Appendix C – Revised

Preliminary Jurisdictional Waters and Wetlands Delineation Report

PRELIMINARY JURISDICTIONAL WATERS AND WETLANDS DELINEATION REPORT
Elder Creek Channel Improvement Project

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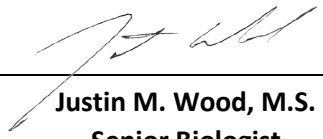
August 2019 (Revised January 2020)

Preliminary Jurisdictional Waters and Wetlands Delineation Report

Elder Creek Channel Improvement Project
San Bernardino County, California

The undersigned certify that this report is a complete and accurate account of the findings and conclusions of a jurisdictional determination and delineation for the above-referenced project.



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1.0 Introduction

This report presents the findings of an investigation of jurisdictional features conducted by Aspen Environmental Group (Aspen) for the Elder Creek Channel Improvement Project (Project). The project site is located within the City of Highland in San Bernardino County, California (Figure 1; note that all figures are included within Attachment 1). Elder Creek Channel carries flows from Elder Creek and developed areas of Highland to the north, downstream into Plunge Creek. The basic project purpose is to provide flood protection to residences and businesses within the downstream segment of the Elder Creek system in the City of Highland.

1.1 Lead Agency Name and Address

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2.0 Project Location and Description

The San Bernardino County Flood Control District (District) proposes to construct and maintain flood control improvements along approximately 2,100 linear feet of the Elder Creek system within the City of Highland, San Bernardino County (Figure 1). The project extends from Old Greenspot Road (upstream, northern limit) to just southwest of the confluence of Elder Creek and Church Street Channel, approximately 700 feet downstream of Abbey Way (downstream, southern limit). The Elder Creek Channel Improvement Project (proposed Project) would increase the capacity of within this reach of the Elder Creek Channel to handle a 100-year storm event. The portion of the Elder Creek system to be improved currently consists of reinforced concrete box, which transitions into an open channel, which then confluences with Plunge Creek downstream. The open channel contains both concrete and earthen segments.

As part of the proposed Project, the existing concrete box culvert (RCB), approximately 10-feet wide by 7-feet deep, between Old Greenspot Road and just north of Merris Street, would be replaced with a concrete rectangular channel, approximately 12-feet wide by 14-feet deep. The upstream end (at Old Greenspot Road) would be designed to accommodate future storm drain connections by the City. Downstream of this section of RCB and just upstream north of Merris Street, the existing 14-feet wide by 6-feet deep concrete rectangular channel would transition into a larger, approximately 20-feet wide by 8-feet deep concrete rectangular channel. Between Merris Street and Abbey Way, the existing 14-feet wide trapezoidal riprap and wire revetment-improved earthen channel would be removed and replaced with an approximately 20-feet wide by 8-feet deep concrete rectangular channel. It should be noted that the

above referenced depths are not fixed at the different reaches and will vary as required to meet upstream and downstream grades. Existing access roads along both sides of the channel would remain in this location. Additionally, two existing 14-feet wide box culverts at the road crossings of Merris Street and Abbey Way would be replaced with approximately 24-feet wide box culverts. Approximately 20-inch diameter sewer sleeves would be placed directly beneath the culverts for approximately 24 feet to allow sewer connections for adjacent residents in the future.

East Highland Storm Drain, which is a small side channel that drains into Elder Creek Channel, is located approximately 610 feet south of Old Greenspot Road. The East Highland Storm Drain is earthen and would remain earthen with implementation of the proposed project but would be regraded to a trapezoidal channel configuration with 2:1 side slope and a bottom width of approximately 6 feet. The earthen trapezoidal channel would include placement of an erosion control mat on the bottom and side slopes. At the confluence of East Highland Storm Drain and Elder Creek Channel an existing 65-feet long section of concrete trapezoidal channel would be removed and replaced with an approximately 48-inch concrete pipe and apron to convey the runoff from the earthen channel into Elder Creek Channel.

Downstream of Abbey Way, the earthen channel would be maintained as a low-flow, vegetated channel, and a concrete by-pass rectangular channel, approximately 26-feet wide by 10-feet high, would be constructed adjacent to the earthen channel. Low flows from the by-pass channel would discharge into a small concrete sedimentation basin, approximately 45 feet by 40 feet, via a low-flow pipe/box drain. The sedimentation basin would allow for centralized capture of sediment and removal, and flows would continue through the basin and into the earthen channel downstream. The earthen channel would experience the day-to-day low flows while the by-pass channel would only experience flows during storm events. The intent of leaving the low-flow channel in place is to avoid impacts to federal wetlands that may be present; widening the channel would also create additional federal wetlands. Two access roads, about 20 feet wide, would be located on either side of the by-pass channel. Adjacent and parallel to the east bank of the low-flow channel, a berm would be constructed to protect the earthen low-flow channel. At the confluence of the low-flow channel, the concrete by-pass channel, and Church Street Channel, approximately 120 linear feet of ¼ ton, 3.5-feet thick, grouted riprap would be placed to control erosion and reduce flow velocities at this location. Grading would occur for approximately 100 feet downstream of the grouted riprap in order to meet downstream grades.

Other improvements include constructing a berm to protect the earthen channel and regrading a portion of the existing stockpile area southeast of the low-flow channel that sits on a shelf, and gently sloping it to meet the existing terrain. Following construction, the low-flow earthen channel downstream of Abbey Way would be revegetated using appropriate riparian and wetland plant palettes as determined by a qualified biologist. Maintenance at the downstream area, where grouted riprap and grading are proposed, would occur approximately twice a year and include debris, trash, sediment removal, and vegetation management as required to convey flows.

The proposed Project also includes a one-time maintenance of Church Street Channel, which is owned by the City of Highland, as well as routine maintenance of Elder Creek within the Project limits. Maintenance activities outside of the low-flow earthen channel would include vegetation, sediment, and debris removal; cleaning out of vegetation and deposited sediment will ensure flow conveyance.

The Elder Creek system will require routine maintenance within the proposed project footprint over the length of the permit. There are two access routes into the Elder Creek Channel within the project area: one below Merris Street adjacent to the channel on the west side, and one downstream of Abbey Way, between the bypass channel and the low-flow earthen channel.

Maintenance is anticipated to be minimal within the concrete sections of the channel and culverts, approximately 1-2 times a year or every few years depending on storms, and consist primarily of debris, trash, and graffiti removal, and fence and appurtenant structure repairs. Maintenance of East Highland Storm Drain is expected to occur 1-2 times a year and involve slope repairs, vegetation management and sediment removal as needed. Maintenance of the low-flow earthen channel is expected to be minimal and occur approximately twice a year, and would include invasive species removal, vegetation management that includes removing large tree species, thinning as required to ensure a healthy ecology and flow conveyance within the system. Sediment removal would occur a few times a year within the sedimentation basin. Vector control may be required more frequently as issues arise. Rodenticide will be applied on an as-needed basis and involve the application of rodenticide. Vector management activities would occur in accordance with the Memorandum of Understanding (MOU) between the District and the County Environmental Health Department for the implementation of vector management activities.

Maintenance within the East Highland Storm Drain would consist of vegetation management, primarily invasive species removal, rodenticide application if needed, and slope and channel bottom repairs and sediment removal as needed, up to twice a year.

2.1 Topography and Surrounding Land Uses

The project site is located just south of Greenspot Road and approximately 0.5 miles east of Orange Street near Highland, California. The project site can be found on the Redlands, California United States Geological Survey (USGS) 7.5’ Quadrangle (USGS, 1966). Representative latitude-longitude coordinates for the project site are 34°06’19.93"N, 117°10'23.02"W. The project site consists of the existing Elder Creek Channel south of Old Greenspot Road and Church Street Channel, unvegetated stockpile areas, access roads, and open areas adjacent to residential development, and a limited amount of native wash vegetation along the margins. The topography of the project site is relatively flat and slopes towards the south. The elevation within the project site ranges from approximately 1,320 to 1,340 feet above mean sea level (MSL). Surrounding land uses include natural open space, flood control, commercial, and residential.

2.2 Vegetation

Vegetation within the project site includes wetland vegetation, such as cattail marshes in Elder Creek and Church Channels. A very small strip of native upland vegetation is also present along the southeast side of the project site, but is not expected to be impacted by the Project. Riparian vegetation is also present just outside of the project site to the southwest; however, this vegetation is not expected to be directly impacted by the Project. Most of the project site is regularly maintained and is unvegetated. Vegetation is further described below and shown in Figure 2.

Table 1: Acreage of Vegetation and Land Cover within the Project Site

Vegetation or Cover Types	Permanent Impact Area	Temporary Impact Area	Total Impact Area
Annual brome grassland	0.01	0.02	0.03
Arroyo willow thickets	0.00	0.01	0.01
California buckwheat scrub	0.00	0.44	0.44
Cattail marshes	0.09	0.17	0.26
Developed	0.22	1.08	1.30
Disturbed	1.13	5.36	6.49
Open water	0.00	0.01	0.01

Smartweed-cocklebur patches	0.28	0.14	0.42
Total	1.73	7.23	8.96

Riparian and Wetland Vegetation Types

Arroyo willow thickets (*Salix lasiolepis* Woodland Alliance). Arroyo willow thickets are present at the downstream end of the project site. These are winter deciduous woodlands which have a dense canopy of arroyo willow (*Salix lasiolepis*), Fremont cottonwood (*Populus fremontii*), and black willow (*Salix gooddingii*). Other species such as narrow leaved willow (*Salix exigua*), mulefat (*Baccharis salicifolia*), and tall cyperus (*Cyperus eragrostis*) are also present.

Cattail marshes [*Typha* (*angustifolia, domingensis, latifolia*) Herbaceous Alliance]. Cattail marshes within the project site are dominated by a dense monotypic stand of broadleaf cattail (*Typha latifolia*). Other cattails such as narrow leaf cattail (*Typha angustifolia*) were also present in lower abundance. They are present within the wettest portion of the project site, which includes much of Elder Creek Channel and Church Channel (see Photo 1 in Attachment 2). This vegetation is seasonally removed by scouring flows, but quickly recolonizes the channels after flows subside.

Smartweed - cocklebur patches (*Polygonum lapathifolium - Xanthium strumarium* Herbaceous Alliance). Smartweed-cocklebur patches within the project area are dominated by common knotweed (*Persicaria lapathifolia*), water speedwell (*Veronica anagallis-aquatica*), and cocklebur (Xanthium strumarium). Other species such as watercress (*Nasturtium officinale*), Mexican sprangletop (*Leptochloa fusca* ssp. *uninervia*), and yellow monkey flower (*Mimulus guttatus*) were also present. Smartweed-cocklebur patches are present along the margins of Elder Creek Channel within the project site.

Upland Vegetation Types

Annual brome grassland. This upland vegetation type is present along the western edge of Church Channel and is dominated by ripgut brome (*Bromus diandrus*) and red brome (*Bromus madritensis* ssp. *rubens*). Other non-native species such as filarees (*Erodium* sps.) are also present.

California buckwheat scrub. California buckwheat scrub is a native upland vegetation type that is present along the southeast edge of the project site (see Photos 3 and 4 in Attachment 2). It is dominated by California buckwheat (*Eriogonum fasciculatum*), with other native species such as scalebroom (*Lepidospartum squamatum*), prickly pear (*Opuntia littoralis*), and California juniper (*Juniperus californica*) also present. Although not mapped, several patches of California juniper woodland (*Juniperus californica* Woodland Alliance) are also present just beyond the project site and are dominated by California juniper.

Other Land Cover Types

Developed. This cover types includes developed areas within the project site and includes paved roads, concrete flood control structures, and other structures.

Disturbed. This cover type includes disturbed unvegetated land surrounding the Elder Creek flood control facility.

Open water. This cover type includes a small area of open water within Church Channel that has accumulated because sediment in the channel is preventing the water from leaving the channel.

2.3 Climate

The climate in the region consists of warm, dry summers and mild, wet winters. The average annual high temperature is about 79.7°F and the average annual low is about 50.3°F (U.S. Climate Data, 2018). Roughly 75 percent of the rain falls from December through March. The mean seasonal precipitation for the region is approximately 13.28 inches (U.S. Climate Data, 2018).

2.4 Hydrology and Geomorphology

Surface flows from Elder Canyon, are conveyed through the community of Highland to the north, to the project site via existing underground storm drains. Elder Creek Channel is an enclosed box channel that is approximately 1.5 miles long before transitioning to an open-top, earthen-bottomed, trapezoidal channel. The project site includes approximately 590 feet of the enclosed box channel, approximately 830 feet of the trapezoidal channel, and about 700 feet of earthen channel. It also includes approximately 450 feet of Church Channel.

Downstream of the project site, Elder Creek confluences with Plunge Creek and continues towards the west under Orange Street and Interstate 210 before merging with City Creek. Flows from these tributaries then enter the Santa Ana River, approximately 3.0 miles downstream of the project site. The Santa Ana River flows to Prado Basin, and finally to the Pacific Ocean. The Pacific Ocean is recognized by the U.S. Army Corps of Engineers (USACE) as traditional navigable water thereby establishing surface connectivity of Elder Creek Chanel to navigable waters.

Based on field observations of vegetation and invertebrates, saturated soils or surface water appear to be present perennially in the low flow channel within Elder Creek Channel. Surface water was present in Elder Creek Channel and Church Channel during the field visit conducted in September 2018. All surface water observed during the survey appears to be fed from upstream urban runoff.

There are numerous blue-line streams mapped within the survey area, including Elder Creek and Plunge Creek (Figure 1), although land use and flood control improvements have substantially altered the historical surface hydrology. The project site is within the Upper Santa Ana Valley Groundwater Basin (CDWR, 2004). It is also within the Santa Ana River hydrologic unit of the South Coast Hydrologic Region as designated by the California Regional Water Quality Control Board (CDWR, 2016).

2.5 Soils and Geology

The project site is located on an extensive alluvial bajada below the San Bernardino Mountains. Soils on the site are loam, sand, and gravel. Historic soil data from the National Resource Conservation Society (NRCS) were reviewed to identify any hydric soils that may have been historically present in the survey area. No hydric soils are mapped in the survey area. However, small patches of hydric soils may be found within non-hydric polygons based on NRCS minimum mapping units. Four soil types are mapped within the survey area and are described below based on the official soil series descriptions (NRCS, 2019c).

Psamments, Fluvents and Frequently flooded soils (Ps). Psamments, fluvents and frequently flooded soils are somewhat excessively drained soils found on alluvial fans. They are found in areas with 0 to 5 percent slope and from elevations of about 10 to 1,500 feet. Water table depth is typically more than 80 inches and these areas are rarely flooded. The substrates are composed of sand (0-12 inches), fine sand (12-48 inches), and stratified gravelly sand to gravelly loamy sand (48-60 inches). It is present along Plunge Creek within the survey area (see Figure 3).

Soboba gravelly loamy sand, 0 to 9 percent slopes (SoC). Soboba gravelly loamy sand is an excessively drained soil that is found on alluvial fans and is derived from granite. It is found in areas with 0 to 9 percent slope and from elevations of about 30 to 4,200 feet. Water table depth is typically more than 80 inches and these areas are rarely flooded. The substrate is composed of gravelly loamy sand (0-12 inches), very gravelly loamy sand (12-36 inches), and very stony sand (36-60 inches). It is present in the central portion of the survey area (see Figure 3).

Soboba stony loamy sand, 2 to 9 percent slopes (SpC). Soboba stony loamy sand is an excessively drained soil that is found on alluvial fans and is derived from granite. It is found in areas with 2 to 9 percent slope and from elevations of about 960 to 3,690 feet. Water table depth is typically more than 80 inches and these areas are rarely flooded. The substrate is composed of stony loamy sand (0-10 inches), very stony loamy sand (10-24 inches), and very stony sand (24-60 inches). It is present in the western portion of the survey area (see Figure 3).

Tujunga loamy sand, 0 to 5 percent slope (TuB). Tujunga loamy sand is a somewhat excessively drained soil that is found on alluvial fans and is derived from granite. It is found in areas with 0 to 5 percent slope and from elevations of about 650 to 3,110 feet. Water table depth is typically more than 80 inches and these areas are rarely flooded. The substrate is composed of loamy sand (0-6 inches), loamy sand (6-18 inches), and loamy sand (18-60 inches). It is present in the northern portion of the survey area (see Figure 3).

3.0 Regulatory Background

Jurisdictional waters, including some wetlands and riparian habitats, may be are regulated by the USACE, the California Department of Fish and Wildlife (CDFW; formerly California Department of Fish and Game), and the Santa Ana Regional Water Quality Control Board (SARWQCB). The USACE Regulatory Program regulates activities pursuant to Section 404 of the federal Clean Water Act (CWA); the CDFW regulates activities under the Fish and Game Code Section 1600-1607; and the SARWQCB regulates activities under Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act. Refer to Attachment 5 for additional details on regulatory authorities and background.

4.0 Waters and Wetlands Delineation Methodology

The assessment of jurisdictional wetlands, other (non-wetland) waters of the United States (waters of the U.S.), waters of the State, and riparian habitat was conducted by Aspen biologist Justin Wood on September 27, 2018. Mr. Wood also field verified his mapping of the vegetation and drainages on October 29, 2018. Prior to conducting the field assessment Mr. Wood reviewed current and historic aerial photographs, the San Bernardino County Soil Survey (NRCS, 2019a), and the local and state hydric soil list (NRCS, 2019b) to evaluate the potential active channels and wetland features in the survey area. Wood also reviewed the District Master Storm Water System Maintenance Program (MSWSMP) Portal (SBCFCD, 2019).

A series of transect locations were determined prior to conducting fieldwork, based on methods in the USACE Wetland Delineation Manual (1987). Each transect was walked perpendicular to the channel and locations were each transect intersected with a state or federally Jurisdictional water a GPS point was collected. Attachment 3 contains the Wetland Determination Data Forms completed during the assessment.

During the field assessment, vegetation, hydrology, and locations of sample locations were mapped using a Trimble Juno 3B GPS unit and identified on aerial photographs (Figures 2 and 4). Field maps were digitized using Global Information System (GIS) and total state and federal jurisdictional areas were calculated.

Vegetation was classified using the names and descriptions in *A Manual of California Vegetation* (Sawyer et al., 2009). Mapping was done by drawing tentative boundaries onto high-resolution aerial images during the site visits, then digitizing these boundaries into GIS shapefiles. Vegetation was mapped digitally using ArcGIS (version 10.1) and one-foot pixel aerial imagery on a 22-inch diagonal flat screen monitor. The smallest mapping unit was approximately 0.10 acre and most mapped vegetation boundaries are accurate to within approximately 3 feet. Any vegetation map is subject to imprecision for several reasons:

1. Vegetation types tend to intergrade on the landscape so that there are no true boundaries in the vegetation itself. In these cases, a mapped boundary represents best professional judgment.
2. Vegetation types as they are named and described tend to intergrade; that is, a given stand of real-world vegetation may not fit into any named type in the classification scheme used. Thus, a mapped and labeled polygon is given the best name available in the classification, but this name does not imply that the vegetation unambiguously matches its mapped name.
3. Vegetation tends to be patchy. Small patches of one named type are often included within mapped polygons of another type. The size of these patches varies, depending on the minimum mapping units and scale of available aerial imagery.

4.1 Federal Wetlands

Jurisdictional wetlands were delineated using a routine determination according to the methods outlined in the USACE Wetland Delineation Manual (USACE, 1987) and the Arid West Supplement (USACE, 2008) based on three wetland parameters: dominant hydrophytic vegetation, wetland hydrology, and hydric soils. The three parameters were evaluated at a series of sample points throughout the survey area. The locations of these sample points were selected at locations judged most likely and least likely to meet wetlands criteria. Soil pits were excavated at these locations to evaluate the presence of hydric soils (Figure 4).

Hydrophytic Vegetation

At each sample location, the aerial cover of all plant species in each vegetation type was visually estimated. Plant species in each stratum (tree, sapling and shrub, herb, and woody vine) were ranked according to their canopy dominance (USACE, 2008). Species that contributed to a cumulative coverage total of at least 50 percent and any species that comprised at least 20 percent of the total coverage for each stratum were recorded on the Field Data Sheets (50/20 Rule). Wetland indicator status was assigned to each dominant species using the Region 0 List of Plant Species that Occur in Wetlands and Summary of Wetland Indicator Status (Reed, 1988), the California sub-region of the National List of Vascular Plant Species that Occur in Wetlands: 1996 National Summary (USFWS, 1997), the Arid West Region of The National Wetland Plant List (USACE, 2012), and the On-line Plants Database (USDA, 2019). If greater than 50 percent of the dominant species from all strata were Obligate, Facultative-wetland, or Facultative species, the criteria for wetland vegetation was met (refer to Table 3 of Attachment 4).

Wetland Hydrology

At each sample location, the presence or absence of wetland hydrology was evaluated by observing indicators of hydrology (USACE, 2008). These indicators are divided into two categories (primary and

secondary indicators). Presence of one primary indicator is evidence of wetland hydrology. Presence of two or more secondary indicators can also be evidence of wetland hydrology. The Arid West Supplement includes two additional indicator groups that can be utilized during dry conditions or in areas where surface water and saturated soils are not present including Group B (evidence of recent inundation) and Group C (evidence of recent soil saturation) (USACE, 2008). For additional information regarding wetland hydrology indicators refer to Tables 4 and 5 in Attachment 4.

Hydric Soils

Soil pits were excavated at each sample location using a shovel. Whenever possible they were excavated to a depth of 20 inches (USACE, 2008). At each soil pit, the soil texture and color were recorded by comparison with a Munsell soil color chart (2000). Any other indicators of hydric soils, such as redoximorphic features, hydrogen sulfide odor, buried organic matter, organic streaking, reduced soil conditions, gleyed or low-chroma soils were also recorded (refer to Tables 6 and 7 of Attachment 4).

4.2 Federal Non-Wetland Waters

Jurisdictional non-wetland waters of the U.S. were delineated based on the limits of the ordinary high-water mark (OHWM) as determined by physical and biological features such as bank erosion, deposited vegetation or debris, and vegetation characteristics. See Tables 1 and 2 in Attachment 4 (Potential Geomorphic and Vegetative Indicators of Ordinary High-Water Marks for the Arid West) for a list of key physical features for determining the OHWM identified by the arid west manual.

4.3 CDFW Jurisdictional Waters

CDFW jurisdiction was delineated to the tops of the channel banks or to the edge of the riparian canopy. Throughout the Project site the CDFW jurisdictional area extended beyond the OHWM. Therefore, the total acreage of CDFW jurisdictional waters is greater than the federal jurisdictional waters of the U.S.

5.0 Results

Based on the results of the field surveys and mapping, Aspen's professional opinion on acreage of jurisdictional waters, wetlands, and CDFW habitat is shown below in Table 1. Additional information for each location can be found on the field data sheets (Attachment 3).

Table 2: Acreage of Jurisdictional Waters, Wetlands, and CDFW Habitat

	USACE Jurisdictional Waters of The U.S. (Acres)		State Jurisdictional Waters (Acres)
	Non-wetland waters of U.S.	Wetlands	
Permanent Impact Area	0.29	0.16	0.94
Temporary Impact Area	0.30	0.08	1.03
Total Impact Area	0.59	0.24	1.97

(a) Non-wetland waters of the United States and non-wetland waters of the State overlap; as such, jurisdictional acreages are not additive.
(b) Wetlands fall under the jurisdiction of the USACE, SARWQCB, and CDFW; as such, wetland acreages are not additive.

5.1 Federal Wetlands

Based on this assessment of hydrology, vegetation, and soils, and Aspen's professional opinion, approximately 0.08 acres of the temporary impact area and 0.16 acres of the permanent impact area satisfies the federal criteria as wetlands (USACE, 1987; USACE, 2008). Additional information for each location can be found on the field data sheets (Attachment 3).

Hydrophytic Vegetation

Ten obligate (OBL), sixteen facultative wetland (FACW), and fourteen facultative (FAC) species were observed within or immediately adjacent to the project site. Many other plants with an indicator status of facultative upland (FACU), upland (UPL), or not classified were also observed. Refer to the Wetland Determination Data Forms for specific information about the vegetation at each sample location (Attachment 3).

Wetland Hydrology

Surface water was present within the survey area. Surface flows in Elder Creek Channel entered from the enclosed box culvert at the north end of the survey area and continued approximately 1,980 feet downstream before flows became sub-surface. Surface flows in Church Channel are intermittent and pond in the concrete-lined section of the channel before merging with flows from Elder Creek Channel. Several other indicators were also present including drift deposits, aquatic invertebrates, hydrogen sulfide odor, presence of reduced iron, and saturation visible on aerial imagery.

Hydric Soils

The soil pit at sample locations 2 and 3 within Elder Creek Channel both showed indicators of hydric soils (Figure 4). The soil pit at sample location 2 had a sandy redox which is an indicator of hydric soils. The soil pit at sample location 3 had a strong odor of hydrogen sulfide and a well-established sandy gleyed matrix, which are both indicators of hydric soils. The soil pit at sample location 1 was near flowing water and hydrophytic vegetation was present but the soil showed no indicators of being hydric. Flows in this section of the channel are likely intermittent and water has not been present for a long enough period to develop hydric soils. Downstream of sample location 1, the water percolates through the substrate and the channel becomes dry. Upstream of sample location 3, the vegetation, hydrology, and indicators of hydric soil (i.e. hydrogen sulfide odor) remain present so additional soil pits were not needed.

5.2 Federal Non-Wetland Waters

Based on this assessment of OHWMs and Aspen's professional opinion, approximately 0.30 acres of the temporary impact area and 0.29 acres of the permanent impact area meet the definition of waters of the U.S. as outlined in 33 CFR Part 328 (Figure 4). Some of the key hydrology indicators noted during the delineation included the following. See Tables 1 and 2 in Attachment 4 for additional information.

- A1 – Surface Water
- A2 – High Water Table
- A3 – Saturation
- B2 – Active floodplain
- B3 – Drift Deposits
- B13 – Drift (organic debris, larger than twigs)
- C1 – Hydrogen Sulfide Odor

Federal non-wetland waters of the U.S. include part of the channel bottom within the survey area and extended up the side slopes slightly depending on the location of drift deposits and vegetation (i.e., the OHWM). A review of historic aerial photography (1995 – 2018) on Google Earth confirms the approximate

location and extent of federal non-wetland waters of the U.S. identified during our site visit. Additional non-wetland waters of the U.S. are also present downstream of the project area, within the survey area.

5.3 CDFW Waters

Based on this assessment and Aspen's professional opinion, 0.94 acres within the permanent impact area and 1.03 acres within the temporary impact area meet the definition of CDFW jurisdictional waters of the State as outlined in Sections 1600-1616 of the California Fish and Game Code (Figure 4). This conclusion is primarily based on the presence of bed and bank and extent of riparian vegetation.

6.0 Summary and Conclusions

The project site includes jurisdictional waters of the State and waters of the U.S. including federally jurisdictional wetlands and USACE non-wetland waters as follows:

- 0.24 acres of federally jurisdictional wetland were mapped in areas that support hydrophytic vegetation, show evidence of wetland hydrology, and contain hydric soils. Approximately 0.16 acres of these federal wetlands are within the permanent impact area and 0.08 acres are within the temporary impact area.
- 0.59 acres of jurisdictional non-wetland waters of the United States where mapped in areas that did not meet the hydrophytic vegetation or hydric soils criteria for wetlands but where evidence of hydrology or a discernible OHWM was visible. This included 0.29 areas within the permanent impact area and 0.30 acres within the temporary impact area.
- 1.97 acres of CDFW jurisdictional waters were mapped based on riparian vegetation, bed and bank delineation, and field observations. This included 0.94 acres within the permanent impact area and 1.03 acres within the temporary impact area.

Note that these acreages overlap and are not additive. All USACE jurisdictional waters are included within the CDFW jurisdictional waters of the State. The conclusions presented above represent Aspen's professional opinion based on our knowledge and experience with the USACE and CDFW, including their regulatory guidance documents and manuals. However, the USACE and CDFW have final authority in determining the status and presence of jurisdictional wetlands and waters and the extent of their boundaries.

7.0 References

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Attachment 1 - Figures

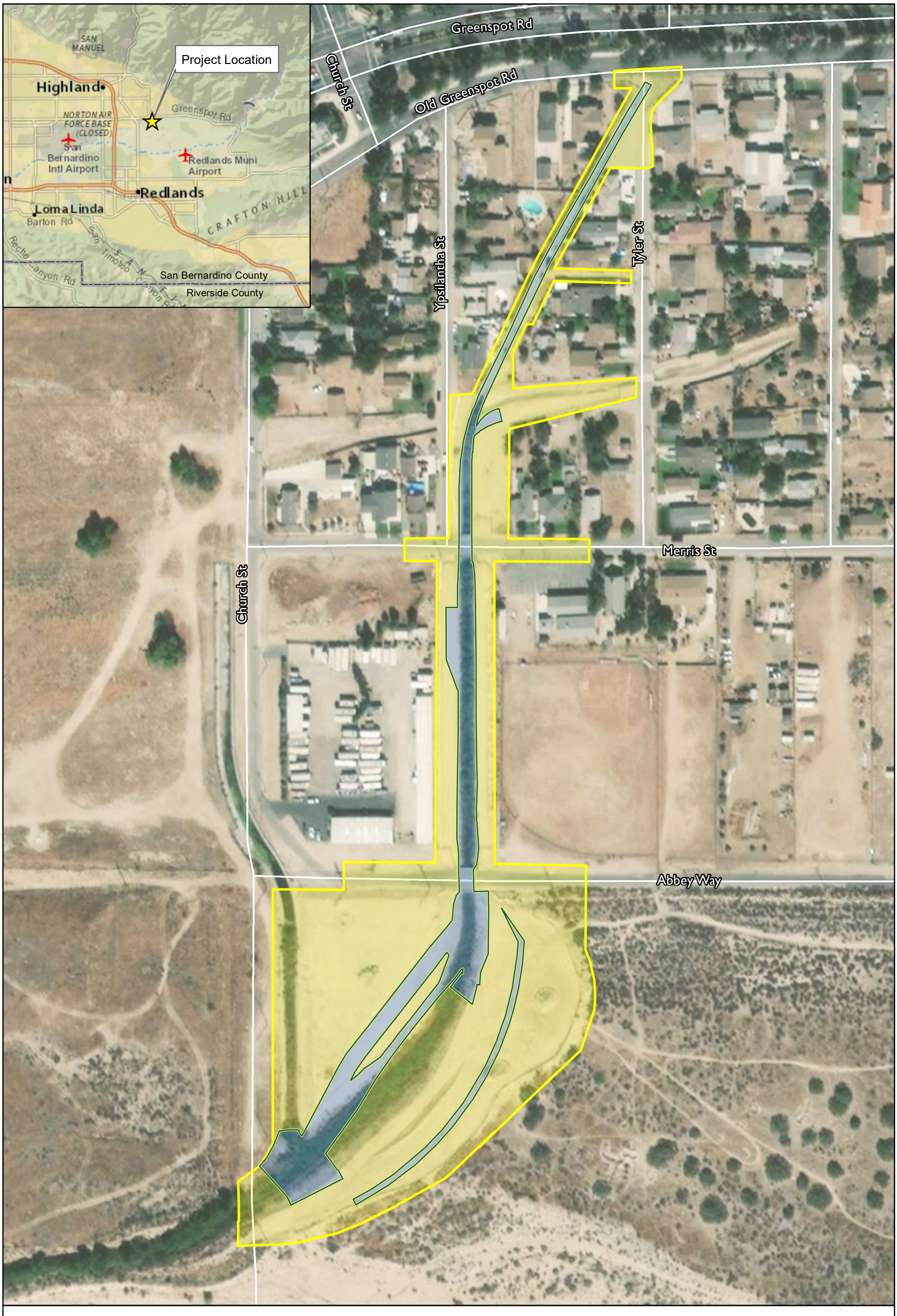
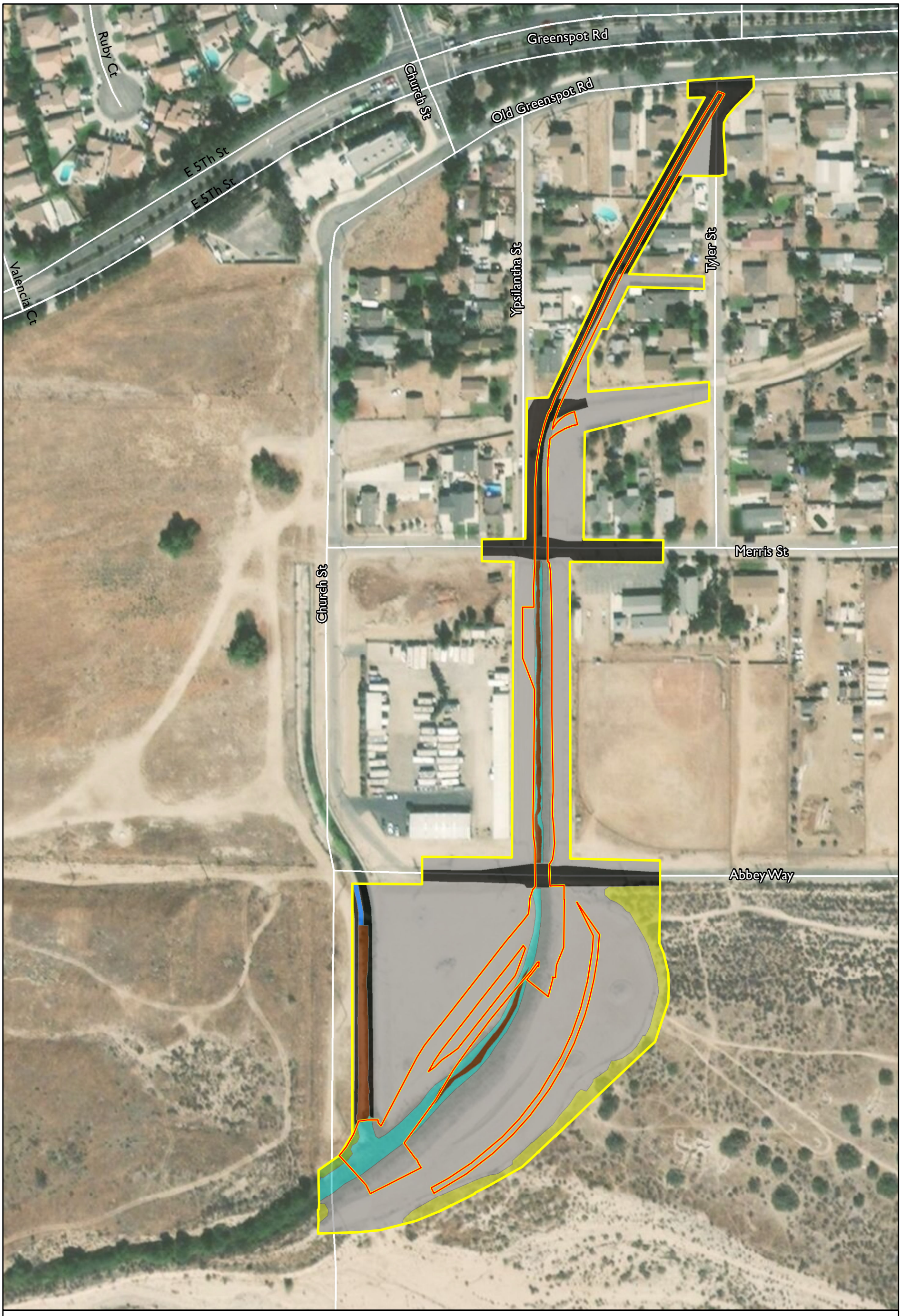


Figure 1.

Project Overview

January 2020



Permanent Construction Impacts

Temporary Construction Impacts

Vegetation and Cover Type (Permanent Infrastructure Impacts/Perm. Vegetation Impacts/Temporary Impacts)

- Annual brome grassland (0.01 ac/0.02 ac)
- Arroyo willow thickets (0 ac/0.01 ac)
- California buckwheat scrub (0 ac/0.44 ac)
- Cattail marshes (0.09 ac/0.17 ac)
- Developed (0.22 ac/1.08 ac)
- Disturbed (1.13 ac/5.36 ac)
- Open water (0 ac/0.01 ac)
- Smartweed-cocklebur patches (0.28 ac/0.14 ac)

Figure 2.

Vegetation

N

0 200

Feet

January 2020

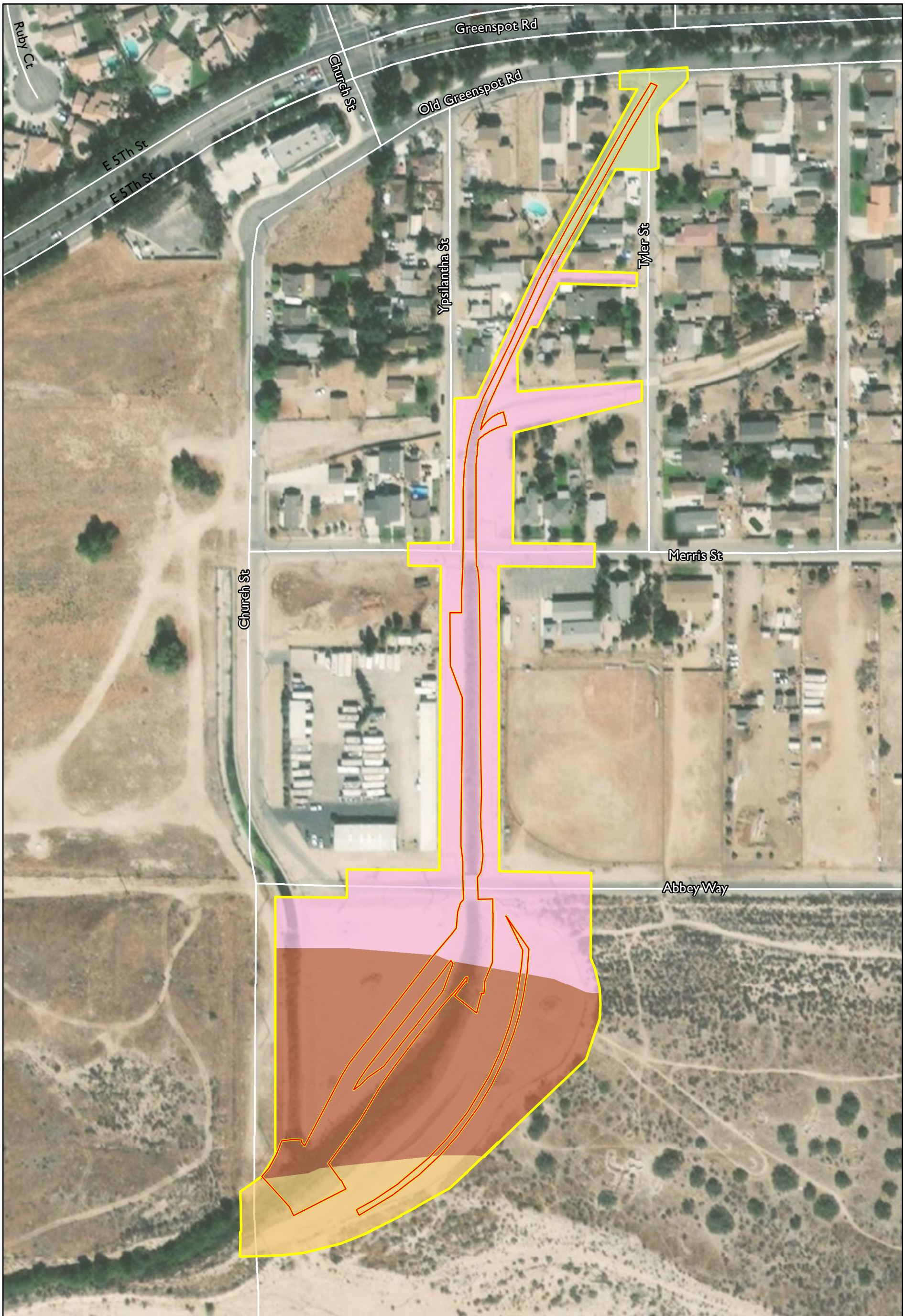
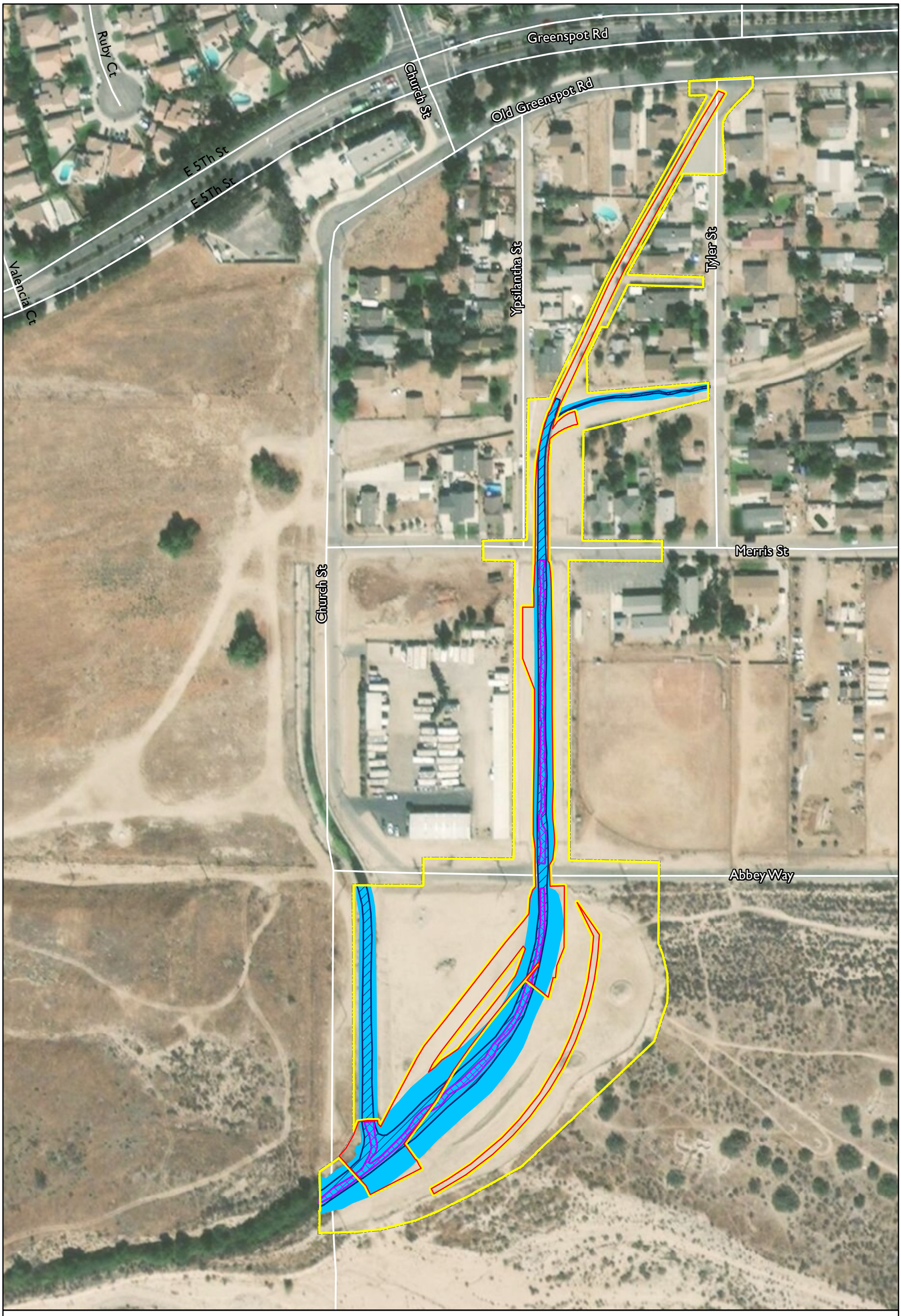


Figure 3.

Soils

January 2020



Permanent Construction Impacts

Temporary Construction Impacts

Jurisdictional Waters (Permanent Infrastructure Impacts/Temporary Impacts)

Waters of the State (1.03 ac/0.94 ac)

Waters of the US (0.29 ac/0.30 ac)

Federal wetlands (0.16 ac/0.08 ac)

Figure 4.

Jurisdictional Waters

0 200

Feet

January 2020

Attachment 2 – Representative Site Photos

Photo 1: South-facing view of wetland vegetation within Church Channel.

Photo 2: Northeast-facing view of wetland vegetation in Elder Channel.

Photo 3: Southwest-facing view of wetland vegetation within the lower portion of Elder Channel.

Photo 4: South-facing view of wetland vegetation in the upper portion of Elder Channel.

Attachment 3 – Field Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Elder Creek Channel City/County: Highland/San Bernardino Co. Sampling Date: 27-Sept-2018

Applicant/Owner: San Bernardino County Department of Public Works State: CA Sampling Point: JD 1

Investigator(s): Justin M. Wood Section, Township, Range:

Landform (hillslope, terrace, etc.): Broad wash Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): Southern California Coastal Plain Lat: 34° 06' 15.51" Long: 117° 10' 31.11" Datum: NAD 83

Soil Map Unit Name: Psamments, Fluvents and Frequently flooded soils NWI classification: R5UBF

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:

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: 5-m radius)			
1. Baccharis salicifolia	30	Yes	FAC
2. Salix lasiandra	30	Yes	FACW
3.			
4.			
5.			
	60 = Total Cover		
Herb Stratum (Plot size: 1-m radius)			
1. Persicaria punctata	35	Yes	OBL
2. Xanthium straminium	20	Yes	FAC
3. Helianthus annus	10	No	FACU
4. Typha domingensis	10	No	OBL
5. Cyperus eragrostis	5	No	FACW
6.			
7.			
8.			
	80 = 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: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	35	x 2 =	70
FAC species	50	x 3 =	150
FACU species	10	x 4 =	40
UPL species		x 5 =	
Column Totals:	140 (A)		305 (B)

Prevalence Index = B/A = 2.2

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

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

___ 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:

SOIL

Sampling Point: JD 1

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 %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 6/2	100					Sand	
7-9	10YR 3/2	100					Loamy sa	

[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:

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): 5

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 5

Wetland Hydrology Present? **Yes** ✓ **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Elder Creek Channel City/County: Highland/San Bernardino Co. Sampling Date: 27-Sept-2018

Applicant/Owner: San Bernardino County Department of Public Works State: CA Sampling Point: JD 2

Investigator(s): Justin M. Wood Section, Township, Range: 10, T1S, R3W (Redlands)

Landform (hillslope, terrace, etc.): Broad wash Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): Southern California Coastal Plain Lat: 34° 06' 15.81" Long: 117° 10' 29.14" Datum: NAD 83

Soil Map Unit Name: Psamments, Fluvents and Frequently flooded soils NWI classification: R5UBF

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:

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: 5-m radius)			
1. Baccharis salicifolia	40	Yes	FAC
2. Salix lasiolepis	10	Yes	FACW
3.			
4.			
5.			
	50 = Total Cover		
Herb Stratum (Plot size: 1-m radius)			
1. Persicaris punctata	35	Yes	OBL
2. Typha latifolia	10	Yes	OBL
3. Cyperus eragrostis	10	Yes	FACW
4. Helianthus annus	5	No	FACW
5. Xanthium straminium	5	No	FAC
6. Artemisia douglasiana	5	No	FAC
7.			
8.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	25	x 2 =	50
FAC species	50	x 3 =	150
FACU species	_____	x 4 =	_____
UPL species	_____	x 5 =	_____
Column Totals:	120 (A)		245 (B)

Prevalence Index = B/A = 2.04

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:

SOIL

Sampling Point: JD 2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	70	7.5YR 5/8	30	RM	M	Loamy san	
5-15	10YR 4/3	100					Loamy sar	

[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:

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): 4

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 4

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Elder Creek Channel City/County: Highland/San Bernardino Co. Sampling Date: 27-Sept-2018

Applicant/Owner: San Bernardino County Department of Public Works State: CA Sampling Point: JD 3

Investigator(s): Justin M. Wood Section, Township, Range: 10, T1S, R3W (Redlands)

Landform (hillslope, terrace, etc.): Broad wash Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): Southern California Coastal Plain Lat: 34° 06' 18.53" Long: 117° 10' 23.19" Datum: NAD 83

Soil Map Unit Name: Psamments, Fluvents and Frequently flooded soils NWI classification: R5UBF

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:

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: 1-m radius)			
1. Persicaris punctata	55	Yes	OBL
2. Xanthium straminium	30	Yes	FAC
3. Leptochloa fusca	10	No	FACW
4.			
5.			
6.			
7.			
8.			
	95 = 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: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 55	x 1 = 55
FACW species 10	x 2 = 20
FAC species 30	x 3 = 90
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 95 (A)	165 (B)

Prevalence Index = B/A = 1.74

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:

SOIL

Sampling Point: JD 3

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 %	Type[1]	Loc[2]	Texture	Remarks
0-9	GLEY2 3/5	100					Loamy san	Hydrogen sulfide smell present
9-11	10YR 3/1	100					Sand	

[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:

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): 4

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 4

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Attachment 4 – Federal Non-Wetland/Wetland Waters Indicator Information

Table 1. Potential Geomorphic Indicators of Ordinary High Water Marks for the Arid West

(A) Below OHW	(B) At OHW	(C) Above OHW
1. In-stream dunes	1. Valley flat	1. Desert pavement
2. Crested ripples	2. Active floodplain	2. Rock varnish
3. Flaser bedding	3. Benches: low, mid, most prominent	3. Clast weathering
4. Harrow marks	4. Highest surface of channel bars	4. Salt splitting
5. Gravel sheets to rippled sands	5. Top of point bars	5. Carbonate etching
6. Meander bars	6. Break in bank slope	6. Depositional topography
7. Sand tongues	7. Upper limit of sand-sized particles	7. Caliche rubble
8. Muddy point bars	8. Change in particle size distribution	8. Soil development
9. Long gravel bars	9. Staining of rocks	9. Surface color/tone
10. Cobble bars behind obstructions	10. Exposed root hairs below intact soil layer	10. Drainage development
11. Scour holes downstream of obstructions	11. Silt deposits	11. Surface relief
12. Obstacle marks	12. Litter (organic debris, small twigs and leaves)	12. Surface rounding
13. Stepped-bed morphology in gravel	13. Drift (organic debris, larger than twigs)	
14. Narrow berms and levees		
15. Streaming lineations		
16. Desiccation/mud cracks		
17. Armored mud balls		
18. Knick Points		

Table 2. Potential Vegetation Indicators of Ordinary High Water Marks for the Arid West

	(D) Below OHW	(E) At OHW	(F) Above OHW
Hydroriparian indicators	1. Herbaceous marsh species 2. Pioneer tree seedlings 3. Sparse, low vegetation 4. Annual herbs, hydromesic ruderals 5. Perennial herbs, hydromesic clonals	1. Annual herbs, hydromesic ruderals 2. Perennial herbs, hydromesic clonals 3. Pioneer tree seedlings 4. Pioneer tree saplings	1. Annual herbs, xeric ruderals 2. Perennial herbs, non-clonal 3. Perennial herbs, clonal and non-clonal co-dominant 4. Mature pioneer trees, no young trees 5. Mature pioneer trees w/upland species 6. Late-successional species
Mesoriparian Indicators	6. Pioneer tree seedlings 7. Sparse, low vegetation 8. Pioneer tree saplings 9. Xeroriparian species	5. Sparse, low vegetation annual herbs, hydromesic 6. ruderals 7. Perennial herbs, hydromesic clonals 8. Pioneer tree seedlings 9. Pioneer tree saplings 10. Xeroriparian species 11. Annual herbs, xeric ruderals	7. Xeroriparian species 8. Annual herbs, xeric ruderals 9. Perennial herbs, non-clonal 10. Perennial herbs, clonal and non-clonal codominent 11. Mature pioneer trees, no young trees 12. Mature pioneer trees, xeric understory 13. Mature pioneer trees w/upland species 14. Late-successional species 15. Upland species
Xeroriparian indicators	10. Sparse, low vegetation 11. Xeroriparian species 12. Annual herbs, xeric ruderals	12. Sparse, low vegetation 13. Xeroriparian species 14. Annual herbs, xeric ruderals	16. Annual herbs, xeric ruderals 17. Mature pioneer trees w/upland species 18. Upland species

Table 3. Summary of Wetland Indicator Status

Category		Probability
Obligate Wetland	OBL	Almost always occur in wetlands (estimated probability >99%)
Facultative Wetland	FACW	Usually occur in wetlands (estimated probability of 67–99%)
Facultative	FAC	Equally likely to occur in wetlands/non-wetlands (estimated probability of 34–66%)
Facultative Upland	FACU	Usually occur in non-wetlands (estimated probability 67–99%)
Obligate Upland	UPL	Almost always occur in non-wetlands (estimated probability >99%)
Non-Indicator	NI	No indicator status has been assigned

Source: Reed, 1988; USFWS, 1997; USACE, 2012.

Table 4. Wetland Hydrology Indicators*

Primary Indicators	Secondary Indicators
Watermarks	Oxidized Rhizospheres Associated with Living Roots
Water-Borne Sediment Deposits	FAC-Neutral Test
Drift Lines	Water-Stained Leaves
Drainage Patterns Within Wetlands	Local Soil Survey Data

*Table adapted from 1987 USACE Manual and Related Guidance Documents.

Table 5. Wetland Hydrology Indicators for the Arid West*

	Primary Indicator (any one indicator is sufficient to make a determination that wetland hydrology is present)	Secondary Indicator (two or more indicators are required to make a determination that wetland hydrology is present)
Group A – Observation of Surface Water or Saturated Soils		
A1 – Surface Water	X	
A2 – High Water Table	X	
A3 – Saturation	X	
Group B – Evidence of Recent Inundation		
B1 – Water Marks	**X** (Non-riverine)	**X** (Riverine)
B2 – Sediment Deposits	**X** (Non-riverine)	**X** (Riverine)
B3 – Drift Deposits	**X** (Non-riverine)	**X** (Riverine)
B6 – Surface Soil Cracks	X	
B7 – Inundation Visible on Aerial Imagery	X	
B9 –Water-Stained Leaves	X	
B10 – Drainage	X	X
B11 – Salt Crust	X	
B12 – Biotic Crust	X	
B13 – Aquatic Invertebrates	X	
Group C – Evidence of Current or Recent Soil Saturation		
C1 – Hydrogen Sulfide Odor	X	
C2 – Dry-Season Water Table		X
C3 – Oxidized Rhizospheres along Living Roots	X	

Table 5. Wetland Hydrology Indicators for the Arid West*

	Primary Indicator (any one indicator is sufficient to make a determination that wetland hydrology is present)	Secondary Indicator (two or more indicators are required to make a determination that wetland hydrology is present)
C4 – Presence of Reduced Iron	X	
C6 – Recent Iron Reduction in Tilled Soils	X	
C7 – Thin Muck Surface	X	
C8 – Crayfish Burrows		X
C9 – Saturation Visible on Aerial Imagery		X
Group D – Evidence from other Site Conditions or Data		
D3 – Shallow Aquitard		X
D5 – FAC-Neutral Test		X

*Table adapted from Regional Supplement to the USACE of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0.

Table 6. Field Indicators of Hydric Soil Conditions*

1. Indicators of Historical Hydric Soil Conditions	2. Indicators of Current Hydric Soil Conditions
a. Histosols b. Histic epipedons; c. Soil colors (e.g., gleyed or low-chroma colors, soils with bright mottles (Redoximorphic features) and/or depleted soil matrix d. High organic content in surface of sandy soils e. Organic streaking in sandy soils f. Iron and manganese concretions g. Soil listed on county hydric soils list	a. Aquic or peraquic moisture regime (inundation and/or soil saturation for *7 continuous days) b. Reducing soil conditions (inundation and/or soil saturation for *7 continuous days) c. Sulfidic material (rotten egg smell)

*Table adapted from 1987 USACE Manual and Related Guidance Documents.

Table 7. Hydric Soil Indicators for the Arid West*

Hydric Soil Indicators			Hydric Soil Indicators for Problem Soils**
All Soils	Sandy Soils	Loamy and Clay Soils	
A1 – Histosol	S1 – Sandy Mucky Mineral	F1 – Loamy Mucky Mineral	A9 – 1 cm Muck
A2 – Histic Epipedon	S4 – Sandy Gleyed Matrix	F2 – Loamy Gleyed Matrix	A10 – 2 cm Muck
A3 – Black Histic	S5 – Sandy Redox	F3 – Depleted Matrix	F18 – Reduced Verti
A4 – Hydrogen Sulfide	S6 – Stripped Matrix	F6 – Redox Dark Surface	TF2 – Red Parent Material
A5 – Stratified Layers	—	F7 – Depleted Dark Surface	Other (See Section 5 of Regional Supplement, Version 2.0)
A9 – 1 cm Muck	—	F8 – Redox Depressions	—
A11 – Depleted Below Dark Surface	—	F9 – Vernal Pools	—
A12 – Thick Dark Surface	—	—	—

* Table adapted from Regional Supplement to the USACE of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0.
** Indicators of hydrophytic vegetation and wetland hydrology must be present

Attachment 5 – Regulatory Background Information

Regulatory Background Information

Section 404 of the Clean Water Act (CWA)

Section 404 of the CWA regulates the discharge of dredged material, placement of fill material, or certain types of excavation within "waters of the U.S." (resulting in more than incidental fallback of material) and authorizes the Secretary of the Army, through the Chief of Engineers, to issue permits for such actions. Permits can be issued for individual projects (individual permits) or for general categories of projects (general permits). "Waters of the U.S." are defined by the CWA as "rivers, creeks, streams, and lakes extending to their headwaters and any associated wetlands." Wetlands are defined by the CWA as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions." The Corps has adopted several revisions to their regulations in order to more clearly define "waters of the U.S." Until the beginning of 2001, "waters of the U.S." included, among other things, isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not part of a tributary system to interstate waters or to navigable "waters of the U.S."

The jurisdictional extent of Corps regulation changed with the 2001 SWANCC (Solid Waste Agency of Northern Cook County) ruling. The U.S. Supreme Court held that the Corps could not apply Section 404 of the CWA to extend their jurisdiction over an isolated quarry pit. The Court ruled that the CWA does not extend Federal regulatory jurisdiction over non-navigable, isolated, intra-state waters. However, the Court made it clear that non-navigable wetlands adjacent to navigable waters are still subject to Corps jurisdiction.

Section 401 of the CWA

Section 401 of the CWA requires that any applicant for a Federal permit for activities that involve a discharge to 'waters of the State,' shall provide the Federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the Federal Clean Water Act. Therefore, before the Corps will issue a Section 404 permit, applicants must apply for and receive a Section 401 Water Quality Certification from the RWQCB. Applications to the RWQCB must include a complete CEQA document (e.g., Initial Study/Mitigated Negative Declaration).

Section 1602 of the California Fish and Game Code

Section 1602 of the California Fish and Game Code requires any person, State or local governmental agency, or public utility which proposes a project that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake, or use materials from a streambed, or result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake, to first notify the CDFW of the proposed project. Notification is generally required for any project that will take place in or in the vicinity of a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life and watercourses having a surface or subsurface flow that support or have supported riparian vegetation. Based on the notification materials submitted, the CDFW will determine if the proposed project may impact fish or wildlife resources. If the CDFW determines that a proposed project may substantially adversely affect existing fish or wildlife resources, a Lake or Streambed Alteration Agreement (SAA) will be required. A completed CEQA document must be submitted to CDFW before a SAA will be issued.