent Wetland

Himalayan Blackberry Wetland

Pacific Willow Wetland

Middle Struve Slough Channel

Non-jurisdictional Features

Ephemeral Drainage

Non-wetland Riparian Forest

N

1 inch=100 feet

0 50 100 200 Feet

Drawn By: J. Davilla, ESW
Date: 4/2/2021
Filepath: E:\Middle Struve Slough \Wetland Delineation

Appendix B. U.S. Army Corps Arid West Region Wetland Delineation Data Forms

Photo 1: NW 330 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP1

Investigator(s): Justin Davilla Section, Township, Range: S5, T12S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609004.145288 Long: 4087268.48801 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: PSS3E

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 _____	**Is the Sampled Area within a Wetland?** **Yes ___ No _____**
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Sample point located at edge of dense himalayan blackberry thicket immediately east of the low flow channel.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	95	Y	FAC
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Juncus patens	5	Y	FACW
2. Cyperus eragrostis	3	Y	FACW
3. Phalaris aquatica	2	N	FACU
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 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 8	x 2 =	16
FAC species 95	x 3 =	285
FACU species 2	x 4 =	8
UPL species _____	x 5 =	_____
Column Totals: 105 (A)		309 (B)

Prevalence Index = B/A = 2.94

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes _____ No _____**

Remarks:

Dominated almost entirely by Himalayan blackberry (FAC).

SOIL

Sampling Point: SP1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	98	10YR 5/4	2	C	M	silty clay	
12-18	10YR 2/1	100					silty clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

2% prominent redox in upper 12 inches of the soil profile meets F6 indicator.

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): 14

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Saturation observed below 12 inches but secondary indicators confirmed wetland hydrology.

Photo 2: WNW 290 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP2

Investigator(s): Justin Davilla Section, Township, Range: S5, T12S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609010.971881 Long: Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: N/A

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

Remarks:

Paired upland sample point in ruderal grassland east of SP-1

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size:____)			
1.	95	Y	FAC
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Phalaris aquatica	90	Y	FACU
2. Rumex crispus	10	N	FAC
3. Geranium dissectum	3	N	UPL
4.			
5.			
6.			
7.			
8.			
	103 = Total Cover		
Woody Vine Stratum (Plot size:____)			
1.			
2.			
	____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species 10	x 3 =	30
FACU species 90	x 4 =	360
UPL species 3	x 5 =	15
Column Totals: 103 (A)		405 (B)

Prevalence Index = B/A = 3.93

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes____No ____**

Remarks:

Dominated almost entirely by Harding grass (FACU).

SOIL

Sampling Point: SP2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/1	100					clay loam	
2-4	10YR 3/1	95	7.5YR 4/6	5	C	M	clay loam	
4-16	10YR 2/1	65	7.5YR 5/8	35	C	M	clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Prominent redox with relictual hydric soils clearly developed under previous, wetter aquic regime.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____ No _____ Depth (inches): _____

Water Table Present? Yes_____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

No evidence of contemporary wetland hydrology at this sampling location.

Photo 3: WSW 245 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP3

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609047.932894 Long: 4087341.03487 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: PSS3E/F

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 _____	**Is the Sampled Area within a Wetland?** **Yes ___ No _____**
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Wetland sample point located at the edge of a mixed willow thicket immediately east of the low flow channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	50	Y	FACW
2.			
3.			
4.			
	50 = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	30	Y	FAC
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Oenanthe sarmentosa	20	Y	FACW
2. Phalaris aquatica	5	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species 70	x 2 =	140
FAC species 30	x 3 =	90
FACU species 5	x 4 =	20
UPL species _____	x 5 =	_____
Column Totals: 95 (A)		250 (B)

Prevalence Index = B/A = 2.63

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes _____ No _____**

Remarks:

Overstory dominated by arroyo willow (FACW) with blackberry (FAC) and water parsley (OBL) co-dominant.

SOIL

Sampling Point: SP3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	98	10YR 5/6	2	C	M	silty clay	
12-18	10YR 3/1	100					silty clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

2% prominent redox in upper 12 inches of soil profile meets F6 hydric soil indicator.

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Standing water in shallow channel approximatly 2 feet west of this sample point location.

Photo 4: SSW 200 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP4

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609050.491494 Long: 4087400.20804 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: N/A

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 _____	**Is the Sampled Area within a Wetland?** **Yes_____No _____**
Hydric Soil Present?	Yes_____No _____	
Wetland Hydrology Present?	Yes_____No _____	

Remarks:

Paired upland sample point slightly upgradient and adjacent to wetland complex and SP-3.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	50 = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Phalaris aquatica	90	Y	FACU
2. Galium aparine	15	N	UPL
3. Raphanus sativus	5	N	UPL
4.			
5.			
6.			
7.			
8.			
	110 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species 90	x 4 =	360
UPL species 20	x 5 =	100
Column Totals: 110 (A)		460 (B)

Prevalence Index = B/A = 4.18

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes_____No _____

Remarks:

Sample point is domianted by opportunistic, non-hydrophyitc speices.

SOIL

Sampling Point: SP4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/2	100					sandy clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

No evidence of contemporary hydric soils at this sampling point location.

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Soil dry and flaky despite early May sampling date.

Photo 5: W 280 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP5

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609046.683502 Long: 4087400.88465 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: PEM1E/F

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 _____	**Is the Sampled Area within a Wetland?** **Yes ___ No _____**
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Sample point located at the edge of cattail dominated freshwater emergent wetland channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: ~100 sq ft)			
1. Typha latifolia	50	Y	OBL
2. Rumex crispus	20	Y	FAC
3. Phalaris aquatica	20	Y	FACU
4. Galium aparine	10	N	UPL
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____	= Total Cover	

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species		x 2 =	
FAC species	20	x 3 =	60
FACU species	20	x 4 =	80
UPL species	10	x 5 =	50
Column Totals:	100 (A)		240 (B)

Prevalence Index = B/A = 2.4

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes _____ No _____**

Remarks:

Sample point taken immediately adjacent to aquatic channel with standing/flowing water. Cattails located in channel; other plants adjacent in unwetted area.

SOIL

Sampling Point: SP5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	80					muck	
0-16	10YR 2/1	20					clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Mucky organic soil extending throughout the sampled 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) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- Salt Crust (B11)
- Biotic Crust (B12)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

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

Water Table Present? Yes _____ No _____ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): 6-16

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

*Several inches of standing water in channel immediately adjacent to sample point in narrow, slow flowing channel. Sample point is saturated beginning at 6 inches below the surface.

Photo 6: S 180 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP6

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609050.491494 Long: 4087400.20804 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: N/A

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 _____	**Is the Sampled Area within a Wetland?** **Yes_____No _____**
Hydric Soil Present?	Yes_____No _____	
Wetland Hydrology Present?	Yes_____No _____	

Remarks:

Prior to channel incision and other hydrologic modifications, this sample point was likely historically part of the Struve Slough wetland complex, but currently located in an upland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Phalaris aquatica	90	Y	FACU
2. Galium aparine	15	N	UPL
3.			
4.			
5.			
6.			
7.			
8.			
	105 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species 90	x 4 =	360
UPL species 15	x 5 =	75
Column Totals: 105 (A)		435 (B)

Prevalence Index = B/A = 4.14

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes_____No _____**

Remarks:

Sample point is domianted by opportunistic, non-hydrophyitc speices.

SOIL

Sampling Point: SP6

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/1	100					clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

No evidence of contemporary hydric soils at this sampling point location.

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Soil dry and flakey despite early May sampling date.

Photo 7: ESE 120 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP7

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609030.130925 Long: 4087400.21991 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: PEM1E

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 _____	**Is the Sampled Area within a Wetland?** **Yes ___ No _____**
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Sample point located in area recently cleared of blackberry and domianted by opportunistic hydrophytic vegetation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	50 = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	10	N	FAC
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Rumex salicifolius	50	Y	FACW
2. Epilobium ciliatum	20	Y	FACW
3. Epilobium brachycarpum	5	N	FAC
4. Lythrum hyssopifolium	2	N	OBL
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 2	x 1 =	2
FACW species 70	x 2 =	140
FAC species 15	x 3 =	45
FACU species _____	x 4 =	
UPL species _____	x 5 =	
Column Totals: 87 (A)		187 (B)

Prevalence Index = B/A = 2.14

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes _____ No _____**

Remarks:

Despite questionable contemporary wetland hydrology, the sample point is dominated by hydrophytes.

SOIL

Sampling Point: SP7

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	98	10YR 4/6	2	C	M	clay loam	
8-14	10YR 2/1	70	10YR 5/8	30	C	M	sandy clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Abrupt transtion from clay to sandy loam at 8 inches with prominent redoximorphic mottles throughout 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) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- Salt Crust (B11)
- Biotic Crust (B12)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Sample point was obviously wetter in the past but deep surface soil cracks indicate contemporary seasonal wetland hydrology.

Photo 8: ESE 185 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP8

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609038.666201 Long: 4087399.53209 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: N/A

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 _____	**Is the Sampled Area within a Wetland?** **Yes_____No _____**
Hydric Soil Present?	Yes_____No _____	
Wetland Hydrology Present?	Yes_____No _____	

Remarks:

Pairued upland sample point in recently cleared central portion of the slough on slightly elevated hummock surrounded by blackberry and cattail wetlands.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	5	N	FAC
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Phalaris aquatica	90	Y	FACU
2. Galium aparine	10	N	UPL
3. Raphanus sativus	2	N	UPL
4.			
5.			
6.			
7.			
8.			
	105 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species 5	x 3 =	15
FACU species 90	x 4 =	360
UPL species 12	x 5 =	60
Column Totals: 107 (A)		435 (B)

Prevalence Index = B/A = 4.07

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes_____No _____**

Remarks:

Sample point is domianted by opportunistic, non-hydrophyitc speices.

SOIL

Sampling Point: SP8

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR 3/1	100					clay	
10-14	10YR 4/2	98	10YR 5/8	2	C	M	sandy loam	alluvium
14-18	10YR 3/1	100					clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Despite mottling evident in sandy loam (alluvial) layer, this begins at 10 inches below the surface and does not meet the F6 (or other hydric soil) indicator.

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

No evidence of wetland hydrology at this sample point.

Photo 9: E 90 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 6/8/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP9

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

Landform (hillslope, terrace, etc.): Riparian Alluvial Terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C-Mediterranean California Lat: 609038.666201 Long: 4087399.53209 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: N/A-riparian

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 _____	**Is the Sampled Area within a Wetland?** **Yes_____ No ____**
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes_____No _____	

Remarks:

Non-wetland sample point in riparian forest. Likely located in a wetland under previous unalterted hydrologic regime, but currently lacks contempoary wetland hydrology.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiandra	70	Y	FACW
2.			
3.			
4.			
	70 = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	30	Y	FAC
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Hedera helix	20	Y	UPL
2. Hedera canariensis	5	N	UPL
3. Cyperus eragrostis	2	N	FACW
4. Galium aparine	2	N	FACU
5.			
6.			
7.			
8.			
	29 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 45 % Cover of Biotic Crust _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species 72	x 2 =	144
FAC species 30	x 3 =	90
FACU species 2	x 4 =	8
UPL species 25	x 5 =	125
Column Totals: 129 (A)		367 (B)

Prevalence Index = B/A = 2.84

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes _____ No _____**

Remarks:

Sample point located within upper portion of former Middle Struve Slough basin and dominaed by mature, woody phreatophytes likely established under more persisently wet conditions. Understory largely comprised of non-hydrophytes.

SOIL

Sampling Point: SP9

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 2/2	100					clay loam	
7-14	10YR 6/3	35					sandy clay	alluvial
7-14	10YR 2/2	58	7.5 YR 6/8	7	C	M	loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: roots

Depth (inches): 14

Hydric Soil Present? Yes_____ No _____

Remarks:

Below 7" soil matrix is depleted with prominent redox. This hydric soil condition likely formed under a previous hydrolgic regime prior to the slough being channelized. This area does not appear to flood regularly under the contemporary hydrologic regime.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____ No _____ Depth (inches): _____

Water Table Present? Yes_____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

No evidence of wetland hydrology at this sample point. Phreatophytes appear to be utilizing groundwater deeper than 12 inches for most of the year.

Photo 10: SE 130 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 6/8/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP10 Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609021.377288 Long: 4087359.10945 Datum: UTM 83 Soil Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: PEM1E

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 _____	**Is the Sampled Area within a Wetland?** **Yes ___ No _____**
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Sample point located in blackberry thicket wetland slightly upslope and west of the low-flow channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	98	Y	FAC
2.			
3.			
4.			
5.			
	98 = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Lythrum hyssopifolium	1	N	FACW
2. Helminthotheca echioides	1	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	2 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 2 % Cover of Biotic Crust _____

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 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 1	x 2 =	2
FAC species 99	x 3 =	297
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: 100 (A)		299 (B)

Prevalence Index = B/A = 2.99

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes _____ No _____**

Remarks:

Dominated almost entirely by a dense, nearly impenatrable thicket of Himalayan blackberry (FAC).

SOIL

Sampling Point: SP10

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/2	70	7.5YR 6/8	10	C	M	clay loam	
0-16	10YR 5/3	20					sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Some depletion observed in the profile but mainly redox dark surface (F6) indicator met at this sample point.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____ No _____ Depth (inches): _____

Water Table Present? Yes_____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Wetland hydrology was inferred by the presence of surface soil cracks and oxidzed rhizospheres.

Photo 11: S 180 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 6/12/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP11 Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609016.212389 Long: 4087363.75578 Datum: UTM 83 Soil Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: N/A

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 _____	**Is the Sampled Area within a Wetland?** **Yes_____No _____**
Hydric Soil Present?	Yes_____No _____	
Wetland Hydrology Present?	Yes_____No _____	

Remarks:

Paired upland sample point uplsope of SP-10 weedy ruderal slope.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Phalaris aquatica	50	Y	FACU
2. Raphanus sativus	30	Y	UPL
3. Galium aparine	15	N	FACU
4. Conium maculatum	15	N	FAC
5.			
6.			
7.			
8.			
	110 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species 10	x 3 =	30
FACU species 65	x 4 =	260
UPL species 30	x 5 =	150
Column Totals: 110 (A)		440 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes_____No _____**

Remarks:

Dominated by weedy, non-hydrophytes with invasive poison hemlock (FAC) subdominant.

SOIL

Sampling Point: SP11

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/2	100					clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

No evidence of hydric soil development at this sampling point.

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

No evidence of wetland hydrology at this sample point.

Photo 12: ESE 115 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 6/12/2021

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP12 Investigator(s): Justin Davilla Section, Township, Range: S5, T12S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 608983.267174 Long: 4087271.46475 Datum: UTM 83 Soil Map Unit Name: Aquents-flooded/174 Tierra-Watsonville Complex; 15-30 % slopes NWI classification: PSS3E

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 _____	**Is the Sampled Area within a Wetland?** **Yes ___ No _____**
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Sample point located in blackberry thicket wetland west and uplsope of low-flow channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	95	Y	FAC
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Conium maculatum	5	N	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 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 5	x 2 =	10
FAC species 95	x 3 =	285
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: 100 (A)		295 (B)

Prevalence Index = B/A = 2.95

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes _____ No _____**

Remarks:

Dominated by a dense thicket of blackberry with scattered poison hemlock.

SOIL

Sampling Point: SP12

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					clay	
8-16	10YR 2/1	96	10YR 5/6	4	C	M/PL	clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

4% prominent redox below 8 inches meets F6

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Marginal contemporary wetland hydrology but meets secondary indicators for wetland hydrology.

Photo 13: S 180 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 6/12/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP13 Investigator(s): Justin Davilla Section, Township, Range: S5, T12S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 608977.990715 Long: 4087272.89195 Datum: UTM 83 Soil Map Unit Name: Aquents-flooded/174 Tierra-Watsonville Complex; 15-30 % slopes NWI classification: N/A

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 _____	**Is the Sampled Area within a Wetland?** **Yes_____No _____**
Hydric Soil Present?	Yes_____No _____	
Wetland Hydrology Present?	Yes_____No _____	

Remarks:

Paired upland sample point on ruderal slope dominated by invasive weeds.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	2	N	FAC
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Raphanus sativus	70	Y	UPL
2. Conium maculatum	20	Y	FACW
3. Silybum marianum	10	N	UPL
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species 20	x 2 =	40
FAC species 2	x 3 =	6
FACU species _____	x 4 =	_____
UPL species 80	x 5 =	446
Column Totals: 102 (A)		446 (B)

Prevalence Index = B/A = 4.37

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes_____No _____**

Remarks:

Dominated by weedy species characteristic of disturbed uplands. Poison hemlock in clayey soils and do not appear to be associated with mesic soil conditions.

SOIL

Sampling Point: SP13

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/1	100					clay	
14-18	10YR 2/2	98	5YR 4/6	1	C	M	Clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Dark, low chroma soils but redox is below 14 inches and therefore does not meet F6 indicator for hydric soils.

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

No evidence of contemporary wetland hydrology at this sample point. Based on topographic position and redox below 14" this area may be below the historic slough indundation margin.

Appendix C. Representative Photographs of the Middle Struve Slough Stormwater and Wetland Enhancement Project Area

Above. Himalayan blackberry wetland sample point (SP-1) looking west (330°) in the southernmost portion of Middle Struve Slough.

Below. Paired upland sample point (SP-2)(290°) immediately east of SP-1 dominated by Harding Grass and other weedy species.

ECOSYSTEMS WEST
CONSULTING GROUP

Above. Wetland sample point (SP-3)(245°) at edge of mixed willow thicket wetland adjacent to low-flow channel in central portion of the Project Area.

Below. Freshwater emergent wetland dominated by cattails along low flow channel immediately south of non-wetland riparian forest.

ECOSYSTEMS WEST
CONSULTING GROUP

Above. Freshwater emergent marsh sample point (SP-5)(280°) along the east edge of cattails along low-flow channel.

Below. Non-wetland riparian sample point (SP-9) (90°) in Himalayan blackberry with willow and eucalyptus overstory in northernmost portion of the Project Area.

ECOSYSTEMS WEST
CONSULTING GROUP

Attachment D. Wetland Delineation Report for the Middle Struve Slough Stormwater and Wetland Enhancement Project Area

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DELINEATION OF AQUATIC RESOURCES SUBJECT TO STATE AND FEDERAL JURISDICTION FOR THE MIDDLE STRUVE SLOUGH STORMWATER AND WETLAND ENHANCEMENT PROJECT AREA WATSONVILLE, SANTA CRUZ COUNTY, CALIFORNIA

Prepared for

Watsonville Wetlands Watch
500 Harkins Slough Road
Watsonville, CA 95076
Contact: Jonathan Pilch
(831) 728-4106

Prepared by

EcoSystems West Consulting Group
180 7th Avenue Suite 201
Santa Cruz, CA 95062
Contact: Justin Davilla
(831) 429-6730

April 2021

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LIST OF TABLES

1 INTRODUCTION

The Middle Struve Slough Stormwater and Wetland Enhancement Project Area (Project Area) covers approximately 5.9 acres of property encompassing and immediately adjacent to Middle Struve Slough in the City of Watsonville, Santa Cruz County, California. The Project Area is bounded by Pennsylvania Drive to the north and east, Hope Drive to the west, and an existing paved footpath to the south (**Figure 1**).

On May 1 and June 8 and 12, 2020, staff senior ecologist Justin Davilla of Ecosystems West Consulting Group conducted a routine wetland delineation of the Project Area to determine the extent of potential aquatic resources subject to jurisdiction under Sections 401 and 404 of the Clean Water Act, and the Porter Cologne Water Quality Act. This report presents the results of this delineation.

1.1 Project Description

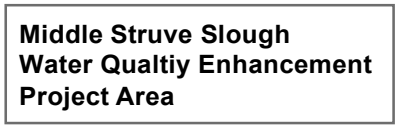
The Middle Struve Slough Stormwater and Wetland Enhancement Project will implement a series of measures to improve water quality associated with urban run-off and restore and enhance natural habitat within the Struve Slough watershed (Figure 2). Project work will entail construction of several best management practices to treat stormwater run-off prior to it entering Struve Slough as well as implementation of a wetland, riparian, and upland habitat enhancement and restoration plan. Struve Slough is one of the six fingers of the Watsonville Slough System complex, located at the southern end of Santa Cruz County within the City of Watsonville and surrounding residential, agricultural, and open space areas.

Specific design elements for stormwater and wetland enhancement include the following:

- Creation of two catchment basins on the upper, non-wetland slopes on the east and west embankments of Middle Struve Slough. The eastern catchment basin will replace an existing ephemeral channel used to direct water from a storm drain west of Pennsylvania Drive into the slough. The western basin will be fed by a new storm-drain system and outfall extending from Hope Drive to the west.
- Creation of three seasonal to semi-permanent wetland depressions within Middle Struve Slough to increase hydroperiod and enhance habitat functions and values in the slough. These features are situated primarily in areas supporting invasive Himalayan blackberry and will be planted with a suite of herbaceous native wetland vegetation.
- Removal of Himalayan blackberry and other invasive weeds and replacement with native wetland and riparian vegetation.
- Removal of invasive poison hemlock and Harding grass on the upland slopes and replace with non-native grassland vegetation.
- Placement of bilingual interpretative signage and educational materials describing the slough ecosystem, pollution prevention, stormwater management, and healthy water resources.

1.2 Driving Directions to the Middle Struve Project Area

The proposed Project is located in Watsonville, California east of Highway 1, and extending from Pennsylvania Drive in the north to a pedestrian footpath bisecting the slough at the same latitude as Firethorne Way to the south. The Project Area is primarily accessed from the paved trail system extending from Hope Drive Park to the west. Due to lack of available parking and sidewalks, access from Pennsylvania Drive to the north and east is not recommended.


Middle Struve Slough
Water Qualtiy Enhancement
Project Area

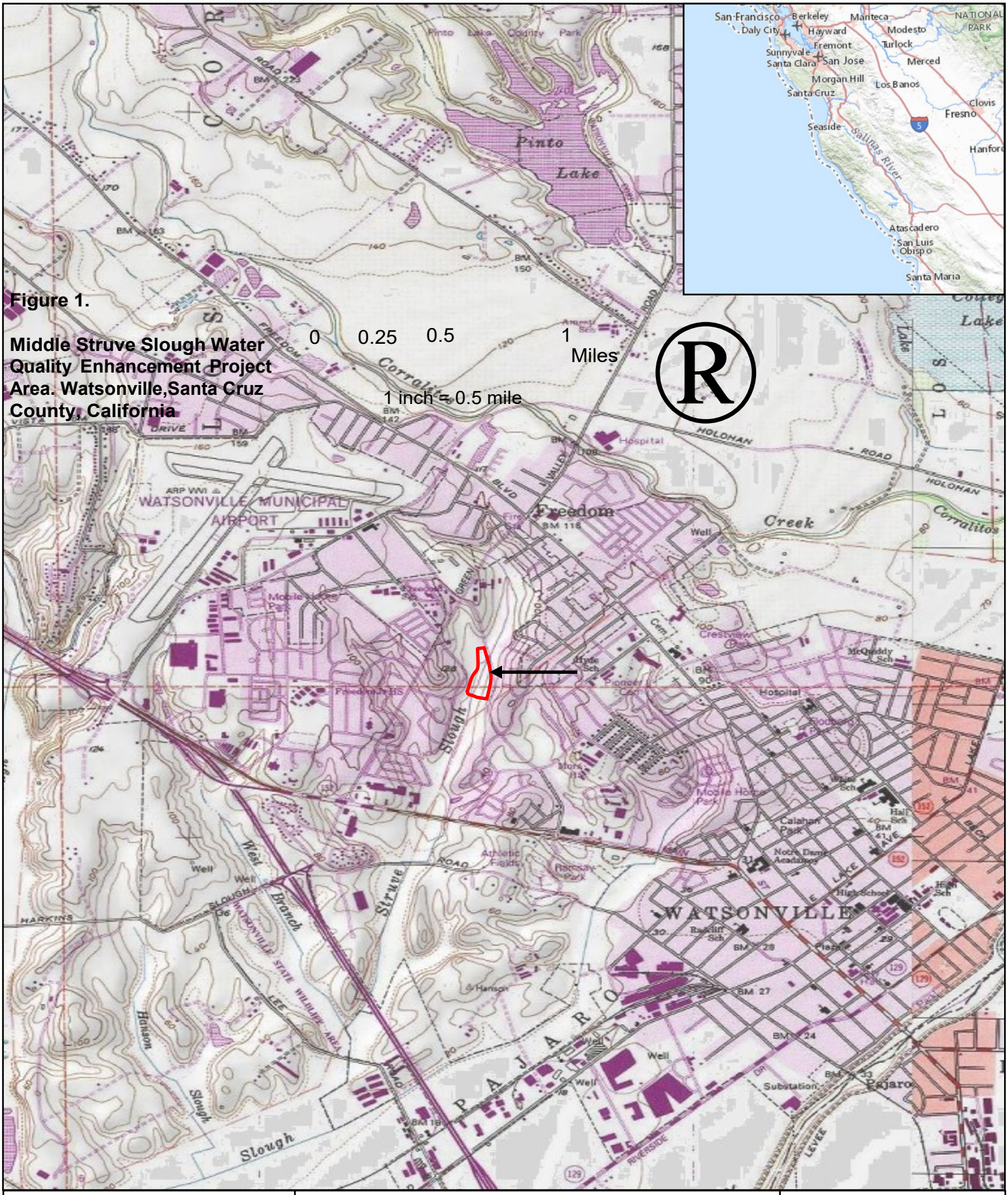


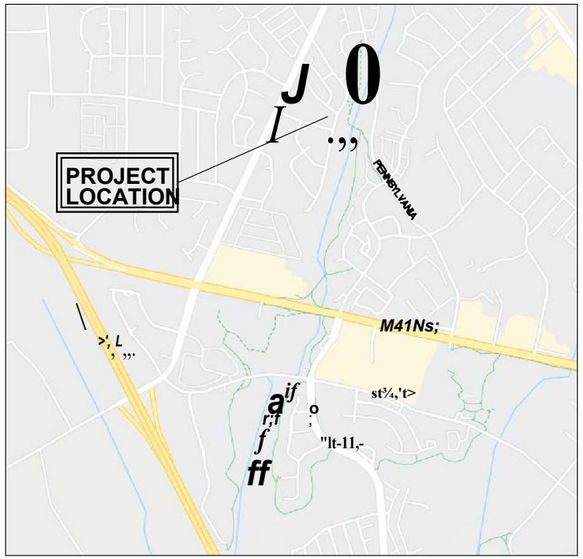
Figure 1.

Middle Struve Slough Water Quality Enhancement Project Area. Watsonville,Santa Cruz County, California

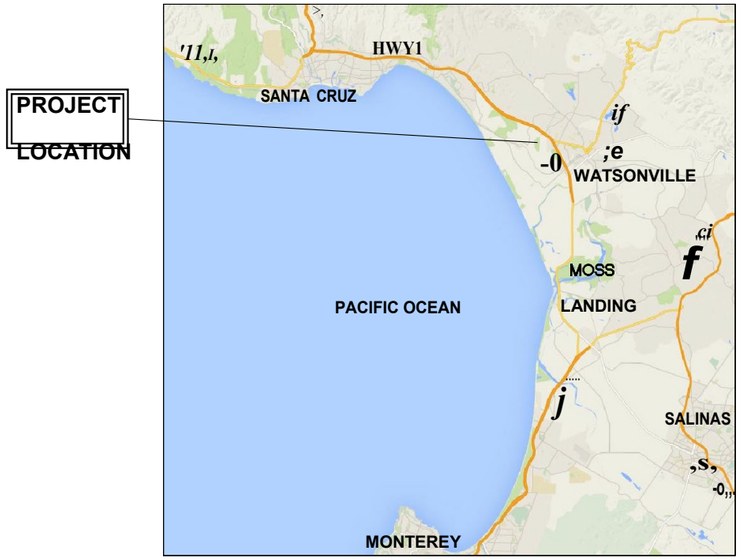
ECOSYSTEMS WEST CONSULTING GROUP

STRUVE SLOUGH WATER QUALITY ENHANCEMENTS PROJECT

SITES 2, 3, AND 4
30% DESIGN SUBMITTAL



VICINITY MAP
N.T.S. (GOOGLE)



REGIONAL MAP
N.T.S. (GOOGLE)

GENERAL NOTES

1. TOPOGRAPHIC MAPPING WAS PERFORMED BY:
   WATERWAYS CONSULTING, INC.
   509A SWIFT STREIT
   SANTA CRUZ, CA 95060
   SURVEY DATE; JANUARY 24, 2020.
2. ELEVATION DATUM: GPS TIES TO NAVD88 USING THE LE/CA GEOSYSTEMS SMARTNET GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) NETWORK.
3. BASIS OF BEARINGS: GPS TIES TO NAD83 CALIFORNIA STATE PLANE, ZONE 3 USING THE LE/CA GEOSYSTEMS SMARTNET GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) NETWORK.
4. AERIAL PHOTO SOURCE:
   MICROSOFT CORP.
5. CONTOUR INTERVAL IS ONE FOOT. ELEVATIONS AND DISTANCES SHOWN ARE IN DECIMAL FEIT
6. THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES ARE NOT SHOWN HEREON.
7. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE 2018 EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").
8. THESE DESIGNS ARE INCOMPLETE WITHOUT THE FINAL STAMPED TECHNICAL SPECIFICATIONS PREPARED BY WATERWAYS CONSULTING, INC. REFER TO TECHNICAL SPECIFICATIONS FOR DETAILS NOT SHOWN HEREON.

**** CALL BEFORE YOU DIG ****
CONTACT UNDERGROUND SERVICE ALERT (USA)
PRIOR TO ANY CONSTRUCT/ON WORK 1-800-227-2600

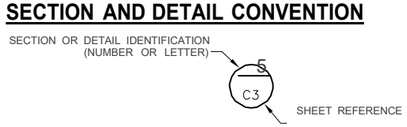
ABBREVIATIONS

AVG.	AVERAGE
CC	CONCRETE
CY	CUBIC YARDS
DIA.	DIAMETER
E	EXISTING
EG	EXISTING GROUND
ELEV.	ELEVATION
DI	DRAINAGE INLET
FG	FINISHED GRADE
FT	FEET
/NV	INVERT
MIN	MINIMUM
N	NEW
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
RC	RELATIVE COMPACTION
RSP	ROCK SLOPE PROTECTION
SPK	SPIKE
SQ.FT.	SQUARE FOOT
T	TREE
T.B.D.	TO BE DETERMINED
TYP	TYPICAL
UNK	UNKNOWN
WSE	WATER SURFACE ELEVATION
YR	YEAR

TREE SPECIES

BUC	BUCKEYE
OF	DOUGLAS FIR
0	OAK
T	TREE (SPECIES UNKNOWN)
W	WILLOW

SECTION AND DETAIL CONVENTION



PROJECT DESCRIPTION

THESE DRAWINGS PROVIDE 30% LEVEL DESIGN DETAILS FOR THE CREATION OF WETLAND DEPRESSIONS AND STORMWATER CATCHMENT BASINS WITHIN AND ADJACENT TO A PORTION OF STRUVE SLOUGH IN WATSONVILLE, CALIFORNIA.

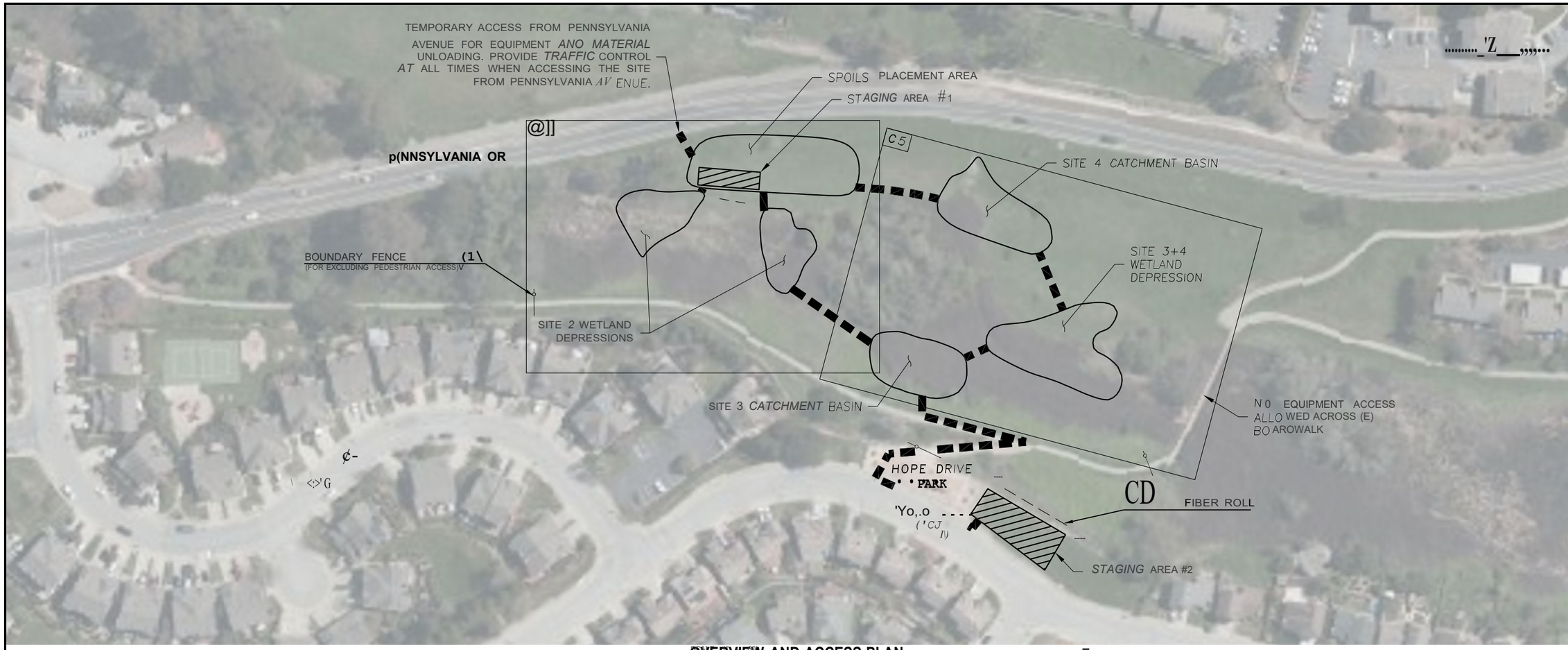
WETLAND DEPRESSIONS WILL BE EXCAVATED TO EXPAND AND ENHANCE EXISTING WETLAND AREAS THAT ARE CURRENTLY DOMINATED WITH NON-NATIVE BLACKBERRY BRAMBLES. STORMWATER CATCHMENT BASINS WILL BE CONSTRUCTED AT THE OUTFALL OF TWO STORMDRAIN NETWORKS TO PROVIDE FILTRATION AND TREATMENT OF SUBURBAN RUNOFF BEFORE IT ENTERS STRUVE SLOUGH.

SHEET INDEX

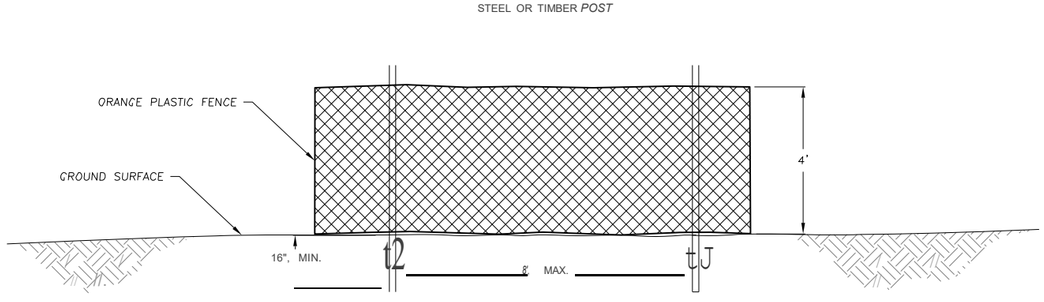
DESIGNED BY: B.M.Z
DRAWN BY: K.P.B.
CHECKED BY: B.M.Z
DATE: 1/29/2020
JOB NO.: 19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, *ADJUST* SCALES FOR REDUCED PLOTS

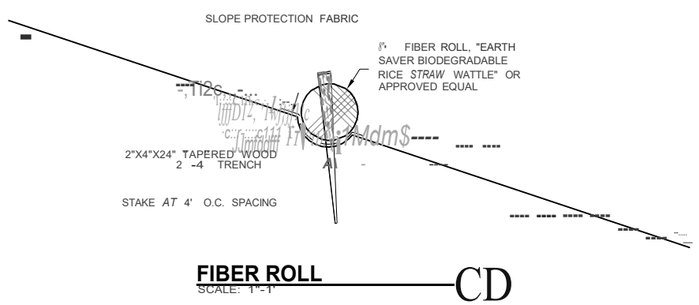
C1



OVERVIEW AND ACCESS PLAN



BOUNDARY FENCE
SCALE: 1"=2'



FIBER ROLL
SCALE: 1"=1'

ACCESS AND STAG/NG *AREA* NOTES

1. USE ONLY THE APPROVED ACCESS POINTS, AS SHOWN ON THE DRAWINGS. STOCKPILE MATERIALS WITHIN AN EXISTING FLAT AND PREVIOUSLY DISTURBED AREA.
2. THE ACCESS PLAN SHOWN ON THE DRAWINGS IS SCHEMATIC. SUBMIT A SITE ACCESS PLAN FOR APPROVAL BY THE ENGINEER, PRIOR TO MOBILIZATION.
3. CONTAIN THE DOWNSLOPE PERIMETER OF STAGING OR STOCKPILE AREAS WITH FIBER ROLLS.
4. STORE, MAINTAIN AND REFUEL ALL EQUIPMENT AND MATERIALS IN A DESIGNATED PORTION OF A STAGING AREA.

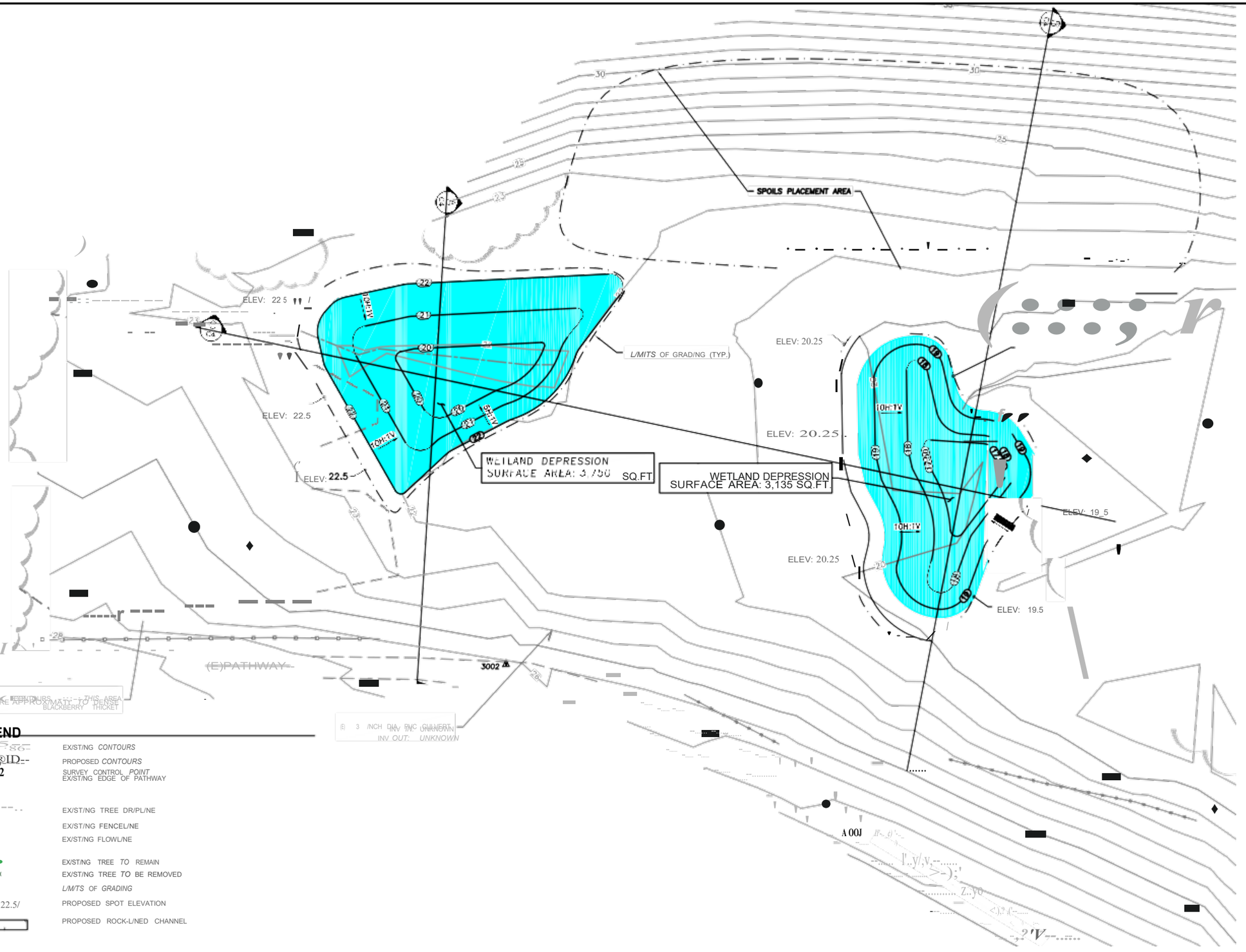
LEGEND

- PROPOSED BOUNDARY FENCE
- *STAG/NG* AREA
- *TEMPORARY* ACCESS *ROUTE*
- LIMITS OF GRADING
- PROPOSED FIBER ROLL

DESIGNED BY: B.M.Z
DRAWN BY: K.P.B.
CHECKED BY: B.M.Z
DATE: 1/29/2020
JOB NO.: 19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, *ADJUST* SCALES FOR REDUCED PLOTS
0" 1"

C2



SITE 2 GRADING AND IMPROVEMENTS PLAN

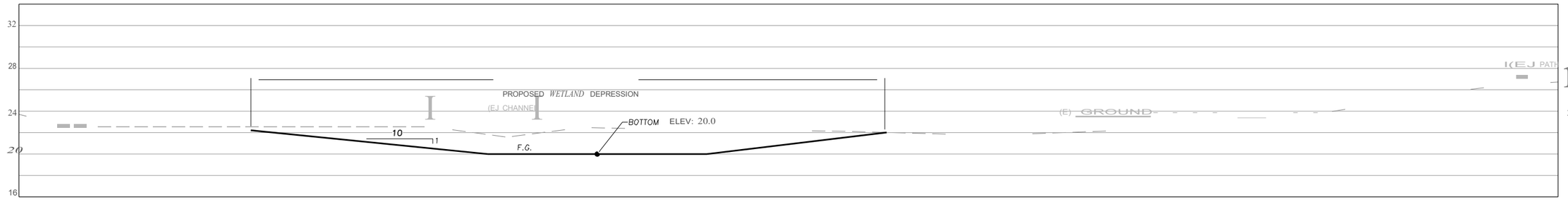
SCALE: 1" = 15'

DESIGNED BY: B.M.Z.
DRAWN BY: K.P.B.
CHECKED BY: B.M.Z.
DATE: 1/29/2020
JOB NO.: 19-005

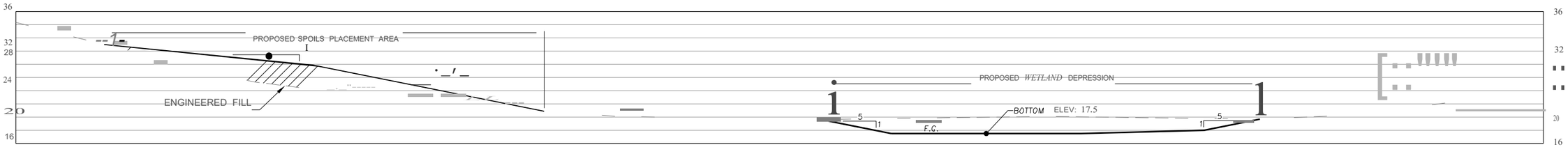
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS.

0 1"

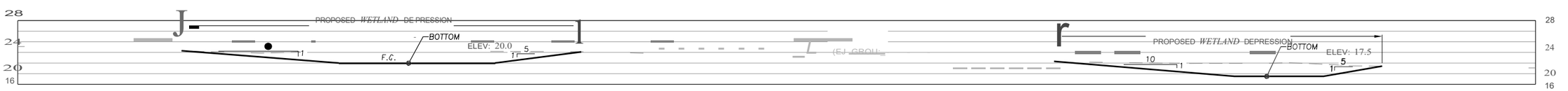
C3



SECTION ©
SCALE: 1" = 5'



SECTION ®
SCALE: 1" = 8'



SECTION ®
SCALE: 1" = 10'

DESIGNED BY: B.M.Z.
DRAWN BY: K.P.B.
CHECKED BY: B.M.Z
DATE: 1/29/2020
JOB NO.: 19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

C4

LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- 8.2 — SURVEY CONTROL POINT
- EXISTING EDGE OF PATHWAY
- EXISTING TREE DRIPLINE
- EXISTING FENCELINE
- EXISTING FLOWLINE
- EXISTING TREE *TO* REMAIN
- EXISTING TREE *TO* BE REMOVED
- LIMITS OF GRADING
- ELEV: 22.5 — PROPOSED SPOT ELEVATION
- PROPOSED ROCK-LINED CHANNEL

(E) 18 INCH DIA. HDPE CULVERT SLEEVED WITH PVC
INV IN: UNKNOWN
INV OUT: 28.6

LIMITS OF SACKED CONCRETE AND CONCRETE RUBBLE

PROTECT (E) TOYON

TOYON

SITE 4 CATCHMENT *BASIN* SURFACE AREA: 3,240 SQ.FT.

SPILLWAY CREST
ELEV: 22.0

ROCK-LINED CHANNEL (TYP.)

SITE 4 PROFILE

LIMITS OF GRADING (TYP.)

PROTECT (E) MULTISTEM BUCKEYE

PROTECT (E) MULTISTEM BUCKEYE

PEDESTRIAN BOARDWALK DECK ELEVATION 17.3

WETLAND DEPRESSION SURFACE AREA: 5,630 SQ.FT.

SITE 3 PROFILE

SITE 3 CATCHMENT *BASIN* SURFACE AREA: 2,715 SQ.FT.

SPILLWAY CREST
ELEV: 22.0

CONCRETE BOULDER ENERGY DISSIPATION BLOCK AND STEP, TYP.

INV IN: UNKNOWN
(E) 14 INCH DIA. CONCRETE CULVERT
INV OUT: 24.5

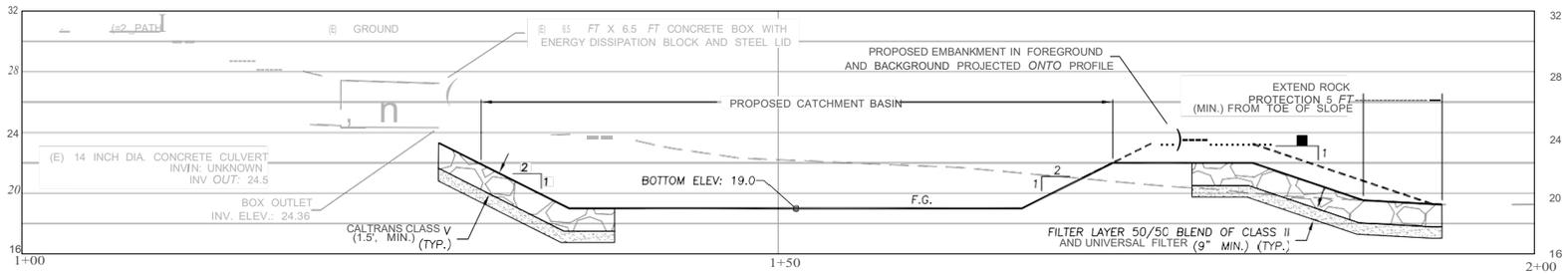
SITE 3 AND SITE 4 GRADING AND IMPROVEMENT PLAN

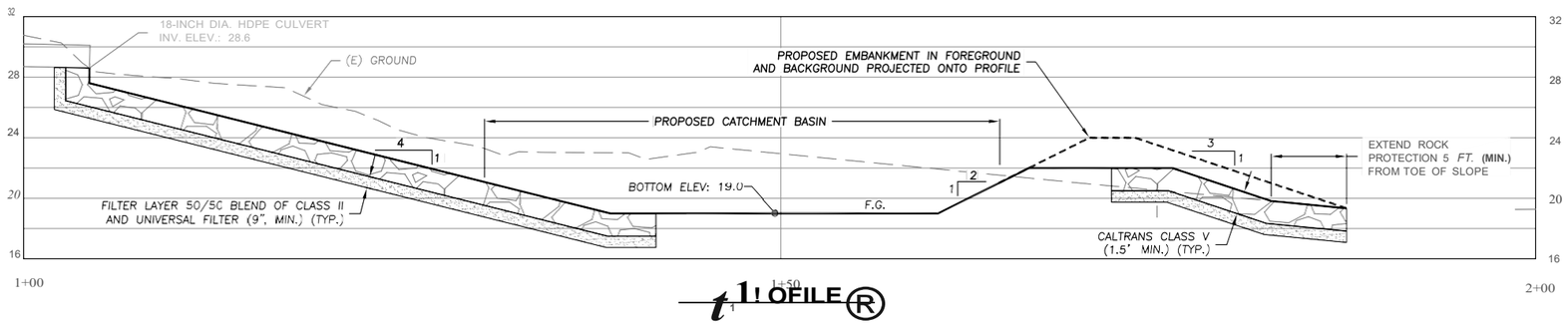
SCALE: 1" = 15'

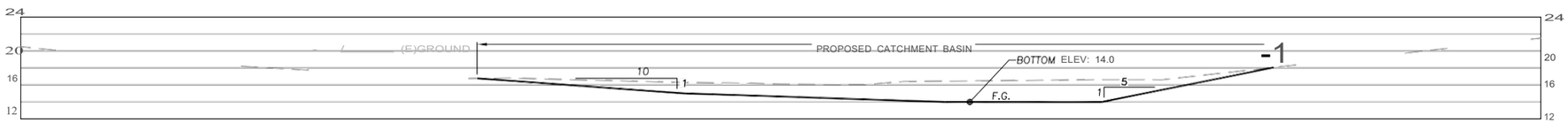
DESIGNED BY:	B.M.Z.
DRAWN BY:	K.P.B.
CHECKED BY:	B.M.Z.
DATE:	1/29/2020
JOB NO.:	19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, *ADJUST* SCALES FOR REDUCED PLOTS

C5







DESIGNED BY: B.M.Z.
DRAWN BY: K.P.B.
CHECKED BY: B.M.Z.
DATE: 1/29/2020
JOB NO.: 19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, *ADJUST* SCALES FOR REDUCED PLOTS

0 1"

C6

GENERAL NOTES

1. NOTIFY THE ENGINEER AT LEAST *48* HOURS PRIOR TO CONSTRUCTION. THE ENGINEER OR A DESIGNATED REPRESENTATIVE SHALL OBSERVE THE CONSTRUCTION PROCESS, AS NECESSARY TO ENSURE PROPER INSTALLATION PROCEDURES.

2. EXISTING UNDERGROUND UTILITY LOCATIONS:

   A. CALL UNDERGROUND SERVICE ALERT (1-800-642-2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.

   8. PRIOR TO BEGINNING WORK, CONTACT ALL UTILITIES COMPANIES WITH REGARD TO WORKING OVER, UNDER, OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.

   C. EXISTING UTILITY LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.

   D. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION.

   E. PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.

   F. TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.

   G. UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.

   H. UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.

3. IF DISCREPANCIES ARE DISCOVERED BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL LAWS, ORDINANCES, CODES, REQUIREMENTS, AND STANDARDS WHICH, IN ANY MANNER, AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.

5. ALL TESTS, INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN OFFICIAL INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE REQUIRED TESTS AND INSPECTIONS ARE PERFORMED.

6. PROJECT SCHEDULE: PRIOR TO COMMENCEMENT OF WORK, SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL A DETAILED CONSTRUCTION SCHEDULE. DO NOT BEGIN ANY CONSTRUCTION *WORK* UNTIL THE PROJECT SCHEDULE AND *WORK* PLAN IS APPROVED BY THE ENGINEER. ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER SO THAT THE QUALITY OF *WORK* CAN BE CHECKED FOR APPROVAL. PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.

9. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL. NEITHER THE PROFESSIONAL ACTIVITIES OF CONSULTANT NOR THE PRESENCE OF CONSULTANT OR HIS OR HER EMPLOYEES OR SUB-CONSULTANTS AT A CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR AND ITS SUBCONTRACTORS OF THEIR RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE HEALTH OR SAFETY REQUIREMENTS OF ANY REGULATORY AGENCY OR OF STATE LAW.

10. MAINTAIN A CURRENT, COMPLETE, AND ACCURATE RECORD OF ALL AS-BUILT DEVIATIONS FROM THE CONSTRUCTION AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS, FOR THE PURPOSE OF PROVIDING THE ENGINEER OF RECORD WITH A BASIS FOR THE PREPARATION OF RECORD DRAWINGS.

11. MAINTAIN THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. STORE ALL MATERIALS WITHIN APPROVED STAGING AREAS.

12. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL PERMIT CONDITIONS, LAWS, ORDINANCES, CODES, REQUIREMENTS ANO STANDARDS, WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION ANO THE MATERIALS USED IN THE CONSTRUCTION.

13. PROVIDE, AT CONTRACTOR'S SOLE EXPENSE, ALL MATERIALS, LABOR ANO EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS ANO REQUIREMENTS.

14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING ANO LAYOUT, UNLESS OTHERWISE SPECIFIED.

15. FIELD INSPECTIONS ANO OR THE PROVISION OF CONSTRUCTION STAKES DO NOT RELIEVE THE CONTRACTOR OF THEIR SOLE RESPONSIBILITY FOR ESTABLISHING ACCURATE CONSTRUCTED LINES ANO GRADES, AS SPECIFIED.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION ANO PRESERVATION OF ALL SURVEY MONUMENTS OR PROPERTY CORNERS. DISTURBED MONUMENTS SHALL BE RESTORED BACK TO THEIR ORIGINAL LOCATION ANO SHALL BE CERTIFIED BY A REGISTERED CIVIL ENGINEER OR LAND SURVEYOR AT THE SOLE EXPENSE OF THE CONTRACTOR.

EARTHWORK NOTES

1. ALL GRADING SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE SANTA CRUZ COUNTY GRADING ORDINANCE.

2. GRADING SUMMARY:

SITE 2 WETLANDS			
TOTAL CUT VOLUME	=	360	CY
TOTAL FILL VOLUME	=	0	CY
SITE 3 CATCHMENT BASIN			
TOTAL CUT VOLUME	=	225	CY
TOTAL FILL VOLUME	=	250	CY
SITE 4 CATCHMENT BASIN			
TOTAL CUT VOLUME	=	525	CY
TOTAL FILL VOLUME	=	200	CY
SITE 3+4 WETLAND			
TOTAL CUT VOLUME	=	330	CY
TOTAL FILL VOLUME	=	0	CY
TOTAL PROJECT			
TOTAL CUT VOLUME	=	1,440	CY
TOTAL FILL VOLUME	=	450	CY
NET CUT VOLUME	=	990	CY

THE ABOVE QUANTITIES ARE APPROXIMATE IN-PLACE VOLUMES CALCULATED AS THE DIFFERENCE BETWEEN EXISTING GROUND AND THE PROPOSED FINISH GRADE, PREPARED FOR PERMITTING PURPOSES ONLY. EXISTING GROUND IS DEFINED BY THE TOPOGRAPHIC CONTOURS ANO/OR SPOT ELEVATIONS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF WORK TO BE CONSTRUCTED. THE QUANTITIES HAVE NOT BEEN FACTORED TO INCLUDE ALLOWANCES FOR BULKING, CLEARING ANO GRUBBING, SUBSIDENCE, SHRINKAGE, OVER EXCAVATION, ANO RECOMPACTION, UNDERGROUND UTILITY AND SUBSTRUCTURE SPOILS AND CONSTRUCTION METHODS.

THE CONTRACTOR SHALL PERFORM AN INDEPENDENT EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING BID PRICES FOR EARTHWORK. THE BID PRICE SHALL INCLUDE COSTS FOR ANY NECESSARY IMPORT ANO PLACEMENT OF EARTH MATERIALS OR THE EXPORT ANO PROPER DISPOSAL OF EXCESS OR UNSUITABLE EARTH MATERIALS.

3. PRIOR TO COMMENCING WORK, PROTECT ALL SENSITIVE AREAS TO REMAIN UNDISTURBED WITH TEMPORARY FENCING, AS SHOWN ON THE DRAWINGS, AS SPECIFIED, OR AS DIRECTED BY THE ENGINEER.

4. 00 NOT OISTRURB AREAS OUTSIDE OF THE DESIGNATED LIMITS OF DISTURBANCE, UNLESS AUTHORIZED IN WRITING BY THE ENGINEER. THE COST OF ALL ADDITIONAL WORK ASSOCIATED WITH RESTORATION, ANO REVEGETATION OF DISTURBED AREAS OUTSIDE THE DESIGNATED LIMITS OF DISTURBANCE, AS SHOWN ON THE DRAWINGS, SHALL BE BORNE SOLELY BY THE CONTRACTOR.

5. DISPOSE OF ALL EXCESS SOIL ON SITE AT THE SPOILS PLACEMENT AREA IN ACCORDANCE WITH THESE NOTES ANO THE TECHNICAL SPECIFICATIONS.

6. CLEARING ANO GRUBBING, SUBGRAOE PREPARATION ANO EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 17 & 19 OF THE STANDARD SPECIFICATIONS, THESE DRAWINGS, ANO THE TECHNICAL SPECIFICATIONS.

7. PRIOR TO STARTING WORK ON THE PROJECT, SUBMIT FOR ACCEPTANCE BY THE ENGINEER A HAZARDOUS MATERIALS CONTROLS ANO SPILL PREVENTION PLAN. INCLUDE PROVISIONS FOR PREVENTING HAZARDOUS MATERIALS FROM CONTAMINATING SOIL OR ENTERING WATER COURSES, AND ESTABLISH A SPILL PREVENTION ANO COUNTERMEASURE PLAN.

9. UNLESS AUTHORIZED BY THE GEOTECHNICAL ENGINEER, THE FOLLOWING MATERIALS SHALL NOT BE INCORPORATED INTO THE WORK:

   A. ORGANIC MATERIALS SUCH AS PEAT, MULCH, ORGANIC SILT OR SOD.
   8. SOILS CONTAINING EXPANSIVE CLAYS.
   C. MATERIAL CONTAINING EXCESSIVE MOISTURE.
   0. POORLY GRADED COURSE MATERIAL.
   E. PARTICLE SIZES IN EXCESS OF *6* INCHES.
   F. MATERIAL WHICH WILL NOT ACHIEVE SPECIFIED DENSITY OR BEARING.

10. FINE GRADING ELEVATIONS, CONFORMS, AND SLOPES NOT CLEARLY SHOWN ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO DIRECT DRAINAGE TO PROTECTED DRAINAGE CONTROL STRUCTURES OR NATURAL WATERWAYS IN A MANNER THAT SUPPORTS THE INTENT OF THE DESIGN. ALL FINAL GRADING SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

11. THE TOP *6"* OF SUBGRAOE UNDER ALL PAVED SURFACES SUBJECT TO VEHICULAR USE SHALL BE COMPACTED TO A MINIMUM OF 95% RELATIVE COMPACTION, IN ACCORDANCE WITH ASTM-D1557. ALL OTHER FILL TO BE COMPACTED TO A MINIMUM OF 90% MAXIMUM DENSITY AS DETERMINED BY ASTM-01557 ANO SO CERTIFIED BY TESTS ANO REPORTS FROM THE CIVIL ENGINEER IN CHARGE OF THE GRADING CERT/FICA TION.

12. SPREAD FILL MATERIAL IN LIFTS OF APPROXIMATELY *8* INCHES, MOISTENED OR DRIED TO NEAR OPTIMUM MOISTURE CONTENT ANO RECOMPACTED. THE MATERIALS FOR ENGINEERED FILL SHALL BE APPROVED BY A REGISTERED CIVIL ENGINEER. ANY IMPORTED MATERIALS MUST BE APPROVED BEFORE BEING BROUGHT TO THE SITE. THE MATERIALS USED SHALL BE FREE OF ORGANIC MATTER AND OTHER DELETERIOUS MATERIALS.

13. ALL CONTACT SURFACES BETWEEN ORIGINAL GROUND AND RECOMPACTED FILL SHALL BE EITHER HORIZONTAL OR VERTICAL. ALL ORGANIC MATERIAL SHALL BE REMOVED AND THE REMAINING SURFACE SCARIFIED TO A DEPTH OF AT LEAST 12 INCHES, UNLESS DEEPER EXCAVATION IS REQUIRED BY THE ENGINEER.

14. REGULA TORY AGENCIES MAY REQUIRE A FINAL GRADING COMPLIANCE LETTER. WE CAN ONLY OFFER THIS LETTER IF WE ARE CALLED TO THE SITE TO OBSERVE AND TEST, AS NECESSARY, ANY GRADING AND EXCAVATION OPERATIONS FROM THE START OF CONSTRUCTION. WE CANNOT PREPARE A LETTER IF WE ARE NOT AFFORDED THE OPPORTUNITY OF OBSERVATION FROM THE BEGINNING OF THE GRADING OPERATION. THE CONTRACTOR MUST BE MADE AWARE OF THIS ANO EARTHWORK TESTING ANO OBSERVATION MUST BE SCHEDULED ACCORDINGLY. PLEASE CONTACT OUR OFFICE: (831) 421-9291.

EROSION CONTROL NOTES

1. THE EROSION CONTROL PLAN SHOWN IS INTENDED FOR THE SUMMER CONSTRUCTION SEASON (APRIL 15TH TO OCTOBER 15TH). IF THE DRAINAGE FEATURES SHOWN ON THESE DRAWINGS ARE NOT COMPLETED AND DISTURBED AREAS STABILIZED BY OCTOBER 1ST, CONSULT THE ENGINEER FOR ADDITIONAL RAINY SEASON EROSION CONTROL MEASURES.

2. PRIOR TO COMMENCING WORK, PROTECT AREAS TO REMAIN UNDISTURBED WITH ESA FENCING, AS SHOWN ON THE DRAWINGS. ADDITIONAL FENCING MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER.

3. UTILIZE ONLY THE APPROVED HAUL ROADS AND ACCESS POINTS (AS SHOWN ON THE DRAWINGS) FOR TRANSPORT OF MATERIALS AND EQUIPMENT.

4. BETWEEN OCTOBER 15 ANO APRIL 15, PROTECT EXPOSED SOIL FROM EROSION AT ALL TIMES. DURING CONSTRUCTION, SUCH PROTECTION MAY CONSIST OF MULCHING AND/OR PLANTING OF NATIVE VEGETATION OF ADEQUATE DENSITY. BEFORE COMPLETION OF THE PROJECT, STABILIZE ALL EXPOSED SOIL ON DISTURBED SLOPES AGAINST EROSION.

5. MAINTAIN A STANDBY CREW FOR EMERGENCY WORK AT ALL TIMES DURING THE RAINY SEASON (OCTOBER 15 THROUGH APRIL 15). STOCKPILE NECESSARY MATERIALS AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES.

6. CONSTRUCT TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THIS PLAN AND/OR AS DIRECTED BY THE ENGINEER TO CONTROL DRAINAGE WHICH HAS BEEN AFFECTED BY GRADING AND/OR TRENCHING OPERATIONS.

7. INCORPORATE ADEQUATE DRAINAGE PROCEDURES DURING THE CONSTRUCTION PROCESS TO ELIMINATE EXCESSIVE PONDING AND EROSION.

8. CONSTRUCT AND MAINTAIN EROSION CONTROL MEASURES TO PREVENT THE DISCHARGE OF EARTHEN MATERIALS FROM DISTURBED AREAS UNDER CONSTRUCTION AND FROM COMPLETED CONSTRUCTION AREAS.

9. INSTALL ALL PROTECTIVE DEVICES AT THE END OF EACH WORK DAY WHEN THE FIVE-DAY RAIN PROBABILITY EQUALS OR EXCEEDS 50 PERCENT AS DETERMINED FROM THE NATIONAL WEATHER SERVICE FORECAST OFFICE: WWW.SRH.NOAA.GOV.

10. AFTER EACH RAINSTORM, REMOVE ALL SILT AND DEBRIS FROM SEDIMENT CONTROL DEVICES.

11. THE EROSION CONTROL DEVICES ON THIS PLAN ARE A SCHEMATIC REPRESENTATION OF WHAT MAY BE REQUIRED. EROSION CONTROL DEVICES MAY BE RELOCATED, DELETED, OR ADDITIONAL ITEMS MAY BE REQUIRED DEPENDING ON THE ACTUAL SOIL CONDITIONS ENCOUNTERED, AT THE DISCRETION OF THE ENGINEER.

12. MAINTAIN ALL EROSION CONTROL DEVICES AND MODIFY THEM AS SITE PROGRESS DICTATES.

13. MONITOR THE EROSION CONTROL DEVICES DURING STORMS AND MODIFY THEM IN ORDER TO PREVENT PROGRESS OF ANY ONGOING EROSION.

14. CLEAN DAILY ANY EROSION OR DEBRIS SPILLING ONTO A PUBLIC STREET.

15. CONTACT THE ENGINEER IN THE EVENT THAT THE EROSION CONTROL PLAN AS DESIGNED REQUIRES ANY SUBSTANTIAL REVISIONS.

16. IMPLEMENT ALL REQUIRED BMP'S PRIOR TO COMMENCING SITE DISTURBING ACTIVITIES.

DUST CONTROL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS DUST CONTROL, THROUGHOUT THE CONSTRUCTION, IN ACCORDANCE WITH THE PERMIT CONDITIONS OF APPROVAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REGULAR CLEANING OF ALL MUD, DIRT, DEBRIS, ETC., FROM ANY AND ALL ADJACENT ROADS AND SIDEWALKS, AT LEAST ONCE EVERY 24 HOURS WHEN OPERATIONS ARE OCCURRING.

2. ALL DISTURBED AREAS, INCLUDING UNPAVED ACCESS ROADS OR STORAGE PILES, NOT BEING ACTIVELY UTILIZED FOR CONSTRUCTION PURPOSES, SHALL BE EFFECTIVELY STABILIZED OF DUST EMISSIONS USING WATER, CHEMICAL STABILIZER/SUPPRESSANT, OR VEGETATIVE GROUND COVER.

3. ALL GROUND-DISTURBING ACTIVITIES (E.G., CLEARING, GRUBBING, SCRAPING, AND EXCAVATION) SHALL BE EFFECTIVELY CONTROLLED OF FUGITIVE DUST EMISSIONS UTILIZING APPLICATION OF WATER OR BY PRE-SOAKING.

4. ALL MATERIALS TRANSPORTED OFFSITE SHALL BE COVERED OR EFFECTIVELY WETTED TO LIMIT DUST EMISSIONS.

5. FOLLOWING THE ADDITION OF MATERIALS TO, OR THE REMOVAL OF MATERIALS FROM, THE SURFACES OF OUTDOOR STORAGE PILES, SAID PILES SHALL BE EFFECTIVELY STABILIZED OF FUGITIVE DUST EMISSIONS UTILIZING SUFFICIENT WATER OR CHEMICAL STABILIZER/SUPPRESANT.

6. ONSITE VEHICLE SPEED ON UNPAVED SURFACES SHALL BE LIMITED TO 5 MPH.

7. DISTURBED AREAS SHALL BE SEEDED PRIOR TO OCTOBER 15TH OR EARLIER AS REQUIRED BY THE APPLICABLE PERMIT CONDITIONS.

DESIGNED BY: 8.M.Z
DRAWN BY: K.P.8.
CHECKED BY: 8.M.Z
DATE: 1/29/2020
JOB NO.: 19-005

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

1"

C7

To safely access the Project Area travelling south on California State Route 1 (Hwy 1), exit Main Street and turn north (left) onto Green Valley Road. Traveling north on Highway 1, exit Green Valley Road/Harkins Slough Road and turn north (right) onto Green Valley Road. Approximately ½ mile past the Green Valley Road and Main Street intersection, turn east (right) onto Maranatha Road. Turn north (left) onto Hope Drive and park adjacent to Hope Drive Park to access the trail into the Middle Struve Slough Project Area.

2 REGULATORY SETTING

2.1 *Section 404 of the Clean Water Act*

Section 404 of the Clean Water Act gives the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps) regulatory and permitting authority regarding the discharge of dredged or fills material into "navigable waters of the United States." Section 502(7) of the Clean Water Act defines navigable waters as "waters of the United States, including territorial seas." Section 328 of Chapter 33 in the Code of Federal Regulations defines the term "waters of the United States" as it applies to the jurisdictional limits of the authority of the Corps under the Clean Water Act. A summary of this definition of "waters of the U.S." in 33 CFR 328.3 includes:

(1) waters used in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(2) interstate waters and wetlands;
(3) "other waters" such as lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    i. used by interstate or foreign travelers for recreational or other purposes; or
    ii. from which fish or shellfish are taken and sold in interstate or foreign commerce; or
    iii. Which are for industrial purpose by industries in interstate commerce;
(4) impoundments of waters otherwise defined as waters of the United States;
(5) tributaries of other waters;
(6) the territorial seas;
(7) wetlands adjacent to waters.

Therefore, for the purpose of determining Corps jurisdiction under the Clean Water Act, "navigable waters" as defined in the Clean Water Act are the same as "waters of the U.S." defined in the Code of Federal Regulations above.

The limits of Corps jurisdiction under Section 404 as given in 33 CFR Section 328.4 are as follows:

(a) *Territorial seas:* three nautical miles in a seaward direction from the baseline;
(b) *Tidal waters of the U.S.:*
    i. extending up to the high tide line or
    ii. up to the limit of adjacent non-tidal waters;
(c) *Non-tidal waters of the U.S.:* ordinary high-water mark or limit of adjacent wetlands;
(d) *Wetlands:* to the limit of the wetland.

Section 328.3 of the Federal Code of Regulations defines wetlands as:

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

The delineation study determined the presence or absence of wetland indicators used by the Corps in making a jurisdictional determination. The three criteria used to delineate wetlands are the presence of: (1) hydrophytic (water-loving) vegetation, (2) hydric soils, and (3) wetland hydrology. According to the Corps Manual, evidence of at least one positive wetland indicator from each parameter must be found in order to make a positive determination.

2.2 *Section 401 of the Clean Water Act*

Section 401 of the CWA requires that any activities licensed or permitted under Section 404 which may result in discharges into "navigable Waters of the U.S." meet state water quality standards. In California, Section 401 certification is the responsibility of the State Water Resource Control Board (SWRCB) and nine statewide Regional Water Quality Control Boards (RWQCBs) pursuant to California Water Code Section 13160 and to California Code of Regulations Title 23, Sections 3830-3869. A Section 401 water quality certification ensures the project appropriately controls or mitigates for any adverse impacts to effluent water that may reduce water quality below state and federal standards.

2.3 *California Department of Fish and Wildlife*

Jurisdictional authority of the California Department of Fish and Wildlife over relatively permanent bodies of standing or flowing water is established under Sections 1600-1616 or the Fish and Game Code, which pertains to activities that would disrupt the natural flow or alter the channel, bed, or bank of any lake, river, or stream. The Fish and Game Code stipulates that it is unlawful to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any lake, river, or stream without notifying CDFW, proposing mitigation, and if determined to be necessary by the Department, entering into a Lake and Streambed Alteration Agreement (LSAA). The lateral extent of the watercourse is defined by CDFW as the top of the bank represented by the physical break in slope or the outward extent of the contiguous riparian canopy for woody vegetation rooted below the top of bank, whichever is greater.

The Wetlands Resources Policy of the CDFW states that the Fish and Game Commission strongly discourages development in, or conversion of wetlands, unless at a minimum, project mitigation assures that there will be "no net loss" of either wetland habitat values or acreage. The CDFW is also responsible for commenting on projects requiring ACOE permits under the Fish and Wildlife Coordination Act of 1958.

3 METHODS

Prior to conducting field surveys, available reference materials were reviewed, including the 1980 Soil Survey of Santa Cruz County (USDA, Soil Conservation Service (SCS)/Natural Resources Conservation Service (NRCS)), USFW National Wetland Inventory Maps, USGS National Hydrography Dataset, the Watsonville West USGS 7.5' quadrangle map, and available current and historical aerial photographs of the site. A focused evaluation of indicators of wetlands and waters was performed in the Project Area on May 1 and June 8 and 12, 2020. Subsequent site visits were made to the site in late 2020 and early 2021

to determine the extent of surface and subsurface wetland hydrology as well as dynamic interannual shifts in annual plant assemblages in response to variable seasonal rainfall amounts and patterns. The methods used in this study to delineate jurisdictional wetlands and waters are based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Corps Manual; Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (Arid West Supplement 2008). The routine method for wetland delineation described in the Corps Manual and Arid West Regional Supplement was used to identify areas potentially subject to Corps Section 404 jurisdiction within the Project Area. A general description of the Project Area, including plant communities present, topography and current and historical land use practices was also produced during the delineation visit. The methods for evaluating the presence of wetlands and other waters of the U.S. employed during the site visit are described in detail below.

3.1 Potential Section 404 Wetlands

Data on vegetation, hydrology, and soils collected at sample points during the delineation site visit were recorded on standard Corps wetland determination data forms for the Arid West Region. In general, sample points for this delineation were selected based on relatively homogeneous plots approximately 100 square-feet in area. Once an area was determined to be a potential jurisdictional wetland, its boundaries were mapped using resource grade GPS equipment (Trimble GeoExplorer XH) and overlaid on a high resolution, orthorectified aerial photo. The acreage of potential jurisdictional wetlands was calculated using ArcGIS software. Wetland indicators described in the Corps Manual and Arid West Regional Supplement that were used to make wetland determinations at each sample point in the Project Area are summarized below.

Vegetation

Plant species identified on the property were assigned a wetland indicator status according to the U.S. Fish and Wildlife Service list of plant species that occur in wetlands (Lichvar 2016). This wetland classification system is based on the expected frequency of occurrence in wetlands as shown in **Table 1.**

Plant species with an indicator status of OBL, FACW, and/or FAC are classified as hydrophytic vegetation according to methodology outlined in the Corps Manual. For the Arid West Supplement, plus (+) and minus (–) modifiers of these classifications are no longer used. For example, plants previously identified in Reed (1986) as FAC–, FAC, and FAC+ are all considered FAC under the Arid West Supplement.

Table 1. Wetland Indicator Status Categories for Vascular Plants

INDICATOR STATUS	SYMBOL	FREQUENCY
OBLIGATE	OBL	greater than 99%
FACULTATIVE WETLAND	FACW	67-99%
FACULTATIVE	FAC	34-66%
FACULTATIVE UPLAND	FACU	1-33%
UPLAND (Not Listed)	UPL/NL	less than 1%
NO INDICATOR	NI	Undetermined

The Arid West Supplement applies a stepwise approach to determining dominance by hydrophytic vegetation. The first procedure (Indicator 1) is the dominance test where the hydrophytic vegetation criterion is met when greater than 50 percent of the dominant plant species have a wetland indicator status rated OBL, FACW, and/or FAC. Dominant plant species are those that contribute more to the

character of the plant community than other species. For the dominance test, the delineator must apply the 50/20 rule where dominant plants are those that individually or collectively account for 50 percent of the total areal coverage of vegetation in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total. If the plant community passes the dominance test, then the vegetation is considered hydrophytic and no additional procedures are required.

If the plant community fails the dominance test, but indicators of hydric soil and wetland hydrology are both present, the delineator must apply Indicator 2 referred to as the "Prevalence Index". To calculate the Prevalence Index, at least 80 percent of the vegetation on the sample plot must be accurately identified and have assigned wetland indicator statuses. The Prevalence Index is a weighted average wetland indicator status of all plants in sampling unit where each indicator status is given a numerical code (OBL=1, FACW=2, FAC=3, FACU=4, NL/UPL=5) and weighting is by abundance based on absolute percent cover. The Prevalence index is calculated using the following formula:

$$PI = \frac{A_{OBL}+2A_{FACW}+3A_{FAC}+4A_{FACU}+5A_{UPL}}{A_{OBL}+A_{FACW}+A_{FAC}+A_{FACU}+A_{UPL}}$$

The Prevalence Index ranges from 1 to 5 and an index less than or equal to 3.0 indicates that hydrophytic vegetation is present. If the plant community fails the Prevalence Index, the delineator proceeds to Indicator 3.

Indicator 3 refers to morphological adaptations made by plants species for life in wetlands. Common adaptations include, but are not limited to, adventitious roots, multi-stemmed trunks, tussocks, and buttressing tree species. Morphological adaptations must be observed on more than 50 percent of the individuals of a FACU species in areas with evidence of hydric soil and wetland hydrology. These species are reassigned as FAC and all other species retain their published indicator statuses. The delineator then recalculates the dominance test (Indicator 1) and the Prevalence Index (Indicator 2) using FAC as an indicator for those species with morphological adaptations. The vegetation is now considered hydrophytic if either test is satisfied.

Hydrology

The Corps jurisdictional wetland hydrology criterion is satisfied if an area is inundated or saturated for a period sufficient to create anoxic soil conditions during the growing season (minimum of 14 consecutive days in the Arid West Region). In the Arid West Supplement, wetland hydrology indicators are broken down into four groups. Group A consists of direct observation of surface water or saturated soils; Group B consists of evidence of recent inundation; Group C consists of evidence of current or recent soil saturation; Group D consists of characteristics that indicate contemporary rather than historical wet conditions. Within each group, evidence of wetland hydrology can include direct ("primary") indicators, such as visible inundation or saturation, drift lines, and surface sediment deposits (including algal mats) and oxidized root channels, or indirect ("secondary") indicators, such as drainage patterns, the FAC-neutral test and saturation visible on recent aerial imagery. One primary indicator is sufficient to conclude that wetland hydrology is present. In the absence of primary indicators, two or more secondary indicators must be present to conclude that an area has adequate wetland hydrology. Primary and secondary hydrology indicators were used to determine if areas surrounding each sample point in the Project Area satisfied the Corps' hydrology criterion.

Soils

The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as:

> *"A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part."*
> (Federal Register July 13, 1994)

Soils formed over long periods of time under wetland (anaerobic) conditions often possess characteristics that indicate they meet the definition of hydric soils. Nearly all hydric soils exhibit characteristic morphologies that result from repeated periods of saturation or inundation, or both, for more than a few days. Characteristic hydric soil indicators observable in the field include: organic histosols and histic epipedons; sulfidic material; aquic or peraquic moisture regime; reducing soil conditions; soil colors (gleyed soils or soils with mottles and/or low chroma matrix); and iron and manganese concretions. Hydric mineral soils in the vicinity of the Project Area generally have a characteristic low matrix chroma and distinct or prominent redoximorphic mottles. Chroma designations are determined by comparing a soil sample with a standard Munsell soil color chart (GretagMacbeth 2000). Soil profiles at each sample point in the Project Area were described to include horizon depths, color, redoximorphic features, and texture to determine if the soils satisfy the ACOE criteria for hydric soils. The NRCS manual *Field Indicators of Hydric Soils in the United States* (Version 8.2)(USDA, NRCS 2018) was also used as a guide for determining hydric soils in the Project Area.

3.2 Non-wetland "Other Waters" of the U.S.

Areas that are inundated for sufficient duration and depth to exclude growth of hydrophytic vegetation, such as lakes and ponds, or convey water, such as streams, are also subject to Section 404 jurisdiction. Within Santa Cruz County and the central California Coast, these "other waters" can include intermittent and ephemeral streams, as well as lakes, mudflats, playas, arroyos, and rivers. The Project Area was concurrently evaluated for the presence of "other waters" at the time of the delineation site visit.

Areas delineated as "other waters" are characterized by an ordinary high-water mark (OHWM), defined as:

> *...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*
> (33 CFR Part 328.3)

"Other waters" are identified in the field by the presence of a defined river or stream bed, a bank, and evidence of the flow of water, or by the absence of emergent vegetation in ponds or lakes. Corps jurisdiction of waters in non-tidal areas extends to the ordinary high water (OHW) mark. "Other waters" within the Project Area were either mapped using sub-meter accuracy GPS units, or digitized using GIS software based on USGS topographic maps and aerial photograph interpretation.

3.3 Difficult Wetland Situations in the Arid West Region

The Arid West Supplement includes guidance for identifying problematic wetlands where indicators may be missing due to natural processes or recent disturbances. It includes examples of problem areas and

atypical situations described in the 1987 Corps Manual, as well other more challenging situations. Problem area wetlands are defined in the Arid West Supplement as "naturally occurring wetland types that lack indicators of hydrophytic vegetation, hydric soil, or wetland hydrology periodically due to normal seasonal or annual variability, or permanently due to the nature of soils or plant species on the site." Atypical situations are wetlands in which vegetation, soil or hydrology indicators are absent due to recent human activities or natural events. Where applicable, guidance outlined in the Arid West Supplement regarding difficult situations was followed during the routine wetland delineation.

3.4 Areas Exempt from Section 404 Jurisdiction

Some areas that meet the technical criteria for wetlands or waters may not be jurisdictional under Section 404 of the Clean Water Act. Included in this category are some man-induced wetlands which are areas that have developed at least some characteristics of naturally occurring wetlands due to either intentional or incidental human activities. Examples of man-induced wetlands include, but are not limited to, irrigated wetlands, stock ponds, drainage ditches excavated entirely in uplands, and dredged material disposal areas.

In addition, some isolated wetlands and waters may also be considered outside of Corps jurisdiction as a result of the Supreme Court's decision in *Solid Waste Agency of Northern Cook County (SWANCC) v. United States Army Corps of Engineers* (531 U.S. 159 (2001)). Isolated wetlands and waters are those areas that do not have a surface or groundwater connection to, and are not adjacent to a navigable "Waters of the U.S.", and do not otherwise exhibit an interstate commerce connection. In the Supreme Court decision *Rapanos v. United States* (547 U.S. 715 (2006)), the Court recommended further restrictions on federal jurisdiction over wetlands and required that a "significant nexus" test be applied to those wetlands and waters which are not "navigable". A joint memorandum issued in December 2008 and formalized in April 2011 provides guidance to the Corps and EPA for implementing the Supreme Court's significant nexus test. The *Rapanos* and *SWANCC* decisions are applicable for potential wetlands considered to lack a direct connection or significant nexus with navigable waters.

In this guidance, non-tidal ditches are not considered jurisdictional features unless they have a clearly defined bed, bank and ordinary high water mark; connect directly to a traditional navigable water (TNW), and have one of the five following characteristics: (1) natural stream that has been altered; (2) ditches excavated in waters of the U.S., including wetlands; (3) ditches that have relatively permanent flowing or standing water; (4) ditches that connect two or more jurisdictional waters of the U.S.; or (5) ditches that drain natural bodies of water (including wetlands) into a tributary system of a TNW or interstate water. Moreover, natural or man-made swales are not considered tributaries; however, ditches and swales may be considered jurisdictional if they meet the regulatory definition of "wetlands" (i.e. three parameters).

Navigable Waters Protection Rule (WOTUS)

On October 22, 2019 the Department of Defense (DOD), EPA and USACE published a final rule to repeal the 2015 Clean Water Rule, defining "Waters of the U.S." (DOD et al. 2019). This 2015 Rule was never implemented due to the 2017 Presidential Executive Order entitled "Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the 'Waters of the United States' Rule." Along with the repeal of the 2015 Rule, the 2019 Final Rule re-codifies the regulatory text that existed prior to the 2015 Rule outlined in the 2008 *Rapanos* joint memorandum (effective December 23, 2019).

On December 11, 2018, the EPA and the Corps signed the Proposed Rule: Revised Definition of "Waters of the U.S." (WOTUS) to clarify federal authority under the Clean Water Act consistent with the February 2017 Executive Order (USACE et al. 2019). The proposed definition would replace the pre-2015 (*Rapanos*) regulations. The Public Comment period on the Proposed Navigable Waters Protection Rule (WOTUS) closed on April 15, 2019. The final WOTUS Rule was published in the Federal Register on April 21, 2020 and became effective on June 22, 2020.

The final WOTUS Rule reduced the types of wetlands and other waters considered jurisdictional pursuant to the Clean Water Act. Features excluded from ACOE jurisdictional under the final rule include the following:

- Wetlands lacking direct surface water connectivity with Traditional Navigable Waters (TNWs) or with intermittent or perennial tributaries with direct connectivity to TNWs;
- Groundwater, including groundwater drained through subsurface drainage systems;
- Ephemeral features that flow only in direct response to precipitation including ephemeral streams, swales, gullies, rills, and pools;
- Diffuse stormwater runoff and directional sheetflow over uplands;
- Ditches that are not TNWs, tributaries to TNWs, or that are not constructed in adjacent wetlands;
- Prior converted cropland;
- Artificially irrigated areas that would convert to upland if irrigation ceases;
- Artificial lakes and ponds that are not jurisdictional impoundments and that are constructed in uplands or non-jurisdictional waters;
- Water filled depressions incidental to mining or construction activity, and pits excavated for the purposes of obtaining fill, sand or gravel;
- Stormwater control features constructed in uplands or non-jurisdictional waters to convey, treat, infiltrate, or store stormwater runoff;
- Groundwater recharge, water reuse, and wastewater recycling structures constructed in uplands or non-jurisdictional waters;
- Waste (sewer) treatment systems.

Under the Navigable Waters Protection Rule, the jurisdictional status of a wetland or waterbody is informed by understanding hydrologic conditions in a “typical year”, or the normal periodic range of precipitation and other climatic variables for a specific location. The rule does not specify methods in determining typical conditions but the ACOE and other agencies will generally rely on the web-based antecedent precipitation tool (APT) for the most recently available 30-year record. The APT defines “normal” as within the 30th and 70th percentile of the 30-year data set; i.e., normal is defined as no less than 30% of years are drier, and no less than 30% are wetter.

3.5 Wetlands and Waters of the State

Under California State law, “waters of the state" pertain to “any surface water or groundwater, including saline waters, within the boundaries of the state.” As a result, water quality laws and permitting authority apply to both surface and groundwater. In the absence of a federal nexus, the Porter-Cologne Water Quality Act (2002) assigns overall responsibility for water rights and water quality protection to the SWRCB and directs the RWQCBs to develop and enforce water quality standards within their boundaries.

Following the 2001 U.S. Supreme Court *SWANCC* decision, the SWRCB released a legal memorandum confirming the State’s jurisdiction over isolated wetlands. The memorandum stated that under the

California Porter-Cologne Water Quality Control Act, discharges to wetlands and other "waters of the state" are subject to State regulation, including wetlands isolated from navigable waters or their tributaries and those features included in the 2020 WOTUS Rule. In general, the RWQCB regulates discharge into non-jurisdictional wetlands and waters in much the same way as they do for Federal jurisdictional waters, using Porter-Cologne rather than Section 404 authority (SWRCB 2001). In the absence of a federal permit requirement, impacts to waters of the state, including wetlands, requires Waste Discharge Requirements (WDR) authorization from the RWQCB (SWRCB 2004).

4 PROJECT AREA DESCRIPTION

The approximately 5.9-acre Study Area extends from a paved footpath bisecting Middle Struve Slough to the south to the intersection of Pennsylvania Drive and Winding Road to the north. The Project Area includes the natural concave basin of the historic slough and slopes up towards Hope Drive Park to the west and Pennsylvania Drive to the east. The Project Area includes the areas proposed for stormwater and wetland enhancement to this segment of the larger of the larger Struve Slough complex. (**Figure 2**).

The Project Area is comprised of gentle to moderate slopes dominated by ruderal non-native grassland invasive poison hemlock transitioning into a flat to slightly concave bottom comprising a degraded segment of Struve Slough. The northern portion of the Project Area is dominated by mature mixed riparian forest and several mature mixed willow thickets occur within the lowland basin. The majority of Middle Struve Slough is dominated by a dense monospecific stand of Himalayan blackberry. A low-flow semi-permanent to perennial channel bisects this reach of the slough, but is almost entirely vegetated with emergent wetland plants except where it is situated within the riparian forest to the north. A paved pedestrian footpath runs along the western perimeter of the slough before turning east and transitioning to a boardwalk over the wetted channel along the southern portion of the Project Area and continuing south towards Main Street. Struve Slough is one of six fingers of the larger Watsonville Sloughs complex. The Project Area is surrounded by high-density urban residential development. Elevations range from approximately 20 to 60 feet above mean level.

Vegetation

Three non-wetland vegetation community/habitat types are present in the vicinity of the Project Area as described by Ecosystems West: ruderal non-native grassland, non-wetland riparian forest, and ruderal/developed.

Within the Middle Struve Slough Project Area, **ruderal non-native grasslands** are primarily situated east of Middle Struve Slough between the basin floor and the Pennsylvania Avenue. The ruderal grasslands within the Study Area are highly disturbed by regular mowing, litter, invasive weed introductions, and off-trail hiking. As a result, very few native species were present and indicator species for native coastal prairie, such as California oatgrass (*Danthonia californica*) and purple needlegrass (*Stipa pulchra*), were not-observed nor expected to occur. Ruderal non-native grassland occurs on nearly-level to moderate hillslopes throughout the majority of the eastern portion of the Study Area along Pennsylvania Drive. The non-native grassland is dominated by dense monospecific patches of Harding grass (*Phalaris aquatica*), particularly at the ecotone between wetland areas comprised almost entirely of Himalayan blackberry (*Rubus armeniacus*) associated with the slough basin. Other commonly occurring species found higher up the slope extending to the east towards Pennsylvania Drive include wild oats (*Avena* spp.), Italian ryegrass (*Festuca perennis*), brome grasses (*Bromus hordeaceus*, *B. diandrus*), barley (*Hordeum murinum* ssp. *leporinum*), six-weeks fescue (*Festuca bromoides*), cutleaf geranium (*Geranium dissectum*), poision

hemlock (*Conium maculatum),* dock (*Rumex spp*), and filarees (*Erodium* spp.). Because the area is frequently mowed, the grassland generally does not support shrubs or trees including coyote brush (*Baccharis piluaris*) and coast live oak (*Quercus agrifolia*) although they would be expected to colonize this area under an altered management regime. A large percentage of plant species identified within this habitat type are listed as invasive weeds with "moderate to high ecological impacts" by the California Invasive Plant Council (Cal-IPC) (2020).

Non-wetland riparian forest is situated in the northernmost portion of the Study Area where the flowing channel is riverine with a distinct bed and bank and lack of emergent herbaceous vegetation. This habitat type is comprised of mature trees with mostly closed canopy and relatively undeveloped understory of herbaceous plants and sub-shrubs. The overstory is comprised of Pacific willow (*Salix lasiandra*), blue and red gum eucalyptus (*Eucalyptus globulus, E. camaldulensis*), Monterey pine (*Pinus radiata*), and glossy privet (*Ligustrum lucidum*). The herbaceous understory is primarily Himalayan blackberry, English Ivy (*Hedera* spp.), flatsedge (*Cyperus eragrostis*), and creeping bedstraw (*Galium aparine*). Significant amounts of trampling, refuse and other impacts are associated with a transient encampment in this wooded area.

Ruderal vegetation is dominated by aggressive, opportunistic species including fennel (*Foeniculum vulgare*), cheeseweed (*Malva parviflora*), wild radish (*Raphanus sativus*), black mustard (*Brassica nigra*), and poison hemlock. Ruderal habitat is located on either side of the paved trail accessing Hill Park and the hillslope along the west side of the slough. Due to the proximity to roads, trails, and other ongoing disturbances, ruderal areas tend to persist over time and succession to other natural communities and wildlife habitat is limited.

Hydrology

The Project Area is situated in the Pajaro HUC-8, Pajaro River HUC-10, and Watsonville Slough Frontal HUC-12 Watersheds (NRCS 2020). The principal natural hydrological sources for the Project Area are direct precipitation, surface runoff, and subsurface sheet flow from adjacent uplands. Southerly flows through the slough system are largely conveyed through a narrow meandering channel situated at the low point of the basin originating in Upper Struve Slough at its terminus immediately east of Airport Boulevard.

The 2019-2020 rainfall year was slightly below normal for the Watsonville area. Using the nearest NOAA weather station data in Santa Cruz County (Watsonville Waterworks Weather Station), seasonal totals were approximately 89 percent of normal (**Table 2**). Although below the 30-year average, seasonal rainfall is within the range of normal precipitation for a typical year.

Table 2. 2018 to 2020 seasonal rainfall totals (inches) compared to 30-year average for Watsonville, CA (NOAA Watsonville Waterworks weather station).

Rain year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
1981-2010 average	0.01	0.02	0.21	1.10	2.74	4.25	4.46	4.68	3.63	1.69	0.60	0.11	**23.50**
2018-2019	0.02	0.00	0.00	0.10	3.70	2.65	5.23	7.37	5.07	0.38	1.87	0.09	**27.38**
2019-2020	0.01	0.02	0.01	0.00	0.56	10.09	1.94	0.00	4.51	3.02	0.67	0.04	**20.87**

Soils

The Santa Cruz County Soil Survey (USDA 1980) identifies four soil map units within the Project Area (**Figure 3**). These soils types are described in detail below.

- 103- Aquents, flooded
- 123- Cropley silty clay, 2 to 9 percent slopes
- 135- Elkhorn sandy loam, 15 to 30 percent slopes
- 174- Tierra-Watsonville complex, 15 to 30 percent slopes

The Soil Survey descriptions of these mapping units are presented below and includes whether the soils are classified as hydric or not according to the Hydric Soils List for Santa Cruz County (NRCS 2020).

103- Aquents, flooded

The Aquents soil type occurs in permanently inundated areas, typically submerged beneath perennial lentic and lotic waterbodies. This soil type is typically mucky and often gleyed due to prolonged anaerobic/anoxic conditions. Aquents are not formally listed as hydric by the NRCS but due to its occurrence in permanently flooded area, it is considered a hydric soil type. Within the Project Area, Aquents are mapped as occurring beneath the formerly inundated portions of Middle Struve Slough.

123- Cropley silty clay, 2 to 9 percent slopes

Cropley silty clay is a very deep, moderately well drained soil formed in alluvium from mixed rock sources and found on alluvial fans, floodplains and in small basins. In natural areas this soil type supports grassland and scattered live oak woodland. Cropley clay is commonly used for irrigated row crops, pasture, and fruit trees. The surface layer is typically a very dark gray hard, sticky clay extending to approximately 11 inches. Below this surface layer, soils are dark gray to black with coarse, blocky structure and very fine tubular pores. The shrink-swell potential is very high with cracks up to 2.5 inches extending up to 25 inches deep during the dry summer and fall months. This soil type is considered a hydric soil type by the NRCS in Santa Cruz County. Within the Study Area, this soil type is limited to a band of non-native grassland along the eastern perimeter of the site but likely occurs in non-flooded areas mapped as Aquents due to changes in the historic hydrologic regime of the slough.

Figure 3.

Soils Mapped within Middle Struve Slough Wetland Enhancement Project Area

Study Area Boundary

103- Aquents, flooded

123- Cropley silty clay, 2-9% slopes

135- Elkhorn sandy loam, 15-30% slopes

174-Tierra-Watsonville complex, 15-30% slopes

0 37.5 75 150 Feet

ECOSYSTEMS WEST CONSULTING GROUP

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye,

135 Elkhorn sandy loam- 15 to 30 percent slopes

Elkhorn sandy loam is a very deep, well-drained soil occurring in old alluvial fans and marine terraces. Elevations range from 20 to 800 feet and permeability is moderately slow. The surface layer is typically a very dark grayish brown or brown slightly acidic sandy loam about 21 inches thick. The subsoil extends to about 61 inches and is a pale brown and variegated light gray neutral sandy clay loam. This soil type is often depleted by erosion and rilling in cultivated and disturbed area. Effective rooting depth is 60 inches or more and the majority of areas supporting this soil type are cultivated for row crop agriculture and fruit orchards. This soil type also supports rangeland which is typically dominated by non-native grasses and forbs. Elkhorn slough is not classified as hydric by the NRCS but often contains inclusions of Watsonville loam, a hydric soil type. Within the Study Area, this soil type is limited to a small portion of non-wetland riparian forest in the northwest portion of the site but may also occur in areas mapped as Aquents due to changes in the historic hydrologic regime of the slough.

174 Tierra-Watsonville Complex- 15 to 30 percent slopes

Tierra-Watsonville Complex soils are comprised of approximately 55 percent Tierra sandy loam and 30 percent Watsonville loam. Also included in the complex are areas of Elkhorn sandy loam, Baywood sandy loam, Pfieffer gravelly loam, and Los Osos loam. This soil type is formed alluvial and marine terraces at elevations ranging from 20 to 1,200 feet.

The Tierra soil component is very deep and moderately well-drained with very slow permeability. The surface layer is a grayish brown and dark gray, slightly acidic sandy loam about 14 inches thick. Below this, the upper portion of the subsoil is a brown to light gray slightly acidic sandy clay and sandy clay loam approximately 23 inches thick. The lower part extends to a depth of 66 inches and is light gray and acidic clay and silty clay.

Watsonville loam is very deep and somewhat poorly drained with very slow permeability. Typically, the surface layer is a very dark grayish brown, slightly acidic loam about 12 inches thick. The subsurface layer is light a light gray, slightly acidic loam approximately 6 inches thick. The subsoil is about 21 inches thick and is pale brown and mixed light gray, slightly acidic clay. Below this, the substratum extends to 63 inches below the surface and is a mixed light gray, very pale brown and yellow slightly to medium acidic sandy clay loam.

Effective rooting depth is 60 inches or more and the majority of undeveloped areas supporting this soil type are used for range which is typically dominated by non-native grasses and forbs. Watsonville-Tierra complex is not classified as hydric by the NRCS but areas with higher prevalence of Watsonville loam, are considered hydric soil type. Within the Study Area, this soil type is limited to small areas of ruderal vegetation along the western perimeter of the site but may also occur in areas mapped as Aquents due to changes in the historic hydrologic regime of the slough.

5 RESULTS

Potential jurisdictional areas and sampling points are described in the following sections and shown on the enclosed map in **Appendix A**. Vegetation, soils, and hydrology data collected during the delineation site visit are reported on standard Arid West ACOE data forms presented in **Appendix B**. Photographs of representative sample points and wetland features are provided in **Appendix C**.

This report identifies all areas that met the 1987 ACOE Manual and Arid West Regional Supplement criteria as wetlands or possessed unvegetated, persistent open water with a discernable ordinary high-water

mark (OHWM) and could be classified as "other waters" of the United States. This delineation report provides the additional information necessary to make recommendations to the ACOE on those areas that are potentially jurisdictional and those which are not.

Wetland boundaries are typically determined in the field by the predominance of hydrophytic vegetation, evidence of wetland hydrology including soil saturation, ponding, the presence of organic muck, redoximorphic mottles and/or oxidized rhizospheres, and shifts in topographical (geomorphic) position.

5.1 Potential Section 404 Jurisdictional Wetlands

Four potential Section 404 jurisdictional wetlands were identified within the Middle Struve Slough Project Area. These areas met the criteria for hydrophytic wetland vegetation, hydric soils, and wetland hydrology at the time of the May and June 2020 wetland delineation field visits. When delineating wetland boundaries in the field, the transition between areas with still-green hydrophytic vegetation to areas dominated by desiccated, upland classified species were used to define the edge of the feature. Deep surface cracks in the clay soil were also used to distinguish the wetland boundaries. The 2020 delineation site visits were conducted during suitable phenological periods for identifying flowering plants to their infraspecific taxon and wetland indicator status. Furthermore, wetland hydrology indicators were clearly observed in this feature and generally consisted of Group A and B primary indicators including soil surface cracks and oxidized rhizospheres along living roots. Hydric soil development was supported by indicator F1 (loamy mucky mineral) or F6 (redox dark surface) comprised of low matrix chroma and distinct or prominent redox concentrations within the upper 12-inches of the profile.

Scrub-Shrub Wetlands

Blackberry Scrub-Shrub Wetland (BBW-1)(0.94 acres)

The majority of the Middle Struve Slough is dominated by an 0.94-acre contiguous thicket of invasive Himalayan blackberry (FAC) with very few other associated plants. At wetland sample points where blackberry was not ubiquitous, associated and co-dominant species include common rush (*Juncus patens*, FACW), willow dock (*Rumex salicifolius*, FACW), willowherb (*Epilobium ciliatum*, FACW), prickly ox tongue (*Helminthotheca echioides*, FAC), and hyssop loosestrife (*Lythrum hyssopifolium*, FACW). Himalayan blackberry is a viny, rhizomatous shrub that rapidly colonizes mesic, clayey soils. Within the Project Area, the nearly impenetrable blackberry thicket extends laterally on either side of the low-flow channel bisecting the slough in the low-lying and gently sloped portions of the basin. Occasionally, blackberry is mechanically cleared in Middle Struve Slough with the most recent removal occurring in July 2009. A component of the proposed Middle Struve Slough Stormwater and Wetland Enhancement includes removal of invasive Himalayan blackberry and replacement with native herbaceous wetland vegetation.

Mixed Willow Thicket Scrub-Shrub Wetlands (MWT-1, MWT-2)(0.58 acres)

Two closed canopy mixed willow thickets covering approximately 0.58 acres dominated by Pacific willow (*Salix lasiandra*, FACW) and arroyo willow (*Salix lasiolepis*, FACW) are situated along the slow-moving low-flow channel in the central and southernmost portion of the Project Area. The understory was relatively undeveloped but supported herbaceous species including flatsedge (*Cyperus eragrostis*, FACW), water parsley (*Oenanthe sarmentosa*, OBL), and curly dock (*Rumex crispus*, FAC). Willows are phreatophytes with deep taproots but require a year-round elevated water table for establishment and persistence. The principal source of hydrology is from the semi-permanently wetted channel, surface sheet flow from surrounding uplands, and elevated groundwater.

Herbaceous Wetlands

Freshwater Emergent Wetland (FEW-1)(0.12 acres)

Freshwater emergent wetlands occur in areas with persistent saturation or inundation in relatively still or slow-moving water bodies. This wetland type is characterized by vegetation that is submerged for a substantial portion of the growing season. These plant species typically occur in boggy areas or along the margins of ditches, ponds, lakes, creeks, and sloughs. Within the Project Area, freshwater emergent wetland is limited to the semi-permanently to permanently inundated low-flow channel in Middle Struve Slough. This slow-moving watercourse is almost entirely vegetated throughout this reach and supports dense emergent vegetation dominated by broadleaved cattail (*Typha latifolia;* OBL), water parsley, curly dock, and flatsedge. Within the area of the low-flow channel with prolonged inundation, soils are mucky and/or gleyed; however, at SP-5 near the edge of emergent vegetation, mineral soils exhibiting low chroma and evidence of prominent redoximorphic mottles were also observed in the profile. Freshwater emergent vegetation transitions abruptly into adjacent blackberry and mixed willow thicket wetlands where soil inundation is reduced at higher surrounding elevations.

5.2 Potential "Other Waters" of the U.S.

One potential non-wetland "other waters" of the U.S. is present within the Project Area. This includes the perennial, unvegetated open-water channel of Middle Struve Slough, as it flows into the subject property through a culvert beneath Pennsylvania Drive and contains a distinct bed and bank with an overstory of mixed willow riparian and eucalyptus trees. The channel reach is approximately 130 in length and 6 feet wide at the OHWM. The open water channel transitions abruptly into the freshwater cattail emergent wetland (FEW-1) as it exits the riparian forest to the south. The Struve Slough complex is connected via flood gate channels along the Pajaro River levee system to the Pacific Ocean, a Traditional Navigable Water (TNW).

5.3 Areas Potentially Exempt from CWA Sections 401 and 404 Jurisdiction

No areas identified by this delineation as 3-parameter wetlands are considered potentially exempt from jurisdiction under Sections 401 and 404 of the Clean Water Act. All wetlands and the open water segment of the Middle Struve Slough channel in the northernmost portion of the Project Area identified by this delineation are relatively permanent waters (RPWs) with direct connectivity to traditional navigable waters (TNWs), or are wetlands immediately adjacent to RPWs with direct surface hydrologic connectivity. These features are considered to be subject to regulatory permitting by the ACOE and RWQCB.

An 0.01-acre non-wetland ephemeral drainage originating at storm-drain/box culvert below Pennsylvania Drive in the central-eastern portion of the Project Area contains a distinct, albeit man-made, bed and bank. However, this ephemeral feature only conveys water into Middle Struve Slough during storm events. Upon enactment of the 2020 WOTUS Rule, ephemeral flowing watercourses are no longer considered jurisdictional Waters of the U.S. These features are still classified as Waters of the State and regulated by the RWQCB under the Porter Cologne Water Quality Act.

5.4 Difficult Situations in the Arid West Region

Blackberry is problematic as a vegetation wetland indicator in that it is equally likely to grow in wetlands and uplands. Due to the rhizomatous growth habitat and sharp thorns, it can be very difficult discern the transitional edge of a wetland dominated by this species. This is especially problematic in years with below average rainfall as hydrology indicators may be difficult to distinguish beyond soil characteristics (i.e. oxidized rhizospheres). To facilitate wetland delineation field efforts, a series of perpendicular transects

were cut into the blackberry bramble to properly situate sample points and demarcate the wetland edge. This delineation was especially problematic along the moderately sloped western edge of the slough. Transition between potential wetlands and uplands along the eastern edge were generally distinguishable by topographic landscape position and abrupt shifts in vegetative cover from FAC dominated plants to FACU and UPL classified species and at the time of the site visits. Nevertheless, the blackberry wetland (BBW-1) was delineated conservatively and may be depicted somewhat larger in area than would be observed if this feature were dominated by a different suite of plants.

5.5 Atypical Situations in the Arid West Region

Atypical situations include wetlands that are the result of unauthorized activities, natural events, or man-induced wetlands purposely or incidentally created by human activities. These include irrigated wetlands from agricultural runoff and impoundments (such as levees) that alter the natural hydrology of an area. No areas identified by this delineation are considered atypical.

5.6 Section 401 Water Quality Certification/Waste Discharge Requirement

A Section 401 Water Quality Certification would be required for any discharge into any Waters of the U.S., including wetlands, identified in this delineation. This certification is typically issued concurrently with a Section 404 Individual or Nationwide Permit pursuant to a verified wetland delineation and mitigation and monitoring plan (MMP) for impacts to wetlands and "other waters" subject to federal jurisdiction. In some instances, the RWQCB will seek additional protections and mitigation measures to ensure state and local water quality standards are upheld. For potential direct and indirect impacts to "waters of the state" or for exempt activities or projects with impacts too minimal in area to require a Section 404 permit, the RWQCB may require a Waste Discharge Requirement (WDR) order which functions like a permit and may include mitigation strategies, design modifications, and best management practices.

5.7 CDFW Lake and Streambed Alteration Agreement

Project activities below the break-in-bank of a flowing watercourse or within the dripline of a riparian corridor likely require a Section 1602 Lake and Streambed Alteration Agreement (LSAA) from the CDFW. Within the Project Area, any enhancements to the low-flow channel or removal of vegetation within the mixed riparian forest in the northern portion of the Project Area will require a Section 1602 notification to CDFW. Where required, a LSAA typically includes similar avoidance, minimization, and mitigation requirements of Section 401, 404, and/or WDR permits but may include additional mitigation measures including revegetation of non-wetland riparian vegetation, erosion control, and wildlife habitat protection and enhancement.

6 CONCLUSION

The Project Area contains four distinct features that met all three wetland indicators. These potential jurisdictional wetlands support a preponderance of hydrophytic vegetation with FAC, FACW, and OBL classified plants, hydric soils characterized by muck or low chroma soils with redoximorphic mottling, and wetland hydrology characterized by direct evidence of saturation or inundation, drainage patterns, soil surface cracks, topographical position, and oxidized root channels. Additionally, the unvegetated segment of the low-flow channel extending through the mixed riparian forest in the northern portion of the Project Area is considered potentially jurisdictional "other waters" of the U.S.

The five features identified by this delineation including the 3-parameter wetlands described above and the non-wetland riverine portion of the Middle Struve Slough channel are considered potentially jurisdictional under Sections 401 and 404 of the federal Clean Water Act as they relatively permanent waters (RPWs) or wetlands directly adjacent to and abutting RPWs with surface water connectivity to traditional navigable waters (TNWs). The ephemeral drainage extending from a culvert below Pennsylvania Drive is not subject to jurisdiction under Section 401 or 404 of the federal Clean Water Act but is regulated as Waters of the State under the Porter Cologne Water Quality Act. **Table 3** presents a summary of potentially jurisdictional wetlands and other waters identified by this delineation.

Table 3. Summary of Potential Jurisdictional Wetlands and Other Waters of the U.S. and State of California.

Wetland ID	NWI (Cowardian) Code	Potential Jurisdictional Regulatory Agency	Potential Jurisdictional Area (acres)
Scrub-Shrub Wetlands			
BBW-1	PSS3E	ACOE, RWQCB	0.94
MWT-1	PSS3E/F	ACOE, RWQCB	0.46
MWT-2	PSS3E/F	ACOE, RWQCB	0.12
Freshwater Emergent Wetland			
FEW-1	PEM1F/H	ACOE, RWQCB	0.12
Potential ACOE Jurisdictional Wetlands Total			**1.64 acres**
Non-Wetland "Other Waters" of the U.S.			
OW-1	R3UB1	ACOE, RWQCB, CDFW	0.02 acres
Potential ACOE Jurisdictional Other Waters Total			**0.02 acres**
Waters of the State			
ED-1	R4UB1	RWQCB	0.01 acres
Potential Jurisdictional Waters of the State			**0.01 acres**

The conclusions presented in this delineation are based on conditions observed at the time of the field visits conducted in May and June 2020 and subsequent site visits in winter 2020 and spring 2021 to confirm contemporary conditions reflect the results of this delineation.

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Appendix A. Map of Potential Jurisdictional Wetlands and Waters of the U.S. for the Middle Struve Slough Wetland Enhancement Project Area

ECOSYSTEMS WEST CONSULTING GROUP

Potential Jurisdictional Wetlands and Other Warter of the U.S.

Middle Struve Slough Stormwater and Wetland Enhancement Project Area

Study Area Boundary

Map Reference Points

Storm Drain Culvert

Sample Points

Upland

Wetland

Potential Jurisdictional Waters

Freshwater Emergent Wetland

Himalayan Blackberry Wetland

Pacific Willow Wetland

Middle Struve Slough Channel

Non-jurisdictional Features

Ephemeral Drainage

Non-wetland Riparian Forest

1 inch=100 feet

0 50 100 200 Feet

Drawn By: J. Davilla, ESW
Date: 4/2/2021
Filepath: E:\Middle Struve Slough \Wetland Delineation

Pennsylvania Drive

Winding Way

Hope Drive

-121.77562, 36.927421

-121.775995, 36.927394

-121.775995, 36.927394

FEW-1

SP-6

SP-5

SP-8

SP-9

SP-7

SP-10

SP-11

SP-4

SP-3

MWT-1

ED-1

BBW-1

SP-2

SP-1

MWT-2

SP-12

SP-13

Appendix B. U.S. Army Corps Arid West Region Wetland Delineation Data Forms

Photo 1: NW 330 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP1

Investigator(s): Justin Davilla Section, Township, Range: S5, T12S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609004.145288 Long: 4087268.48801 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: PSS3E

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 _____	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** _____
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Sample point located at edge of dense himalayan blackberry thicket immediately east of the low flow channel.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	95	Y	FAC
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Juncus patens	5	Y	FACW
2. Cyperus eragrostis	3	Y	FACW
3. Phalaris aquatica	2	N	FACU
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 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 8	x 2 =	16
FAC species 95	x 3 =	285
FACU species 2	x 4 =	8
UPL species _____	x 5 =	_____
Column Totals: 105 (A)		309 (B)

Prevalence Index = B/A = 2.94

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

Dominated almost entirely by Himalayan blackberry (FAC).

SOIL

Sampling Point: SP1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	98	10YR 5/4	2	C	M	silty clay	
12-18	10YR 2/1	100					silty clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

2% prominent redox in upper 12 inches of the soil profile meets F6 indicator.

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): 14

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Saturation observed below 12 inches but secondary indicators confirmed wetland hydrology.

Photo 2: WNW 290 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP2

Investigator(s): Justin Davilla Section, Township, Range: S5, T12S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609010.971881 Long: Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: N/A

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

Remarks:

Paired upland sample point in ruderal grassland east of SP-1

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size:____)			
1.	95	Y	FAC
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Phalaris aquatica	90	Y	FACU
2. Rumex crispus	10	N	FAC
3. Geranium dissectum	3	N	UPL
4.			
5.			
6.			
7.			
8.			
	103 = Total Cover		
Woody Vine Stratum (Plot size:____)			
1.			
2.			
	____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species 10	x 3 =	30
FACU species 90	x 4 =	360
UPL species 3	x 5 =	15
Column Totals: 103 (A)		405 (B)

Prevalence Index = B/A = 3.93

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes____ No ____**

Remarks:

Dominated almost entirely by Harding grass (FACU).

SOIL

Sampling Point: SP2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/1	100					clay loam	
2-4	10YR 3/1	95	7.5YR 4/6	5	C	M	clay loam	
4-16	10YR 2/1	65	7.5YR 5/8	35	C	M	clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Prominent redox with relictual hydric soils clearly developed under previous, wetter aquic regime.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____ No _____ Depth (inches): _____

Water Table Present? Yes_____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

No evidence of contemporary wetland hydrology at this sampling location.

Photo 3: WSW 245 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP3

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609047.932894 Long: 4087341.03487 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: PSS3E/F

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 _____	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** _____
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Wetland sample point located at the edge of a mixed willow thicket immediately east of the low flow channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	50	Y	FACW
2.			
3.			
4.			
	50 = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	30	Y	FAC
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Oenanthe sarmentosa	20	Y	FACW
2. Phalaris aquatica	5	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species 70	x 2 =	140
FAC species 30	x 3 =	90
FACU species 5	x 4 =	20
UPL species _____	x 5 =	_____
Column Totals: 95 (A)		250 (B)

Prevalence Index = B/A = 2.63

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

Overstory dominated by arroyo willow (FACW) with blackberry (FAC) and water parsley (OBL) co-dominant.

SOIL

Sampling Point: SP3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	98	10YR 5/6	2	C	M	silty clay	
12-18	10YR 3/1	100					silty clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

2% prominent redox in upper 12 inches of soil profile meets F6 hydric soil indicator.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____ No _____ Depth (inches): _____

Water Table Present? Yes_____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Standing water in shallow channel approximatly 2 feet west of this sample point location.

Photo 4: SSW 200 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP4

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609050.491494 Long: 4087400.20804 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: N/A

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 _____	**Is the Sampled Area within a Wetland?** **Yes_____No _____**
Hydric Soil Present?	Yes_____No _____	
Wetland Hydrology Present?	Yes_____No _____	

Remarks:

Paired upland sample point slightly upgradient and adjacent to wetland complex and SP-3.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
	50 = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Phalaris aquatica	90	Y	FACU
2. Galium aparine	15	N	UPL
3. Raphanus sativus	5	N	UPL
4.			
5.			
6.			
7.			
8.			
	110 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species 90	x 4 =	360
UPL species 20	x 5 =	100
Column Totals: 110 (A)		460 (B)

Prevalence Index = B/A = 4.18

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes_____No _____**

Remarks:

Sample point is domianted by opportunistic, non-hydrophyitc speices.

SOIL

Sampling Point: SP4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/2	100					sandy clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes_____ No _____

Remarks:

No evidence of contemporary hydric soils at this sampling point location.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____ No _____ Depth (inches): _____

Water Table Present? Yes_____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Soil dry and flaky despite early May sampling date.

Photo 5: W 280 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP5

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609046.683502 Long: 4087400.88465 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: PEM1E/F

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 _____	**Is the Sampled Area within a Wetland?** **Yes ___ No _____**
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Sample point located at the edge of cattail dominated freshwater emergent wetland channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: ~100 sq ft)			
1. Typha latifolia	50	Y	OBL
2. Rumex crispus	20	Y	FAC
3. Phalaris aquatica	20	Y	FACU
4. Galium aparine	10	N	UPL
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____	= Total Cover	

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	_____	x 2 =	_____
FAC species	20	x 3 =	60
FACU species	20	x 4 =	80
UPL species	10	x 5 =	50
Column Totals:	100 (A)		240 (B)

Prevalence Index = B/A = 2.4

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes _____ No _____**

Remarks:

Sample point taken immediately adjacent to aquatic channel with standing/flowing water. Cattails located in channel; other plants adjacent in unwetted area.

SOIL

Sampling Point: SP5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	80					muck	
0-16	10YR 2/1	20					clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Mucky organic soil extending throughout the sampled 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) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- Salt Crust (B11)
- Biotic Crust (B12)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

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

Water Table Present? Yes _____ No _____ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): 6-16

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

*Several inches of standing water in channel immediately adjacent to sample point in narrow, slow flowing channel. Sample point is saturated beginning at 6 inches below the surface.

Photo 6: S 180 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP6

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609050.491494 Long: 4087400.20804 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: N/A

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 _____	**Is the Sampled Area within a Wetland?** **Yes_____No _____**
Hydric Soil Present?	Yes_____No _____	
Wetland Hydrology Present?	Yes_____No _____	

Remarks:

Prior to channel incision and other hydrologic modifications, this sample point was likely historically part of the Struve Slough wetland complex, but currently located in an upland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Phalaris aquatica	90	Y	FACU
2. Galium aparine	15	N	UPL
3.			
4.			
5.			
6.			
7.			
8.			
	105 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species 90	x 4 =	360
UPL species 15	x 5 =	75
Column Totals: 105 (A)		435 (B)

Prevalence Index = B/A = 4.14

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes_____No _____**

Remarks:

Sample point is domianted by opportunistic, non-hydrophyitc speices.

SOIL

Sampling Point: SP6

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/1	100					clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes_____No _____

Remarks:

No evidence of contemporary hydric soils at this sampling point location.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____No _____ Depth (inches): _____

Water Table Present? Yes_____No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes_____No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Soil dry and flakey despite early May sampling date.

Photo 7: ESE 120 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP7

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609030.130925 Long: 4087400.21991 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: PEM1E

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 _____	**Is the Sampled Area within a Wetland?** **Yes ___ No _____**
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Sample point located in area recently cleared of blackberry and domianted by opportunistic hydrophytic vegetation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	50 = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	10	N	FAC
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Rumex salicifolius	50	Y	FACW
2. Epilobium ciliatum	20	Y	FACW
3. Epilobium brachycarpum	5	N	FAC
4. Lythrum hyssopifolium	2	N	OBL
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 2	x 1 =	2
FACW species 70	x 2 =	140
FAC species 15	x 3 =	45
FACU species _____	x 4 =	
UPL species _____	x 5 =	
Column Totals: 87 (A)		187 (B)

Prevalence Index = B/A = 2.14

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes _____ No _____**

Remarks:

Despite questionable contemporary wetland hydrology, the sample point is dominated by hydrophytes.

SOIL

Sampling Point: SP7

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	98	10YR 4/6	2	C	M	clay loam	
8-14	10YR 2/1	70	10YR 5/8	30	C	M	sandy clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Abrupt transtion from clay to sandy loam at 8 inches with prominent redoximorphic mottles throughout 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) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- Salt Crust (B11)
- Biotic Crust (B12)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____ No _____ Depth (inches): _____

Water Table Present? Yes_____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Sample point was obviously wetter in the past but deep surface soil cracks indicate contemporary seasonal wetland hydrology.

Photo 8: ESE 185 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 5/1/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP8

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609038.666201 Long: 4087399.53209 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: N/A

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 _____	**Is the Sampled Area within a Wetland?** **Yes_____No _____**
Hydric Soil Present?	Yes_____No _____	
Wetland Hydrology Present?	Yes_____No _____	

Remarks:

Pairued upland sample point in recently cleared central portion of the slough on slightly elevated hummock surrounded by blackberry and cattail wetlands.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	5	N	FAC
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Phalaris aquatica	90	Y	FACU
2. Galium aparine	10	N	UPL
3. Raphanus sativus	2	N	UPL
4.			
5.			
6.			
7.			
8.			
	105 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species 5	x 3 =	15
FACU species 90	x 4 =	360
UPL species 12	x 5 =	60
Column Totals: 107 (A)		435 (B)

Prevalence Index = B/A = 4.07

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes_____No _____**

Remarks:

Sample point is domianted by opportunistic, non-hydrophyitc speices.

SOIL

Sampling Point: SP8

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	100					clay	
10-14	10YR 4/2	98	10YR 5/8	2	C	M	sandy loam	alluvium
14-18	10YR 3/1	100					clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes_____ No _____

Remarks:

Despite mottling evident in sandy loam (alluvial) layer, this begins at 10 inches below the surface and does not meet the F6 (or other hydric soil) indicator.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____ No _____ Depth (inches): _____

Water Table Present? Yes_____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

No evidence of wetland hydrology at this sample point.

Photo 9: E 90 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 6/8/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP9

Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

Landform (hillslope, terrace, etc.): Riparian Alluvial Terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C-Mediterranean California Lat: 609038.666201 Long: 4087399.53209 Datum: UTM 83 Soil

Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: N/A-riparian

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 _____	**Is the Sampled Area within a Wetland?** **Yes_____No _____**
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes_____No _____	

Remarks:

Non-wetland sample point in riparian forest. Likely located in a wetland under previous unalterted hydrologic regime, but currently lacks contempoary wetland hydrology.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiandra	70	Y	FACW
2.			
3.			
4.			
	70 = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	30	Y	FAC
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Hedera helix	20	Y	UPL
2. Hedera canariensis	5	N	UPL
3. Cyperus eragrostis	2	N	FACW
4. Galium aparine	2	N	FACU
5.			
6.			
7.			
8.			
	29 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 45 % Cover of Biotic Crust _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species 72	x 2 =	144
FAC species 30	x 3 =	90
FACU species 2	x 4 =	8
UPL species 25	x 5 =	125
Column Totals: 129 (A)		367 (B)

Prevalence Index = B/A = 2.84

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes _____ No _____**

Remarks:

Sample point located within upper portion of former Middle Struve Slough basin and dominaed by mature, woody phreatophytes likely established under more persisently wet conditions. Understory largely comprised of non-hydrophytes.

SOIL

Sampling Point: SP9

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 2/2	100					clay loam	
7-14	10YR 6/3	35					sandy clay	alluvial
7-14	10YR 2/2	58	7.5 YR 6/8	7	C	M	loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: roots

Depth (inches): 14

Hydric Soil Present? Yes_____ No _____

Remarks:

Below 7" soil matrix is depleted with prominent redox. This hydric soil condition likely formed under a previous hydrolgic regime prior to the slough being channelized. This area does not appear to flood regularly under the contemporary hydrologic regime.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____ No _____ Depth (inches): _____

Water Table Present? Yes_____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

No evidence of wetland hydrology at this sample point. Phreatophytes appear to be utilizing groundwater deeper than 12 inches for most of the year.

Photo 10: SE 130 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 6/8/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP10 Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609021.377288 Long: 4087359.10945 Datum: UTM 83 Soil Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: PEM1E

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 _____	**Is the Sampled Area within a Wetland?** **Yes ___ No _____**
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Sample point located in blackberry thicket wetland slightly upslope and west of the low-flow channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	98	Y	FAC
2.			
3.			
4.			
5.			
	98 = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Lythrum hyssopifolium	1	N	FACW
2. Helminthotheca echioides	1	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	2 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 2 % Cover of Biotic Crust _____

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 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 1	x 2 =	2
FAC species 99	x 3 =	297
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: 100 (A)		299 (B)

Prevalence Index = B/A = 2.99

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes _____ No _____**

Remarks:

Dominated almost entirely by a dense, nearly impenatrable thicket of Himalayan blackberry (FAC).

SOIL

Sampling Point: SP10

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/2	70	7.5YR 6/8	10	C	M	clay loam	
0-16	10YR 5/3	20					sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Some depletion observed in the profile but mainly redox dark surface (F6) indicator met at this sample point.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____ No _____ Depth (inches): _____

Water Table Present? Yes_____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Wetland hydrology was inferred by the presence of surface soil cracks and oxidzed rhizospheres.

Photo 11: S 180 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 6/12/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP11 Investigator(s): Justin Davilla Section, Township, Range: S32, T11S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 609016.212389 Long: 4087363.75578 Datum: UTM 83 Soil Map Unit Name: Aquents-flooded/123 Cropley silty clay; 2-9 % slopes NWI classification: N/A

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 _____	**Is the Sampled Area within a Wetland?** **Yes_____No _____**
Hydric Soil Present?	Yes_____No _____	
Wetland Hydrology Present?	Yes_____No _____	

Remarks:

Paired upland sample point uplsope of SP-10 weedy ruderal slope.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Phalaris aquatica	50	Y	FACU
2. Raphanus sativus	30	Y	UPL
3. Galium aparine	15	N	FACU
4. Conium maculatum	15	N	FAC
5.			
6.			
7.			
8.			
	110 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species 10	x 3 =	30
FACU species 65	x 4 =	260
UPL species 30	x 5 =	150
Column Totals: 110 (A)		440 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes_____No _____

Remarks:

Dominated by weedy, non-hydrophytes with invasive poison hemlock (FAC) subdominant.

SOIL

Sampling Point: SP11

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/2	100					clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes_____No _____

Remarks:

No evidence of hydric soil development at this sampling point.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____No _____ Depth (inches): _____

Water Table Present? Yes_____No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes_____No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

No evidence of wetland hydrology at this sample point.

Photo 12: ESE 115 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 6/12/2021

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP12 Investigator(s): Justin Davilla Section, Township, Range: S5, T12S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 608983.267174 Long: 4087271.46475 Datum: UTM 83 Soil Map Unit Name: Aquents-flooded/174 Tierra-Watsonville Complex; 15-30 % slopes NWI classification: PSS3E

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 _____	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** _____
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Sample point located in blackberry thicket wetland west and uplsope of low-flow channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	95	Y	FAC
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Conium maculatum	5	N	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 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 5	x 2 =	10
FAC species 95	x 3 =	285
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: 100 (A)		295 (B)

Prevalence Index = B/A = 2.95

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks:

Dominated by a dense thicket of blackberry with scattered poison hemlock.

SOIL

Sampling Point: SP12

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					clay	
8-16	10YR 2/1	96	10YR 5/6	4	C	M/PL	clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes_____ No _____

Remarks:

4% prominent redox below 8 inches meets F6

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____ No _____ Depth (inches): _____

Water Table Present? Yes_____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

Marginal contemporary wetland hydrology but meets secondary indicators for wetland hydrology.

Photo 13: S 180 degrees

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Middle Struve Slough Enhancement City/County: Watsonville/Santa Cruz Sampling Date: 6/12/2020

Applicant/Owner: Watsonville Wetlands Watch State: CA Sampling Point: SP13 Investigator(s): Justin Davilla Section, Township, Range: S5, T12S-R2E

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

Subregion (LRR): C-Mediterranean California Lat: 608977.990715 Long: 4087272.89195 Datum: UTM 83 Soil Map Unit Name: Aquents-flooded/174 Tierra-Watsonville Complex; 15-30 % slopes NWI classification: N/A

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 _____	**Is the Sampled Area within a Wetland?** **Yes_____No _____**
Hydric Soil Present?	Yes_____No _____	
Wetland Hydrology Present?	Yes_____No _____	

Remarks:

Paired upland sample point on ruderal slope dominated by invasive weeds.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:_____)			
1. Rubus armeniacus	2	N	FAC
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: ~100 sq ft)			
1. Raphanus sativus	70	Y	UPL
2. Conium maculatum	20	Y	FACW
3. Silybum marianum	10	N	UPL
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
	_____ = Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species 20	x 2 =	40
FAC species 2	x 3 =	6
FACU species _____	x 4 =	_____
UPL species 80	x 5 =	446
Column Totals: 102 (A)		446 (B)

Prevalence Index = B/A = 4.37

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes_____No _____**

Remarks:

Dominated by weedy species characteristic of disturbed uplands. Poison hemlock in clayey soils and do not appear to be associated with mesic soil conditions.

SOIL

Sampling Point: SP13

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/1	100					clay	
14-18	10YR 2/2	98	5YR 4/6	1	C	M	Clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes_____ No _____

Remarks:

Dark, low chroma soils but redox is below 14 inches and therefore does not meet F6 indicator for hydric soils.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes_____ No _____ Depth (inches): _____

Water Table Present? Yes_____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No _____

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

Remarks:

No evidence of contemporary wetland hydrology at this sample point. Based on topographic position and redox below 14" this area may be below the historic slough indundation margin.

Appendix C. Representative Photographs of the Middle Struve Slough Stormwater and Wetland Enhancement Project Area

Above. Himalayan blackberry wetland sample point (SP-1) looking west (330°) in the southernmost portion of Middle Struve Slough.

Below. Paired upland sample point (SP-2)(290°) immediately east of SP-1 dominated by Harding Grass and other weedy species.

ECOSYSTEMS WEST
CONSULTING GROUP

Above. Wetland sample point (SP-3)(245°) at edge of mixed willow thicket wetland adjacent to low-flow channel in central portion of the Project Area.

Below. Freshwater emergent wetland dominated by cattails along low flow channel immediately south of non-wetland riparian forest.

ECOSYSTEMS WEST
CONSULTING GROUP

Above. Freshwater emergent marsh sample point (SP-5)(280°) along the east edge of cattails along low-flow channel.

Below. Non-wetland riparian sample point (SP-9) (90°) in Himalayan blackberry with willow and eucalyptus overstory in northernmost portion of the Project Area.

ECOSYSTEMS WEST
CONSULTING GROUP

Attachment E. Phase I Cultural Resources Inventory for Middle Struve Slough, Watsonville

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Phase I Cultural Resources Inventory

for Middle Struve Slough, Watsonville, Santa Cruz County, California

Prepared for Watsonville Wetlands Watch

ALBION

OCTOBER 2021 FINAL

Phase I Cultural Resources Inventory for Middle Struve Slough, Watsonville, Santa Cruz County, California

OCTOBER 2021 FINAL
J2021-042.01
Photo Credit: Brittney Biasi

Prepared for

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Prepared by

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Matthew Paul Manigault, BA

Albion Environmental, Inc.
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Executive Summary

In August 2021, Watsonville Wetlands Watch contracted with Albion Environmental, Inc. (Albion) to conduct a cultural resources assessment of an approximately 9.4-acre Project Area at Middle Struve Slough in Watsonville, California. The property owner proposes the creation of wetland depressions and stormwater catchment basins at the outfall of two storm drain networks to provide filtration and treatment of suburban runoff before it enters Struve Slough (Project). The Project will also install an elevated boardwalk over the wetland area to enhance public access. Since the Project requires permits from the City of Watsonville (City), the Project is subject to environmental review under the California Environmental Quality Act (CEQA).

Albion's study was conducted to comply with requirements under CEQA (Public Resources Code 21000 et seq.) and the City's General Plan (Goal 9.10) guidelines. The purpose of this Phase I cultural resource inventory is to document cultural resource identification efforts for the Project. This study included: (1) archival and background research; (2) a search of records at the California Historical Resources Information System's Northwest Information Center at Sonoma State University (NWIC); (3) pedestrian survey of the proposed Project Area; and (4) a technical report of our findings.

A search of records at the NWIC indicated that no archaeological resources have been previously identified within the Project Area and one resource has been recorded within a $^1/_4$-mile radius of the Project Area. One archaeological study has been conducted within the Project Area, and one archaeological study has been conducted within a 500-foot radius of the Project Area.

Visual inspection of the Project Area surface revealed no evidence of precolonial or historic-era artifacts or intact archaeological deposits; however, the center of the Project Area was not surveyed due to standing water and dense blackberry bushes. According to historic aerial photographs, the Project Area appears to have never been developed and therefore the Project Area has a low potential to contain historic-era archaeological deposits. For precolonial resources, it is Albion's judgement that the Project Area has moderate to high potential to contain buried archaeological deposits. According to early historic maps, the water and wetlands of the slough covered most of the Project Area, but these wetland locations likely fluctuated throughout the Holocene era.

Given the poor ground surface visibility in the central portion of the Project Area, proposed Project impacts (i.e., creation of wetland depressions and stormwater catchment basins) to a depth of 3 to 5 feet below grade, and the moderate to high sensitivity of buried archaeological deposits, it is Albion's judgment that the current assessment cannot rule out the possibility that precolonial archaeological resources exist in the current Project Area. Since no precolonial resources have been recorded within a $^1/_4$-mile radius of the Project Area, it is Albion's judgement that a project-specific Archaeological Monitoring Plan should be developed and implemented to help guide the restoration Project should any significant archaeological deposits be uncovered during construction. The plan should provide detailed guidance for how the ground disturbance should be methodically excavated under the direct supervision of a qualified archaeologist, CEQA evaluation protocols and Tribal participation. Moreover, it is Albion's judgement that a qualified archaeologist monitor all initial

ground-disturbing activities associated with the Project in a manner outlined in the Archaeology Monitoring Plan.

Since many important cultural resources, such as Tribal Cultural Resources, do not necessarily leave an archaeological footprint or have physically identifiable manifestations, it is vital to seek out information regarding the possible presence of these important resources and their locations through consultation with local Tribal members. Under the authority of Assembly Bill 52, the City of Watsonville (City) may have received information from interested Native American tribes or representatives concerning Tribal Cultural Resources at the Project site. The City is responsible for collecting and incorporating Tribal information into the environmental review process. At this time, Albion does not know if the City has received any such information.

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Introduction

1

This report documents the results of a cultural resource inventory of an approximately 9.4-acre Project Area at Middle Struve Slough in Watsonville, California. The property owner proposes the creation of wetland depressions and stormwater catchment basins at the outfall of two storm drain networks to provide filtration and treatment of suburban runoff before it enters Struve Slough. The Project will also install an elevated boardwalk over the wetland area to enhance public access.

Since the property is in an area designated as "archaeologically sensitive" by the City of Watsonville, Albion was contracted to conduct a cultural resource assessment. The investigation comprised four tasks: (1) archival and background research; (2) a search of records at the California Historical Resources Information System's Northwest Information Center at Sonoma State University (NWIC); (3) pedestrian survey of the proposed Project Area; and (4) a technical report of our findings and recommendations for the City of Watsonville Planning Division.

Albion designed the investigation to address treatment of cultural resources under current guidelines outlined by Watsonville's General Plan (Goal 9.10) and California Environmental Quality Act (CEQA) guidelines. All work was conducted in accordance with guidelines and regulations set forth in CEQA.

The records search was requested by Albion Senior Archaeologist Stella D'Oro in August 2021 (NWIC File No.: 21-0343). The subsequent pedestrian survey was conducted on September 14, 2021, by Albion archaeologists Matthew Paul Manigault, who earned a BA in Anthropology and has worked in California archaeology for 10 years, and Brittney Biasi, who also earned a BA in Anthropology and has worked in California archaeology for three years. Mr. Manigault and Ms. Biasi conducted the fieldwork under the supervision of Stella D'Oro, who holds an MA in Applied Anthropology and has been working in California archaeology for 17 years.

Project Location and Description

2

The Project Area consists of a 9.4-acre parcel of land located at Middle Struve Slough in Watsonville, California. The Project Area is on the west side of Pennsylvania Drive approximately 109 feet (33 m) south of the intersection at Pennsylvania Drive and Winding Way, and 34 feet (10 m) north of the intersection of Pennsylvania Drive and Clifford Avenue in Watsonville, California (Figure 1). The parcel ranges from approximately 20 to 30 feet above sea level.

The Project applicant proposes the creation of wetland depressions at a depth of 2.5 to 3 feet below grade, stormwater catchment basins at a depth of 3 to 5 feet below grade, and an elevated boardwalk over the wetland area to enhance public access. The depth of piers or footers for the elevated boardwalk have not been determined yet; however, they will likely be 3 to 4 feet below grade.

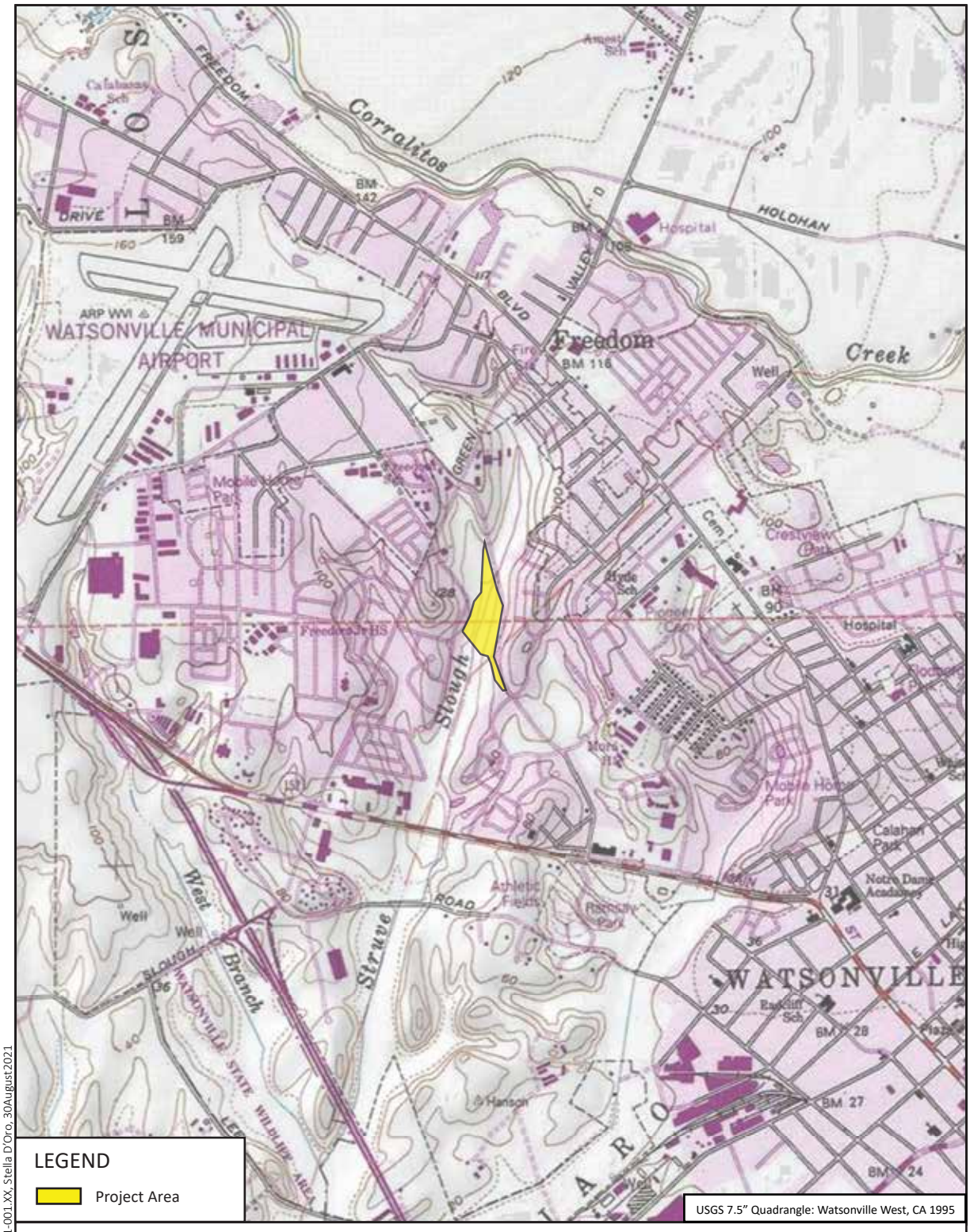


Figure 1. Location map, Middle Struve Slough, Watsonville, Santa Cruz County, California.

File name: Figure_1.ai; J2021-001.XX; Stella D'Oro, 30August2021

Sources Consulted

3

RECORDS SEARCH

Annette Neal, Researcher for the NWIC, provided the results of a records search for resources within a $^1/_4$-mile radius of the Project Area and studies within a 500-foot radius of the Project Area on September 7, 2021 (Appendix A). In addition to official maps and records, the following sources of information were consulted as part of the records search:

- Built Environment Resources Directory (BERD), which includes:
  - National Register of Historic Places (NRHP)
  - California Historical Landmarks
  - Office of Historic Preservation Historic Properties Directory
- Office of Historic Preservation Archaeological Determinations of Eligibility
- California Inventory of Historical Resources
- Special Research Collections at the UCSC and UCSB Libraries (aerial images and historic maps)

BERD

No resources are listed on the NRHP within a $^1/_4$-mile radius of the Project Area.

OFFICE OF HISTORIC PRESERVATION ARCHAEOLOGICAL DETERMINATIONS OF ELIGIBILITY

No properties are listed on the Archaeological Determinations of Eligibility Directory within a $^1/_4$-mile radius of the Project Area.

CALIFORNIA INVENTORY OF HISTORICAL RESOURCES

No properties are listed on the Directory within a $^1/_4$-mile radius of the Project Area.

PREVIOUSLY CONDUCTED CULTURAL RESOURCE STUDIES

According to the NWIC, one cultural resource study has been previously conducted within the Project Area (Table 1). The survey was conducted in advance of development proposed for churches, a trailer park, commercial buildings, and multiple family residences. The entirety of the current

Project Area was included in the survey and no archaeological materials were observed during the study.

Table 1. Cultural Resource Study Conducted Within the Project Area.

Report No.	Authors	Citation Year	Citation Title
S-3820	Lonnberg, A.	1973	Preliminary Archaeological Reconnaissance of Some Parcels to be Developed in the City of Watsonville

One cultural resource study has been previously conducted within a 500-foot radius of the Project Area. No archaeological resources were noted. The study is listed in Table 2 below.

Table 2. Cultural Resource Study Conducted Within a 500-Foot Radius of the Project Area.

Report No.	Authors	Citation Year	Citation Title
S-10546	Edwards, R.	1988	Archaeological Studies, Green Valley and Airport Boulevard Projects, Watsonville, California

PREVIOUSLY RECORDED CULTURAL RESOURCES

The records search identified no cultural resources located within the boundary of the Project Area and one previously recorded cultural resource located within a $^{1}/_{4}$-mile radius of the Project Area. The previously recorded resource is listed in Table 3 below.

Table 3. Cultural Resource Recorded Within a $^{1}/_{4}$-Mile Radius of the Project Area.

Resource No.	Trinomial	Resource Description	Recorded By	Proximity to Project Area
P-44-000395	None	Historic District of Watsonville	Johnston (2005)	227 meters east of the Project Area

HISTORICAL IMAGERY

Albion also conducted an online search of historic maps and aerials and found information pertinent to the Project Area from the following:

- 1872 GLO plat map
- 1881 plat map
- 1889 plat map
- 1906 plat map
- 1931 aerial photograph
- 1956 aerial photograph
- 1975 aerial photograph

Background

4

NATURAL ENVIRONMENT

The Project Area ranges from approximately 20 to 30 feet above sea level. Soils in the Project Area include Elkhorn sandy loam, 15 to 30 percent slopes; Aquent, flooded, Tierra-Watsonville complex, 15 to 30 percent slopes; and Cropley silty clay, 2 to 9 percent slopes.

The Elkhorn series consists of well drained soils formed in marine deposits; stratigraphy characterized by fine, sandy loam from 0 to 21 inches below surface (A horizon) followed by sandy clay loam, clay loam from 21 to 61 inches below the surface (B and C horizons). Approximately 90 percent of the Project Area is mapped within Aquent, flooded soils, which are very poorly drained soils formed by organic material and/or alluvium and characterized by clay, sand, muck, and peat (United States Department of Agriculture 2021). The Tierra-Watsonville series are moderately well drained soils formed in alluvium derived from sedimentary rock. The series is characterized by sandy loam from 0 to 14 inches (A and B21t horizons) followed by clay, clay loam, and sandy clay from 14 to 66 inches below the surface (B22t, B3t, and C horizons). The Cropley series consists of well drained soils formed in silty and clayey alluvium derived from sedimentary rock; stratigraphy is characterized by clay from 0 to 60 inches below the surface. Geologic maps place the project Area within Qwf (Pleistocene), Qt (Pleistocene), and primarily Qb (Holocene) within the middle of the slough (Figure 2).

CULTURAL ENVIRONMENT

Prehistory of the southern San Francisco Bay area is complex due to the dramatic increase in human populations from middle to late Holocene times (Milliken et al. 2007). Cultural chronology is quite variable spatially but is generally framed within a tripartite sequence that is commonly used in central California—Early, Middle, and Late (Hylkema 2002; Milliken et al. 2007). These temporal periods are preceded by early to middle Holocene occupation, often characterized as the Millingstone era (Hylkema 2002; Milliken et al. 2007).

The Millingstone Period (9000–5500 years Before Present (BP) (Ingram et al. 1996)) is characterized by small groups who travelled widely and practiced broad spectrum foraging of easily acquired plant and animal resources. Artifacts common to this time period are handstones and millingstones. Flaked stone implements, such as projectile points, are much less common than grinding and battering tools (Fitzgerald 2000). Common foods are thought to have included a variety of small seeds, shellfish, and small mammals.

The Early Period ranges from approximately 5500–2500 BP and encompasses an era where people are thought to still have practiced wide ranging residential mobility but placed a greater emphasis

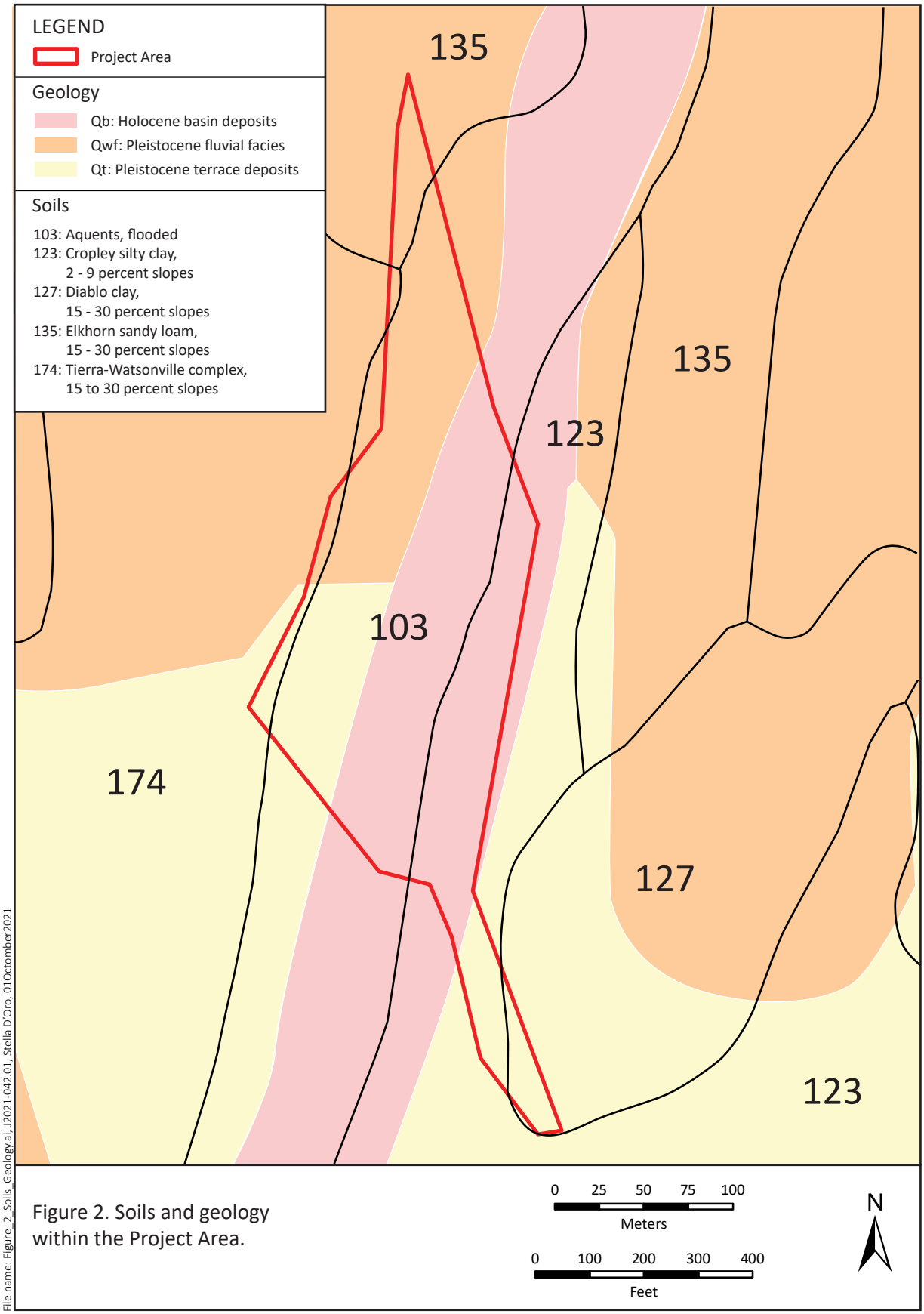


Figure 2. Soils and geology within the Project Area.

File name: Figure_2_Soils_Geology.ai; J2021-042.01; Stella D'Oro, 01October2021

on hunting larger game. Large pinnipeds, such as northern fur seal, are common to coastal archaeological sites during this time. Several styles of large projectile points correspond to this general time frame, which also marks the initial use of mortar and pestle technology.

The Middle Period dates from 2500–1000 BP and appears to represent a time when people were somewhat more residentially stable and practiced more logistical (short term) mobility (Milliken et al. 2007:106). By this time, people apparently went on extended resource acquisition forays for the purpose of bringing subsistence or trade items back to residential base camps. Large, terrestrial mammals were hunted more often during this time and grinding implements become more common (Milliken et al. 2007:107).

The Late Period begins at 1000 BP and extends to ca. 1550 BP (Hylkema 2002:33), or perhaps more recently. The Late Period is characterized by increased sociopolitical complexity and settlement centralization. Large village sites in the northern Santa Clara Valley are often found in the valley center along perennial streams (Bergthold 1982; Milliken et al. 2007). There is a continued prevalence of mortar and pestle technology, thought to signify a greater reliance on acorn than in earlier times. Other labor-intensive foods were also used with greater frequency during this latest time period (Hylkema 2002). For example, sea otter and harbor seal were exploited more heavily. These animals are thought to be more labor-intensive to capture compared to other pinnipeds and large mammals, which were more commonly hunted in earlier time. Bow and arrow technology is also believed to have been adopted by aboriginal hunters during this latest precolonial interval (Milliken et al. 2007:117).

ETHNOGRAPHIC BACKGROUND

The Project Area was inhabited by Ohlone, or Costanoan populations (Levy 1978; Milliken et al. 2007). When first encountered by Spanish explorers, aboriginal inhabitants of the Bay Area and vicinity were referred to as *Costaños* (Levy 1978). The people came to be known as Costanoans (cf. Levy 1978), although now, the descendants of those earlier inhabitants prefer to be referred to as Ohlone (Bean 1994). Both terms refer to the language group spoken by the people, rather than any sort of political group. The Ohlone inhabited the San Francisco Peninsula, the East Bay to the Delta, and south past Santa Clara Valley to the coast of Monterey Bay.

At Spanish contact, aboriginal groups residing in the southern Bay Area were organized under a tribelet system where villages, thought to number around 50, were autonomous political units (Levy 1978). The Ohlone exploited all of the regional habitats including bay marshes, valley grasslands, mountainous uplands and open coastal environs. Resources exploited included elk, pronghorn, deer, sea mammals, salmon, trout, shellfish, ducks, geese, acorns, seeds, grasses, and roots (Baumhoff 1963).

HISTORIC CONTEXT

SPANISH MEXICAN PERIOD

Sebastian Vizcaino's landing at present day Monterey in 1602 is one of the earliest documented contact with Native Americans in the area. Following Vizcaino's landing, other Spanish ships may have stopped at Monterey, but contact was minimal until the initial overland exploration of the area

by Gaspar de Portolá in 1769 (Hoover et al. 1990). Subsequent exploration of the region included Pedro Fages in 1770 and 1772, Fernando Javier de Rivera in 1774, and Juan Bautista de Anza in 1776 (Beck and Haase 1974).

In late September of 1769, Portolá's expedition encountered a small band of Indians engaged in collecting pine nuts. Miguel Costansó, one of the expedition's main chroniclers, called the natives "wandering people without either house or home." A few days later, they came upon a village, which Costansó described as "very poor" and its inhabitants as "friendly and obsequious." Finally, on the 26th of September, they encountered another, larger band of Indians who were also engaged in pine nut collecting. Costansó wrote:

> At the foot of the slope was a band of wandering Indians, which must have numbered more than two hundred souls. They had no houses, and lived in the open near a fallen oak tree. For this reason the place was named *Rancheriá del Palo Caido*. These natives offered us a quantity of pine nuts and seeds. We remained a short time among them, and then passed on in order to make camp on the bank of a river… (Costansó 1992:81).

Portolá's expedition, though at the time producing little lasting and substantive contact, was a harbinger of later developments. As a direct result of the expedition, the Spanish established a system of fully functioning Franciscan missions over the length of Alta California, from San Diego to the northern San Francisco Bay. Missions in the area included Mission San Antonio de Padua (1771), Mission Soledad (1791), Mission Santa Cruz (1791), Mission San Juan Bautista (1797), and Mission San Miguel (1797).

In 1821, Mexico achieved her independence from Spain, and word of this event reached Alta California the following year. In California history, this era is known as the Mexican Period (ca. 1821–1848). The colonial policies of the republic were to be quite different from those of the Spanish monarchy. Not only were Californians allowed to trade with foreigners, but foreigners could also now hold land in the province once they had been naturalized and converted to Catholicism. Under Spain, land grants to individuals were few in number, and title to these lands remained in the hands of the crown. Under Mexican rule, however, governors were encouraged to make more grants for individual ranchos, and these grants were to be outright. Most importantly, the new Mexican republic was determined to move to "secularize" the missions, to remove the natives and the mission property from the control of the Franciscan missionaries.

Secularization was set in motion by the Mexican Governor Echeandia in 1826, but was not carried out in earnest until 1834 when Governor José Figueroa issued an official proclamation ordering the secularization of the California missions. His proclamation turned the mission properties over to Mexican civil authorities, allowed for the disbursement of mission property, opened mission land for settlement by petitioners, and created a series of pueblos. Indian neophytes were freed from their role as personal servants to the padres; however, in reality, the effects of secularization throughout California were to deprive a large percentage of the remaining mission Indians of their property. This resulted in the creation of a relatively large population of landless Indian tenants, many of whom sought work in the newly created *rancherias*.

The new ranchos that sprang up as a result of secularization created a wholly new culture in California, one that was centered on the raising and maintaining of vast herds of cattle. These ranchos were usually owned by individual families who supervised a veritable army of Indian

laborers and vaqueros. The ranch owners owed their livelihood to the sale and trade of the products, primarily hide and tallow, derived from their cattle. A flourishing trade with foreign merchants, mostly Americans, kept the Mexican ranchos afloat; hides and tallow were traded to American merchants for everything from food staples and clothing to furniture and luxury goods.

The end of the Mexican-American War and the signing of the Treaty of Guadalupe Hidalgo in 1848 marked the beginning of the American Period (ca. 1848–present) in California history. The onset of this period, however, did nothing to change the economic condition of the Native American populations working on the ranchos.

AMERICAN PERIOD

The town of Watsonville was first established in 1852 on a small portion of the rancho obtained from the Rodriguez family. Watsonville became an incorporated municipality in 1868, with a population of almost 2000 people (Archives and Architecture, LLC 2013). Residential and commercial development increased over the next three decades, including annexation of nearby residential lots between 1907 and 1925. Between 1940 and 1960, the city nearly doubled in size. In the immediate project area, development patterns generally mirrored those of the city (Archives and Architecture, LLC 2013):

> "The area developed in the 1890s with scattered homes and commercial establishments such as the Martinelli Cider Works at 227 East Beach St., religious facilities, and Watsonville High. In 1901, Watsonville High burned down and architect William H. Weeks designed a new building that was constructed in 1902. By 1902, the neighborhood was completely built out with residences as well as All Saints Church. In 1917, Weeks designed another building on the Watsonville High campus attesting to growth of the city. In 1934 the Veteran's Memorial Building was constructed across from the subject property. In 1937, the Martinelli Cider Works also expanded at their facility site."

After 1940, the population of Watsonville changed significantly, with arrival of people from other parts of the United States and foreign immigrants (Archives and Architecture, LLC 2013).

> The influx Americans from the Midwest continued to populate Watsonville Interwar period, and foreign immigrants including Chinese, Japanese, and Filipinos already in the Pajaro Valley were experiencing increased resentment from local whites. Hostilities because of union formation and increased demands by workers for better working conditions, combined with a general anti-immigrant (especially anti-Asian) sentiment were further strained by the plunge in economic vitality. By the time the United States entered into World War II against Germany and Japan, overt racism and discrimination was common in a location that had always been ethnically mixed and relatively tolerant compared to the rest of the country. The signing of Executive Order 9066 by President Roosevelt, which called for the systematic removal the Japanese population from all coastal areas, including those who resided in parts of Watsonville was the culmination of this period.

A shift in local population began after the war. Many Japanese who were interned during World War II returned to the area and faced new competition from the large numbers of Mexican workers brought in through the Bracero Program. Some Japanese families stayed and rebuilt their lives, others left. As a whole, they did not return to agriculture in the same numbers as before the war. Their places, at least in the fields, were now filled by Mexicans, starting the trend that continues today. Growth in the community during the 1950s also marked the growth of Watsonville High

across from the subject properties, with school expansion necessitating the construction of classrooms, music halls and shop buildings between 1956 and 1958.

HISTORY OF THE PROJECT AREA

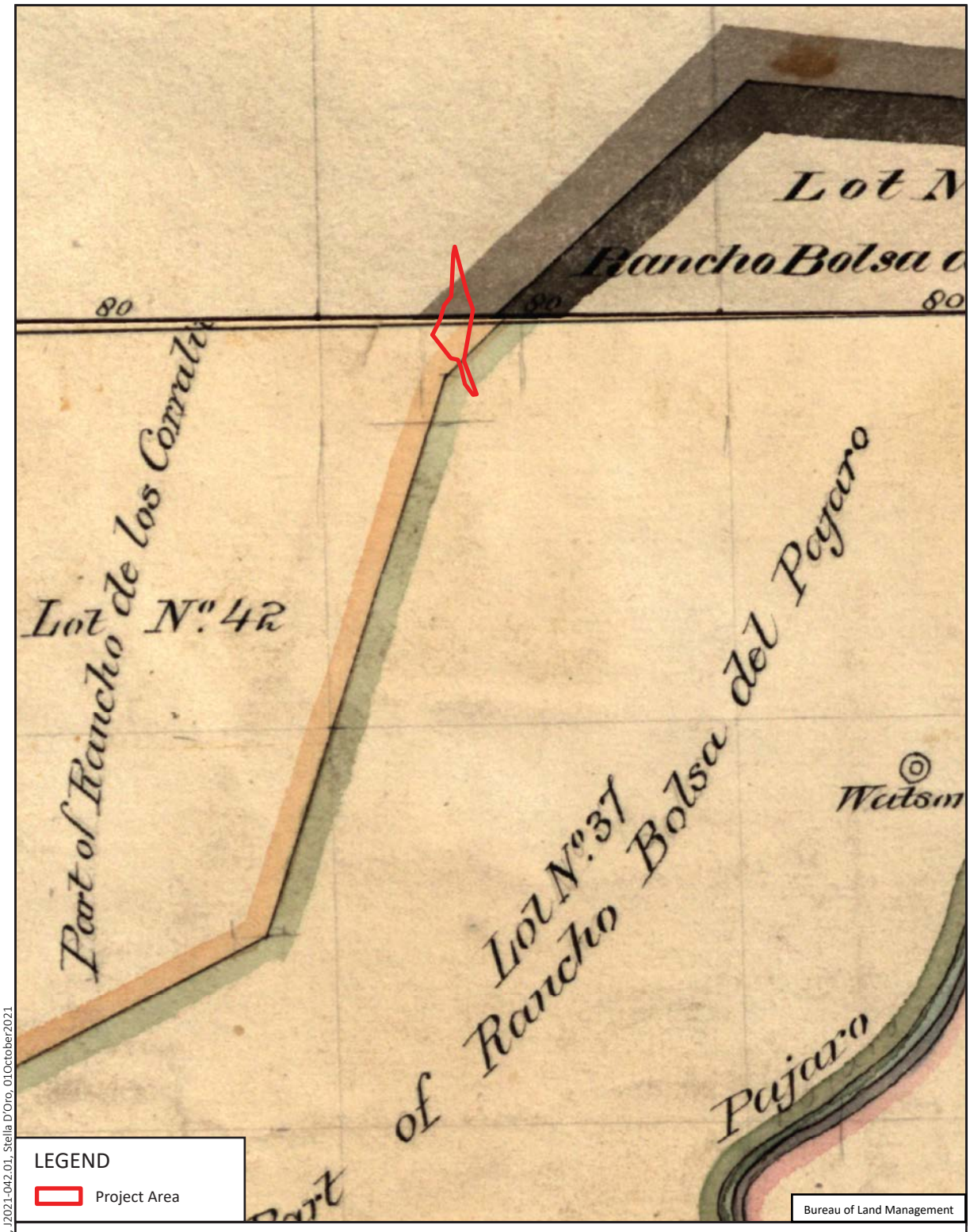
The Project Area is located within two land grants; the northern portion of the Project Area is within *Rancho de Los Corralitos* (Ranch of the little corrals) land grant that comprised 15,440 acres, and the southern portion lies within *Rancho Bolsa del Pajaro* (Ranch of the Pocket of the Pajaro River) according to GLO plat maps made in 1872 (Figure 3). *Rancho de Los Corralitos* may have derived its name from a campsite in the area named *La Laguna del Coral* or *Lagunita del Corral*, which was recorded by members of the Portolá expedition in 1769 (Clark 1986). The Rancho was granted to Joe Amesti in 1843. *Rancho Bolsa del Pajaro* derived its name from its location in the pocket, or the semi-enclosed area, probably by the slough which is usually only accessible from one side. The word "*bolsa*" is also meant to convey a fertile location in a valley (Clark 1986:273). *Rancho Bolsa del Pajaro*, consisting of 5,496 acres, was granted to Sebastian Rodriguez in 1860.

An 1881 plat map shows that the Project Area was within three different parcels. The northwestern portion was located within a 133.383-acre parcel owned by Quirk; the remainder of the Project Area was located within a 206.11-acre parcel owned by C. Storm (Figure 4). Notably, Freedom Boulevard had already been laid out by this time, but was called County Road from Santa Cruz to Watsonville.

A plat map from 1889 illustrates the same owners, although the property lines had shifted slightly. S. H. Quirk only owned a small portion of the western side of the Project Area, while the rest of the Project Area was located within lands owned by C. Storm. The map also shows that approximately 80 percent of the Project Area is mapped as a swamp (Figure 5).

By 1906, a plat map indicates the Project Area was located within three parcels. The northern portion of the Project Area was located within land owned by Dr. Easterday, the western portion of the Project Area was located in land owned by Mrs. A. Rowe, and the southern portion of the Project Area was owned by Christ Storm. Once again, wetlands are depicted throughout most of the Project Area (Figure 6).

An aerial photograph from 1931 indicates the presence of vegetation in the northern portion of the Project Area and that the swamp land had been reclaimed; however, it does not appear the Project Area was developed nor in agriculture (Figure 7). Vegetation on the northern portion of the Project Area is still visible in an aerial photograph from 1956, and the rest of the Project Area has been sectioned off in what appears to be agricultural fields; however, no crops are present (Figure 8). According to an aerial photograph from 1975, the vegetation on the northern section of the Project Area has been reduced to a few trees, the rest of the land remains sectioned, and it appears the center portion is returning to a wetland (Figure 9).



File name: Figure_3_1872.ai; J2021-042.01; Stella D'Oro, 01October2021

Figure 3. Detail of an 1872 GLO plat map with the Project Area.

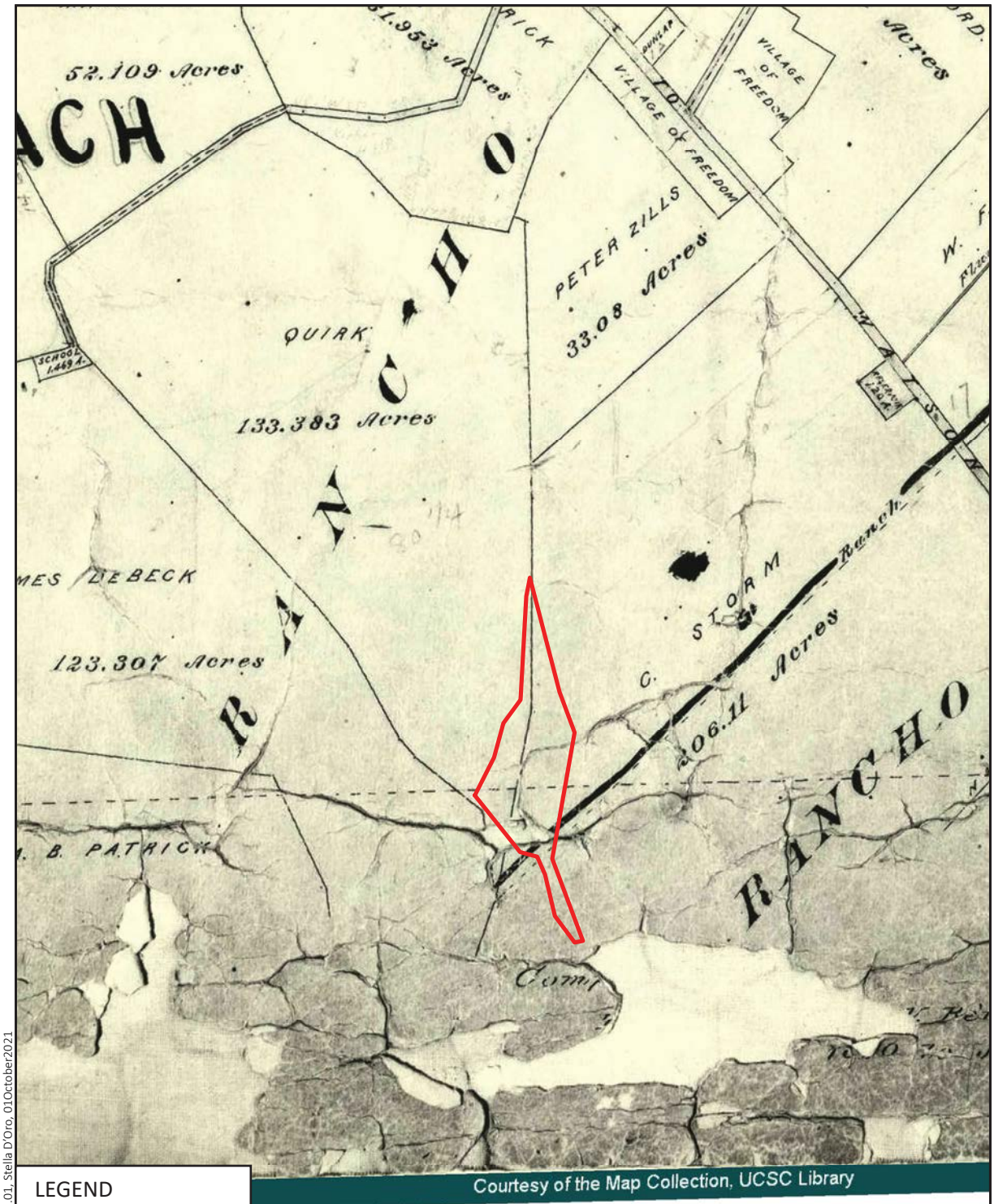


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Figure 4. Detail of an 1881 plat map with the Project Area.

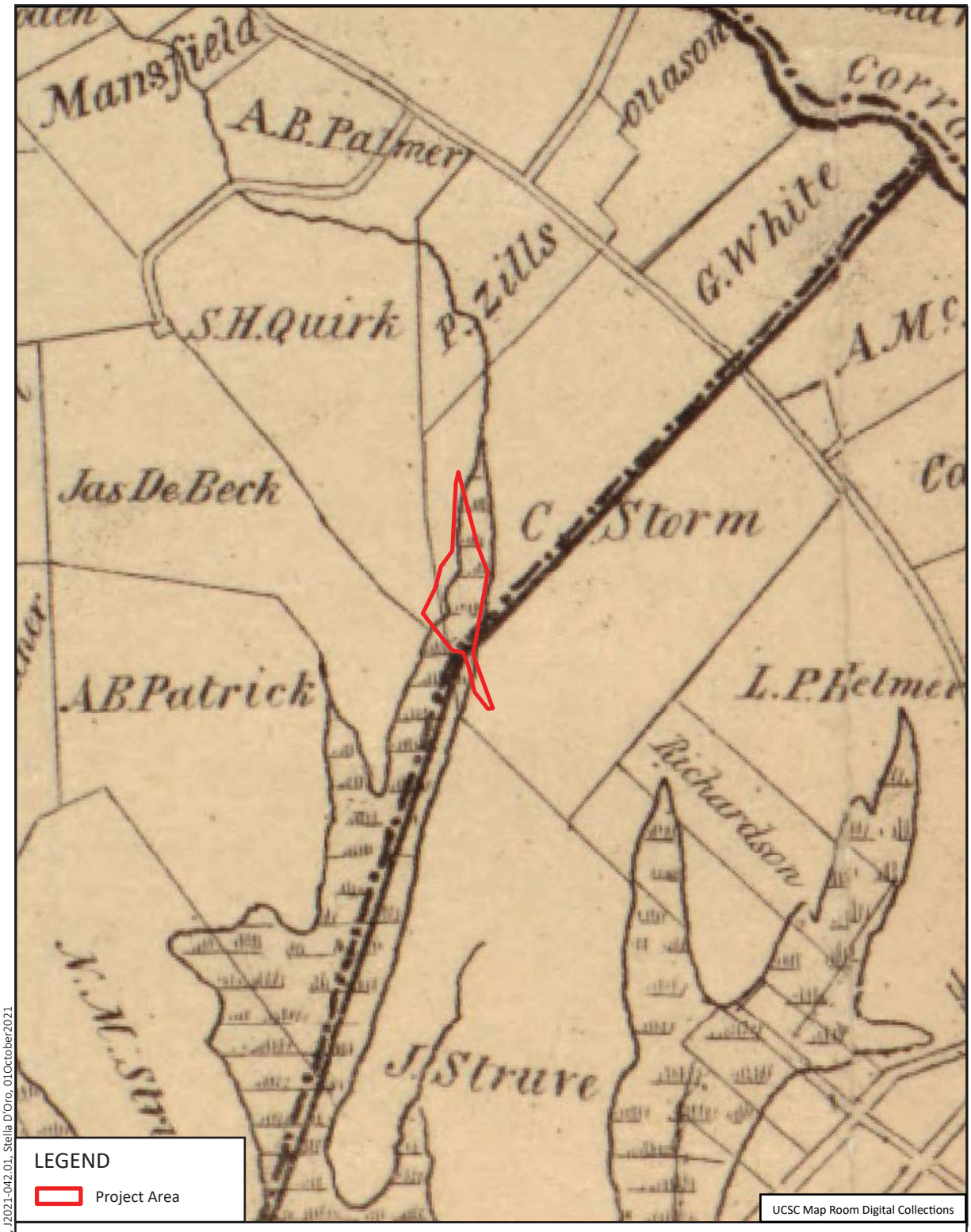

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Figure 5. Detail of an 1889 plat map with the Project Area.

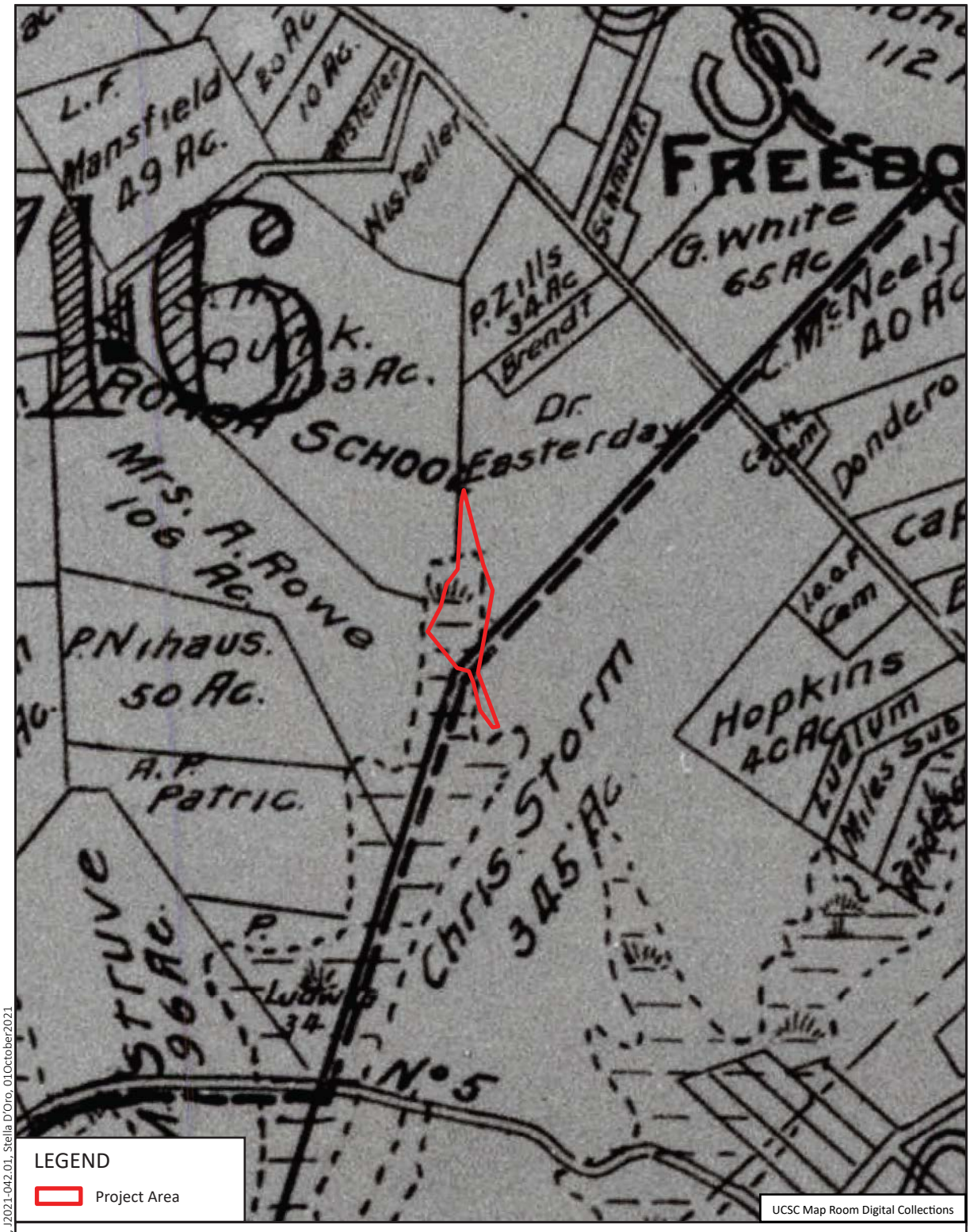

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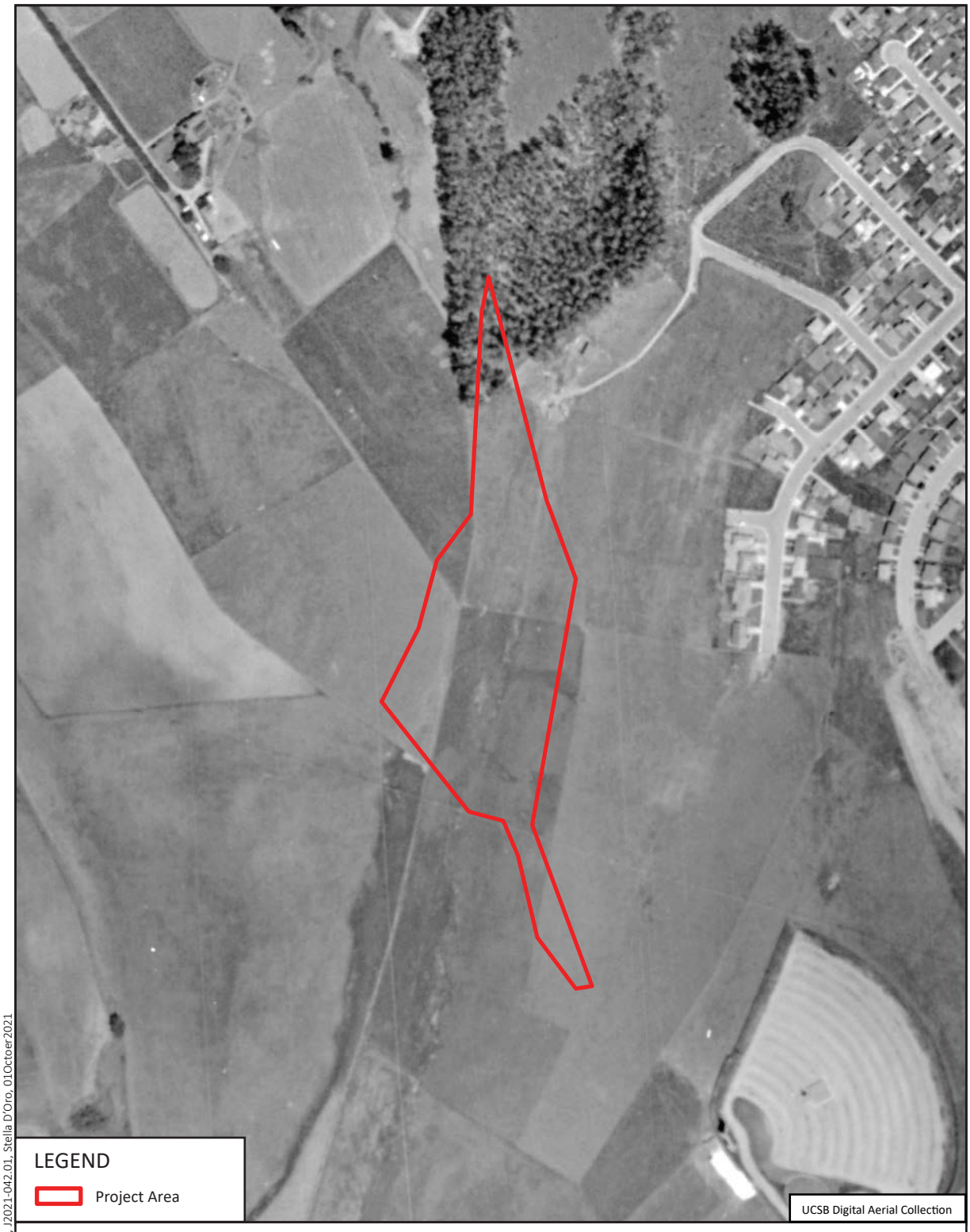
Figure 6. Detail of a 1906 plat map with the Project Area.

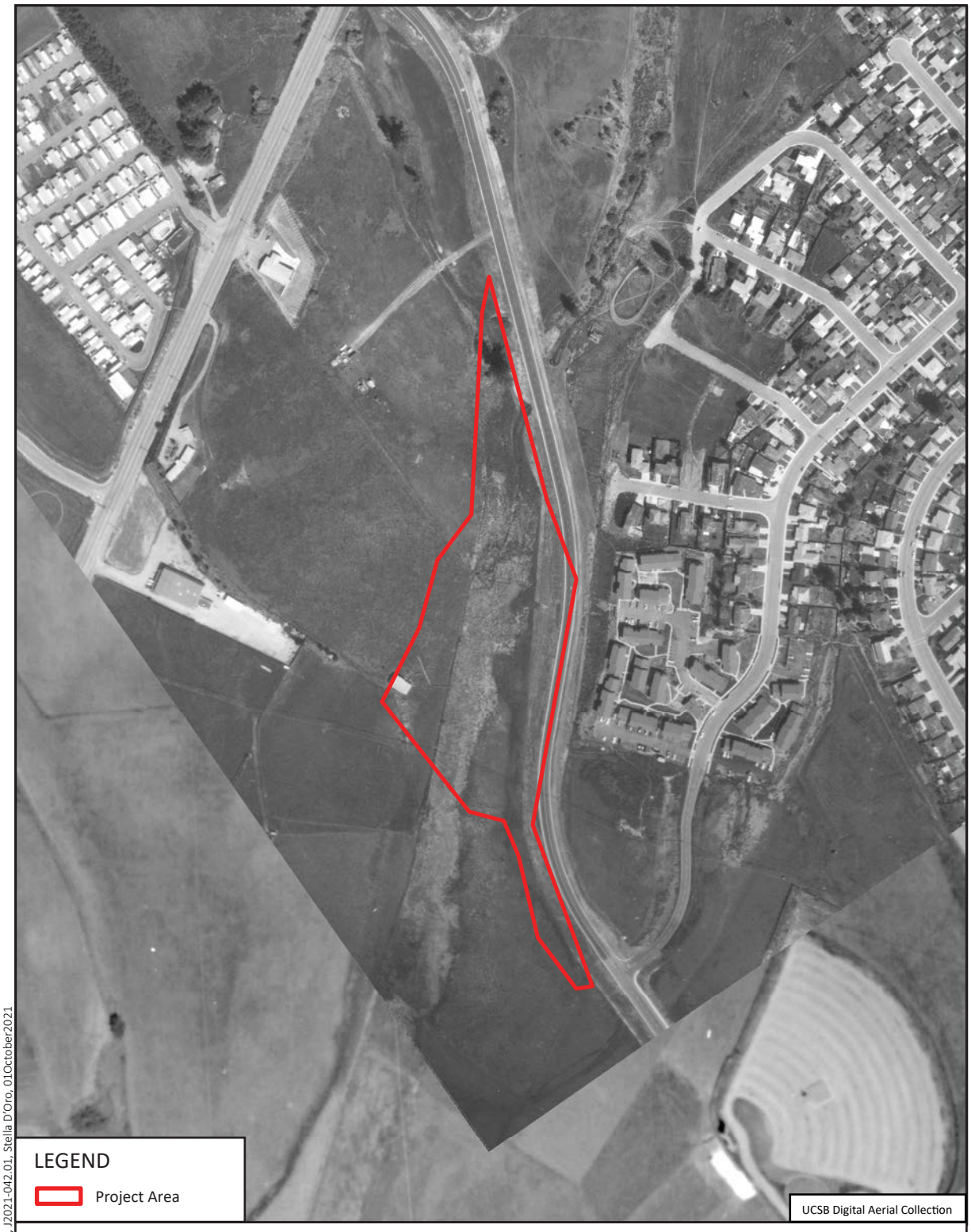
Figure 7. Detail of a 1931 aerial photograph with the Project Area.

File name: Figure_7_1931.ai; J2021-042.01; Stella D'Oro, 01October2021



File name: Figure_8_1956.ai; J2021-042.01; Stella D'Oro, 01Octoer2021

Figure 8. Detail of a 1956 aerial photograph with the Project Area.



File name: Figure_9_1975.ai; J2021-042.01; Stella D'Oro, 01October2021

Figure 9. Detail of a 1975 aerial photograph with the Project Area.

Field Methods and Results

5

On September 14, 2021, Albion archaeologists Matthew Paul Manigault and Brittney Biasi conducted a pedestrian survey of the accessible portions of the Project Area, which included an open land parcel with irrigation utilities, benches, fences, bridges, and paved walkways (Figures 10 and 11). The center of the Project Area was inaccessible due to standing water and dense blackberry bushes. The survey was conducted using 1.5-meter-wide transects across the Project Area while closely inspecting the surface for cultural materials. Visibility of the ground surface throughout most of the Project Area was poor due to water and dense vegetation in the center of the Project Area, and asphalt covering Pennsylvania Drive on the eastern boundary of the Project Area. Survey efforts did not locate any precolonial or historic-era resources.

Albion's background research and historic aerial photographs suggests the Project Area appears to have never been developed, which indicates the Project Area has a low potential to contain historic-era archaeological deposits.

ARCHAEOLOGICALLY SENSITIVE LANDFORMS

Using a model, the potential for buried archaeological sites can be conceptualized as a set of factors that either encouraged or discouraged human use or occupation of certain landforms (e.g., aspect, extent, setting, slope), combined with those that affected the subsequent preservation (i.e., erosion or burial) of those landforms (Meyer et al. 2010; Rosenthal and Meyer 2004). Using this model, landforms can be ranked as being more or less sensitive based on demonstrated relationships between environmental variables and known prehistoric site locations.

For example, the contact between depositional and non-depositional (e.g., eroded or older) landforms can also be a factor because these often mark environmental ecotones, or spatial transitions between different ecosystems, habitats, and/or plant and animal communities (Meyer et al. 2010; Rosenthal and Meyer 2004). In California, precolonial sites are commonly identified at or along ecotones, and are frequently located near the contact between younger and older geomorphic surfaces, such as fans or terraces that are higher than the floodplain (Meyer et al. 2010; Rosenthal and Meyer 2004). For this reason, areas in which both landforms occur in close proximity have a higher potential for containing buried archaeological resources than broad, level depositional landforms that lack elevated surfaces. Additionally, a study of GIS data indicates that archaeological site densities are greatest at distances of 200 meters (~656 feet) or less from a known watercourse (Meyer et al. 2010; Rosenthal and Meyer 2004). Consequently, it is expected that previously unidentified buried sites will be located relatively close to present springs and water courses, as well as former ones.

In summary, using this model, the potential for buried archaeological deposits can be conceived as follows:

- Very Low — pre–latest Pleistocene deposits regardless of the combination of other factors;
- Low — Latest Pleistocene or Holocene deposits with slopes greater than 9 degrees located more than 200 meters (656 feet) from a water source and/or geomorphic contact;
- Moderate — Holocene deposits with slopes less than 9 degrees located less than 200 meters (656 feet) geomorphic contact, located more than 200 meters (656 feet) from a water source;
- High — Holocene deposits with slopes less than 9 degrees located less than 200 meters (656 feet) geomorphic contact, AND less than 200 meters (656 feet) from a water source;
- Very High — Holocene deposits with slopes less than 9 degrees located less than 200 meters (656 feet) from a geomorphic contact, water source, and confluence of two or more watercourses, AND/OR contains previously identified buried site.

The Project Area soils are hypothesized to be from the Pleistocene to Holocene, and are located in a flat alluvial fan with slopes less than 9 degrees and within 200 meters from a water course (Figure 2). Based on this model, the sensitivity for the Project Area to contain buried archaeological sites is moderate to high. According to early historic maps, the water and wetlands of the slough covered most of the Project Area, but these wetland locations likely fluctuated throughout the Holocene era.

Photograph 1. Dense vegetation on the northern portion of the Project Area, facing south.

Photograph 2. Dense vegetation on the northern portion of the Project Area, facing east.

Photograph 3. Dense blackberry bushes in the middle of the slough, facing southeast.

Photograph 4. Overview of the southern portion of the Project Area, facing southeast.

Photograph 5. Overview of the southern portion of the Project Area, facing northeast.

Photograph 6. Overview of the Project Area from Pennsylvania Drive, facing south.

Figure 10. Photographs from the field.

File name: Figure_10_Photos.ai, J2021-042.01, Stella D'Oro, 01October2021

File name: Figure_11_SurveyedArea.ai, J2021-042.01, Stella D'Oro, 01October2021

Figure 11. Project Area and surveyed area.

Conclusions and Recommendations 6

Visual inspection of the Project Area surface revealed no evidence of precolonial or historic-era artifacts or intact archaeological deposits; however, the ground visibility was poor and the center of the Project Area was not surveyed due to water and dense blackberry bushes.

According to historic aerial photographs, the Project Area appears to have never been developed and therefore the Project Area has very low potential to contain historic-era archaeological deposits. For precolonial resources, it is Albion's judgement that the Project Area has moderate to high potential to contain buried archaeological deposits. According to early historic maps, the water and wetlands of the slough covered most of the Project Area, but these wetland locations likely fluctuated throughout the Holocene era.

Given the poor ground surface visibility in the central portion of the Project Area, proposed Project impacts (i.e., creation of wetland depressions and stormwater catchment basins) to a depth of 3 to 5 feet below grade, and the moderate to high sensitivity of buried archaeological deposits, it is Albion's judgment that the current assessment cannot rule out the possibility that precolonial archaeological resources exist in the current Project Area. Since no precolonial resources have been recorded within a $^1/_4$-mile radius of the Project Area, it is Albion's judgement that a project specific Archaeological Monitoring Plan should be developed and implemented to help guide the restoration Project should any significant archaeological deposits be uncovered during construction. The plan should provide detailed guidance for how the ground disturbance should be methodically excavated under the direct supervision of a qualified archaeologist, CEQA evaluation protocols and Tribal participation. Moreover, it is Albion's judgement that a qualified archaeologist monitor all initial ground-disturbing activities associated with the Project in a manner outlined in the Archaeology Monitoring Plan.

Since many important cultural resources, such as Tribal Cultural Resources, do not necessarily leave an archaeological footprint or have physically identifiable manifestations, it is vital to seek out information regarding the possible presence of these important resources and their locations through consultation with local Tribal members. Under the authority of Assembly Bill 52, the City of Watsonville (City) may have received information from interested Native American tribes or representatives concerning Tribal Cultural Resources at the Project site. The City is responsible for collecting and incorporating Tribal information into the environmental review process. At this time, Albion does not know if the City has received any such information.

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Archives and Architecture, LLC
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Appendix A

Records Search Results

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

ALAMEDA
COLUSA
CONTRA COSTA
DEL NORTE
HUMBOLDT
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLATA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
1400 Valley House Drive, Suite 210
Rohnert Park, California 94928-3609
Tel: 707.588.8455
nwic@sonoma.edu
http://nwic.sonoma.edu

9/7/2021 NWIC File No.: 21-0343

Stella D'Oro
Albion Environmental, Inc.
1414 Soquel Avenue, Suite 203
Santa Cruz, CA 95062

Re: Middle Struve Slough

The Northwest Information Center received your record search request for the project area referenced above, located on the Watsonville West USGS 7.5' quad(s). The following reflects the results of the records search for the project area and a ¼ mi. Resource and 500 ft. Report radii:

[* no information sent, not mapped]

Resources within project area:	None listed
Resources within ¼ mi. radius:	P-44-000395*
Reports within project area:	S-3820
Reports within 500 ft. radius:	S-10546

Resource Database Printout (list): ☐ enclosed ☒ not requested ☐ nothing listed

Resource Database Printout (details): ☐ enclosed ☐ not requested ☒ nothing listed

Resource Digital Database Records: ☐ enclosed ☒ not requested ☐ nothing listed

Report Database Printout (list): ☐ enclosed ☒ not requested ☐ nothing listed

Report Database Printout (details): ☒ enclosed ☐ not requested ☐ nothing listed

Report Digital Database Records: ☐ enclosed ☒ not requested ☐ nothing listed

Resource Record Copies: ☐ enclosed ☐ not requested ☒ nothing listed

Report Copies: ☒ enclosed ☐ not requested ☐ nothing listed

OHP Built Environment Resources Directory: ☐ enclosed ☒ not requested ☐ nothing listed

Archaeological Determinations of Eligibility: ☐ enclosed ☐ not requested ☒ nothing listed

CA Inventory of Historic Resources (1976):	☐ enclosed	☒ not requested	☐ nothing listed
GLO and/or Rancho Plat Maps:	☐ enclosed	☒ not requested	☐ nothing listed
Historical Maps:	☐ enclosed	☒ not requested	☐ nothing listed
Local Inventories:	☐ enclosed	☒ not requested	☐ nothing listed

*Notes:

** Current versions of these resources are available on-line:

Caltrans Bridge Survey: http://www.dot.ca.gov/hq/structur/strmaint/historic.htm

Soil Survey: http://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=CA

Shipwreck Inventory: http://www.slc.ca.gov/Info/Shipwrecks.html

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System (CHRIS).

Sincerely,

Annette Neal

Researcher

Attachment F. EnviroStor and GeoTracker Database Searches for Hazardous Waste Sites

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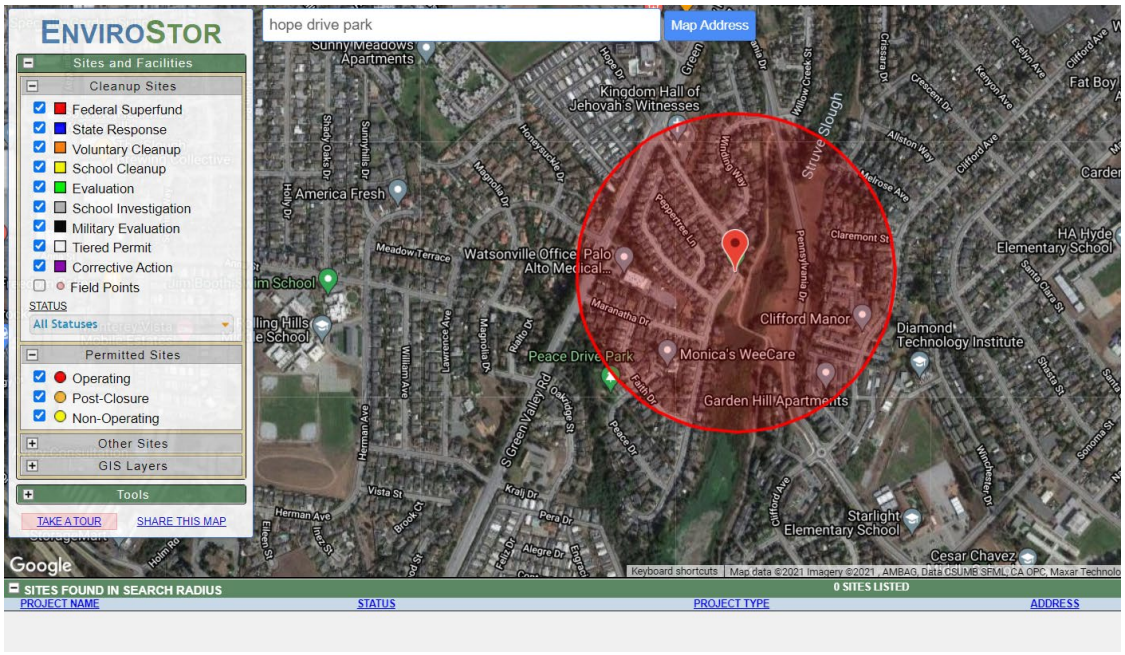
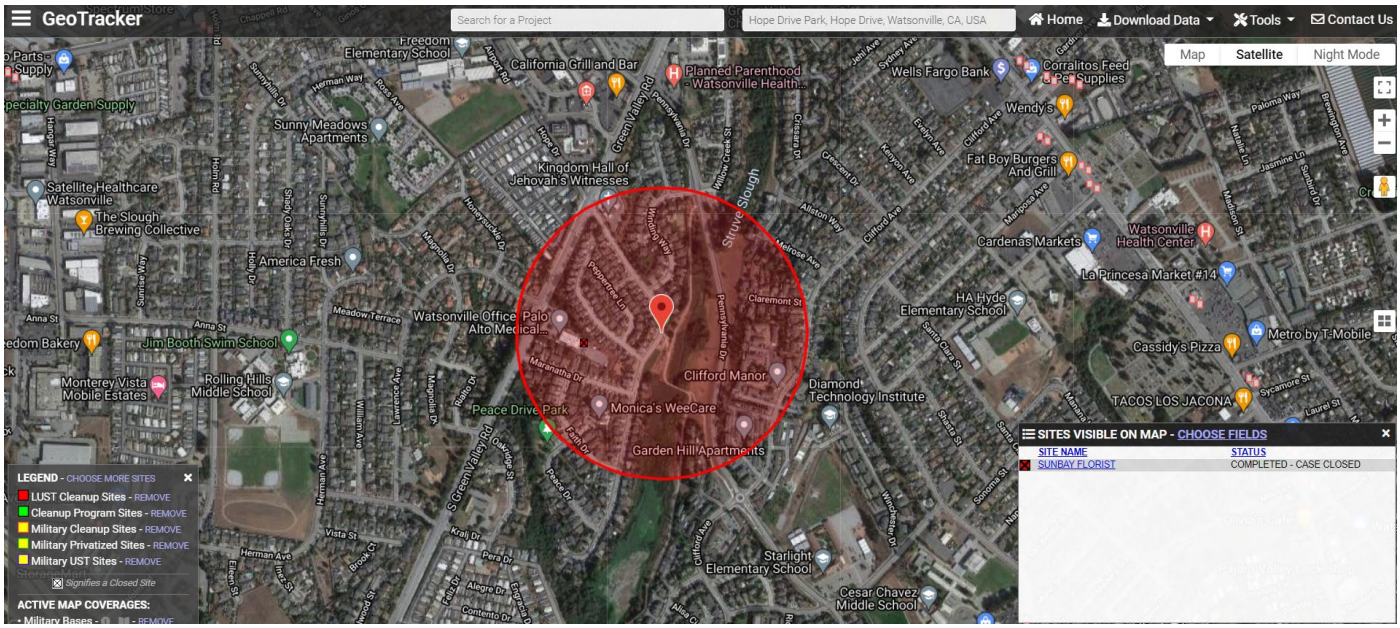
EnviroStor and GeoTracker Database Searches for Hazardous Waste Sites
for the Middle Struve Slough Stormwater and Wetland Enhancement Project Area

EnviroStor Map



California Department of Toxic Substances Control. 2019. Database query of EnviroStor for toxic waste sites in Watsonville, CA. Completed October 2021. https://www.envirostor.dtsc.ca.gov

Geotracker Search



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