

Habitat Revegetation Plan

Federal Blvd Chollas Creek De-Channelization & Trail Project

City of San Diego, San Diego County, California



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Executive Summary

This Habitat Restoration Plan (HRP) has been prepared for the Federal Boulevard Chollas Creek Restoration and Trail Project (Project) to detail the proposed revegetation efforts associated with this Project.

The Project entails the removal of approximately 1,885 linear feet of concrete lined channel on Chollas Creek along Federal Boulevard between the I-805 overpass and Home Avenue and the construction of a 3,100 linear foot pedestrian trail. The Project is located in the City of San Diego, California.

The Project would result in no loss of Waters of the US/State/City jurisdictional areas. The restored natural channel would result in a larger cross-sectional area than the current concrete channel, resulting in 2.11 acres of restoration/creation of streambed and 0.73 acre of newly additional CDFW jurisdiction on the north bank. The restored active channel would vary in width from 50 to 68 feet. Four natural-rock and one concrete drop structures would be installed to create the gentle slope between drops, and dissipate energy, with the largest drop at the upstream end. This structure would be concrete lined that flows into an ungrouted rock energy dissipater. Larger natural rock would be placed intermittently in the channel bottom, combined with the smaller cobble to create a natural-looking streambed, similar to nearby reaches of Chollas Creek. All cobble and natural grade control structures would be ungrouted to retain the natural streambed function.

The north banks of the creek would be graded to a 2:1 slope to allow for planting, but would be rock lined. A new retaining wall of varying heights (6'-12') would be installed along the southern side of the creek, mostly along the current flood channel maintenance road and outside current Waters of the US/State. The retaining wall structure would be located on City-owned and Caltrans property. The abutting Caltrans SR-94 engineered slopes would be temporarily impacted during construction due to the need to construct this structure. The 2.11 acres of streambed restoration will serve as mitigation for impacts to City of San Diego defined Disturbed Wetland associated with the removal of the concrete channel.

To construct the retaining wall up to 30' of temporary slope impacts will occur to disturbed habitat, southern mixed chaparral and eucalyptus woodland. This area will be revegetated with Diegan coastal sage scrub (CSS) vegetation after construction is complete.

Active CSS habitat revegetation will occur on the north banks of Chollas Creek (0.73 acre) and on the Caltrans SR-94 slopes (1.64 acres). No active planting will occur within Chollas Creek channel bottom. Both the north banks and the Caltrans slopes will be hydroseeded. The north banks will also have containerized plants and temporary irrigation. Once project construction is complete the City of San Diego Storm Water Division (SWD) and Caltrans will re-assume maintenance activities within the Creek. Short-term maintenance and monitoring will be conducted for five years to monitor the success of the Project.

1.0 Introduction

This Habitat Revegetation Plan (HRP) has been prepared to provide mitigation, revegetation and maintenance guidance for the Federal Boulevard Chollas Creek De-Channelization and Trail Project (Project) in the City of San Diego, California. The Project will result in temporary impacts to native upland habitat on Caltrans State Route (SR) 94 slopes above Chollas Creek. Revegetation of this area and on the north bank of the creek after concrete removal, will consist of active coastal sage scrub (CSS) revegetation. The concrete in Chollas Creek will be removed and replaced with a rock-lined meandering stream, and will not be actively revegetated.

1.1 Project Location

The Project is located in the City of San Diego, San Diego County, California. As shown in Figure 1, Project Location, and Figure 2, Vicinity Map, the Project is located north of SR-94, east of SR-15 and Home Avenue, south of Federal Boulevard, and west of Interstate 805. It is in an urban setting surrounded by freeways and roads on all sides, with a City of San Diego Police Department canine facility and a shooting range to the north immediately across Federal Blvd.

1.1.1 Directions to the Site

The nearest physical address, located across the street from the Project is: 4088 Federal Boulevard, San Diego California 92105 (San Diego Police Department Revolver Club). From SR-15 heading south, exit I-805 South towards SR-94 East. Take exit 13B towards Home Avenue. Turn right onto Home Avenue and travel for 0.6 mile. Turn left on Federal Boulevard and project begins immediately on the right.

1.2 Project Background

The Project is located within the Fairmount Park neighborhood of City Heights in the Mid-City Community Planning area. City Heights was identified in the City of San Diego's Chollas Creek Enhancement Program (2002) to benefit from habitat restoration and the development of a trail system to improve water quality and quality of life.

In 2017, Groundwork San Diego obtained a Prop. 1 Disadvantaged Community Involvement (DACI) Grant from the California Department of Water Resources Integrated Regional Water Management (IRWM) Program. Part of this grant was to study the feasibility of removing concrete along the identified 2,100 linear feet of Chollas Creek. The grant included hydrology/hydraulic modeling (see Appendix A), which revealed that it was possible to remove the concrete without causing downstream changes to the hydrology or impacts to downstream structures. As part of this grant, stakeholders including the City of San Diego and Caltrans (property owners), and the Resource Agencies were consulted; biological impacts were initially assessed; 60% design engineering drawings were developed. Two subsequent grants were awarded that covers current permit approvals, final engineering and landscape design, construction costs, and three years of post-construction monitoring.

The project will improve surface water quality and contain high volume surface run-off. The development of the trail segment on the project site will augment recreational spaces and connect communities to the emerging Chollas Creek Watershed Regional Park.

1.3 Summary and Objectives of Overall Project

As shown in Figures 3 through 5, the proposed project consists of two main components: (1) the de-channelization (concrete-removal) and widening of 1,885 linear feet of Chollas Creek, and (2) the construction of a 3,100 linear foot trail and landscaping around the trail and on the restored north bank of the Creek.

Chollas-Creek De-Channelization & Restoration

Overall, the proposed Project would remove 2.26 acres of impermeable concrete channel and replace it with 2.84 acres of permeable channel lined with natural stone placed to mimic a natural stream meander during low flow, and capable of containing a 100-year flood during high flows (in the existing condition, Federal Blvd and the police facility on the north side of Federal Blvd would be inundated). Non-native plants on the disturbed north side of the channel would be removed and replaced with native vegetation.



Chollas Creek within the Project limits is currently lined with concrete, extending 50 feet



Armorflex

at the top of the concrete and 30 feet in the active channel bottom for the 2,030-foot length, totaling approximately 2.84 acres of hardened channel. The Project would remove concrete on the bottom and sides for 1,885 linear feet and on the channel sides for an additional 145' linear feet (downstream-most reach) and restore it to a more natural condition. Concrete channel would remain for the initial 80 feet from the culvert to just past the I-805 Bridge at the upstream end of the Project. Post restoration acreage of the Creek would be 2.11 acres of City jurisdiction, 2.11 acres of ACOE/RWQCB jurisdiction and 2.84 acres of CDFW (including planted slope and access ramps). The restored natural channel would require a larger cross-sectional area than the current concrete channel in order to accommodate flood flows. Following concrete removal, the creek bed would be widened, deepened and lined with natural stone placed to mimic a natural stream meander on the channel bottom. Under existing conditions, the 100-year flood is not contained within the creek and inundates nearby property.

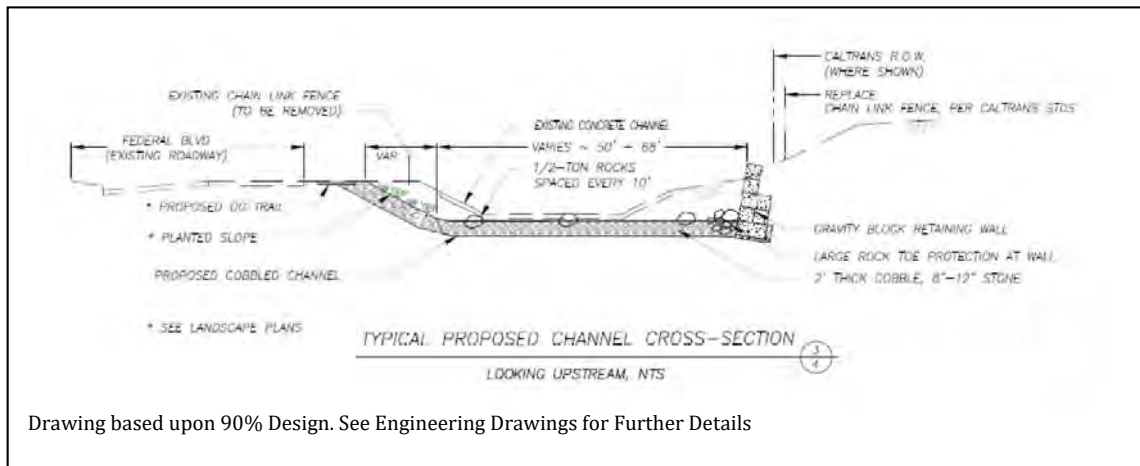
This project would reduce flooding and allow for the 100-year flood event to remain within the confines of the creek, with minor overflow at the downstream connection to the existing channel (this overflow is still a reduction of the existing flood condition).

An existing bridge (part of the old Federal Blvd alignment) spans Chollas Creek and is currently used to access the south side of the channel for sewer maintenance. The bridge

would be removed and the sewer manhole on the south side of the channel would be removed and replaced with pipe. Channel access would be maintained through the installation of four access ramps on the north side of the channel, which will be stabilized with armor-flex (or equivalent) and herbaceous vegetation characteristic of Diegan coastal sage scrub. The proposed active channel would have a top width of about 80 feet, with a gentler channel slope to create velocity reduction. Four ungrouted natural-stone drop structures and one concrete drop structure (at the upstream end of the site) would be installed to create the gentle slope between drop structures, and dissipate energy. The largest drop structure at the upstream end of the project would incorporate a concrete spillway. Larger natural stone would be placed intermittently in the channel bottom, combined with the smaller natural stone to create a natural-looking streambed, similar to nearby reaches of Chollas Creek. Natural stone and natural grade control structures would be ungrouted to best mimic the natural streambed function.

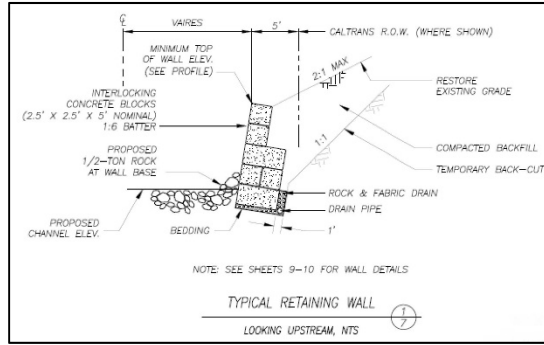


The natural stone would be placed in the channel bottom and on the north side slope by an excavator to form a riffle type channel to create a natural stream meander. The riffle would also have larger, imported natural stone spaced throughout the bottom to encourage a meandering type of flow and to stabilize the creek. The proposed stone in the channel bottom would have a median size of 18-21 inches, with the drop structure stone composed of one to half-ton graded stone. The larger drop structure at the easterly end of project would be made up of one to two-ton stone and a concrete spillway. The channel bottom would be approximately 2 to 3-feet thick comprised of stone, with the intermittent larger natural stone exposed above the channel flowline. Bedding beneath the natural stone will be 6 inches of 2-inch crushed gravel. The north-channel banks would be



graded at a 2:1 slope ratio, lined with natural stone and planted with native vegetation.

A new retaining wall of varying heights (6 to 12 feet) would be needed along the along the southern side of the Creek, mostly along the current City maintenance road situated above the top of channel. The retaining wall structure would be located on City and Caltrans owned property. The adjacent Caltrans SR-94 manufactured slopes would be temporarily disturbed by construction activities as a result of retaining wall construction.



Concrete removed as part of demolition, including removal of the old Federal Boulevard bridge culvert, would be broken with a steel-tracked excavator mounted with a hydraulic concrete breaker. A rubber-tired loader would be used to move broken concrete as needed. An excavator would also be used that would be positioned on the top of the bank outside of the creek channel and its banks. Excavation of the channel would be done using a rubber-wheeled grader. The project earthwork volume, including the removal of the existing concrete channel, is anticipated to be approximately 45,000 cubic yards of excavation.



Staging Area on NW Corner

The proposed staging area for construction equipment and material would be provided at the empty lot located in the northwest corner of the construction site. This area is owned by the City of San Diego, with a Right of Way by the Real Estate Assets Department (READ), managed for use by the Public Utilities Department (PUD) for a monitoring well. A second staging area is proposed on a disturbed area on the east side of the

Interstate 805 underpass. As described further below, the northwest staging area would be revegetated with a native tree and shrub plantings in a park-like setting using native sycamores and coast live oak above the channel with an understory of Diegan coastal sage scrub following project construction.

Trail Construction & Landscaping

A second project component includes the construction of a new asphalt trail, ranging from 5 to 12' wide that extends from the existing sidewalk at Home Avenue to approximately 1,000 feet beyond the I-805 Bridge, just across from the City of San Diego's Sunshine Berardini Park, where it will connect with the existing sidewalk to the east. This ADA compliant ~3,100 linear foot trail parallels Chollas Creek above the top of bank, mostly at street level, then continues east along Federal Boulevard at street level for the remainder of the reach. The trail is designed to provide access to existing trunk sewer manholes in the vicinity.

Landscaping would include native tree and shrub planting that includes sycamore and coast live oak trees, with an understory of coastal sage scrub adjacent to the entire reach of the constructed trail. All trees would be put on permanent bubbler irrigation systems and maintained by the City, pending City Approval. A landscape plan has been prepared as part of this project.

At the west end of the project, the trail would meander through the triangular northwest staging area. To allow City access to the water monitoring well located in this area, a 50-foot-radius decomposed granite (DG) area would be included around the well, with a fenced DG 15-foot access trail connecting to Federal Blvd. The well would be protected by bollards. Access would also be maintained to the fire hydrant approximately 450 feet east of Home Ave adjacent to Federal Blvd, with DG placed at a minimum of 15 feet to the west and south of the hydrant, and 17 feet to the east (to allow 15 feet for vehicle access). Bollards would be placed around the hydrant for protection. The remaining READ managed area would be planted with native trees and low-growing native vegetation including sycamore and coast live oak trees, with an understory characteristic of coastal sage scrub.

Where the trail is adjacent to the creek, a “wood-crete” fence would be placed between the trail and the creek channel. Where the trail is adjacent to Federal Blvd (beginning just east of the staging area) a 6-inch asphalt curb would be installed along the edge of Federal Blvd, and “No Parking” signs would be installed.

To facilitate pedestrians who wish to cross from the trail to Sunshine-Berardini Field, red curbs will be extended at 200’-300’ prior to the crossing area. Landscaping would include native tree and shrub planting adjacent to the constructed trail wherever space allows which would include sycamores and coast live oak trees with an understory characteristic of Diegan coastal sage scrub above the active channel. All trees would be put on permanent bubbler irrigation systems and maintained by the City, pending City Approval. A landscape plan has been prepared as part of this project.

1.4 Ownership, Easements & Responsible Parties

Ownership of the Chollas Creek (Creek) in this reach includes both the City of San Diego SWD and Caltrans.

Groundwork San Diego-Chollas Creek (Groundwork) will be the responsible party for implementation of this restoration and trail project. Groundwork’s contact is below. Once the Project construction is complete and the landscaping/revegetation areas installed and meets the short term performance goals, the City of San Diego and Caltrans will re-assume maintenance responsibilities within revegetated areas.

Responsible Party: Groundwork San Diego – Chollas Creek
(Construction)

Address: 5106 Federal Building, Suite 203 San Diego, CA 92105

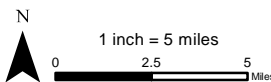
Contact: Leslie Reynolds, Executive Director, (619) 543-0430



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Figure 1

Regional Map



Federal Boulevard Chollas Creek Restoration and Trail Project

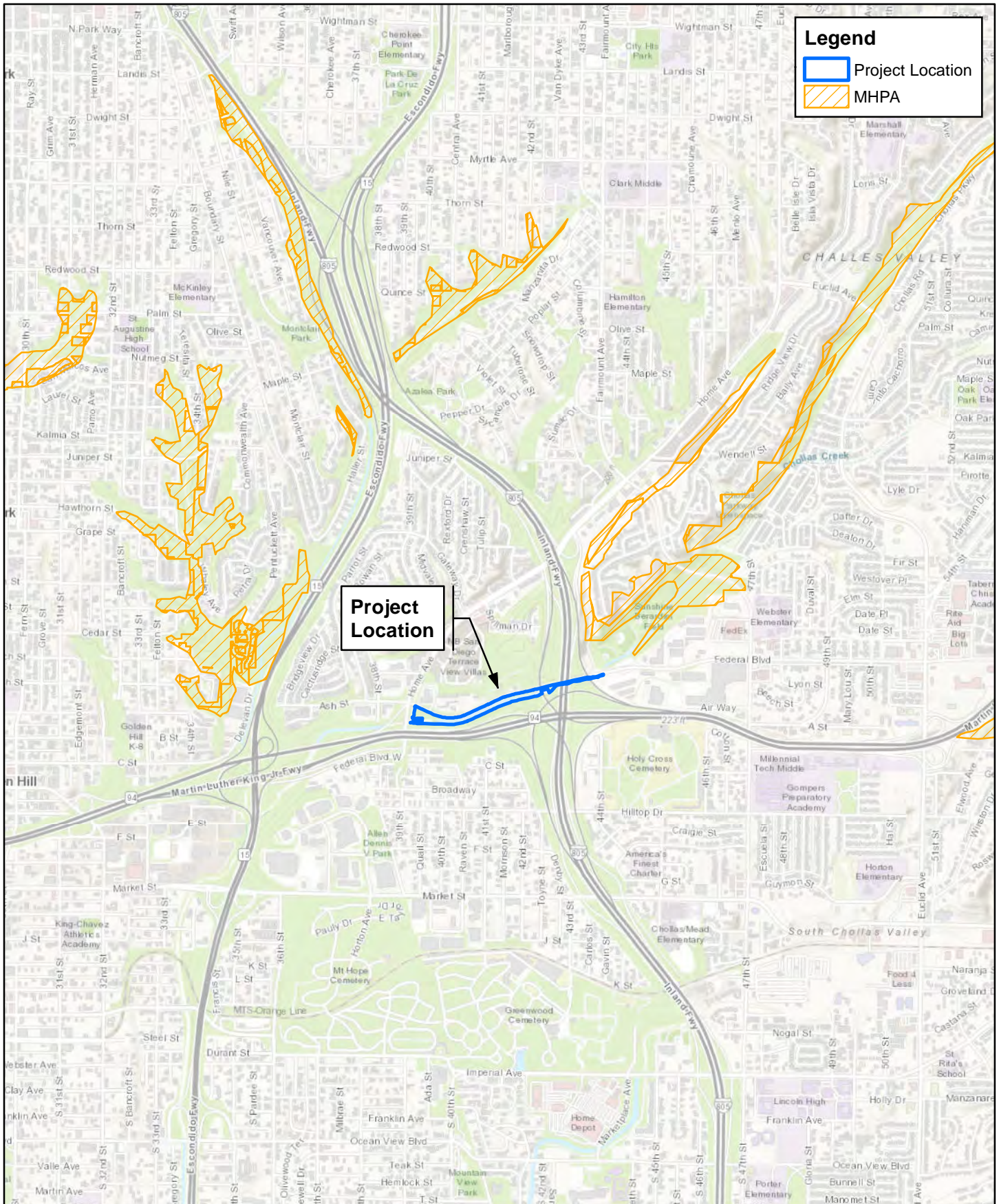
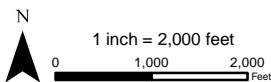











Figure 2

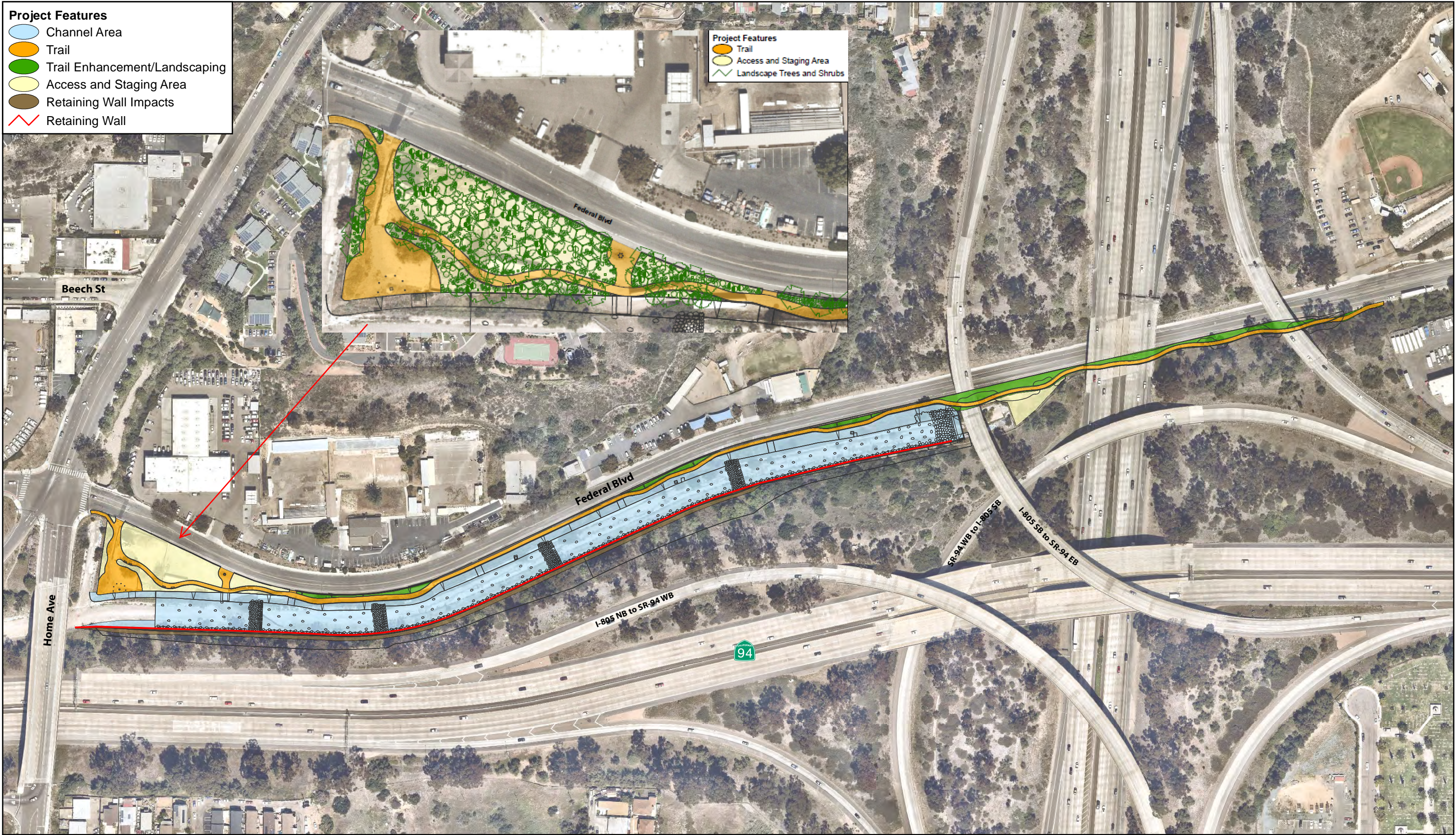
Vicinity Map



Federal Boulevard Chollas Creek Restoration and Trail Project

- Project Features**
-  Channel Area
 -  Trail
 -  Trail Enhancement/Landscaping
 -  Access and Staging Area
 -  Retaining Wall Impacts
 -  Retaining Wall

- Project Features**
-  Trail
 -  Access and Staging Area
 -  Landscape Trees and Shrubs

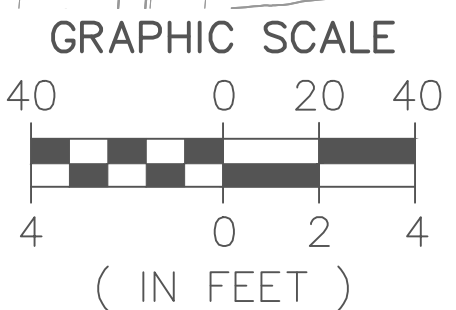
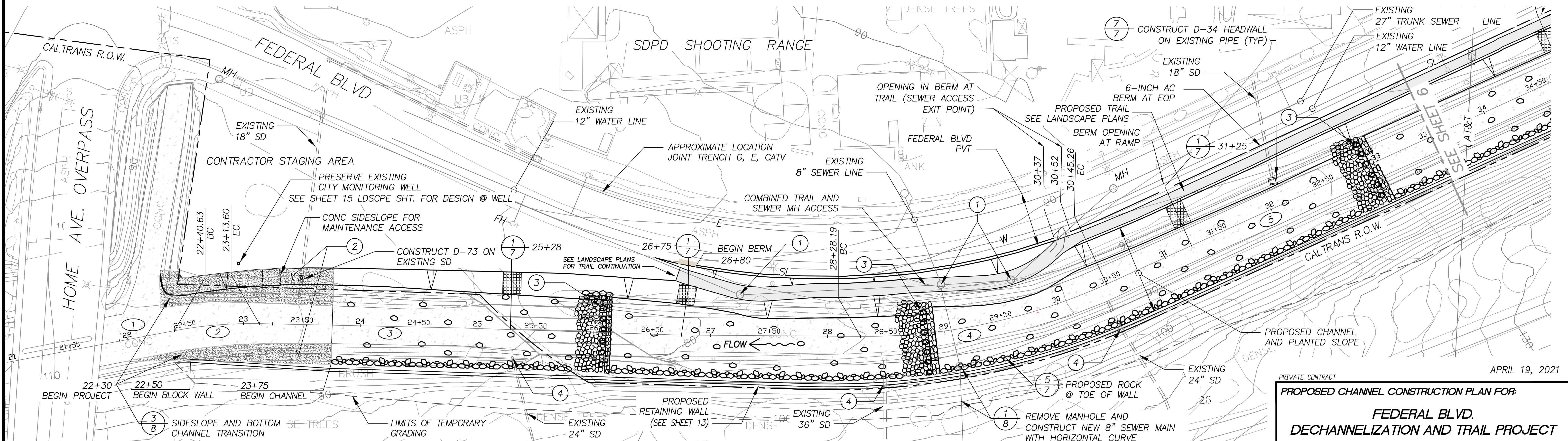
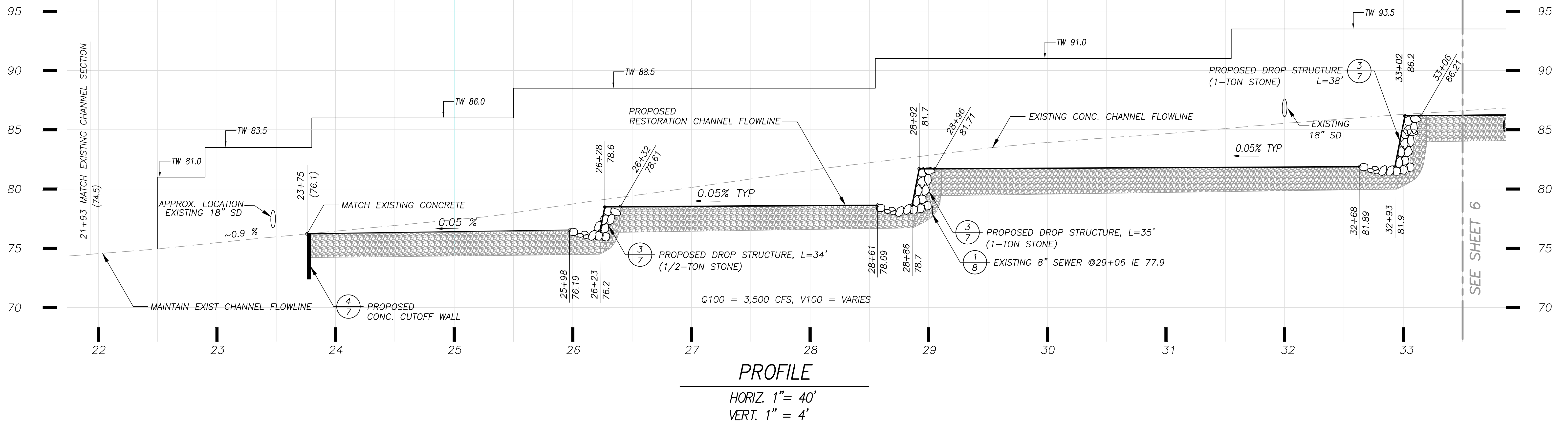


Aerial Photo: Nearmap 2021



Figure 3
Federal Boulevard De-Channelization
& Trail Project

Site Plan



Channel Centerline Data			
Data Symbol	Delta or Bearing	Length (FT)	Radius (FT)
1	$\Delta = 11^\circ 56' 45"$	47.63	-
2	N $79^\circ 16' 51"$ E	72.79	350
3	N $88^\circ 09' 17"$ W	514.59	-
4	$24^\circ 52' 27"$	217.07	500
5	N $65^\circ 34' 15"$ E	541.82	-

- CONSTRUCTION NOTES:**
- LOWER SEWER MH RIM TO MATCH TRAIL PER STD M-02
 - PROPOSED CONCRETE SIDE WALLS AND CHANNEL BOTTOM (560-C-3250 CONCRETE, 12" THICK) SEE DETAIL SHEET 8
 - PLACE ROW OF 2-TON ROCK ALONG DROP STRUCTURE TOE SPACED ~3-FT APART (TYP)
 - CUT STORM DRAIN AT OUTER FACE OF WALL. CAST-IN-PLACE CUSTOM FILLET HEADWALL TO BE FORMED AND CONSTRUCTED CONCURRENT WITH BLOCK PLACEMENT.

Figure 4. Project Plan - Downstream



PRIVATE CONTRACT APRIL 19, 2021

PROPOSED CHANNEL CONSTRUCTION PLAN FOR:
FEDERAL BLVD.
DECHANNELIZATION AND TRAIL PROJECT

CITY OF SAN DIEGO, CALIFORNIA
 DEVELOPMENT SERVICES DEPARTMENT
 SHEET 5 OF 22 SHEETS

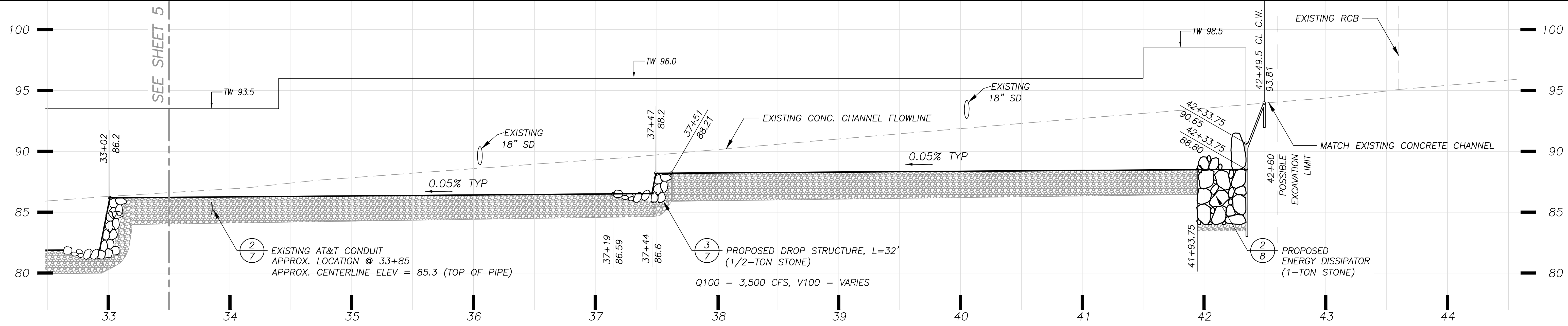
FOR CITY ENGINEER		DATE		V.T.M.
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XXX			

AS-BUILTS CONTRACTOR INSPECTOR

DATE STARTED: DATE COMPLETED:

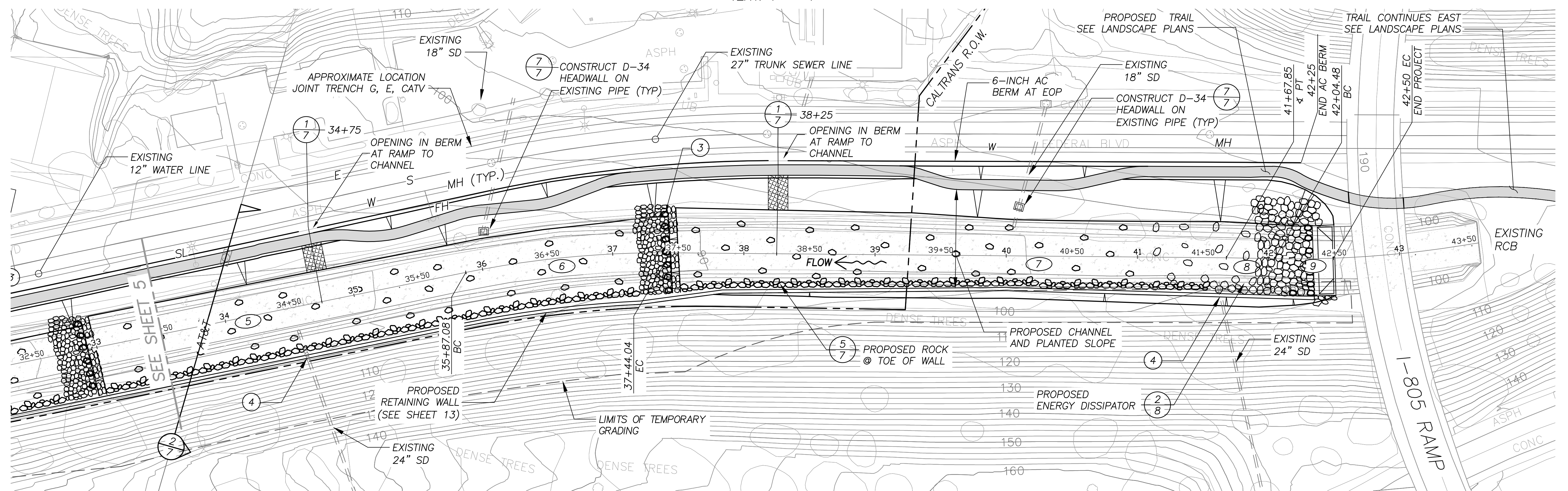
1843-6297 NAD83 COORDINATES
 194-1725 LAMBERT COORDINATES

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PROFILE

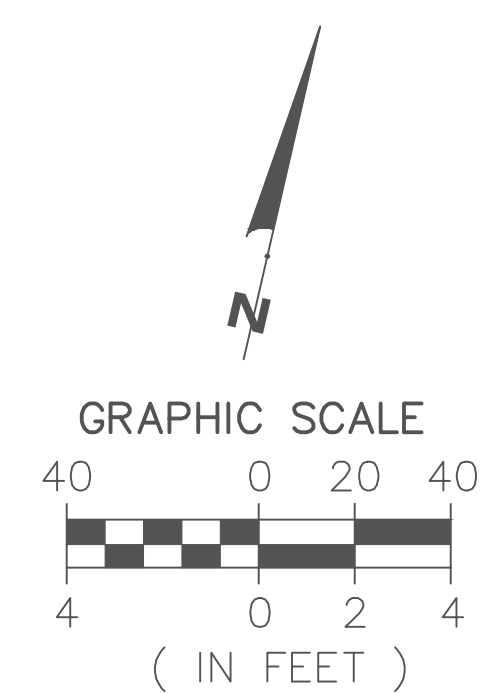
HORIZ. 1" = 40'
VERT. 1" = 4'



PLAN

1" = 40'

Channel Centerline Data			
Data Symbol	Delta or Bearing	Length (FT)	Radius (FT)
5	N 65° 34' 15"	541.82	-
6	∧ = 11° 59' 26"	156.96	750
7	N 77° 33' 41"	423.21	-
8	N 78° 10' 13"	35.05	-
9	∧ = 03° 13' 27"	45.02	300



CONSTRUCTION NOTES:

- ③ PLACE ROW OF 2-TON ROCK ALONG DROP STRUCTURE TOE SPACED ~3-FT APART (TYP)
- ④ CUT STORM DRAIN AT OUTER FACE OF WALL. CAST-IN-PLACE CUSTOM FILLET HEADWALL TO BE FORMED AND CONSTRUCTED CONCURRENT WITH BLOCK PLACEMENT.

Figure 5. Project Plan - Upstream



PROPOSED CHANNEL CONSTRUCTION PLAN FOR:
FEDERAL BLVD.
DECHANNELIZATION AND TRAIL PROJECT

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET 6 OF 22 SHEETS

FOR CITY ENGINEER		DATE		V.T.M.
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	XXX			
AS-BUILTS				
CONTRACTOR	DATE STARTED			1843-6297
INSPECTOR	DATE COMPLETED			NAD83 COORDINATES
				194-1725
				LAMBERT COORDINATES
				XXXXX-6-D

2.0 Existing Conditions & Project Impacts

The overall goal of this habitat revegetation plan is to provide direction on restoring native upland habitats within the project footprint. No planting will occur within the restored Chollas Creek channel. Revegetation of habitat will be accomplished by active planting and seeding to support establishment and growth of native upland plant species.

2.1 Existing Vegetation Communities

Total acreages of recorded vegetation communities of pre-project conditions are provided below. Table 1 provides a breakdown of acreages, providing details of existing vegetation community types within the Project footprints prior to start of construction. Figure 6 provides a map of the vegetation communities (existing conditions). The majority of the Project limits is Disturbed/Developed habitat that is either fully impacted or highly disturbed, and areas occupied by invasive species.

TABLE 1. EXISTING VEGETATION COMMUNITIES

Vegetation Community (Holland/Oberbauer Code)	SDBG Vegetation Community	Tier/Wetland *	Acreage
Southern Mixed Chaparral	Mixed Chaparral	IIIA	1.11
Disturbed Wetland	Disturbed Wetland	Wetland	1.52
Disturbed Concrete Lined Channel Banks	Disturbed Land	IV	0.74
Disturbed/Developed/Upland Habitat	Disturbed Land	IV	2.61
Eucalyptus Woodland/ Ornamental Planting	Eucalyptus woodland/ Ornamental Planting	IV	0.36
Total:			6.34

*per City of San Diego Biology Guidelines (2018)

2.2 Soils

Soils mapped within the Project limits are primarily classified as “Made Land” (see Figure 7, Soils Map), including the current location of Chollas Creek and the SR-94 slopes. A small pocket of Redding-Urban Land Complex mapped unit also is found. Within the study area other mapped soils, in addition to the Made Land and Redding-Urban Land Complex, includes Huerhuero loam and Terrace Escarpments (USDA, 2020). The “Made Land” classification is generally associated with highly disturbed or altered land, such as the placement of fill or other materials, in urban areas.

By definition it reads: *Made Land consists of areas filled artificially with earth, trash, or both, and smoothed. It occurs most commonly in and around urban areas.*

For the Redding-Urban Land Complex, where there are mixtures or complexes of spots of recognizable series extensive areas of cut and fill made land, both intermixed with urban areas of streets, houses and industrial areas, a name combining the identified series and urban land is used. Redding soils consists of a cobbly to gravelly loam in the upper surface

with a hardpan layer typically 20-40 inches below the surface. This hardpan restricts downward movement of water, and allows the concentration of clays just above this layer.

Soils of the Huerhuero series are now included with the Antioch series. These are soils that are clays with a strong shrink-swell capacity, and have very high salt content in the subsurface Bt horizon. Terrace escarpments consist of long, narrow, rocky areas that rise abruptly from the mean tide line to the coastal plain terraces or plateaus. This land type consists of steep faces that separate the terraces from the lower lying land. The faces are composed of soft coastal sandstone, hard shale, or hard, weather-resistant, fine-grained sandstone.

2.3 Jurisdictional Areas (Wetlands/Waters)

Chollas Creek within the Project limits extends for 1,885 linear feet and is concrete lined. It is considered an intermittent stream. Chollas Creek falls under the jurisdiction of two state agencies and one federal agency: the California Department of Fish and Wildlife (CDFW), the Regional Water Quality Control Board (RWQCB), and Army Corps of Engineers (ACOE). In addition, it meets the definition of City wetlands. See Figure 8 for a map of CDFW/RWQCB/ACOE/City jurisdiction within Chollas Creek. It is outside the coastal zone.

The area of regulatory jurisdictional waters would include the channel from the culvert immediately west of the I-805/SR-94 on-ramp, extending downstream to the Home Avenue Bridge. Within the project survey area is also the concrete-lined tributary flowing into Chollas Creek on the north side, immediately east of the Home Avenue Bridge (see Figure 4).

The concrete lined channel would be considered a “non-wetland Water of the US/State”. The bottom of channel is 30 feet wide, and extends to 50 feet wide spanning across the top of the concrete banks. Some plants have established within the cracks of the concrete but are mostly invasive species. Under the 2020 ACOE new “Navigable Waters Protection Rule” it would be considered a “Category (a)(2) Water of the US”, which is a tributary to a Traditionally Navigable Water (Pacific Ocean) due to its intermittent flow.

Total regulated jurisdiction, which is assumed as top of concrete lined channel for the CDFW and approximately 1 foot above the Ordinary High Water Mark (OHWM) for the RWQCB/ACOE/City, total 2.26 acres and 1.52 acres, respectively within the Project.

The restoration of the channel would result in a wider channel width. Post-restoration jurisdiction for CDFW would sum to 2.84 acres and ACOE/RWQCB/City jurisdiction would sum to 2.11 acres.

2.3.1 Existing Functions and Values of Chollas Creek

Chollas Creek is currently concrete lined on both the channel bottom and sides. It offer little to no functions and values in terms of flood flow attenuation, ability to sequester toxins or nutrients, or provide habitat value.

2.4 Habitat Impacts

Upland habitat impacts resulting from the project implementation are primarily to disturbed/developed areas. These are due to the construction of the 3,100 linear feet of

trail and landscaping, and construction of the retaining wall on the south side of Chollas Creek, above existing jurisdictional waters. Temporary impacts to native upland habitat (southern mixed chaparral) and eucalyptus woodland/ornamental will occur on the SR-94 manufactured slopes as a result of the need to construct this retaining wall. Temporary impacts will extend to up to 30 feet beyond the retaining wall. The retaining wall permanent impacts are to Disturbed/Developed areas along an existing maintenance road, and extend for 1,885 linear feet (0.1 acre). Project impacts are depicted in Figure 9.

Thus the Project has no compensatory mitigation requirements for impacts on SR-94 engineered slopes, per City of San Diego Land Development Guidelines (City, 2018). However, the temporary disturbed slopes on SR-94 will be revegetated with CSS following specifications in this HRP. Table 2 below provides a summary of project impacts based upon habitat type and project components.

TABLE 2. SUMMARY OF IMPACTS TO VEGETATION COMMUNITIES

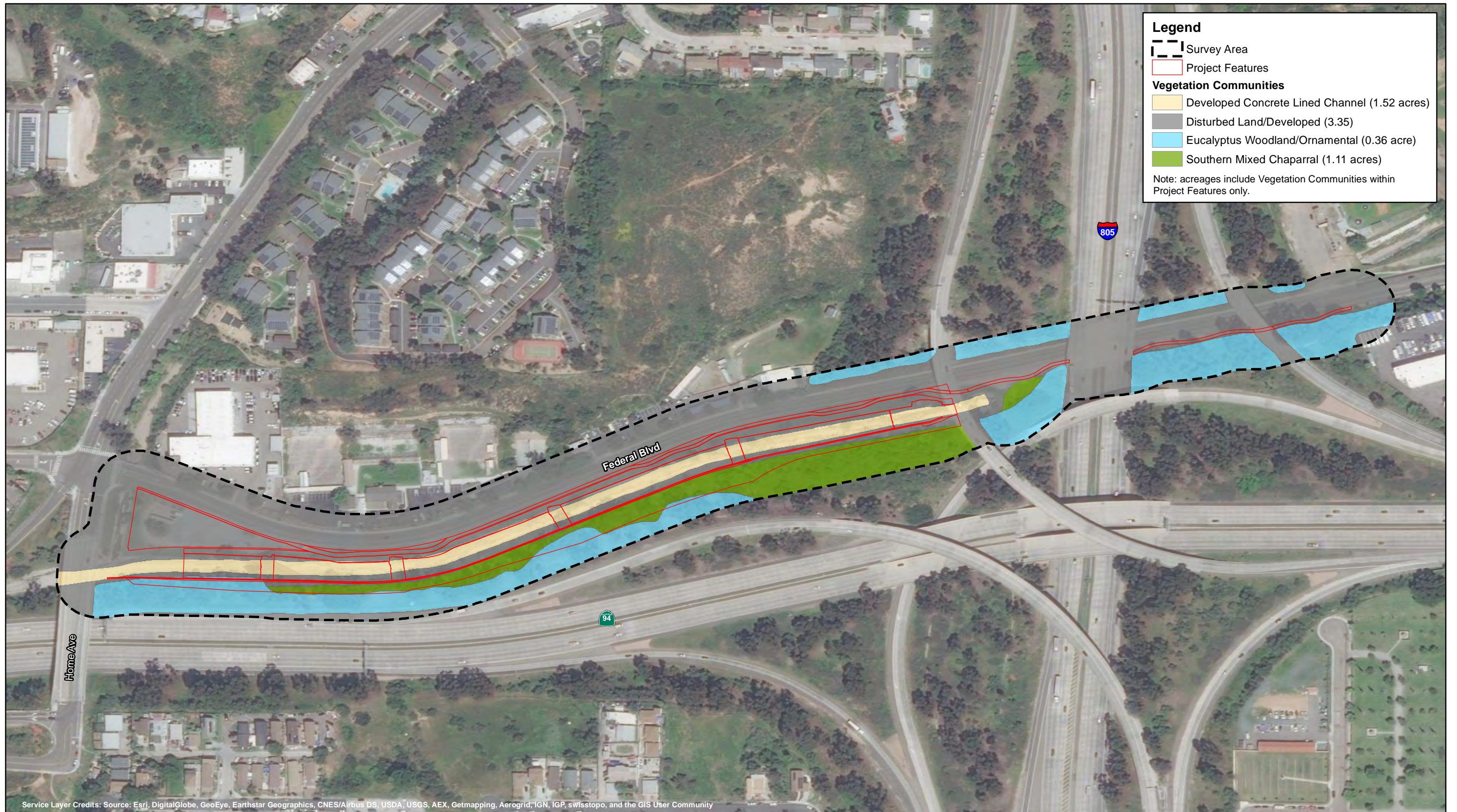
Vegetation Community	Project Component					Total
	Removal of Concrete Channel ^{1,2}	Removal of Concrete Channel Banks ^{2,3}	Retaining Wall	Channel Widening	Trail	
Disturbed Wetland	1.52*	--	--	--	--	1.52
Southern Mixed Chaparral	--	--	1.11	--	--	1.11
Eucalyptus Woodland/Ornamental	--	--	0.36	--	--	0.36
Disturbed/Developed	--	--	0.27	0.58	1.76	2.61
Developed – Concrete lined channel bank	--	0.74	--	--	--	0.74
Total	1.52	0.74	1.74	0.58	1.76	6.34

¹ Includes footprint of proposed drop structures (0.31 acre)

² Includes impacts from removal of existing bridge

³ Includes footprint of proposed access ramps (0.03 acre)

* Requires compensatory mitigation per City



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

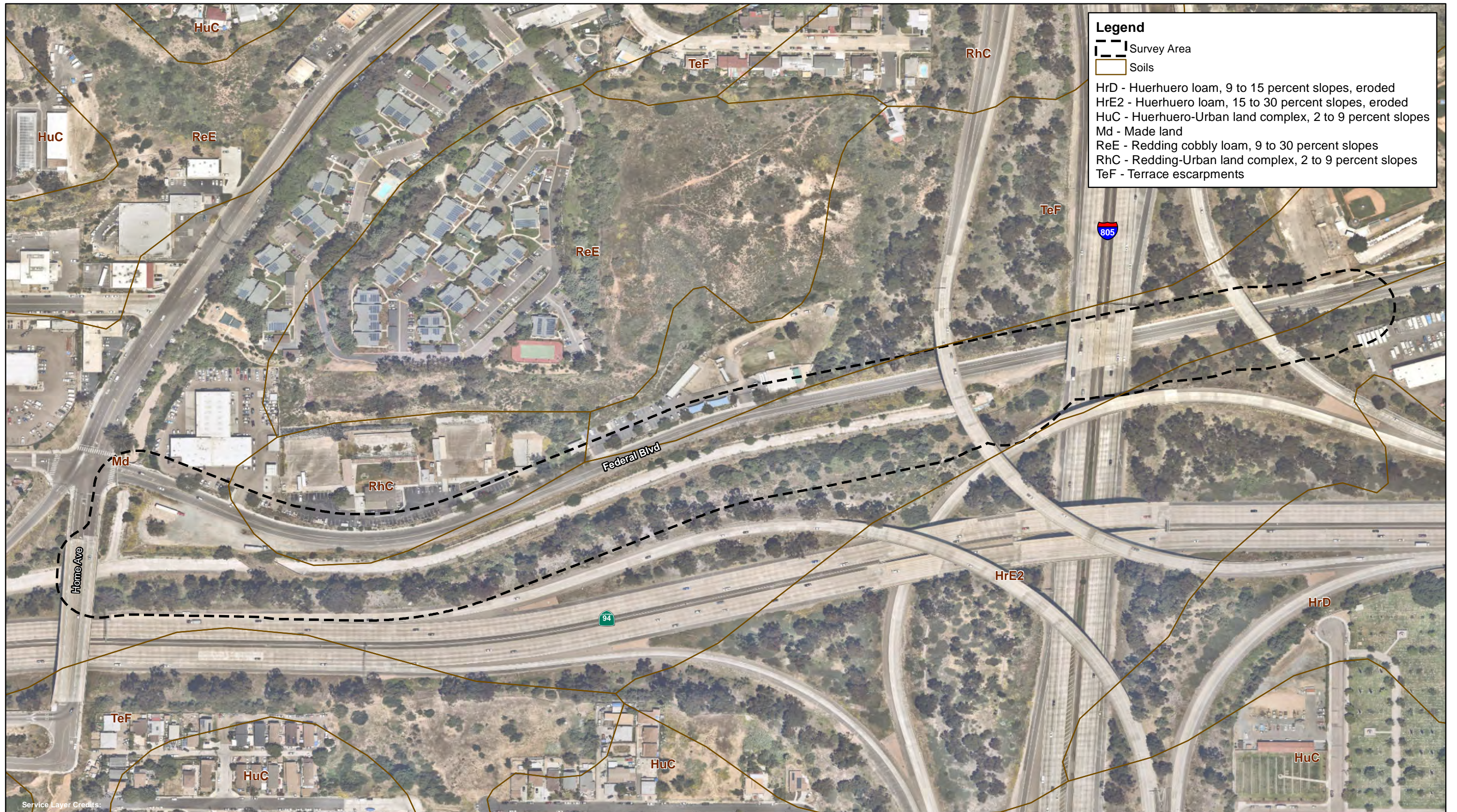
Figure 6



1 inch = 250 feet
0 125 250 Feet

Vegetation Communities

Federal Boulevard Chollas Creek Restoration and Trail Project



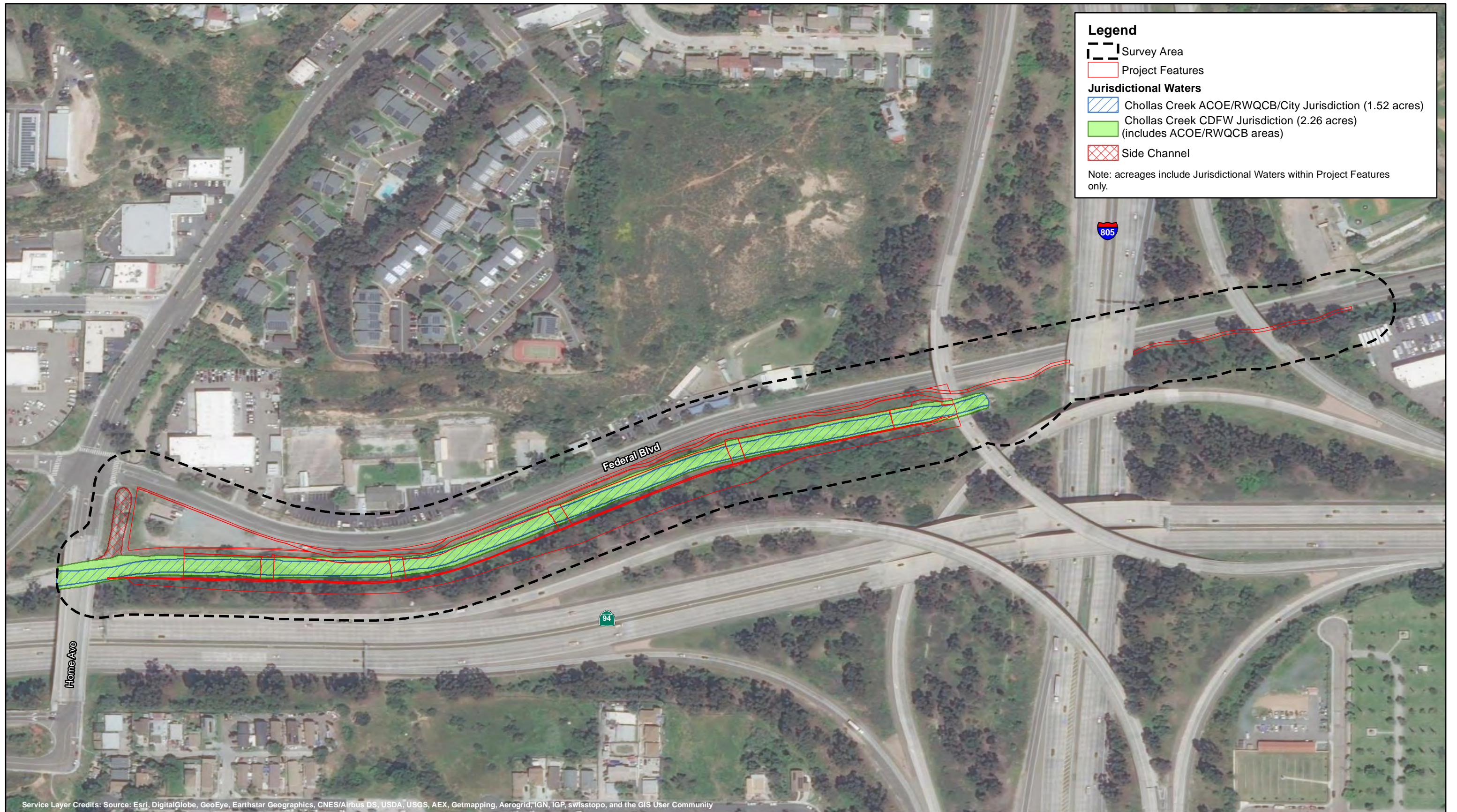
Service Layer Credits:

Figure 7

Soils Map



1 inch = 250 feet
 0 125 250 Feet



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 8

Chollas Creek Jurisdictional Area

Federal Boulevard Chollas Creek Restoration and Trail Project



1 inch = 250 feet
0 125 250 Feet

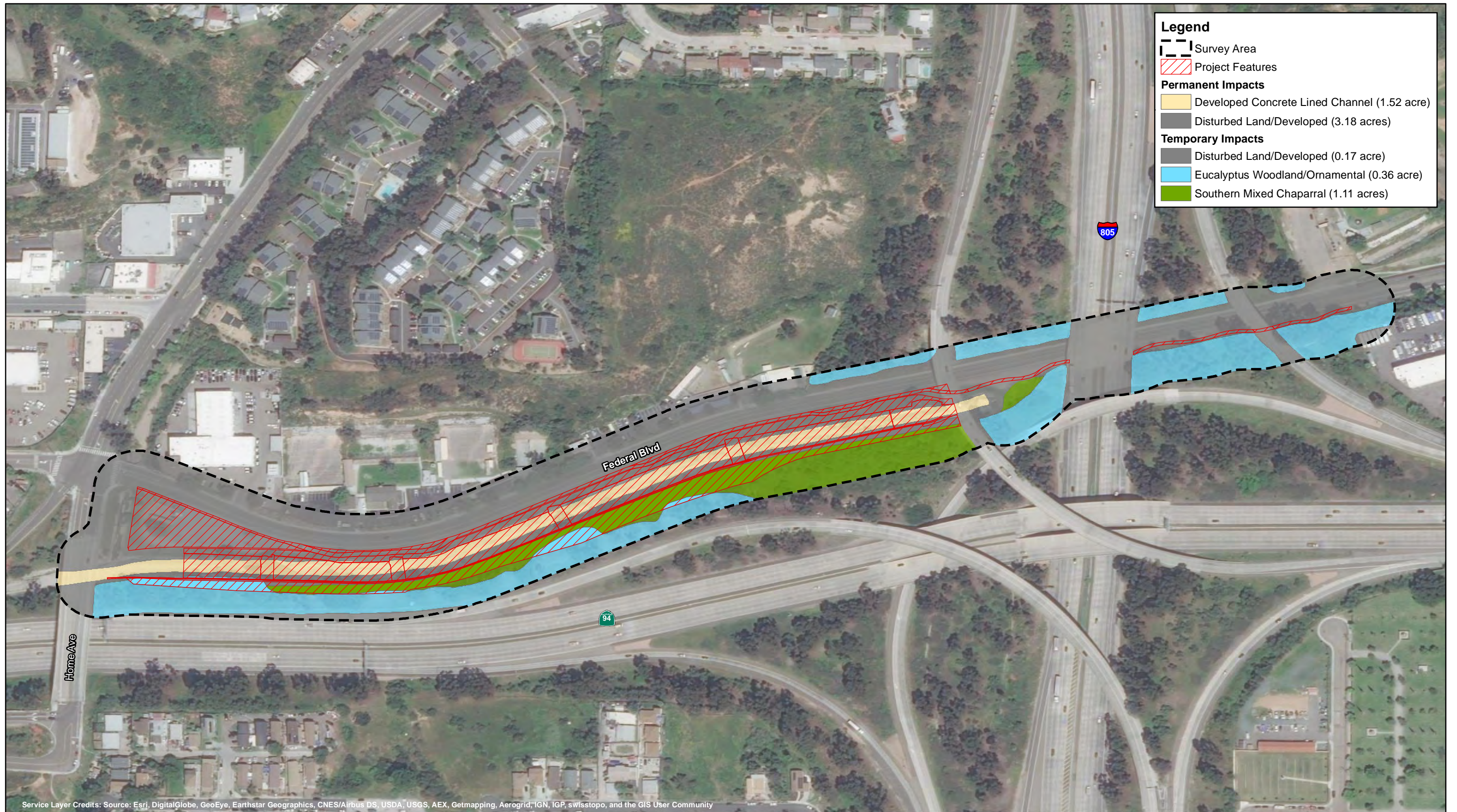
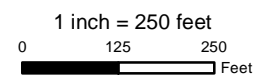


Figure 9

Project Impacts

Federal Boulevard Chollas Creek Restoration and Trail Project



3.0 Goals of the Habitat Revegetation Program

The goal of the revegetation plan is to provide direction to ensure that revegetation occurs on the north banks of Chollas Creek and on the SR-94 manufactured slopes following Project construction.

3.1 Revegetation Definitions

Revegetation is a general term for the rehabilitation of natural systems. More specifically, it has been defined by the Society for Ecological Restoration (SER) as “the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed” (SER, 2014). For the purpose of this report, habitat revegetation, creation, enhancement, and management are terms that will describe the different type of revegetation activities to take place, as defined by Lewis (1990), taken from the U.S. Army Corps of Engineers Special Public Notice on Revegetation Guidelines and Monitoring Requirements (2014).

Restoration – the return of ecological function to a pre-existing condition.

Establishment – the process of creating a new habitat where one did not exist before.

Enhancement – the increase in one or more functions due to intentional activities (e.g., plantings).

Passive Revegetation – allowing a disturbed area to naturally revegetate without plantings.

Management – includes actions that ensure the project goals will be met, in both the long- and short-term.

3.2 Type(s) and Area(s) of Habitat to be Established and Restored

Completion of the restoration project would result in a net gain in total Waters of the US/State/City within Chollas Creek. Post restoration acreage would sum to 2.11 acres of active streambed and 0.73 of slope (CDFW only). Table 3 provides a breakdown of acreage. Figure 10 depicts active restoration and revegetation areas.

3.3 Chollas Creek Channel

One principal component of this Project is to remove concrete within Chollas Creek and restore it to a more natural conditions. This includes removal and re-contouring of approximately 1,885 linear feet of the channel banks and bottom. Following concrete removal the bed will be lined with natural rock placed to mimic a natural stream meander, and natural grade control structures installed for grade stability. See Section 1.3 Project Description, for more details on the restoration of Chollas Creek. Details provided herein are based upon 100% design.

3.3.1 Post-Restoration Conditions

The restored channel would be wider and have a more gentle gradient following restoration. All concrete would be removed and replaced with rock and ungrouted grade control structures. Total streambed area post-restoration would be 2.84 acres of CDFW

jurisdiction and 2.11 acres of ACOE/RWQCB/City jurisdiction. No active planting within channel bottom will take place.

3.3.2 Functions and Values to be Gained

Following restoration, the Creek would allow greater flood storage as a result of the channel widening and reduction in slope. This temporary storage would also provide improved water quality, while resulting in no additional storage of sediment which would cause additional maintenance. Under current design it is not anticipated that sediment will accumulate.

3.3.3 Reference Sites for Design



Channel would be similar to this post-restoration condition (Chollas Creek – Lenox Avenue Creek Restoration).

The Chollas Creek restoration project has been designed based upon a similar successful restoration project along a separate segment of Chollas Creek. This post-condition reference site is located at Lenox Drive south of State Route 94 and east of Euclid Avenue (Figure 11). The Lenox Drive restoration was the result of a vector issue where ponding occurred. The same engineering firm (Tory Walker Engineering) was responsible for the design, which included the removal of concrete grade control structures, creek grading and placement of rock and

ungROUTED grade controls within the Creek. The banks were also restored to native habitat. This successful restoration effort is in its third year following implementation and has had no further modifications needed.

Directly upstream of the Project, adjacent to Bernardini Fields, a Chollas Creek is soft bottomed which can also be used as a reference site to anticipate similar post-restoration conditions. Along this reach, Chollas Creek is rock lined and is devoid of vegetation in the active channel. Along the channel edges mule fat (*Baccharis salicifolia*) and coyote brush (*Baccharis pularis*) are rooted. See adjacent photo insert. These references site are for design purposes, and not intended to be used as part of any performance specification.



Upstream reach of Chollas Creek near Bernardini Fields.

3.4 North Banks of Chollas Creek

Once the restoration project has been constructed, the northern banks of Chollas Creek will be revegetated. Low growing coastal sage scrub plants will be installed between the rocks that will line the channel. A temporary above ground irrigation line will be installed

and utilized for establishment of the vegetation during the first several years. The trail will be separated from the banks through the installation of a 3' high “wood-crete” decorative fence. Approximately 0.73 acre of CSS will be restored as a result.

TABLE 3. HABITAT MITIGATION AND RESTORATION

1	Impacts (acres)	Ratio	Mitigation (acres)		Revegetation (acres)
			Wetland	Upland	
Disturbed Wetland	1.52	1.4:1	1.52	--	--
Southern Mixed chaparral	1.11	--	--	--	1.11 DCSS
Eucalyptus Woodland	0.36	--	--	--	0.36 DCSS
Disturbed/ Developed	2.61 ¹	--	0.58 (widened channel)	--	0.17 DCSS (temporarily disturbed for wall construction)
Disturbed Concrete Lined Channel	0.74	--	0.01 (widened channel)	--	0.73 (former channel bank 0.7 now planted rock-lined slopes, 0.03 now planted access ramps)
Total	6.34	--	2.11	--	2.37

¹ 1.76 acres for trails; 0.1 acre for retaining wall

3.5 Caltrans Slopes Behind Retaining Wall

In order to construct the retaining wall to the south of the current Chollas Creek channel, temporary impacts to habitat will occur up to 130 feet behind this wall on the SR-94 manufactured slopes. Although no compensatory mitigation is required for these impacts (see Section 2.4), these slopes will be revegetated. Coastal sage scrub habitat will be established on these lower slopes due their ability to establish without irrigation. No temporary irrigation will be used due to the difficulty of site access. This area totals approximately 1.64 acres.

3.6 Northwest Staging Area

The northwest staging area will be revegetated once the project has been completed. Native trees including western sycamore and coast live oak will be planted and put on permanent irrigation. Between trees, native shrubs characteristic of Diegan sage scrub will be planted and permanently maintained and irrigated. This will create a park-like setting but not true “habitat restoration”, as would occur on the north banks and SR-94 slopes. Planting details are provided in the project landscape plan.

3.7 Time Lapse between Construction & Revegetation

Planting of all revegetation areas will take place once grading has been completed. Construction activities will commence once all permits are procured and work will take

place in the non-rainy season to the extent possible. Project construction is estimated to take 10 months.

3.8 Estimated Total Project Costs

Overall construction costs for the entire project is approximately \$6.5 million, for which grant money is being received. This includes the cost for the channel and revegetation efforts on the north bank of Chollas Creek as well as on SR-94 slopes. Five years of post-construction revegetation monitoring are included in this budget.

3.9 Overall Watershed Improvement to be Gained

Based upon the Drainage Design Report (TWE, 2021), the project will result in improved flood flow attenuation along this segment of Chollas Creek as a result of the widening and de-channelization efforts. Water quality improvements may result as well which include the transformation and sequestration of toxins. The planting of the north bank will provide a habitat and shelter for wildlife passing through this area.



Figure 10

Restoration Areas

Federal Boulevard Chollas Creek Restoration and Trail Project



1 inch = 200 feet
 0 100 200
 Feet



Figure 11

Reference Site Location



1 inch = 100 feet
0 50 100 Feet

4.0 Implementation Plan

This section addresses the implementation of the revegetation. Implementation of habitat revegetation activities will involve grading, site preparation of soils, temporary irrigation, active seeding and planting and short-term maintenance.

4.1 Rationale for Expecting Implementation Success

The slope CSS revegetation area should succeed as a result of the landscape position, site preparation and maintenance activities. Removal of the concrete armoring on the banks will allow for seed-establishment, which will be enhanced through site preparation, active seeding, and maintenance (e.g., watering and weeding).

4.2 Timing of Site Preparation & Installation

Site preparation, planting and hydroseeding shall be seasonally timed to capture winter/spring rainfall. Seeding of material shall occur just prior to the rainy season and no later than mid-February.

4.3 Contractor Requirements

Restoration Ecologist

Overall supervision of the installation, maintenance, and monitoring of this revegetation project shall be overseen by a qualified Restoration Ecologist. The Restoration Ecologist must have a degree in biology or related field and possess a minimum of five years of documented habitat restoration experience in Southern California.

The Restoration Ecologist shall educate all participants with regard to revegetation goals and requirements and oversee soil amendment incorporation, planting and seeding, irrigation installation, and maintenance during the project. In addition, the Restoration Ecologist will conduct monitoring data collection and annual assessments, and prepare annual monitoring reports. The Restoration Ecologist is responsible for notifying the Contractor and Responsible Party if any significant issues arise.

Installation/Maintenance Landscape Contractor

The habitat installation Contractor (Contractor) must have documented native habitat restoration experience, work effectively in coordination with the Restoration Ecologist, be responsible for completion of planting and seeding, invasive plant control, temporary irrigation, and maintenance of revegetation areas. The revegetation installation and post-revegetation maintenance may be conducted by the same, or by a different Contractor. However, the Contractor must have the qualifications described herein.

The Contractor shall be experienced with the installation and maintenance of native plant habitat, specifically CSS habitat, and be knowledgeable of the identification of native plants versus invasive plants. If significant trespassing and vandalism occurs that damages portions of the revegetation areas at no fault to the Contractor, the affected areas shall be restored to the extent possible as funds are available. All activities conducted by the Contractor shall be seasonally appropriate and conducted in

coordination with the Restoration Ecologist. The Contractor shall meet the Restoration Ecologist at the site when requested, and perform all checklist items in a timely manner, as directed by the Restoration Ecologist to accomplish the required activities.

4.4 Site Preparation

4.4.1 Contractor Education

All grading and landscape contractors participating in the creek restoration will meet at the site with the Restoration Ecologist to review plans, site information, and contractor responsibilities before beginning work in the area. Specifically, the Restoration Ecologist will review requirements of the plan that concern the Contractor, including fine grading of the revegetation slopes, soil amendments, landscape procedures and guarantees. The Restoration Ecologist will have input over field installation and will request changes in the field to the Project Engineer as deemed necessary to meet project goals and requirements.

4.4.2 Revegetation Areas Site Grading

Site grading will be based upon the stream restoration design concepts translated onto the grading plan. A qualified grading contractor that can create natural landscapes, and is able to work with fine grading elevations up to 0.2 inch accuracy is needed to successfully accomplish this task. Fine grading will be required as well as in the field to establish correct elevations and natural contours. The Restoration Ecologist will have the ability to provide input on recommended adjustments in the field, as needed. All final slopes shall be contoured to mimic natural conditions.

4.4.3 Pre-Planting Invasive Plant & Weed Control

If planting and seeding is delayed more than a few months, undesirable exotic plants that have become established prior to planting and seeding must be killed. If deemed necessary by the Restoration Ecologist, a "grow-and-kill" cycle will be established during that period. A "grow-and-kill" cycle is a cycle of applying water, germinating the existing seed bank of non-native species, and removal via manual methods or spraying with the appropriate herbicide. This allows a large portion of the seed load present in the soil to be removed. Removing competition and seed load early in the revegetation process helps ensure more rapid growth and establishment of native species.

If planting is delayed by more than six months, a pre-emergent non-synthetic weed killers can be applied, such as Orland's Safe-T-Weed, Gluten-8 OLP™, Gluten 8, Soil Mender® Corn Gluten Meal, 9-0-0. These have been shown to be an effective pre-emergent weed killer for up to six months. When working within 100 feet of water, only herbicides approved for use around water shall be used.

Requirements & Recommendations

A combination of synthetic and non-synthetic herbicides can be used to minimize use of synthetic herbicides.

Non-synthetic herbicides can be used to control persistent weeds, however most of the commercially available non-synthetic herbicides are not as effective in killing below ground biomass, and therefore are not effective on weeds such as fennel. Non-synthetic herbicides are effective on annual forbs, but not as effective on annual grasses. Application must be timed such that the plant is at the flowering stage. Applied too early

in the growing stage, the plant will recover. Application post-seed production and re-seeding with the undesirable plant will take place.

Examples of post-emergent non-synthetic weed killers include d-Limonene-based herbicides marketed under the trade names of Avenger Weed Killer, Nature's Avenger Organic Herbicide and GreenMatch.

Phytotoxic oils have also been used to exotic annual weeds. Trade names of phytotoxic oils include Organic Interceptor®, Barrier H®, WeedZap, Bioganic Broadleaf Killer, EcoSmart Weed and Grass Killer, Matratec, GreenMatch EX, Black Jack Twenty-One, Burn Out II.

These non-synthetic treatments can be used effectively with spot treatment (such as daubing or cut and paint) using synthetic herbicides to control invasives.

Round up Pro and Fusilade mixed with a no foam adjuvant, both a synthetic herbicide, may be used to spot treat select invasive plants. These two synthetic herbicides have demonstrated to be harmful to human health as well as bees and soil biology, thus will be used only where absolutely necessary.

All herbicide treatments will include a blue dye to allow applicators to keep track of which areas have already been treated.

All herbicides shall be applied by a licensed/certified pesticide applicator.

Below are general guidelines for species specific weed control, but the qualified restoration contractor shall provide recommendations as to the most effective means of control.

The following glyphosate concentrations shall be used according to the type of application required as per the product label:

Foliar spray application – a minimum of two percent solution.

Foliar wick application – a 33 percent solution.

Cut stump treatment – a 100 percent solution.

All herbicide treatment shall be conducted only when weather conditions are conducive to effective uptake of the herbicide by the exotic species (e.g., sunny, dry with ambient temperatures 65 degrees Fahrenheit, and when plants are at the specified growing stage), and when wind conditions are such that herbicide drift is minimized (five mph or less). Herbicide preparation shall be allowed only in approved staging areas more than 100 feet from a stream course or body of water. Treated plants or stumps shall not be disturbed until the applied herbicide has had time to take effect per the manufacturer's instruction.

4.5 Soil Testing During Site Grading

Once the north banks of Chollas Creek and the temporary impacted areas of SR-94 slopes are course graded, soils testing for agronomic suitability shall be conducted. Soil samples shall be collected prior to fine grading.

Chemical (nutrient) soil tests will be sent to and performed by Wallace Laboratories, 365 Coral Circle, El Segundo, CA 90245, telephone number (310) 615-0116, contact Garn Wallace, or equivalent. Because different laboratories use different extraction methods, soil samples may not be sent to different laboratories. The minimum tests performed will be the Agricultural Soils Suitability test plus organic matter for each sample. The test will include, but not be limited to the following: all macro- and micronutrients, organic matter content, metals, pH, recommendations for amendments, and maintenance organic-based (not synthetic) fertilizations. The soil lab will be informed that this is a native habitat restoration project using organic-based products, not an agricultural operation. The results and recommendations of soil testing laboratory will be submitted to the Restoration Ecologist for review and analysis. The Restoration Ecologist will then determine the amendment mixture to be incorporated directly into the soil by the grading contractor. A minimum of 2 soil samples shall be collected each from the north banks of Chollas Creek planting area and from the SR-94 slopes.

4.6 Soil Amendments

The extent of soil amendments and application rates needed to allow for effective plant growth is unknown at this time. Following the soil testing the Restoration Ecologist will determine the type and amount of soil amendments needed for the revegetation areas. Below provides a sample of acceptable organic amendments that can be used.

4.6.1 Compost/Vermicompost Blend

An 80/20 compost/vermicompost blend can be used on all slope revegetation areas, in addition to amendments included as part of hydroseeding and in the containerized backfill material. The compost/vermicompost blend will also be used in the backfill for each planting hole and during hydroseeding.

On the slopes, the 80/20 compost/vermicompost blend will be spread as a surface layer per the compost/vermicompost application rates determined by the Project Restoration Ecologist, then mixed into the top 4 inches of the surface layer during fine grading and prior to hydroseeding.

For backfill planting areas during site preparation, the planting hole will be backfilled with 25% of the compost/vermicompost blend.

Compost Manufacturing & Formulation Requirements

Compost/vermicompost blend must be derived from green and brown material consisting of chipped, shredded or ground vegetation or clean processed recycled wood products, or Class A exceptional quality biosolids compost, as required by U.S. EPA, 40 CFR, part 503c regulations, or a combination of green material and Class A biosolids compost. The compost must be thermally processed following USDA Organic Regulations for Organic Compost (7 CFR § 205.203(c)). It shall not contain paint, petroleum products, herbicides, fungicides or other chemical residues that would be harmful to plants or animals. Other deleterious materials such as plastic, glass, metal, or rocks cannot not exceed 0.1 percent by weight or volume. The finished compost must be screened through a minimum of 1/4-inch screen.

After the thermal composting stage and the compost temperature drops to ambient temperature the compost will then be blended with the vermicompost at 20% by volume.

The vermicompost will be derived from worm casting that have not been fed manure. The finished vermicompost shall be less than 4 months old. The moisture content of the compost/vermicompost blend should not exceed 35 percent. Moisture content shall be determined by California Test 226. Compost products with a higher moisture content may be used, provided the weight of the compost is increased to equal compost with maximum moisture content of 35 percent.

The compost can be order through Earthworm Soil Factory in Chico, CA (530) 895-9676, dave@earthwormsoilfactory.com. This facility is qualified for production, or equal professional compost/vermicompost manufacturer and facility. All products must meet specification stated herein, as demonstrated by the Revegetation Contractor.

Onsite Compost/Vermicompost Storage Requirements

The final compost/vermicompost soil amendment shall not be stored more than 5 days onsite. It shall be stored onsite in a manner that maintains moisture content (35%), but not be saturated or anaerobic. Water shall be added to the compost/vermicompost mix if moisture levels fall below 35%.

4.6.2 Montmorillonite and Chelated Elements

Montmorillonite and chelated elements are excellent sources of micronutrients that are often limiting in poor quality soils. The montmorillonite multi-mineral can comprise bentonite, montmorillonite, and other clay-based blends. Elemite, multi-mineral manufactured by Wasatch Minerals of Lehi, Utah, meets these specifications. Other equal can be substituted.

The chelated elements can include a non-synthetic chelation of mineral nutrients with a blend of chelating agents containing amino acid (glycine) and/or organic acids approved for use by the Organic Materials Review Institute (OMRI). Prohibited chelating agents include DTPA, EDTA, HEDTA, NTA, glucoheptonic acid and its salts, and synthetic amino acids. JHBiotech's Biomin series or equivalent can be used.

4.6.3 Compost Tea

Compost tea, which can also be derived from worm castings (called worm tea), will contribute to the active soil microbial activity necessary for nutrient availability and ultimately for improving soil health. Compost/worm tea (tea) can be incorporated into the compost/vermicompost blend or applied directly to the soil. The application rates incorporated would be based upon soil test results. Compost tea will be utilized as part of the hydroseed slurry mix. Tea must be made locally and applied within 18 hours of being manufactured. "Shelf stable" tea should not be used unless prior approval is granted. If temperatures are above 85 degrees, the tea must not sit in the tanks for more than 1 hour prior to application. Compost tea will be incorporated in the hydroseed application.

4.6.4 Humic & Fulvic Acids (Granular)

Humic and fulvic acids, in granular form, can be incorporated into compost/verimicompost blend or applied directly to the soil. These provide important benefits, including tying up excessive salt levels, providing microbial food necessary for nutrient cycling, and

improving long-term organic matter levels. Humic and fulvic acids shall be derived from mined Leonardite, and processed utilizing either cold extraction or potassium hydroxide. It shall contain a minimum 75% total humic acid, including both humic and fulvic fractions and must be at least 75% water soluble. BioAg's Ful-Humix or equal shall be used. The application rates incorporated would be based upon soil test results.

4.6.5 Seaweed with Potassium & Sulfur

A seaweed with potassium and sulfur product can be incorporated into compost/vermicompost blend, and can be used to improve soil microbial activity, provide immediate plant-available micronutrients and be an excellent source of potassium and sulfur. At a minimum the product must contain a minimum 7% soluble potash, *Ascophyllum nodosum* (seaweed), humic acids derived from mined Leonardite (and processed utilizing either cold extraction or potassium hydroxide), and sulfur. It must contain a minimum 40% total humic acid. BioAg's CytoPlus or equal shall be used. The application rates incorporated would be based upon soil test results.

4.6.6 Mycorrhizal Inoculum

Mycorrhizal inoculum can be incorporated within the compost/vermicompost blend applied directly to the soil, and will be used as part of the hydroseed application and backfill mix. Incorporation into the compost/vermicompost blend must take place after the thermal stage of composting is complete and the compost temperature has fallen to outside ambient temperature. The mycorrhizal inoculum will be applied, together with the seeds, during the first step of hydroseeding and must be in the planting medium during contract growing or at the time of containerized plant installation following manufacturer instructions. All mycorrhizal inoculum must contain of spores, mycelium, and mycorrhizal root fragments in a solid carrier suitable for handling by hydroseeding or dry-seeding equipment, and have a minimum of 19 ecto- and endo-mycorrhizal species. MycoGrow™ Soluble from Fungi.com meets these specifications. Approved equal can be used but must meet these requirements.

Storage

Mycorrhizae shall not be stored in temperatures greater than 90°F and no less than 32°F or in direct sun. Mycorrhizae that have become wet, moldy, or otherwise damaged by extreme temperatures will be rejected.

4.6.7 Incorporation of Amendments During Fine Grading

The soil amendments will be incorporate it into the soil while fine grading is taking place. The specified soil amendment will be mixed into the soil by the grading contract at a minimum depth of 4" during fine grading and prior to hydroseeding.

4.7 Planting Plan and Specifications

The habitat revegetation planned for this Project will incorporate a combination of active seeding and planting. All revegetation areas will be seeded using standard horticultural practices, as outlined below, and in locations depicted in Figure 10. The revegetation of the northwest staging area is also depicted in Figure 3. A landscape plan has been prepared for this project which all revegetation areas will be depicted. In the northwest staging area 27 western sycamore and 52 coast live oak will be planted. Substitutions to the plant or seed list (adjustments in quantities and/or species) may be allowed with the

approval of the Project Restoration Ecologist if quantities or species are either not available at the time of planting or not suitable for planting based upon final soil conditions.

Seeds shall be secured in advance of the anticipated seeding dates. If the landscape contractor is unable to obtain the specified species at the time of seeding, substitute species will be considered at the discretion of the Restoration Ecologist, who may make necessary substitutions to the seed list depending on availability, biological appropriateness, and/or variability of the site conditions.

4.7.1 Landscape Contractor Responsibilities

The landscape contractor will be responsible for implementing this HRP and performing landscape maintenance for three months after the 90 day establishment period. Thereafter the City of San Diego will assume responsibility for such areas. Short-term maintenance tasks will include re-seeding areas that have not germinated adequately, and irrigation and weeding to support successful plant establishment.

4.7.2 Seed and Containerized Plant Mixes

Revegetation will be performed using species found within the immediate project vicinity. The proposed containerized plant and seed lists for the revegetation areas are presented in Tables 4-6.

TABLE 4. CHOLAS CREEK SLOPES AND NORTHWEST STAGING AREA CONTAINERIZED PLANTS

Scientific Name	Common Name	Size*	Spacing (ft between plants)	Plants/Acre
<i>Artemesia californica</i>	California sagebrush	D-40 or Rose Pots	6	250
<i>Diplacus aurantiacus</i>	Sticky monkey flower	Rose Pots	3	300
<i>Elymus condensatus</i>	Giant wild rye	D-40 or Plugs	4	150
<i>Oenothera eleta ssp hookeri</i>	Evening primrose	Rose Pots	3	300
<i>Salvia apiana</i>	White sage	Rose Pots	6	200
<i>Salvia mellifera</i>	Black sage	Rose Pots	6	200
<i>Stipa pulchra</i>	Purple needlegrass	D-40 or Plugs	0.25	700

*1 gallon containers shall be used in northwest staging area planting.

TABLE 5. SR-94 CONTAINERIZED PLANTS

Scientific Name	Common Name	Size	Spacing (ft between plants)	Plants/Acre
<i>Heteromeles arbutifolia</i>	Toyon	1 gallon	6-10	357
<i>Rhus integrifolia</i>	Lemonade berry	1 gallon	6-10	358
Total				715

TABLE 6. CHOLLAS CREEK SLOPES & SR-94 SLOPES SEED MIX

Scientific Name	Common Name	Purity/ Germination*	Pounds/acre
<i>Acmispon glaber</i>	Deerweed	95/80	3
<i>Artemesia californica</i>	California sagebrush	30/60	3
<i>Deinandra fasciculata</i>	Fascicled tarweed	25/65	2
<i>Encelia californica</i>	California encelia	30/45	2
<i>Eriogonum fasciculatum</i>	California buckwheat	55/20	6
<i>Eriophyllum confertiflorum</i>	Long-stem golden yarrow	TBD	1.5
<i>Eschscholzia californica</i>	California poppy	98/80	2
<i>Isocoma menziesii</i>	Coastal goldenbush	18/40	2
<i>Lasthenia californica</i>	Goldfields	98/95	2
<i>Lupinus bicolor</i>	Miniature lupine	98/85	1
<i>Melica imperfecta</i>	Small-flowered melic grass	90/67	1
<i>Sisyrinchium bellum</i>	Blue-eyed grass	98/80	0.5
<i>Salvia apiana</i>	White sage	88/30	1
<i>Salvia mellifera</i>	Black sage	85/50	2
<i>Stipa pulchra</i>	Purple needlegrass	90/75	3
<i>Plantago insularis (ovata-indica)</i>	Plantain	98/75	8
<i>Vulpia microstachys**</i>	Small fescue	90/70	6
Total			46

** This may include var. *microstachys*, var. *pauciflora*, or var *ciliate* *update prior to seed ordering

4.7.3 Seed Material Sources Containerized Plants & Hydroseeding

Seeds for both containerized materials and for the hydroseed will be procured from a native seed-supply company and shall originate within coastal San Diego County to the extent possible. Seed shall be less than 2 years old. For those species that function as erosion control (small fescue, plantain) or do not exist in large enough quantities within the specified area, it will be necessary to either use seed that is commercially grown or extend the seed source area on a species-by-species basis with input from the Restoration Ecologist.

4.7.4 Containerized Plants

Containerized plant materials will be planted on the north banks of Chollas Creek, per Table 4 and on the SR-94 slope, per Table 5. Plant installation will include a specified backfill mix detailed here. The northwest staging area will follow the approved landscape plan for species and quantity.

4.7.4.1 Contract Growing Containerized Plant Specifications

The planting medium for the containerized plants should contain a mix of compost/vermicompost, plus locally made fresh compost tea that hosts a wide range of native flora. Mycorrhizal inoculum must be included in the planting medium and formulated to the specific type of plants being grown.

It will be the responsibility of the Project Restoration Ecologist to ensure these conditions are met. In order for the mycorrhizae to merge with the plant roots, the planting medium needs to receive a relatively insoluble form of phosphorous (rock phosphate, colloidal phosphate or bone meal). Synthetic forms of fertilizers must not be used since they are incompatible with the soil biology in the compost and do not set up the plants for the difficult soil conditions that are anticipated. Herbicides for weeding are also prohibited. The contracted nursery should be familiar with and must utilize organic-based nutrients, and be experienced in growing native plants. Climatic and growing conditions must be similar to that which the plants will be exposed to onsite.

4.7.4.2 Containerized Plant Installation

Container plants will be installed following the onset of the winter rains up to early spring (approximately December-February). Plants will be inspected prior to going into the soil. Unhealthy plants, or those with poorly developed roots or those that are pot-bound, will be rejected and substitution sought.

4.7.4.3 Containerized Planting Backfill Mix

Assuming planting holes for rose pots will be 1' in diameter and 1' deep of excavation per planting hole. The soil amendments will consist 25% of the compost/vermicompost blend, mycorrhizal inoculum and the native soil. Thus a total of ~0.12 cubic yards of soil amendment is needed per planting hole for rose pots. Similar calculations will be necessary for D-40 and plugs to ensure sufficient backfill material is ordered.

4.7.4.4 Containerized Planting Technique

The layout of container plants will consist of groups of plants distributed in natural groupings. All container plants shall be planted to the following specifications:

- Planting holes shall be at a minimum twice the depth and width of the containerized plant, or a minimum of twice the width containerized plants.
- Prior to planting, the planting hole shall be mixed 25% with compost/vermicompost blend and filled with water, and allowed to drain.
- Mycorrhizal inoculum shall be placed at the bottom of hole such that the root ball intercepts the inoculum in the hole
- Plants shall be set in the planting hole so that the crown of the root ball is approximately 1-2 inches above finish grade. Under no circumstance should the plant crown be buried.
- A watering basin shall be provided around each plant from 18 - 24 inches in diameter.
- Watering basins shall be filled with ~ 2 cups of compost tea after planting.
- Plant basins shall be mulched with approximately 4 - 6 inches of approved wood mulch or compost after planting.

Planting done in soil that is too wet, too dry, not properly conditioned or in a condition not generally accepted as satisfactory for planting will not be accepted.

Container stock shall be thoroughly watered the day before planting. No more plants shall be distributed in a planting area than can be planted and watered-in on that day.

Shrubs to be planted in areas to be seeded will be planted before seed is applied.

Planting holes may be excavated by hand digging or by drilling. Water shall not be used for the excavation of planting holes. The Contractor shall avoid creating smooth, vertical walls in the planting hole, and scarify the side of planting holes with shovel or digger bar if an auger is used.

Instructions for planting are as follows:

Add mycorrhizal inoculum to the bottom of the planting hole prior to installation of the plant.

With the palm of the hand covering the open end, upend the plant container. Carefully tap the container so the plant rests upside down on the hand leaving the rootball completely intact. Plants shall be removed from their containers in such a manner that the ball of earth surrounding the roots is not broken. Plants shall be planted and watered as hereinafter specified immediately after removal from their containers. Plant containers shall not be cut prior to delivery of the plants to the planting area.

Examine the plant for a healthy root system. If there are signs of girdling, scarify the rootball.

Before placing the container plant on the backfill, work the soil around the roots so that they are not compressed into a tight mass, but are spread and supported by the soil beneath them. Set rootball atop backfill so the root crown is slightly above finished grade.

Fill remaining portion of planting hole with compost and native soil backfill. Be sure the crown is still slightly above grade. If the backfill material settles below the top of the root ball after planting and watering, additional soil shall be added to bring the backfill even with the top of the root ball.

Apply wood mulch or compost as top dressing within the entire watering basin. Mulch must not be placed directly against the main stem of the plant. Wood mulch must be free from deleterious materials, including any eucalyptus or invasive species.

4.7.5 Hydroseeding

The north banks of Chollas Creek and any temporarily disturbed areas on SR-94 slope resulting from the installation of the retaining wall shall be hydroseeded using the specifications provided herein. Hydroseed list shall follow Table 6.

4.7.5.1 Hydroseeding Technique

Hydroseeding of the specified native seed mix will be applied in the habitat revegetation areas. Seeds shall be supplied on the basis of bulk weight, percent purity, and percent germination from a qualified native seed supplier. The native seed mix, together with the liquid humic/fulvic acid, compost tea, mycorrhizal inoculum, binder, compost and mulch shall be applied by hydroseed using a two-step technique.

Materials shall be applied in two (2) separate applications. The first application as specified in the tables below consists of the following mixture in the proportions indicated,

shall be applied with hydroseeding equipment within 60 minutes after the seed and mycorrhizae have been added to the mixture.

First Application	
Material	Quantity per acre
Compost /Vermicompost Blend	15 cubic yards per acre
Liquid Humic or Fulvic Acid	2 gallons (Must be added & mixed prior to compost tea being added to tank)
Compost Tea	5 gallons
Specified Seed Mix	As specified per habitat type in Table 5; location depicted on Figure 10
Mycorrhizal Inoculum	5 lbs/acre, or per manufacturers recommendation

Humic/fulvic acid shall be applied to the water in the tank and mixed well prior to the addition of all other ingredients. Once the seed, compost tea, mycorrhizal inoculum and compost are added to the mixing tank, application must be made within 1 hour. If the temperature will exceed 90 degrees Fahrenheit (32 degrees Celsius), step two must be applied within 3 hours of the first step.

The second application consists of the following mixture in the proportions indicated which shall be applied with hydroseeding equipment:

Second Application	
Material	Quantity per acreage
Cellulose Wood Fiber	2000 lbs
Green Dye Cellulose Fiber Mulch	500 lbs
Organic Soil Stabilizer	160 lbs

The ratio of total water to total stabilizing emulsion in the mixture shall be as recommended by the manufacturer of the emulsion.

Any mixture containing stabilizing emulsion shall not be applied during rainy weather or when soil temperatures are below 40 F. Pedestrians or equipment shall not be permitted to enter areas where mixtures containing stabilizing emulsion have been applied.

4.7.5.2 Hydroseed Materials

In Step 1 hydroseeding application will include the compost/vermicompost blend, mycorrhizal inoculum, compost tea, humic/fulvic acid and water. The humic/fulvic acid shall be added to the tank prior to the other additives and the tank thoroughly agitated.

Compost/Vermicompost Blend

See section 4.6.1 in Soil Amendments for requirements on the compost/vermicompost blend specifications.

Mycorrhizal inoculum

Mycorrhizal inoculum shall follow the same specification as described in Section 4.6.6 Soil Amendments.

Compost Tea

Compost/worm tea shall follow the same specification as described in section 4.6.3 Soil Amendments.

Seed

Individual seed species may be measured and premixed prior to delivery by the seed supplier. Seed mix shall be applied per habitat type based upon Figure 10 and Table 6.

Seed not required to be labeled under the California Food and Agricultural Code shall be tested for purity and germination by a seed laboratory certified by the Association of Official Seed Analysts, or a seed technologist certified by the Society of Commercial Seed Technologists.

Seed shall have been tested for purity and germination not more than one year prior to application of seed.

Results from testing seed for purity and germination shall be furnished prior to applying seed. If additional seed is required, then arrangements shall be made with the seed company to secure the material in a timely manner.

Seed required to be labeled under the California Food and Agricultural Code shall be labeled by the vendors supplying such seed. Contractor shall save seed labels and submit them to the Restoration Ecologist at the time of seeding operations.

All shipments of seed not accompanied by a valid California Nursery Stock Certificate shall be reported to the County Agricultural Commissioner at the point of destination for inspection and shall be held until released by the Commissioner.

Seed shall be labeled and furnished in sealed standard containers. The seed shall not contain more than 0.5 percent weed seed by volume. Seed that has become wet, moldy, or otherwise damaged will not be accepted. Seed in broken or damaged containers will be rejected.

Potential seed procurement source: S&S Seeds, P.O. Box 1275, Carpenteria, California 93014. Contact: Jody Miller, telephone number (805) 684-0436 (recommended)

Humic/Fulvic Acid

Humic/Fulvic acid shall be included in the hydroseed slurry mix as a neutralizer of chlorine and chloramine found in municipal water, and to promote beneficial fungi within the soil. Humic acid shall be applied at a rate of 2 gallons per acre for the first step. Humic/fulvic acid product shall be derived from mined Leonardite, and processed utilizing either cold extraction or potassium hydroxide. Sodium hydroxide extracted humic acid is not acceptable. Coal, peat based or synthetic humic acid is not acceptable. Non-plant food ingredients shall include a minimum 50% Humic Acid. Fulvic acid, legally sold in California as humic acid, is acceptable.

Fulvic acid shall be derived from Leonardite, and processed utilizing either cold extraction or potassium hydroxide. In California, fulvic acid can be legally be labeled as humic acid. Fulvic acid is golden in color and shall not be confused with humic acid, which is dark chocolate in color. The Contractor will be responsible for verification and approval of the product prior to application. Fulvic acid solution shall be a minimum 8% if measured by the Verploegh and Brandvold method; if measured by the Classical Method it shall contain a minimum of .015% fulvic acid. BioAg's Ful-Power or Ful-Humix or equal can be used.

In Step 2: Following hydroseed application, hydroseeded areas will be covered with a layer of weed free hydraulic wood mulch, a green dyed cellulose much, and organic tackifier. No straw mulch shall be used.

Cellulose Wood Fiber

Wood mulch will be used to cover hydroseeded areas. It will serve to retain soil moisture and ensure proper erosion protection. Hydraulic wood fiber mulch will be produced from annually renewable and certified weed-free wood based mulch, or originate from onsite. Mulch will consist of wood chips, tree bark, or shredded bark, or any combination thereof. Mulch produced from tree trimmings that contain leaves or small twigs will not be accepted. It must be free of deleterious materials, including but not limited to, salt and foreign materials such as clods, coarse objects, sticks, rocks, weeds, weed seeds, plastic material, growth inhibiting additives, or other non-biodegradable substances. The particle size of the chips should be between one and one-half inch (1-1/2") and three inches (3") in length, and not less than 3/8-inch in width and 1/16-inch in thickness. No straw-based product can be used since it will result in the consumption of all the available nitrogen that would otherwise be used by the plants. Conweb Fibers Hydromulch 1000 with Triflow Wood Mulch available from S&S Seeds meets these specifications. Equal product meeting these specifications can be used and must be approved by the Project Restoration Ecologist.

A Certificate of Compliance for fiber shall be furnished.

Green Dyed Cellulose Fiber Mulch

Green dyed cellulose fiber mulch will be applied in order to provide a suitable medium in the hydroseeding machine to provide a visual identification of coverage. This mulch should be a paper-based cellular fiber product that has a water holding capacity 1,200% by weight or greater, be non-toxic to plants or animals, pH range 5-7, and manufactured with a non-staining green dye. It should contain no plastic or other foreign materials that could inhibit germination or growth. Enviro-Fiber S100 available from S&S Seeds meets these specifications. Equal product meeting these specifications can be used and must be approved by the Project Restoration Ecologist.

Organic Tackifier

Organic tackifier, also known as a soil binder, is used to hold the hydroseeded material in place. This product must be biodegradable, non-synthetic and non-tar based, non-toxic to plant and animal life, non-corrosive and non-crystalline, and be non-staining to concrete or painted surfaces. It should be composed of psyllium or other organic material. Tackifier must conform to Section 21-1.02F of the State of California Department of Transportation Standard Specifications. The Ecology Control M-Binder Tackifier, available commercially by S&S Seeds meets these specifications. Equal product meeting these specifications can be used and must be approved by the Project Restoration Ecologist.

4.8 Supplemental Irrigation

Supplemental irrigation will be supplied on the north banks of Chollas Creek and SR-94 slopes. A temporary irrigation line will be installed post-fine grading but prior to the installation of containerized plants or hydroseeding. This will be separate for any permanent landscaped area associated with the trail/landscaping and permanently irrigated northwest staging area that will be revegetated. All temporary irrigation will be removed post-revegetation once the plants have established. The Contractor will be responsible for supplying sufficient water to adequately germinate and establish the seed and support survival and growth of the containerized and live staked material.

The frequency of irrigation will depend on soil texture and infiltration rates, plant health/vigor, soil moisture, and the rate of evapotranspiration occurring between irrigation events. The irrigation schedule will be based water needs of the plants. The following management scheme is recommended:

- Irrigate soil to full field capacity to the desired depth (approximately 18 inches during germination and seedling establishment and 18 to 24 inches during containerized and live stake plant establishment).
- Initially keep hydroseeded areas moist, until seeded material has germinated.
- Allow soil to dry down to approximately 50 to 60 percent of field capacity (in the top 6 to 10 inches after germination and during seedling establishment and 8 to 12 inches during plant establishment) before the next irrigation cycle.

Wetting of the full root zone and drying of the soil between irrigation events is essential to the maintenance of the plants and the promotion of a deep root structure that will support the vegetation after establishment. A soil probe or shovel is useful to directly examine soil moisture and rooting depth.

4.9 As-Builts

Following the completion of all grading, site preparation, and planting and seeding an As-Built report will be submitted to the City, the ACOE, the CDFW and the RWQCB. The As-Built will be prepared by the Contractor, and will be reviewed by the Restoration Ecologist and Project Engineer before it is finalized. This report will include the following: final elevations (if deviated from grading plan), any changes in project impacts, photographs, final revegetation acreages, and any deviations from the landscape plan.

5.0 Short-Term Maintenance Activities

Maintenance activities planned during the maintenance period will focus on creating conditions favorable to the establishment of plants to a self-sufficient state. Maintenance activities expected to be necessary during the short-term maintenance program include weed removal, re-seeding as needed, trash removal and irrigation.

5.1 Responsible Parties

The responsible parties for the short-term maintenance program is Groundwork for the 25 months following revegetation. The City and Caltrans shall be the responsible party thereafter based upon site ownership.

5.2 Maintenance Schedule

The start of the short-term maintenance period begins when the installation of the revegetation program has been certified as complete by the Project Restoration Ecologist. The project schedule for the habitat revegetation phase is provided in Table 7. The maintenance period will begin once the area has been seeded and planted.

5.2.1 90 Day Establishment Period

The plant establishment period will start after seeding installation has been completed and will have a duration of 90 calendar days. The establishment period is intended to provide an observation and guarantee time, during which the installation landscape contractor is responsible for ensuring that plants become properly established and that installation has been properly executed. During this period, irrigation frequency will be adjusted to maximize the probability of germination and root development. Many problems that could threaten the overall survivability of revegetation efforts are likely to be detected during this period, and the installation contractor is provided an opportunity to fix them. As a part of this period, the installation contractor is contractually obligated to guarantee their workmanship and perform remedial measures if necessary.

5.2.2 Short-Term Maintenance Period

After the 90 day plant establishment period, the revegetation areas will be maintained by Groundwork or its representative for up to five additional years. These activities include the short-term maintenance activities identified in this section. Table 7 below outlines the anticipated maintenance schedule.

TABLE 7. PROPOSED MAINTENANCE SCHEDULE

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Year 1	W	W	W, P	W,P	W, I	W, I	W, I	W, I	I, L	I, L	I, L	W, I
Year 2	W, I	W, P, I	W, P, I	W, I	W, I	W,I	W, I	W	L	L	L	W, I
Year 3	W	W, P	W, P	W	W	W	W	W	L	L	L	W
Year 4		W	W	W								
Year 5		W	W	W								

NOTES: Timeframe subject to change. W= Weed Control (more may be required) L = Ongoing maintenance P = Planting & Seeding (replacement planting) I = Irrigation, as needed

90 day Establishment Maintenance not included in this table.

Planting to occur ~ Oct/Nov prior to Year 1

5.3 Maintenance Activities

5.3.1 Contractor Education

The Project Restoration Ecologist will meet with the landscape contractor prior to the start of work to ensure that the contractor understands the maintenance provisions required, as well as the recommendations for current maintenance procedures. This will include education regarding avoidance measures to be implemented during maintenance to ensure necessary protection of sensitive species that may occur on the revegetation site.

5.3.2 Contractor Guarantees

The landscape contractor will be responsible for reseeding and plant replacement at the specified replacement rates as defined by the landscape plan. The Project Restoration Ecologist may recommend species substitutions or spot reseeding.

5.4 Ongoing Weed Control

Weed control activities will follow the same procedures as outlined in Section 4.4.3 Invasive Plant and Weed Control.

The intent is to continue to treat persistent and newly emerging non-native plants to effectively allow for the establishment of native species.

After seeding and planting is completed, ongoing weeding will be required until the native plants become established and can effectively compete against the annual non-native forbs and grasses. Weed whipping is the preferred method for weed control, and all weeds shall be managed before they seed. Once seeds begin to emerge it is important to control them before they consume the soil nutrients and outcompete the seedlings and plants for light and moisture.

5.5 Irrigation Maintenance

Temporary irrigation line maintenance will be the responsibility of Groundwork after initial installation during the short-term maintenance period. The irrigation lines will be maintained and repaired as needed. As a confirmation that self-sustaining habitats have been established, it is intended that temporary irrigation be use for up to two years.

5.6 Trash Removal

Trash will be removed by the Contractor on an as-needed basis. Care will be taken that trash removal activities minimize or avoid impacts to plants in the revegetation areas. Dead limbs and natural plant litter will be left in place. Invasive species and annual grasses and forbs weeded from the site if seed heads are present will be removed from the project area and disposed of legally.

6.0 Success Goals & Monitoring of Restoration

The goal of the restoration is that the habitat revegetation areas become self-sustaining native habitat. Self-sustaining is defined as the site resists invasion by non-native species, and that native plant habitat is established without significant weed maintenance. Because the northwest staging area revegetation will be permanently and actively maintained by the City after the area has been revegetated, there are no success parameters for that area. Monitoring of that area, however will be conducted as part of the 5 year monitoring program to ensure that the installed plants are maintained alive and in good health.

6.1 Chollas Creek Channel

General restoration goals for the Chollas Creek channel are as follows:

- Widen Chollas Creek to allow for a net gain of 0.59 acre of jurisdictional waters, for a total of 2.11 acres of channel bottom restoration/creation
- The reach remains sediment neutral
- Water overflows from the low-flow channel & is temporary stored within the reach
- No signs of erosion or instability are noted

To track whether the Chollas Creek channel goals are met, Chollas Creek will be visited and visually inspected as part of the overall 5-year monitoring program.

6.2 North Bank of Chollas Creek

General revegetation goals for the north bank of Chollas Creek are as follows:

- Restore approximately 0.73 acre of CSS habitat on the north bank of Chollas Creek
- The restored habitat resists invasion by exotic plant species as demonstrated by 10 percent or less cover of weed species at the end of the monitoring period
- Less than 5% cover of California Invasive Plant Council (Cal-IPC) high risk invasives species.

6.3 Caltrans Upland Slopes Behind Retaining Wall

General revegetation goals for the project are as follows:

- Restore up to 1.64 acre of CSS habitat on the SR-94 slopes (if temporary slope impacts are less, this number would reflect as-built acreages of temporary impacts)
- The restored habitat resists invasion by exotic plant species as demonstrated by 10 percent or less cover of weed species at the end of the monitoring period
- Less than 5% cover of Cal-IPC high risk invasives species.

Tables 8 and 9 provides the per year goal of cover of both natives and invasives in the revegetation areas, and includes remedial measures if the metrics are not achieved based upon anticipated conditions. This will provide 5 years of monitoring.

6.4 Monitoring Methods

6.4.1 Photo Monitoring & Physical Inspection

All areas will be physically inspected quarterly for the two years, and then twice annually, based upon the proposed schedule identified in Table 10. Photo-documentation of all activities conducted during monitoring will be conducted once a year. Permanent photo-points will be established throughout the project area and will be documented on a map. The habitat revegetation maintenance and monitoring shall cease if performance goals are met prior to the five year period.

6.4.2 Qualitative Monitoring

Qualitative assessments will be conducted quarterly to evaluate the overall condition of the revegetation areas, progress towards achieving native plant cover, plant health, recruitment of native plant species and any damage or problems that may occur. Qualitative surveys will be completed during each monitoring visit, and will consist of a site walkover and general habitat characterization. General observations, such as fitness and health of the planted species, pest problems, herbivory, weed establishment, mortality, and drought stress, will be noted during each site walkover. The monitor will also note wildlife use, native plant recruitment, and the condition of the creek channel.

6.4.2 Quantitative Monitoring

Quantitative monitoring, in the form of a native and non-native plant cover, and survival count of installed native plants, will be conducted according to Tables 8 and 9.

Plant cover (native and non-native) and native plant species diversity will be collected using 50-meter transects. Total cover provides information regarding how many points are covered vs bare regardless of how many plants may be intercepted at a given point. Total cover will not exceed 100 percent. Monitoring protocols, including two 30-meter transects per revegetation location, are based on the California Native Plant Society field sampling protocol (Sawyer and Keeler-Wolf 1995). Four vegetation transects will be monitored in June beginning in Year 1. Transect locations will be mapped and provided in annual summary reports. Native and non-native cover data will be collected every 0.5 meter along the transect lines.

TABLE 8. PERFORMANCE-BASED REVEGETATION METRICS: NORTH BANKS OF CHOLLAS CREEK

Milestone	Performance Metrics/Goals	Remedial Measures
Year 1	<ul style="list-style-type: none"> All exotics killed in place 80% survivorship of container plants Total absolute native cover in revegetation areas 25% 	Continue exotics and weed control; Determine cause of mortality, rectify cause of mortality as possible, and replace dead plants and re-seed, as directed. (Possible remedial measures could include: additional watering, installation of container plants, addition of mulch, etc).
Year 2	<ul style="list-style-type: none"> Control of all exotic exotics, and overall total non-native plant cover <30% <10% of Cal-IPC high risk invasives 80% survivorship of container plants Total absolute native cover in revegetation areas >30% 	Continue exotics and weed control; Determine cause of mortality, rectify cause of mortality as possible, and replace dead plants and/or apply seed as directed.

Milestone	Performance Metrics/Goals	Remedial Measures
Year 3	<ul style="list-style-type: none"> Control of all exotic exotics, and overall total non-native plant cover <30% <10% of Cal-IPC high risk invasives Total absolute native cover in revegetation areas >35% 	<p>Continue exotics and weed control; Determine cause of mortality, rectify cause of mortality as possible, and replace dead plants and/or apply seed as directed.</p>
Year 4	<ul style="list-style-type: none"> Control of all exotic exotics, and overall total non-native plant cover <30% <10% of Cal-IPC high risk invasives Total absolute native cover in revegetation areas >35% 	<p>Continue exotics and weed control; Determine cause of mortality, rectify cause of mortality as possible, and replace dead plants and/or apply seed as directed.</p>
Ultimate Goal	<ul style="list-style-type: none"> Control of all exotic exotics, and total nonnative plant cover <10% <5% of Cal-IPC high risk invasives Total absolute native cover in revegetation areas >40% 	<p>Continue exotics and weed control; Determine cause of mortality, rectify cause of mortality as possible, and replace dead plants and/or apply seed in areas not performing. as directed.</p>

TABLE 9. PERFORMANCE-BASED REVEGETATION METRICS: SR-94 SLOPES

Milestone	Performance Metrics/Goals	Remedial Measures
Year 1	<ul style="list-style-type: none"> All exotics killed in place; 80% survivorship of container plants. Total absolute native cover in revegetation areas 20% Plant cover sufficient to maintain slope stability and no erosion 	<p>Continue exotics and weed control; Determine cause of mortality, rectify cause of mortality as possible and re-seed, as directed. (Possible remedial measures could include: additional watering, installation of container plants, addition of mulch, etc).</p>
Year 2	<ul style="list-style-type: none"> Control of all exotic exotics, and overall total native plant cover >30% <10% of Cal-IPC high risk invasives 80% survivorship of container plants Plant cover sufficient to maintain slope stability and no erosion 	<p>Continue exotics and weed control; Determine cause of mortality, rectify cause of mortality as possible and re-seed, as directed.</p>
Year 3	<ul style="list-style-type: none"> Control of all exotic exotics, and overall total native plant cover >35% <10% of Cal-IPC high risk invasives Plant cover sufficient to maintain slope stability and no erosion 	<p>Continue exotics and weed control; Determine cause of mortality, rectify cause of mortality as possible and re-seed, as directed.</p>
Year 4	<ul style="list-style-type: none"> Control of all exotic exotics, and overall total native plant cover >35% <10% of Cal-IPC high risk invasives Plant cover sufficient to maintain slope stability and no erosion 	<p>Continue exotics and weed control; Determine cause of mortality, rectify cause of mortality as possible and re-seed, as directed.</p>
Ultimate Goal	<ul style="list-style-type: none"> Control of all exotic exotics, and total non-native plant cover <10% and overall total native plant cover >40% <5% of Cal-IPC high risk invasives Plant cover sufficient to maintain slope stability and no erosion 	<p>Continue exotics and weed control; Determine cause of mortality, rectify cause of mortality as possible and re-seed, as directed.</p>

TABLE 10. PROPOSED MONITORING SCHEDULE*

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	O C T	N O V	DEC
Year 1			QA			QA, QN			QA			QA,AR
Year 2			QA			QA, QN			QA			QA,AR
Year 3						QA, QN						QA,AR (YR 3)
Year 4						QA, QN						QA,AR (YR 4)
Year 5						QA, QN						QA,FR (YR 5)

NOTES: Timeframe subject to change. QA = Qualitative monitoring QN = Quantitative monitoring
AR = Annual Summary Report FR = Final Summary Report

*If performance goals are met prior to the 5 year monitoring period, short term maintenance and monitoring will transition to long-term maintenance activities.

6.5 Summary Reports

Once a year, a summary report of activities conducted and the results of the qualitative and quantitative monitoring will be prepared and submitted to the City and Caltrans. This annual summary report will include:

1. Names of individuals who prepared the annual report and participated in monitoring activities for that year.
2. An analysis with discussion of all quantitative monitoring data (plant survival, percent cover, etc.), prepared in table format to present project progress relative to project goals.
3. Monitoring photographs.
4. Details of necessary replacement plantings/seedings and other remedial actions.
5. Maps or photos identifying monitoring areas, transects and areas requiring remedial measures.
6. The final report shall summarize the results of all monitoring years and provide an overall quantitative assessment of the project’s success, problems encountered or potential problems and proposed solutions.

6.6 Completion of Revegetation Monitoring

Groundwork or its representative will notify the City MMC, Caltrans, ACOE, RWQCB, and CDFW in writing upon completion of the habitat revegetation effort through the submittal of the final monitoring report. This report will include a summary of the monitoring and maintenance period.

6.7 Adaptive Management

An integral part of a successful revegetation program is the ability to detect problems with the revegetation early in the process, determine the cause of the problem, and attempt to modify the revegetation program to accommodate emerging issues or situations. Minor problems, such as trash, vandalism, isolated instances of plant mortality, or small-scale weed or pest infestations will be rectified as they are discovered during routine site monitoring.

If qualitative and quantitative monitoring efforts suggest that the revegetation site is not progressing towards meeting the success goals, remedial measures may be taken. Remedial measures may include such measures as additional seeding, intensified weeding.

6.8 Force Majeure

The Groundwork is responsible to maintain and remediate the revegetation areas, except on the occurrence of certain Catastrophic Events or Unlawful Acts, as defined below.

A “Catastrophic Event” is defined as an event, such as a spill of hazardous or toxic substance, the impact of a vehicle or failing aircraft, or a fire, which has a material and detrimental impact on the quality of native vegetation, soils, or wildlife of the revegetation areas and over which the property owner and/or Responsible Party had no reasonable control.

An “Unlawful Act” is defined as the unlawful act of another and shall include, an event or series of events, such as the intentional dumping within the revegetation area or its watershed of a hazardous or toxic substance, or the discharge of such a substance by any person or entity other than the property owner and Responsible Party in violation of a statute, ordinance, regulation or permit, which event or series of events has a material and detrimental impact on the water quality, native vegetation, soils or wildlife of the revegetation area, and which event or series of events could not reasonably have been prevented by property owner and Responsible Parties.

If a catastrophic flood, fire, or outbreak of disease or pestilence occurs during the monitoring period, if funds are available, Groundwork will make an effort to remediating the revegetation areas. If funds are not available these areas will not be remediated. In cases where site remediation is necessary, Groundwork shall contact the City, Caltrans and the resource agencies to discuss the most appropriate course of action to achieve the required remediation.

7.0 Long-Term Management Program

Maintenance activities include those activities that will occur after the Short-Term Maintenance Period. Long-term maintenance of the revegetation areas will be performed by the respective landowner (City and Caltrans).

7.1 Responsible Parties

Once the short-term maintenance period has passed the City and Caltrans will re-assume long-term management of Chollas Creek and any revegetation areas within their property. Each department, as described in the Project Description, will be responsible for the long-term maintenance (SWD, READ, PUD, Caltrans, etc).

7.2 Anticipated Maintenance Activities

Long-term maintenance activities associated with the revegetation include weeding and occasional trash removal.

7.2.1 Within Chollas Creek Channel

Inherent to the design of the restoration of Chollas Creek is limited maintenance will be necessary. Because the channel will be rock lined, maintenance activities would be considered minor and would not result in a loss of function or acreage.

7.2.2 North Banks of Chollas Creek

Once the CSS on the north banks of Chollas Creek are established, maintenance activities may include periodic weeding and trash removal.

7.2.3 Caltrans Slope Behind Retaining Wall

It is not anticipated that the Caltrans slopes behind the retaining wall will require any maintenance following CSS revegetation of any temporary disturbed areas. Should maintenance be required, the landowner (Caltrans) would assume maintenance responsibilities.

7.2.4 Northwest Staging Area

The revegetation of the northwest staging area will be maintained by the City, per the respective department(s) to maintain the irrigation and landscaping.

8.0 References

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