

# FINAL LOS PEÑASQUITOS CANYON PRESERVE WETLAND ENHANCEMENT PLAN

Prepared for

City of San Diego  
Transportation & Storm Water Department  
2781 Caminito Chollas  
San Diego, CA 92105

URS Project No. 27679954

February 28, 2014  
Updated February 25, 2015, with assistance from HELIX Environmental Planning,  
Inc.

**URS**

4225 Executive Square, Suite 1600  
La Jolla, CA 92037  
858.812.9292 Fax: 858.812.9293

# TABLE OF CONTENTS

---

<b>Section 1</b>	<b>Introduction.....</b>	<b>1-1</b>
	1.1 Project Locations .....	1-1
	1.2 Maintenance Impacts and Proposed Mitigation.....	1-2
	1.3 Functions and Services of Affected Areas.....	1-5
	1.4 Compensatory Mitigation Definitions .....	1-6
	1.5 Current Mitigation Requirements .....	1-8
	1.6 Estimated Future Impacts and Mitigation Requirements.....	1-9
	1.7 Restoration Goals and Objectives.....	1-9
<b>Section 2</b>	<b>Description of Proposed Mitigation Site .....</b>	<b>2-1</b>
	2.1 Mitigation Location .....	2-1
	2.2 Ownership Status .....	2-1
	2.3 Existing Conditions .....	2-1
	2.4 Mitigation Concept .....	2-5
	2.5 MSCP Land Use Consistency.....	2-5
<b>Section 3</b>	<b>Responsibilities .....</b>	<b>3-1</b>
	3.1 Financial Responsibility .....	3-1
	3.2 Project Team.....	3-1
	3.3 Schedule.....	3-2
<b>Section 4</b>	<b>Implementation Plan.....</b>	<b>4-1</b>
	4.1 Rationale for Expecting Implementation Success .....	4-1
	4.2 Implementation Schedule .....	4-1
	4.3 Irrigation Plan .....	4-1
	4.4 Non-Native Plant Removal.....	4-1
	4.5 Planting Plan and Specifications.....	4-7
	4.6 120-Day Plant Establishment Period .....	4-9
	4.7 Documenting As-Built Conditions .....	4-9
<b>Section 5</b>	<b>Maintenance Program.....</b>	<b>5-1</b>
	5.1 Maintenance Schedule .....	5-1
	5.2 Non-Native Plant Control .....	5-1
	5.3 Supplemental Seeding/Cutting Installation .....	5-2
<b>Section 6</b>	<b>Monitoring and Performance Standards .....</b>	<b>6-1</b>
	6.1 Monitoring and Reporting Schedule.....	6-1
	6.2 Performance Standards .....	6-1
	6.3 Monitoring Methods .....	6-3
	6.4 Reporting Program.....	6-8
<b>Section 7</b>	<b>Completion of Mitigation .....</b>	<b>7-1</b>
	7.1 Notification of Completion.....	7-1
	7.2 Agency Confirmation .....	7-1

# TABLE OF CONTENTS

---

	7.3 Long-Term Management .....	7-1
<b>Section 8</b>	<b>Contingency Measures .....</b>	<b>8-1</b>
	8.1 Initiating Procedures .....	8-1
<b>Section 9</b>	<b>References .....</b>	<b>9-1</b>

**Tables**

Table 1	Proposed Mitigation for Sorrento Valley Maintenance Area (Reaches 3 and 7) Impacts <sup>1</sup>
Table 2	Anticipated Compensatory Wetland Mitigation Requirements and Allocation For Mission Bay High School Area Channel Maintenance
Table 3	Anticipated Compensatory Wetland Mitigation Requirements and Allocation for Tripp and Industrial Area Channel Maintenance Impacts
Table 4	Wetland Creation And Enhancement Required For Proposed Impacts Within The Peñasquitos Hydrologic Unit
Table 5	Wetland Enhancement Opportunities Accounting and Project Use
Table 6	Invasive and Non-Native Plants in Los Peñasquitos Canyon Preserve
Table 7	Proposed Project Schedule
Table 8	Target Non-Native Species and Control Methods
Table 9	Primary Enhancement Area Native Seed Mix
Table 10	Performance Standards and Potential Remedial Measures
Table 11	Function-Based Goals for Success of the Primary Enhancement Area

**Figures**

Figure 1	Regional Map
Figures 2a-c	Maintenance Locations
Figure 3	Enhancement Opportunities
Figure 4	Biological Resource Locations

## List of Acronyms and Abbreviations

---

Cal-IPC	California Invasive Plant Council
CCC	California Coastal Commission
CDP	Coastal Development Permit
CEQA	California Environmental Quality Act
City	City of San Diego Transportation and Storm Water Department
CRPR	California Rare Plant Rank
EIR	Environmental Impact Report
GPS	global positioning system
HU	Hydrologic Unit
MHPA	Multi-Habitat Planning Area
MMP	Master Storm Water System Maintenance Program
MSCP	Multiple Species Conservation Program
Plan	Wetland Enhancement Plan
PLS	pure live seed
Preserve	Los Peñasquitos Canyon Preserve
Site	Los Peñasquitos Canyon Preserve Primary Enhancement Area

## SECTION 1 INTRODUCTION

This Wetland Enhancement Plan (Plan) provides direction for implementation of mitigation to offset impacts resulting from channel maintenance activities associated with the City of San Diego Transportation & Storm Water Department's (City) Master Storm Water System Maintenance Program (Master Maintenance Program or MMP [Helix 2012]). The MMP outlines maintenance procedures that periodically clear out City storm water facilities to allow them to effectively convey storm water. During this maintenance process, sediment and vegetation is removed, including wetland vegetation. The removal of wetland vegetation requires mitigation for impacts to United States Army Corps of Engineers (USACE) jurisdictional wetlands under Section 404 of the federal Clean Water Act, California Department of Fish and Wildlife (CDFW) riparian habitat under Section 1605 of the California Fish and Wildlife Code, and areas considered wetlands by the Regional Water Quality Control Board (RWQCB), City (Helix 2011), and California Coastal Commission (CCC) through the Local Coastal Program and Coastal Development Permit (CDP).

This Plan includes (1) a description of maintenance impacts, (2) a description of the enhancement opportunities (the Site) in Los Peñasquitos Canyon Preserve (Preserve), (3) a plan for enhancing existing wetland/riparian habitat within the Preserve, and (4) a description of the maintenance and monitoring period following the enhancement activities within the Preserve. The mitigation concept involves removing a variety of non-native species that currently occur sporadically throughout the Site, removing non-native species seed sources from the Preserve and allowing native species to replace them (either naturally or via supplemental seeding/planting). A comprehensive maintenance and monitoring plan is also included within this plan in addition to performance standards by which the success of the enhancement effort will be assessed. This plan has been developed to be consistent with the Conceptual Mitigation Plan contained in the Master Maintenance Program Final Environmental Impact Report (EIR, City of San Diego 2011). Vegetation communities throughout the plan are classified according to Holland (1986).

### 1.1 PROJECT LOCATIONS

This Plan addresses the enhancement portion of the mitigation program to offset impacts resulting from channel maintenance activities proposed within the Peñasquitos Hydrologic Unit (HU), including maintenance work within the Soledad Creek, Sorrento Creek, Los Peñasquitos Creek, and Flintkote channels, Tripp and Industrial channels, and at the Mission Bay High School (and Pacific Beach Drive/Olney Street) (Figure 1). All required mitigation for these maintenance impacts will occur within the coastal zone in Los Peñasquitos Canyon Preserve (Preserve). This plan presents the conceptual design for wetland enhancement, one component of the anticipated required mitigation. A separate establishment plan has been prepared (URS 2015) addressing remaining anticipated mitigation requirements.

#### 1.1.1 Sorrento Valley Area Channel Maintenance

Emergency maintenance was performed in 2010/2011 in the Sorrento Valley Area (Figure 2A). Maintenance is proposed to occur in the same geographic footprint in winter of 2015. Mitigation associated with the creation of the majority of the facility was implemented several years ago. The emergency flood control channel maintenance work as well as the proposed work in Sorrento Valley

extends past this previously mitigated work area in two locations: the concrete-lined portion of Soledad Creek and the concrete-lined Flintkote channel. The vegetated portion of these channels consists of sparse, low-growing freshwater marsh species, which have established on accumulated sediment.

### 1.1.2 Mission Bay High School Channel Maintenance

The currently proposed flood control channel maintenance work at Mission Bay High School includes a concrete-lined portion of a channel adjacent to Mission Bay High School as well as a portion of the channel at Pacific Beach Drive and Olney Street, consisting of concrete-lined and earthen bottom portions (Figure 2B).

### 1.1.3 Tripp and Industrial Channel Maintenance

Emergency channel maintenance was performed on channels adjacent to Tripp and Industrial Courts in 2010 (Figure 2C). The maintenance work at both channels involved the removal of trash/debris, vegetation, and sediment within the concrete-lined channels. The Tripp Court channel runs upstream from several outfalls from Interstate-5 towards two 57-inch diameter culverts that run under Sorrento Valley Road (City 2010b). The Industrial Court channel runs upstream from an outfall from Interstate-5 toward a double-box culvert under Sorrento Valley Road (City 2010a).

## 1.2 MAINTENANCE IMPACTS AND PROPOSED MITIGATION

### 1.2.1 Sorrento Valley Area Channel Maintenance

Dredging of channels in Sorrento Valley occurred as part of Emergency work conducted in 2010/2011 and is currently anticipated to occur within Flintkote and the concrete-lined portions of Soledad Creek in the winter of 2015. Portions of the 2010/2011 emergency maintenance impacts were within the same geographic footprint as permitted in the past, specifically the earthen portions of Soledad Creek. Mitigation for these impacts was implemented successfully as required in the original permits. No new mitigation is proposed. The City implemented 12.07 acres of compensatory habitat mitigation in conformance with regulatory permits for flood control maintenance of Sorrento Creek, Los Peñasquitos Creek, and Soledad Creek and minor wetland impacts from implementation of the El Cuervo Wetland Revegetation Mitigation Project and the Famosa Slough Off-Site Salt Marsh Mitigation Area.

Impacts to the Flintkote channel and the concrete-lined portions of Soledad Creek will be mitigated using the 2010/2011 impacts as a mitigation baseline. Mitigation for the areas not previously permitted and mitigated is proposed pursuant to the CDP and Master Maintenance Program EIR (City of San Diego 2011) at the ratios shown in Table 1. Proposed mitigation includes a 1:1 wetland creation component. For the emergency channel maintenance that occurred in 2011 (and the repeat impact proposed for 2013 in the same geographic footprint), a total of 1.91 acre of wetland creation and 5.53 acres of wetland enhancement is proposed. There are no impacts to upland habitat that would require mitigation. Table 1 summarizes the mitigation requirements for the Sorrento Valley area channel maintenance work.

**Table 1**  
**Proposed Mitigation for Sorrento Valley Maintenance Area (Reaches 3 and 7) Impacts <sup>1</sup>**

Habitat (Ratio)	2011 Impact Acreage	2013 Impact Acreage	2013 Impact Linear Feet	Impact Acreage Used to Calculate Mitigation	Mitigation Ratio/Type	Mitigation Required
Freshwater Marsh (4:1)	1.21	0.81	900	1.21 <sup>2</sup>	1:1 Creation	1.21
					3:1 Enhancement	3.63
Disturbed Wetland (4:1)	0.50	-		0.50	1:1 Creation	0.50
					3:1 Enhancement	1.50
Southern Willow Scrub (3:1)	0.04	-		0.04	1:1 Creation	0.04
					2:1 Enhancement	0.08
Riparian Scrub (3:1)	0.16	-		0.16	1:1 Creation	0.16
					2:1 Enhancement	0.32
<b>Total</b>	<b>1.91</b>	<b>0.81</b>	<b>900</b>	<b>1.91</b>	<b>Creation</b>	<b>1.91</b>
					<b>Enhancement</b>	<b>5.53</b>

<sup>1</sup> Total mitigation acreage is based on the impacts of the first maintenance activity (i.e., the 2010/2011 Emergency Maintenance Impacts). Subsequent maintenance impacts do not require additional mitigation if conducted within the same reach and footprint as the original impacts regardless of any changes in vegetation distributions assuming no new sensitive species have been detected. Mitigation will only be done once for a given geographic area. Therefore, the 2013 impacts are covered by the mitigation being done for the 2011 impacts.

<sup>2</sup> Impact acreage encompasses the 0.69 acre of freshwater marsh impacts that required mitigation by RWQCB (Dudek 2013).

## 1.2.2 Mission Bay High School Channel Maintenance

Maintenance of the Mission Bay High School and Pacific Beach Drive/Olney Street channels has not been previously mitigated and will require compensatory mitigation (Table 2). The earthen portion of Pacific Beach Drive/Olney Street channel supports freshwater marsh vegetation and these portions would be classified as freshwater marsh pursuant to the City's Land Development Code. Impacts are proposed to be mitigated at 4:1 within the Coastal Zone pursuant to the Master Maintenance Program EIR (City of San Diego 2011), including a minimum 1:1 creation of freshwater marsh within the coastal zone. The unvegetated, earthen portions of the channel would be classified as a streambed/natural flood channel pursuant to the City's Land Development Code and mitigation for these impacts would be required at a 2:1 ratio.

Based on this analysis, a total of 0.34 acre of wetland creation will occur at the El Cuervo del Sur site and 0.96 acre of wetlands enhancement is proposed to occur at the Los Peñasquitos Canyon primary enhancement area (1.30 acres total). Table 2 shows the impacts and mitigation associated with the Mission Bay High School channel maintenance.



**Table 2**  
**Anticipated Compensatory Wetland Mitigation Requirements and Allocation**  
**For Mission Bay High School Area Channel Maintenance**

Habitat (Ratio)	Projected Impacts (acres)	Mitigation Ratio/Type	Required Mitigation (acres)
Freshwater marsh (concrete-lined) (4:1)	0.13	1:1 Creation	0.13
		3:1 Enhancement	0.39
Freshwater marsh (earthen-bottom) (4:1)	0.18	1:1 Creation	0.18
		3:1 Enhancement	0.54 <sup>3</sup>
Unvegetated Streambed/Natural Flood Channel (2:1)	0.03	1:1 Creation	0.03
		1:1 Enhancement	0.03
<b>Total</b>	<b>0.34</b>	<b>Creation<sup>1</sup></b>	<b>0.34</b>
		<b>Enhancement<sup>2</sup></b>	<b>0.96</b>

<sup>1</sup> Creation acreage will be mitigated in accordance with the *El Cuervo del Sur Conceptual Wetland Habitat Mitigation and Monitoring Plan* (URS 2015).

<sup>2</sup> Enhancement acreage will be fulfilled at the locations outlined in this plan.

<sup>3</sup> USACE requires 0.18 acre establishment at the El Cuervo del Sur site and 0.18 acre enhancement at the Los Peñasquitos Canyon Preserve primary enhancement area

### 1.2.3 Tripp and Industrial Channel Maintenance

Emergency maintenance of the Tripp and Industrial Court channels has not been previously mitigated and impacts to this channel will require compensatory mitigation (Table 3). Emergency maintenance was conducted in 2010. Maintenance activities at the Industrial Court channel consisted of work on approximately 300 feet of a 690-foot long facility. Approximately 20 percent of the maintenance work (50 feet) involved the removal of freshwater marsh vegetation which had established on accumulated sediment on top of the concrete-lined drainage facility. The remainder of the maintenance involved the removal of trash and sediment (City 2010a). Maintenance activities at the Tripp Court channel consisted of work on approximately 900 feet of an 1800-foot long facility. Approximately 20 percent of the maintenance work (400 feet) involved the removal of freshwater marsh vegetation which had established on accumulated sediment on top of the concrete-lined drainage facility. The remainder of the maintenance involved the removal of trash and sediment (2010b).

Mitigation is proposed pursuant to the Master Maintenance Program EIR at a 4:1 ratio for areas of freshwater marsh vegetation, with one component included as 1:1 wetland creation. Based on this analysis, a total of 0.05 acre of wetland creation and 0.15 acre of wetlands enhancement is proposed (0.20 acre total). Table 3 summarizes the mitigation requirements for the Tripp and Industrial area channel maintenance work.

**Table 3**  
**Anticipated Compensatory Wetland Mitigation Requirements and Allocation for Tripp and Industrial Area Channel Maintenance Impacts**

Habitat (Ratio)	Impacts (acres)	Mitigation Ratio/Type <sup>2,3</sup>	Required Mitigation (acres)
Freshwater marsh (concrete-lined) (4:1)	0.05	1:1 Creation	0.05
		3:1 Enhancement	0.15
Total	0.05	Creation <sup>1</sup>	0.05
		Enhancement <sup>2</sup>	0.15

<sup>1</sup> Creation acreage will be mitigated in accordance with the *El Cuervo del Sur Conceptual Wetland Habitat Mitigation and Monitoring Plan* (URS 2015).

<sup>2</sup> Enhancement acreage will be fulfilled at the locations outlined in this plan.

## 1.3 FUNCTIONS AND SERVICES OF AFFECTED AREAS

### 1.3.1 Sorrento Valley Area Channel Maintenance

Flintkote and Soledad Creeks are mainly unvegetated, but the vegetated portion consists of patches of freshwater marsh of varying quality that has established on accumulated sediment averaging four to six inches in depth and is subject to scour from storm flows on an annual basis (Dudek 2013). This vegetation, especially given its location within an urbanized channel and the temporal nature of its existence, provides low to moderate function and services. The vegetation ranges from poor to good quality (Dudek 2013) and may support nesting and foraging uses for wildlife and provide nutrient transformation. The habitat does not provide flood attenuation or groundwater recharge due to its location within a concrete-lined channel. There is a lack of potential for hydric soil development and the small size and temporal and immature (one to two year old) nature of the vegetated area, substantially limits its function as habitat or as a native vegetation community (Dudek 2012). Despite the low to moderate functions and services of these impacts, they will be mitigated in accordance with the conditions outlined in the CCC's CDP issued for the Master Maintenance Program (CCC 2012) at the ratios described in Section 1.2.1 above.

### 1.3.2 Mission Bay High School Channel Maintenance

The flood control channels that comprise the Mission Bay High School channel maintenance project have been found to support freshwater marsh and non-native grass species in the past. The small overall area of these channels, combined with their linear configuration and urbanized location limits the function and services of any vegetation that grows here, such that these areas would not qualify as wetlands or non-native grassland, pursuant to the City of San Diego's Land Development Code, Biology Guidelines (Dudek 2012). These channels do not support typical functions and services because the plants here grow on accumulated sediment approximately four to six inches in depth. The vegetation is not large enough in

overall extent (up to only two feet wide in most areas) nor located in an area that can support nesting or foraging by wildlife, nor does it provide opportunity for flood attenuation or groundwater discharge due to its location within a concrete-lined channel.

The Pacific Beach Drive/Olney Street flood control channel supports freshwater marsh and non-native grass species. Freshwater marsh with the earthen bottom section of this channel, although limited in function and services provided, does have the potential to be classified as freshwater marsh pursuant to the City of San Diego's Land Development Code (Dudek 2012) and provides habitat for wildlife, including potential nesting and foraging songbirds and small mammals. Despite the limited functions and services of this channel, impacts will be mitigated in accordance with the conditions outlined in the CDP issued for the Master Maintenance Program (CCC 2012) at the ratios described in Section 1.2.2 above.

### 1.3.3 Tripp and Industrial Channel Maintenance

The Tripp and Industrial channels are concrete-lined flood control drainages that only support marginal freshwater marsh plant species as sediment accumulates during storm events. The channels are also located within urbanized areas consisting of commercial office complexes, which coupled with the low quality of native vegetation, provide little to no cover for use as a migratory corridor. The sparse and immature vegetation is unable to support nesting or foraging uses for wildlife, provides very limited potential for nutrient transformation, and provides no opportunity for flood attenuation or groundwater recharge due to its location within a concrete-lined channel.

## 1.4 COMPENSATORY MITIGATION DEFINITIONS

There are agency definitions of restoration and enhancement that are relevant to the discussion of mitigation options. Mitigation is described in this plan using terms and definitions that are contained in the USACE Compensatory Mitigation Rule (2008). The distinctions of mitigation type are important during the assessment phase to better inform the permitting phase of mitigation available to compensate for program impacts to federal jurisdictional waters and wetlands. Each mitigation type has a unique, acknowledged compensatory value for temporary and permanent impacts. However, mitigation projects do not always clearly fit into one category. It becomes incumbent for the consultant and City to highlight those project elements that support the mitigation type that is desired for the project.

Mitigation credit for the enhancement of wetland/riparian habitat is proposed as part of the mitigation plan outlined in this document. The Los Peñasquitos Canyon primary enhancement area would be considered enhancement as defined below by City, USACE, and RWQCB.

### 1.4.1 City of San Diego

The following list provides the City of San Diego operational definitions of the four types of activities that constitute wetland mitigation under Environmentally Sensitive Lands in the Land Development Manual- Biology Guidelines dated June 2012:

1. **Wetland creation** is an activity that results in the formation of new wetlands in an upland area. An example is excavation of uplands adjacent to existing wetlands and the establishment of native wetland vegetation.

2. **Wetland restoration** is an activity that re-establishes the habitat functions of a former wetland. An example is the excavation of agricultural fill from historic wetlands and the re-establishment of native wetland vegetation.
3. **Wetland enhancement** is an activity that improves the self-sustaining habitat functions of an existing wetland. An example is removal of exotic species from existing riparian habitat.
4. **Wetland acquisition** may be considered in combination with any of the three mitigation activities above.

The Biology Guidelines further state that:

*Wetland enhancement and wetland acquisition focus on the preservation or the improvement of existing wetland habitat and function, and do not result in an increase in wetland area; therefore, a net loss of wetland may result. As such, acquisition and/or enhancement of existing wetlands may be considered as partial mitigation only, for any balance of the remaining mitigation requirement after restoration or creation if wetland acreage is provided at a minimum of a 1:1 ratio.*

However, the Biology Guidelines acknowledge that:

*Wetland mitigation required as part of any federal (404) or state (1601/1603) wetland permit will supersede and will not be in addition to any mitigation identified in the California Environmental Quality Act (CEQA) document for those wetland areas covered under any federal or state wetland permit.*

#### 1.4.2 California Department of Fish and Wildlife

CDFW does not have official definitions of wetland mitigation but has typically followed the traditional definitions like those in the City's Biology Guidelines. CDFW has discretion in evaluating the appropriateness of mitigation proposals in light of the project impacts and available mitigation options. CDFW works closely with the USACE when evaluating mitigation options.

#### 1.4.3 U.S. Army Corps of Engineers

The following list provides the USACE operational definitions of the three types of activities that constitute wetland mitigation from *Compensatory Mitigation for Losses of Aquatic Resources* (2008):

1. **Establishment (creation)** - the manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area and functions.
2. **Restoration** - the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: reestablishment and rehabilitation.

- a. **Re-establishment** - the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/ historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.
  - b. **Rehabilitation** - the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/ historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.
3. **Enhancement** - the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

#### 1.4.4 Regional Water Quality Control Board

The following list provides the RWQCB operational definitions of the three types of activities that constitute wetland mitigation:

1. **Re-establishment** - the return of natural/historic functions to a site where vegetated or unvegetated waters of the U.S. and/or State previously existed (e.g., removal of fill material to restore drainage).
2. **Rehabilitation** - the improvement of the general suite of functions of degraded vegetated or unvegetated waters of the U.S. and/or State (e.g., removal of a heavy infestation or monoculture of exotic plant species from jurisdictional areas and replacing with native species).
- 3.

**Enhancement** - the improvement to one or two functions of existing vegetated or unvegetated waters of the U.S. and/or State (e.g., removal of small patches of exotic plant species from an area containing predominantly natural plant species).

The USACE and RWQCB definitions of rehabilitation and enhancement explicitly distinguish between (1) the removal of a heavy infestation or monoculture of exotic plant species from jurisdictional areas followed by establishing native species and (2) the removal of small patches of exotic plant species from an area containing predominantly natural plant species.

### 1.5 CURRENT MITIGATION REQUIREMENTS

The proposed mitigation for Mission Bay High School, Tripp and Industrial, and the Sorrento Valley area channel maintenance activities, including the enhancement portion discussed in this Plan, follow the conditions of the CDP issued for the MMP (CCC 2012). The total amount of wetland mitigation required as compensation for the Mission Bay High School, Tripp and Industrial, and Sorrento Valley area channel

maintenance is 8.94 acres, consisting of 2.30 acres of wetland creation proposed at the El Cuervo del Sur mitigation site (URS 2015) and 6.64 acres of wetland enhancement proposed at the Los Peñasquitos Canyon mitigation site (primary enhancement area) addressed by the Plan (Table 4). It is anticipated that this amount of mitigation will fulfill all compensatory wetland mitigation requirements of federal, state, and local regulatory agencies for impact areas not previously mitigated at the El Cuervo and Famosa Slough Mitigation Sites.

**Table 4**  
**Wetland Creation And Enhancement Required For Proposed Impacts Within The**  
**Peñasquitos Hydrologic Unit**

Location	1:1 Wetland Creation Component (acres) <sup>1</sup>	Wetland Enhancement (acres) <sup>2</sup>	Total Acres
Sorrento Valley Area	1.91	5.53	7.44
Mission Bay High School Area	0.34	0.96	1.30
Tripp and Industrial Area	0.05	0.15	0.20
<b>Total</b>	<b>2.30</b>	<b>6.64</b>	<b>8.94</b>

<sup>1</sup> Creation acreage will be mitigated in accordance with the *El Cuervo del Sur Conceptual Wetland Habitat Mitigation and Monitoring Plan* (URS 2015).

<sup>2</sup> Enhancement acreage will be fulfilled at the locations outlined in this plan.

## 1.6 ESTIMATED FUTURE IMPACTS AND MITIGATION REQUIREMENTS

As part of the City's Storm Water Programs, it is anticipated that future projects located in environmentally sensitive areas and wetlands would require compensatory mitigation including other channel maintenance activities under the MMP. The primary enhancement area mitigation site outlined in this plan is intended to mitigate for all City Storm Water impacts in the watershed until all available credit from the primary enhancement area is exhausted. The secondary enhancement area has been identified as an opportunity to offset future impacts from channel maintenance activities and a separate wetland enhancement plan will be prepared for review and approval.

## 1.7 RESTORATION GOALS AND OBJECTIVES

The purpose of the project is to provide 6.64 acres of wetland enhancement mitigation for wetland impacts resulting from implementation of the MMP and other City projects within the Los Peñasquitos Hydrologic Unit. The primary enhancement area comprises 8.8 acres (7.66 acres not including easements) and encompasses the required 6.64 acres of wetland enhancement mitigation. The current Sorrento Valley and Mission Bay High School locations covered by Coastal Development Permit A-6-NOC-11-086 require 6.49 acres of wetland enhancement. The Tripp and Industrial maintenance is anticipated to be

permitted in the near future (for past and recurring maintenance) and is also included in the estimate of mitigation requirements (Table 5). The goal of the Los Peñasquitos 8.8-acre primary enhancement area is to provide 0.18 acre of wetland enhancement for the USACE and 6.64 acres of wetland enhancement for both the CCC and City. The mitigation being provided as part of this plan will also meet the habitat enhancement requirements from CDFW and RWQCB for the channel maintenance projects listed above. Wetland enhancement provided by this Plan will be obtained through the removal of invasive non-native plant species from the sparsely vegetated riparian drainage (primary enhancement area) in Lopez Canyon (refer to Figure provided in Appendix A).

**Table 5**  
**Wetland Enhancement Opportunities Accounting and Project Use**

Location	Acreage
Primary Enhancement Area (garland daisy polygon)	8.8 <sup>1</sup>
Secondary Enhancement Areas <sup>2</sup>	1.69 <sup>1,2</sup>
<b>Total Enhancement Acreage Available</b>	<b>10.49 <sup>1,2</sup></b>
Sorrento Valley Area (enhancement acreage required)	5.53
Mission Bay High School Area (enhancement acreage required)	0.96
Tripp and Industrial Area (enhancement acreage required)	0.15
<b>Total Enhancement Mitigation Used</b>	<b>6.64<sup>3</sup></b>

<sup>1</sup> Estimates which will be verified based on mapping done in the field during enhancement activities.

<sup>2</sup> Secondary enhancement areas are not part of this plan.

<sup>3</sup> The entire 8.8-acre primary enhancement area (7.66 acres with easements subtracted) will be used to satisfy the mitigation requirements for the Sorrento Valley, Mission Bay High School, and Tripp and Industrial Channel Maintenance areas. The City will not retain any excess mitigation associated with the primary enhancement for future channel maintenance projects.

## SECTION 2 DESCRIPTION OF PROPOSED MITIGATION SITE

### 2.1 MITIGATION LOCATION

This Plan covers the portion of the Preserve within the coastal zone and east of Interstate 805, as shown in Figure 1. During preliminary field surveys, non-native species were mapped throughout both Los Peñasquitos Creek and Lopez Canyon Creek, including portions of nearby uplands that contain source populations of non-native species found in the canyon bottoms (Figure 3).

Mitigation site selection considered a watershed approach to the extent practicable. The main constraints for the selection included ensuring that the mitigation site be located within the coastal zone and within the Peñasquitos HU. The mitigation site selection also considered upstream weed infestations. URS conducted an initial site search on July 18, 2012 to identify potential wetland mitigation sites within the coastal zone portions of the Peñasquitos HU. The analysis showed that the best mitigation options were located within the Los Peñasquitos Canyon Preserve.

The primary enhancement area showed to be the best mitigation option because it encompasses a large distribution of garland daisy (*Glebionis coronaria*) in the upper reach of Lopez Canyon Creek (Figure 3). An additional site evaluation was conducted in 2014 to map the distribution of garland daisy in the primary enhancement area. The areas upstream of the primary enhancement area were also evaluated to confirm that stands of exotic weeds were not present. Implementation of additional enhancement efforts in the future that would focus on the secondary enhancement area would contribute to the watershed approach.

### 2.2 OWNERSHIP STATUS

The Site is owned by the City and County of San Diego and is also located within the MHPA.

### 2.3 EXISTING CONDITIONS

#### 2.3.1 Vegetation

Several vegetation communities are found in the Preserve including native upland and riparian communities, and several disturbed communities as well. Vegetation communities throughout the plan are classified according to Holland (1986). The creeks are dominated by riparian vegetation ranging from sparsely vegetated cobble to willow- and sycamore-dominated riparian woodland. Adjacent uplands are predominantly non-native grassland along the valley bottom and native shrub communities such as chaparral and coastal sage scrub on the surrounding hillsides. Portions of the valley bottoms also support coast live oak woodlands, while portions of Los Peñasquitos Creek support freshwater marsh habitat. Due to past and ongoing weed removal efforts, the majority of the riparian portion of the Preserve is free of non-natives; however, the upland areas still contain a considerable amount of non-native vegetation that may be available for future projects that require upland mitigation.

The primary enhancement area containing garland daisy contains sparsely vegetated cobble. The garland daisy generally occurs within and adjacent to the existing jurisdictional streambed habitat (non-wetland



Waters of the U.S.). There is also a known population of willow monardella (*Monardella viminea*), a federal- and state-listed endangered species and a California Rare Plant Rank [CRPR] 1B species, in the area that must be avoided during any enhancement activities (Figure 4).

### 2.3.2 Sensitive Habitat and Species

Light-footed Clapper Rail (*Rallus longirostris levipes*) and Least Bell's Vireo (*Vireo bellii pusillus*) have been documented in the Preserve (Figure 4). However, the Light-footed Clapper Rail and Least Bell's Vireo do not occur within or adjacent to the primary enhancement area. Measures to avoid impacts to these species only apply to the secondary enhancement area, which will be addressed in a separate enhancement plan.

Willow monardella is located adjacent to the primary enhancement area, and mitigation measures will be employed to avoid impacts to this species from the implementation of this Plan. San Diego marsh elder (*Iva hayesiana*), a California Rare Plant Rank (CRPR) 2 species, and southwestern spiny rush (*Juncus acutus ssp. leopoldii*), a CRPR 4 species, are also located within Los Peñasquitos Creek and care will be taken to avoid impacting these and other riparian plant species as well.

Enhancement activities throughout the Preserve will need to consider measures to avoid impacts to a number of federal and state listed wildlife species, including Coastal California Gnatcatcher (*Poliophtila californica californica*), Light-footed Clapper Rail (*Rallus longirostris levipes*), and Least Bell's Vireo (*Vireo bellii pusillus*) which have both been documented throughout the Preserve (Figure 4; only the Coastal California gnatcatcher has been documented immediately adjacent to the primary enhancement area). One such measure would be to avoid enhancement activities during the breeding season of sensitive birds, from February 15 to September 15. Sensitive habitat and plant species also occur within the Preserve; however, the goal of this Plan will be to avoid impacting any sensitive biological resources. Work areas will be surveyed by a biologist and/or botanist familiar with the sensitive biological resources present to check each area prior to work. If any sensitive resources are found, they will be avoided or the work will not occur to ensure no sensitive resources are impacted.

### 2.3.3 Exotics Mapping

URS biologists performed field surveys in January 2013 to map occurrences of invasive and non-native species within the Preserve. These surveys consisted of walking the lengths of the main drainages, walking up larger tributary drainages or canyons, looking up smaller tributary canyons, looking down into some canyons from above, and mapping observed target species with handheld global positioning system (GPS) units (Figure 3). The garland daisy within the primary enhancement area was surveyed again in 2014 and the updated 8.8-acre primary enhancement area is provided in Appendix A. As noted above, a separate wetland enhancement plan will be provided for the secondary enhancement area. Table 6 provides a list of the non-native species identified during the site visits that are growing in and along the creeks, broken down into primary and secondary enhancement areas.

Not all non-native species were targeted in the exotics surveys; biologists focused on those non-native species that are invasive and damaging to the ecosystem, or considered potentially damaging (with not enough information to be certain), or are not very invasive but are large enough to be disruptive. Targeted exotic species were determined by California Invasive Plant Council (Cal-IPC) ratings identified to be

controlled as part of this enhancement program (refer to Section 4.4). Non-native species that have already become established with apparently minimal impact, such as celery (*Apium graveolens*) were not mapped; invasive species growing in uplands near the creeks and wetlands but not in them, such as large patches of black mustard (*Brassica nigra*) and Italian thistle (*Carduus pycnocephalus*) were also not mapped. Additional non-native herbaceous species such as veldt grass (*Ehrharta erecta*), Bermuda buttercup (*Oxalis pes-caprae*), and smilo grass (*Stipa miliacea*) were observed growing with other non-native species and were not specifically mapped for that reason. Exotic species within 10 feet of the revegetation areas will be eradicated (see Section 5.2 of this plan).

Constraints on this mapping effort included: reduced visibility of some species in January, such as perennial pepperweed (*Lepidium latifolium*) and tamarisk (*Tamarix parviflora*); and an assumed undercount of seedling and young exotic trees because they were harder to detect through the dense existing cover.

**Table 6**  
**Invasive and Non-Native Plants in Los Peñasquitos Canyon Preserve**

Species	Common name	Stratum	Number of Individuals	Footprint area (square feet)
<b>Primary Enhancement Area<sup>1</sup></b>				
<i>Glebionis coronaria</i> polygon	garland daisy	Herb	-	370,260
<b>Total in acres</b>				<b>8.8</b>
<b>Secondary Enhancement Areas</b>				
<i>Acacia</i> sp.	acacia	Shrub	1	12
<i>Asphodelus fistulosus</i>	asphodel	Herb	-	24
<i>Callistemon</i> sp.	bottlebrush	Tree	6	175
<i>Cinnamomum camphora</i>	camphor tree	Tree	29	35
<i>Cortaderia selloana</i>	pampas grass	Herb (shrub-like)	141	3,470
<i>Cynara cardunculus</i>	cardoon, artichoke thistle	Herb	-	6,777
<i>Cyperus involucreatus</i>	umbrella sedge	Herb	-	113
<i>Dipsacus fullonum</i>	wild teasel	Herb	-	5,440
<i>Echium</i> sp.	Pride of Madeira	Shrub	2	15
<i>Eucalyptus</i> sp.	eucalyptus	Tree	78	38,035
<i>Hedera helix</i>	English ivy	Vine	-	200
<i>Iris pseudacorus</i>	paleyellow iris, yellowflag iris	Herb	-	754
<i>Lepidium latifolium</i>	perennial pepperweed	Herb	-	4
<i>Limonium</i> sp.	sea-lavender	Herb	-	3
<i>Liquidambar styraciflua</i>	sweetgum	Tree	30	200
<i>Nicotiana glauca</i>	tree tobacco	Shrub	18	80
<i>Paspalum dilatatum</i>	dallis grass	Herb	-	9,995
<i>Phoenix canariensis</i>	Canary Island palm	Tree	31	4,355
<i>Rhus lancea</i>	African sumac	Tree	1	50
<i>Schinus molle</i>	Peruvian pepper	Tree	6	1,773
<i>Schinus terebinthifolius</i>	Brazilian pepper	Tree	15	42
<i>Tamarix parviflora</i>	smallflower tamarisk	Shrub	68	541
<i>Washingtonia robusta</i>	Mexican fan palm	Tree	56	1,456
<b>Total in acres</b>				<b>1.69</b>

<sup>1</sup>Other invasive non-native species listed in the *Final Baseline Functional Assessment Report* (AMEC 2014) include umbrella sedge, fennel (*Foeniculum vulgare*), english ivy, bristly ox-tongue (*Helminthotheca echioides*), mustards, tocalote (*Centaurea melitensis*), and Italian thistle (*Carduus pycnocephalus*).

## 2.4 MITIGATION CONCEPT

The goal of the enhancement plan for this Site is to remove 8.5 acres of non-native species found within and adjacent to jurisdictional waters in Lopez Canyon using chemical and hand held methods to minimize impacts to existing riparian habitat. Previous enhancement efforts have been successful and there are limited areas of exotic vegetation remaining in the Preserve. Areas within the watershed outside of the Preserve are outside the Coastal Zone and/or San Diego City limits. The largest and primary area of focus is a patch of garland daisy in the upper reach of Lopez Canyon east and west of the Camino Santa Fe bridge (Figure 3). This area was chosen as the primary enhancement area due to the large contiguous area available and also because the removal of this species will benefit small populations of state- and federally-listed willow monardella that is also present in this portion of Lopez Canyon. Non-native species will be removed using hand tools with smaller shrubs being removed from the site, while larger trees and shrubs may be controlled with herbicides and left in place.

Revegetation of enhancement areas will benefit from recruitment and seeding from adjacent native habitat; however, supplemental seeding will be utilized to increase the likelihood of successful revegetation of the enhancement areas. Maintenance requirements (Section 5) and monitoring of performance standards (Sections 5 and 6) will determine if the initial non-native species removal is successful and notify the City if remedial measures are necessary to keep the project moving towards the attainment of the final performance standards.

Secondary enhancement areas were identified during the exotic species survey (Figure 3), which may be considered for enhancement mitigation for future projects if needed. A separate wetland enhancement plan will be provided for review and approval if it is to be considered for future enhancement mitigation.

## 2.5 MSCP LAND USE CONSISTENCY

The implementation of the mitigation project and subsequent maintenance thereof will be consistent with the San Diego Multiple Species Conservation Program (MSCP) (refer to Table 13 of the Biological Technical Report [Helix 2010]). The project specifically conforms to the MSCP because the Site will be converted from its current disturbed, low habitat quality state, into native habitat that will provide increased and improved hydrologic, biogeochemical, and habitat functions and services as noted in Section 2.7 of this Plan. Specifically, drainage functions will be improved, invasive species will be removed, dry non-native brush will be removed, and habitat for native flora and fauna will be created. As these improvements are being made to lands within the MHPA, the functions and services created will be in line with associated MSCP land use guidelines, sub area plans, and directives.

## **SECTION 3 RESPONSIBILITIES**

### **3.1 FINANCIAL RESPONSIBILITY**

The Responsible Party for implementation of this Plan is the City. The City will be financially responsible for implementing all enhancement requirements. This mitigation plan, each of the permits acquired for City channel maintenance projects, as well as the public record for the channel maintenance activities all constitute a commitment that the City of San Diego will implement any and all required mitigation.

### **3.2 PROJECT TEAM**

#### **3.2.1 Project Proponent**

The Responsible Party for implementation of this Plan is the City. The City will be responsible for implementing all aspects of this Plan. The City will be responsible for retaining a qualified restoration specialist with over 5 years of experience monitoring wetland/riparian mitigation and native habitat revegetation programs to oversee the enhancement effort. The City will be also responsible for retaining a qualified landscape contractor with documented successful experience with non-native species removal and habitat revegetation programs.

#### **3.2.2 Restoration Specialist**

The City will retain a qualified restoration specialist with over 5 years of experience monitoring wetland/riparian mitigation and native habitat revegetation programs. The restoration specialist will have overall responsibility for implementation of this Plan, and will oversee the work of the landscape contractor. The restoration specialist will also be responsible for monitoring and reporting.

The restoration specialist will oversee the landscape contractor during the removal of non-native species in order to minimize impacts to existing native vegetation. The restoration specialist will be responsible for documenting the location and extent of weed removal at each location and reporting to assess the actual amount of mitigation completed as a result of this enhancement plan. The restoration specialist will also determine whether a site should receive supplemental seeding and/or the installation of cuttings after weed removal. The restoration specialist must approve any seed or plant substitutions prior to application/installation.

Once the initial weed removal has taken place, the restoration specialist will make regular monitoring visits to each weed removal location to determine how successful the initial effort was in permanently eradicating each weed. If any new growth is observed, the restoration specialist will notify the landscape contractor so the new growth can be removed prior to seed being set. The restoration specialist will outline the progress of the site and the need for remedial weed removal in progress memos and an annual monitoring report. The restoration specialist will be in close coordination with the landscape maintenance contractor and provide a written checklist of tasks to be performed after each monitoring visit to make sure weed removal is done in a timely manner.

The restoration specialist can be an individual or a group of qualified professionals with the following minimum qualifications:

1. A minimum of a Bachelor's degree in biology, ecology, botany, horticulture, or landscape architecture.
2. Five (5) years of experience with restoration projects in southern California.
3. Knowledge of the vegetation associations proposed for the revegetation effort, including species identification, general composition, overstory, understory, and species ecological positions.
4. Knowledge of native and non-native plant species present in the Preserve.
5. Practical experience or equivalent study, including plant installation, fertilization, weeding, pruning, irrigation, and pest control.

### 3.2.3 Landscape Contractor

The City will retain the services of a qualified landscape contractor with demonstrated experience in native and non-native plant maintenance, including successfully installing native habitat revegetation projects. The contractor will be responsible for removing non-native species throughout the Preserve, as well as seeding and installing cuttings after weed removal. The restoration contractor will be a firm (or firms) holding a valid C-27 Landscape Contracting License from the State of California, a valid Maintenance Gardener Pest Control Business License or Pest Control Business License, and a Qualified Applicator Certificate or Qualified Applicator License, with Category B, that will allow them to perform the required work for this Project. The Contractor will have specific documented experience with the installation and maintenance of restoration projects representative of the habitats included in this Plan. The landscape contractor should have examples of completed work that has resulted in successful native plant revegetation, including weed-free maintenance of such projects. All work shall be performed by a trained crew in accordance with the standards and practices related to the trade. The landscape contractor shall maintain one experienced full-time supervisor on the crew.

Once the initial weed removal has been completed, the landscape contractor will be responsible for maintaining each location in a weed-free state, based on the recommendation of the restoration specialist. Any problems identified by the restoration specialist in progress memos or other correspondence will be addressed by the landscape contractor in a timely manner (i.e., within two weeks).

## 3.3 SCHEDULE

Table 7 below includes the proposed schedule for initial enhancement activities, and maintenance and monitoring for the duration of the project.

The proposed schedule below is provided as a guideline and may change based on unforeseeable issues that may arise after the submittal of this plan. Enhancement activities can begin no sooner than September to avoid the breeding season, but may start later in the fall season if needed. Enhancement activities will

continue until finished which should be no more than a month or two. At that time, the 5-year maintenance and monitoring period will begin.

During the 5-year maintenance and monitoring period, the Site will be visited by the restoration specialist monthly the first year, every other month during the second year, and quarterly thereafter. The restoration specialist may adjust this schedule to capture emergence and peak blooming periods of species targeted for removal. Monitoring by the restoration specialist will be reduced as the project progresses and non-native plants are eradicated from the project site. Maintenance will occur only if requested by the restoration specialist, but is likely to follow the same schedule as the monitoring visits. Annual monitoring will occur in early spring (March or April) to capture the presence of garland daisy. In accordance with the CDP, annual reports will be due in March after the year the report is documenting in order to include observations made during the December qualitative monitoring visit.

**Table 7**  
**Proposed Project Schedule**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2015		I	I, M	I, M	L, M	L, M	L, M	L, M	L, M	L, M	L, M	L, M
2016	RM,	L, M	L, M, R	L, M		L, M		L, M		L, M		L, M
2017	RM,		L, M, R			L, M			L, M			L, M
2018	RM,		L, M, R			L, M			L, M			L, M
2019	RM,		L, M, R			L, M			L, M			L, M
2020			L, M, R			F						

**Notes:**

F = Final report and scheduled completion of the mitigation and monitoring period.

I = Implementation of enhancement activities.

L = Landscape maintenance.

M = Biological/Horticultural Monitoring.

R = Annual report.

RM = Remedial measures (if necessary).

## SECTION 4 IMPLEMENTATION PLAN

This section addresses the design and implementation of the Plan. The primary strategy of this plan will be the removal of non-native species using hand tools and/or herbicide coupled with hand seeding and/or the installation of willow or mulefat cuttings in areas greater than 1/10<sup>th</sup> of an acre. It is anticipated that native recruitment from adjacent vegetation will be sufficient to fill in the space left by the non-native species removal in areas smaller than 1/10<sup>th</sup> of an acre; however, supplemental seeding will be utilized to aid in the re-establishment of native species in these situations as well. If vegetation is sprayed, it will be left in place; however, if it is cut or pulled, it will be removed from the Preserve and disposed of at an appropriate facility. Care will also be taken to avoid creating paths into the riparian zone to prevent unauthorized access by the public. If paths do form, they should be camouflaged using adjacent vegetation, and/or restored after the access routes are no longer needed.

### 4.1 RATIONALE FOR EXPECTING IMPLEMENTATION SUCCESS

The majority of Los Peñasquitos Canyon currently exists as a fully functioning riparian corridor with a diverse number of native plant communities and a year-round supply of water (from urban run-off and natural rainfall) which is sufficient to support the existing vegetation. Lopez Canyon is an ephemeral drainage with large unvegetated portions along its reach. Previous weed removal efforts as shown on Figure 3 successfully removed large stands of *Eucalyptus* and other exotic species, which has resulted in the majority of riparian areas being fairly free of weeds with scattered patches and individuals remaining and available for enhancement opportunities. This work is expected to succeed as each weed location will be initially treated and then regularly checked to ensure no new growth is observed. In addition to the eradication of the weed species, the sites will also be enhanced with native seed and/or cuttings to promote growth of native species and further reduce the likelihood of weed re-emergence in these locations.

### 4.2 IMPLEMENTATION SCHEDULE

The general implementation schedule for this Plan will avoid the bird breeding season between February 15 and September 15. Initial weed removal efforts may also have to avoid the rainy season as the Preserve can be closed after large winter storm events. The timeframe for the initial weed removal is therefore recommended to occur between September 15 and the end of November (Table 7). If the Preserve is dry enough to work in, work may continue through February 15 at the direction of the restoration specialist.

### 4.3 IRRIGATION PLAN

No irrigation is required or planned for the enhancement effort outlined in this Plan.

### 4.4 NON-NATIVE PLANT REMOVAL

The primary strategy of this Plan is removal of undesirable non-native plant species in and along riparian habitat within the Preserve; specifically, this plan targets removal of garland daisy from the 8.8-acre primary enhancement area. Specific methods are shown in Table 8. Weed control within the primary enhancement area will be completed through foliar chemical treatment and hand-held manual removal. All weeds should be eradicated by hand or herbicide treatment each season before they set seed.



The majority of the weeds that occur or have the potential to occur within the Preserve are identified along with the proposed methods of control in Table 8. Information on life form, growth habitat, reproduction, and removal/eradication methods are provided from *Invasive Plants of California's Wildlands* (Bossard et al. 2000), the Cal-IPC website, and the University of California Statewide Integrated Pest Management Project. These sources were reviewed for information on physical, biological [e.g., insects and fungi], and chemical/herbicide control methods.

Non-native species that are treated with chemical methods will be left in place if there is no concern with seed or plant material spreading post-treatment. All vegetation that is pulled by hand will be properly disposed of offsite along with treated material that may spread if not removed.

Chemical and manual weed removal methods are recommended as they will cause little to no incidental damage to existing native vegetation. The potential control methods are presented here to help illustrate possible methods. The final methods chosen will be based on recommendations provided by a licensed Pest Control Advisor.

**Table 8**  
**Target Non-Native Species and Control Methods**

Species	Life Form	Growth Habitat	Reproduction	Potential Control Methods
Acacia ( <i>Acacia</i> sp.)	perennial tree/shrub	Dense evergreen tree or tall shrub growing 20-45 feet tall	seed, root suckers, stump resprouting	Hand remove small individuals; however, note that species can resprout from roots and stumps and seeds can remain viable for up to 20 years. For mature trees and larger saplings, use cut-stump or girdle method with herbicide.
African sumac ( <i>Searsia lancea</i> )	perennial tree	15-30 foot, round, single or multi-stemmed tree; dense canopy when young.	seed	Hand remove small individuals. For mature trees and larger saplings, use cut-stump or girdle method with herbicide.
Asphodel ( <i>Asphodelus fistulosus</i> )	perennial herb	2 foot herb	seed	Hand remove or treat with glyphosate solution. Seeds may remain viable in the soil for several years.
Bottlebrush ( <i>Callistemon</i> sp.)	perennial shrub	1.5-12 foot woody shrubs	seed	Hand remove small individuals. For mature trees and larger saplings, use cut-stump or girdle method with herbicide.
Brazilian pepper ( <i>Schinus terebinthifolius</i> )	perennial tree	up to 30 feet with a short trunk hidden in a thicket of branches	seed	Triclopyr (as Garlon 3®), applied at 100 percent and using the girdle method, has been shown to kill mature trees and prevent regrowth. Successful treatments for full-sized plants also include basal spot applications of bromacil and hexazinone, which kill by blocking photosynthesis. For widely scattered plants, where access to the main stem is difficult, basal spot treatments are easily applied and effective.
Camphor tree ( <i>Cinnamomum camphora</i> )	perennial tree	broad-leafed evergreen up to 50 feet or more	seed	Hand remove small individuals. For mature trees and larger saplings, use cut-stump or girdle method with herbicide. Seeds may remain viable in the soil for several years.
Canary Island palm ( <i>Phoenix canariensis</i> )	perennial tree	palm tree with a thick trunk and broad canopy	seed	Cut down large trees, hand remove small seedlings.
Cardoon, artichoke thistle ( <i>Cynara cardunculus</i> )	perennial herb	up to 5 foot tall, thistle-like perennial	seed	Hand removal requires pulling or digging to remove the taproot to prevent resprouting. A foliar spray of 2 percent glyphosate (as Roundup®) can kill 95 to 98 percent of mature, bolting plants. For isolated plants or remote populations, cut-stump treatment is effective with application of 25 percent glyphosate (as Roundup®) solution.

**Table 8**  
**Target Non-Native Species and Control Methods**

Species	Life Form	Growth Habitat	Reproduction	Potential Control Methods
Dallis grass ( <i>Paspalum dilatatum</i> )	perennial grass	tufted, clump-forming grass	seed	Clumps can be removed by digging but may resprout if rhizomes are left behind. Herbicide treatment may require pre- and post-emergent herbicides.
Eucalyptus ( <i>Eucalyptus</i> spp.)	perennial tree	erect to >20 feet tall	seed	Hand pulling is effective if the majority of root system is removed, or use cut-stump treatment with application of 25% glyphosate.
English ivy ( <i>Hedera helix</i> )	perennial vine	vine reaching 90 feet or more in length	seeds and stem fragments	Hand removal. Remove all stem fragments near the ground to prevent re-establishment.
Garland daisy ( <i>Glebionis coronaria</i> )	annual herb	3-4 foot tall with numerous semi-woody stems	seed	Hand removal or application of foliar herbicide.
Mexican fan palm ( <i>Washingtonia robusta</i> )	perennial tree	erect 60 to 100 feet tall	seed	Cut main stem to remove apical meristem.
Paleyellow iris, yellowflag iris ( <i>Iris pseudacorus</i> )	perennial herb	3-4 foot tall, growing sporadically into clumps	seeds, rhizomes	Dig out rhizomes to remove smaller clumps. Use chemical treatment on larger infestations.
Pampas grass ( <i>Cortaderia</i> ssp.)	perennial grass	erect 6 to 8 feet tall	seed (root crown resprouts)	Physically remove plants ensuring the entire crown and top sections of roots are removed, or treat with a post-emergent application of glyphosate at about a 2% solution with surfactant.
Perennial pepperweed ( <i>Lepidium latifolium</i> )	perennial herb	2-4 foot tall herb with numerous erect semi-woody stems	seed	Foliar application of chlorsulfuron has been found to provide the most effective control while triclopyr can also provide moderate to good control.
Peruvian pepper ( <i>Schinus molle</i> )	perennial tree	evergreen tree growing to 26 feet	seed	Triclopyr (as Garlon 3®), applied at 100 percent and using the girdle method, has been shown to kill mature trees and prevent regrowth. Successful treatments for full-sized plants also include basal spot applications of bromacil and hexazinone, which kill by blocking photosynthesis. For widely scattered plants, where access to the main stem is difficult, basal spot treatments are easily applied and effective.
Pride of Madeira ( <i>Echium</i> sp.)	perennial herb/shrub	evergreen shrub-like woody perennial growing to 8 feet	seed	Hand removal down to the stem base to prevent resprouting.
Sea lavender ( <i>Limonium</i> sp.)	perennial forb	rosette forming perennial	seed	Hand removal or application of foliar herbicide.

**Table 8**  
**Target Non-Native Species and Control Methods**

Species	Life Form	Growth Habitat	Reproduction	Potential Control Methods
Smallflower tamarisk ( <i>Tamarix parviflora</i> )	perennial shrub	dense 15 foot tall shrub	seed	Hand removal of seedlings and small plants can be effective if the majority of the root system is removed. Otherwise, use chemical treatment with imazapyr, triclopyr, and/or glyphosate. For mature trees and larger saplings, use cut-stump or girdle method with application of 25% glyphosate.
Sweetgum ( <i>Liquidambar styraciflua</i> )	perennial tree	large, open-crowned tree growing up to 75 feet	seed	Hand remove young saplings. For mature trees and larger saplings, use cut-stump or girdle method with herbicide.
Tree tobacco ( <i>Nicotiana glauca</i> )	perennial shrub	erect 6 to 15 feet tall	seed	Hand pull if the root system can be removed, or cut and apply triclopyr or glyphosate.
Umbrella sedge ( <i>Cyperus involucratus</i> )	perennial grass	2-6 foot clumping sedge	seeds, rhizomes	Dig out rhizomes to remove smaller clumps. Use chemical treatment on larger infestations.
Wild teasel ( <i>Dipsacus fullonum</i> )	biennial herb	2-8 foot tall, upright	seed	Apply chemical treatment to basal rosette in spring or fall.

At a minimum, the following weed removal methods should be included in the implementation specifications.

Weed removal shall be performed predominantly by hand, but herbicides can be utilized under certain conditions to eradicate larger shrubs/trees and noxious weeds. Herbicides using glyphosate (such as Roundup® or Rodeo®) should be acceptable in most situations; however, a licensed Pest Control Advisor may make substitutions as appropriate. Any herbicide used will be applied by a licensed applicator.

The restoration specialist shall monitor enhancement areas throughout the year and notify the landscape contractor if any resprouting is observed so action can be taken before the plants reach 12 inches in height or produce seed, whichever is first.

#### 4.4.1 Chemical Treatment

As required by law, the final recommendations for herbicide use will be made by a licensed Pest Control Advisor and applied under the supervision of a licensed Pest Control Applicator. If weed ecology information indicates herbicide application is necessary to eradicate certain species, then it is recommended that direct application (instead of foliar sprays) and selective herbicides be used. Most weeds should be eradicated before they reach 12" high or set seed. In accordance with some control recommendations, weeds such as giant reed (*Arundo donax*) and eucalyptus (*Eucalyptus* sp.), for example, may have 3' to 6' high resprouts before receiving follow-up eradication treatment.

##### 4.4.1.1 Foliar Spray

Foliar spray of glyphosate can achieve a kill of 95 to 98 percent on mature, bolting plants, but will likely require a follow-up application. Spraying plants that had gone to seed can also achieve a similar high kill rate. Spraying plants in earlier stages of growth before a plant sends up its flower stalk kills the above-ground vegetative structures, but often does not kill all of the roots. In such cases the plant dies back, but a large percentage of sprayed mature plants resprout in the same season and will require a secondary application. Transport of fluids is generally up to the stems and leaves and less down to the roots in pre-bolting plants, probably preventing sufficient herbicide from reaching the roots. A licensed Pest Control Advisor will determine the appropriate concentration of glyphosate solution to use with this method.

##### 4.4.1.2 Cut-Stump Method

The cut-stump method of herbicide application can be used on any size of plant, but is typically used for small to large trees. It will be limited to small saplings no more than 10 feet in height within the secondary enhancement area to minimize damage caused to adjacent vegetation by cutting down non-native trees. This method involves cutting the plants as close to the base as possible with a machete, loppers, brush cutter, or chainsaw and applying a solution of 25 percent glyphosate to the stump. This method is useful for isolated plants or remote populations where spray equipment is impractical or when it is in close proximity to sensitive species and foliar spray is not advised.

Stumps should be cut as low to the ground as practical and brushed clean of sawdust to maximize absorption of the herbicide. For best results, herbicides should be applied to the freshly cut surface as soon after cutting as possible. This method will not be used in the primary enhancement area.

#### 4.4.1.3 Girdling

Girdling involves cutting a groove or notch into the trunk of a tree to interrupt the flow of sap between the roots and crown of the tree. The groove should encircle the trunk completely and should penetrate into the wood to a depth of at least 1/2 inch on small trees, and up to 1-1/2 inches on larger trees. Girdling can be done with an ax, saw, or chain saw. If using an axe, the groove is made by hitting the trunk from above and below to take out chunks of wood such that the chunk is deep enough to reach wood. The width of the notch can vary with the tree size and can be as small as one to two inches for a small tree to six to eight inches for a large tree. The depth of the cut should be deep enough to go through the bark and expose wood. Once the cut has been made, a solution of 25 percent glyphosate should be applied to the exposed area.

If a chain saw is used, one horizontal cut should be made completely around the tree with an application of 25 percent glyphosate to the exposed area. This method applies to the secondary enhancement area and would not apply to the primary enhancement area.

#### 4.4.2 Hand-Held Manual Removal

Pulling or hand grubbing non-native plants is most effective during the seedling and sapling growth stage of shrubs and trees. A Pulaski, mattock, weed wrench, or shovel are the safer and most effective tools for removing established plants; however there is a limit to how large a plant can be before pulling or removal is infeasible. In such cases, larger shrubs may require herbicide treatments, while trees will require girdling combined with herbicide application as discussed above. To prevent resprouting, it is important to remove the entire crown and top section of the roots. If non-native species have been pulled from the ground, they must be disposed of offsite at a suitable location.

### 4.5 PLANTING PLAN AND SPECIFICATIONS

Although native recruitment is anticipated to provide substantial assistance with native plant re-establishment, native seed will also be hand spread to aid in the re-establishment of native vegetation. In some instances the installation of willow or mule fat cuttings may be appropriate where non-native species were eliminated, such as the disturbed soil from larger contiguous areas of weeds or an area where a tree is removed. Such cuttings would reduce establishment of exotic herbs and improve water quality by stabilizing the substrate. Installation of cuttings is recommended for disturbed areas that are greater than 100 square feet in area, or that are on a bank that would benefit from stabilization. No seed or cuttings will be collected from outside the coastal areas of San Diego County.

#### 4.5.1 Seeding

The following seed specifications will be followed to the extent practicable.

It is recommended that the seeds come from a supplier certified by the California Crop Improvement Association.

Seed shall be collected from the Project vicinity (within the same watershed) to the extent feasible or be from coastal areas within 25 miles of the watershed. Preferably, seed shall be legally collected from the

immediate project area. Seed must be delivered to in sealed and labeled packaging including the supplier's name, geographic location and collection date, and the tested purity and germination percentage rates. The restoration specialist will inspect the seed prior to its application onsite.

Commercial seed must be delivered to the site in sealed and labeled packaging along with a California State Agricultural Code seed certification including the supplier's name, geographic location and collection date, and the tested purity and germination percentage rates. The restoration specialist will inspect the seed prior to its application onsite and shall reject seed lacking certified tags or not conforming to specifications.

Seed will be labeled with the species, purity, germination, percent live seed, and quantity of seed in pounds.

Plant palettes and seed application rates for the secondary enhancement areas are provided in Table 9. If the delivered seed differs from specified purity and germination rates, the total pounds per acre rates shall be adjusted accordingly to achieve the specified pounds of pure live seed (PLS).

Prior to seeding, the restoration specialist will confirm that the seed bed is properly prepared. Site preparation shall include removal of weed species and weed litter/debris and trash and light raking to loosen and roughen (i.e., scarification) of the soil surface if necessary. Seed shall be applied after weeding has been completed.

All seed will be evenly hand applied or applied using a seed grinder type applicator as dry seed mixes.

To ensure the seed is placed in a favorable setting to promote germination, some hand raking will be performed to work it into the top one inch of soil.

Volunteer recruitment is expected and desired at the enhancement sites. Seed transport from the high-quality native vegetation adjacent to the proposed enhancement areas should result in the germination of volunteer plants.

**Table 9**  
**Primary Enhancement Area Native Seed Mix**

Species	Common Name	Bulk Application Rate (lbs/acre)	Purity/ Germination	Pounds of Pure Live Seed (PLS) per Acre
<i>Ambrosia psilostachya</i>	western ragweed	2.0	20/30	0.12
<i>Artemisia douglasiana</i>	Douglas' mugwort	2.0	15/50	0.15
<i>Eleocharis macrostachya</i>	common spikerush	1.0	90/70	1.29
<i>Juncus mexicanus</i>	Mexican rush	1.0	-	1.0
<i>Lupinus truncatus</i>	collar lupine	2.0	95/85	1.62
<i>Muhlenbergia rigens</i>	deergass	1.0	80/70	0.56
<i>Pluchea odorata</i>	marsh fleabane	1.0	20/50	0.40
<b>Total</b>		<b>10.0</b>		<b>5.14</b>

#### 4.5.2 Cutting Installation and Procedure

Source material will be mature shrubs and trees found adjacent to the enhancement site within the Preserve and from coastal areas of San Diego county within 25 miles of the watershed. Planting should take place at sites that have an appropriate amount of soil moisture or a water table close to the ground surface, preferably in the fall, or shortly after winter rains have moistened the soils.

Specific stem cutting procedures for small cuttings would include taking cuttings that are as straight as possible and at least 1½ feet long, and between ½ and 1-inch in diameter. However, cuttings placed in or near the groundwater table should be sufficiently long enough to reach the water table. In some cases and at the discretion of the restoration specialist and project manager, larger pole cutting could be used individually or as winnows of pole clusters placed directly into the groundwater.

A few cuttings can be taken from an individual shrub or tree; however, over-pruning should be avoided. The stems would be cut so that the bottom end is at an angle, to help identify which end to put into the ground. Small cuttings will be stripped of leaves to keep the cutting from drying out, while the tops will be cut flat to allow for gentle hammering if necessary. This would not apply to large pole cutting placed directly into the groundwater. Cuttings will be installed so that 50-60 percent of its total length is below grade. Cuttings should be installed right away to avoid desiccation.

#### 4.6 120-DAY PLANT ESTABLISHMENT PERIOD

Because container plantings are not proposed for this plan, a 120-plant establishment period is not proposed. Maintenance will begin after the initial weed removal and continue throughout the 5-year maintenance and monitoring period. If seeding and/or cuttings are used in an enhancement area, the restoration specialist will monitor the area and determine whether or not additional seeding or cuttings will be required and relay that information to the landscape contractor in a timely manner.

#### 4.7 DOCUMENTING AS-BUILT CONDITIONS

Pre-mitigation conditions have already been roughly documented through the January 2013 exotics mapping effort. The primary enhancement area was re-mapped in 2014 to document the location and extent of the garland daisy. Upon completion of the site preparation and installation of the primary enhancement area, an as-built report will be provided to the USACE, RWQCB, CDFW, CCC, and City detailing any changes to the primary enhancement area.



## SECTION 5 MAINTENANCE PROGRAM

Maintenance activities planned during the maintenance and monitoring program revolve around the establishment of the plantings to a self-sufficient state. Maintenance activities expected to be necessary during the maintenance program include weed removal and supplemental seeding/cutting installation.

### 5.1 MAINTENANCE SCHEDULE

The start of the 5-year maintenance period begins immediately after initial weed removal is completed. The restoration specialist will make regular visits to each weed removal site to determine the success of the initial removal efforts and to determine whether or not maintenance will be required. Based on the need for maintenance after each qualitative visit by the restoration specialist, maintenance visits may occur monthly the first year, every other month the second year, and quarterly thereafter (Table 7). The restoration specialist may request additional maintenance visits to attend to any pressing issues observed during monitoring visits.

### 5.2 NON-NATIVE PLANT CONTROL

Non-native plant (weed) control requires constant diligence by the landscape maintenance contractor. Weeds reported by the restoration specialist in monitoring memos will be removed within two weeks of notification. Because of the critical nature of weed control at the beginning of the project, the landscape maintenance contractor will be required to conduct extra maintenance visits if weeds are not controlled on a timely basis.

Weeds will be controlled within the Site throughout the duration of the monitoring period. Weeding will be conducted as necessary or as recommended by the restoration specialist to keep weeds at manageable levels, likely two to three times in the spring and once in the summer to adequately control weeds when they are most likely to be blooming. The actual schedule should be flexible and be responsive to recruitment timing and infestation patterns which will be determined by the restoration specialist and relayed to the landscape contractor. The goals of the weed eradication program are to (1) comply with Project and permit conditions; (2) ensure early achievement of habitat enhancement performance standards; and (3) reduce maintenance costs.

Weed control during the maintenance period will involve (1) eradication of resprouting weeds that were initially cut or treated during the mitigation installation phase, and (2) eradication of target weeds that establish during the maintenance and monitoring period. The primary weeds that occur or have the potential to occur onsite are identified along with the proposed methods of control in Table 8. Detailed weed removal methods are described in Section 4.4. The final methods chosen will be based on recommendations provided by a licensed Pest Control Advisor.

Weed species are divided between aggressive and invasive exotics, which can out-compete desirable native species if not controlled, and more benign weed species, which tend to fade away as native species become established. Invasive exotics will be eradicated wherever they occur in or adjacent to (i.e., within 10 feet) the revegetation areas. Invasive exotics include, but are not limited to, garland daisy, fennel (*Foeniculum vulgare*), tamarisk (*Tamarix* spp.), giant reed, pampas grass (*Cortaderia* ssp.), star-thistle

(*Centaurea* spp.), and wild artichoke (*Cynara cardunculus*). Other weeds such as mustard (*Brassica* spp.), clover (*Melilotus* spp.), and horseweed (*Conyza* spp.) need to be removed when they are inhibiting development of native plants. The restoration specialist will coordinate with the maintenance contractor to identify weed species that must be eradicated. A licensed Pest Control Advisor will supervise the use of herbicide (e.g., for certain invasive exotics).

### **5.3 SUPPLEMENTAL SEEDING/CUTTING INSTALLATION**

The landscape contractor will be responsible for supplemental seeding/cutting installation that may be required in areas where the initial seeding effort is failing or where additional weeding was necessary. The restoration specialist will determine the need for supplemental seeding and/or cutting installation based on conditions observed during routine visits. The restoration specialist will recommend if seeding or cuttings will be required and at what location.

## **SECTION 6 MONITORING AND PERFORMANCE STANDARDS**

### **6.1 MONITORING AND REPORTING SCHEDULE**

The monitoring year begins on January 1. Monitoring will occur monthly for the first year, every other month for the second year, and quarterly thereafter (Table 7). The restoration specialist may adjust this schedule to capture emergence and peak blooming periods of species targeted for removal. Monitoring by the restoration specialist will be reduced as the project progresses and non-native plants are eradicated from the project site. Maintenance visits will only be made if requested by the restoration specialist, but are likely to follow the same schedule as above, within two weeks of the monitoring visit as noted in the progress memos.

The monitoring term is anticipated to be five years. A reduction in the 5-year monitoring may be permitted if the 5<sup>th</sup> year success criteria are met in less than five years as confirmed by resource agency sign-off. Achieving the 5<sup>th</sup> year success criteria would indicate that the sites are self-sustaining. The site would immediately be subject to long-term management and maintenance which would continue to protect the site for the remainder of the initial 5-year period and on an ongoing basis thereafter.

### **6.2 PERFORMANCE STANDARDS**

Performance standards are provided to guide the Site towards the goal of complete removal of target non-native species within five years. Yearly performance standards are provided as milestones to determine whether the mitigation is on an adequate trajectory and whether additional weeding and/or other remedial measures are necessary to meet final performance standards. Performance standards and potential remedial measures are presented in Table 10. Based on monitoring results, the restoration specialist will determine when performance standards have been achieved during the milestone periods and recommend project completion and sign-off to the regulatory agencies.

The Project will be considered successful at the end of the 5-year monitoring period once the following criteria have been met:

- No targeted non-native species are observed in the enhancement area
- Cover by other non-native species provides less than 15% absolute cover
- Native plant species within the primary enhancement area are increasing in size and cover
- Native vegetation provides at least 25% absolute cover

If an enhancement area does not meet its yearly performance standard, remedial measures may be required to bring the site into compliance including additional weeding, additional hand seeding, and/or the installation of cuttings.

**Table 10**  
**Performance Standards and Potential Remedial Measures**

Milestone	Performance Standards <sup>1</sup>	Remedial Measures
Year 1	<ul style="list-style-type: none"> <li>• All targeted non-native species have been treated at least once.</li> <li>• Less than 25% cover by target non-native species (relevé cover class 3b or less).</li> <li>• Less than 15% cover by other non-native species (relevé cover class 3a or less).</li> <li>• Native plant species are observed in previously cleared/treated areas.</li> <li>• Minimum 5% native absolute cover (relevé cover class 3a or greater)<sup>1</sup>.</li> </ul>	<ul style="list-style-type: none"> <li>• Remove/re-treat persisting non-native species or resprouts.</li> <li>• Hand seed areas and/or install additional cuttings where no native species appear to be recolonizing cleared areas.</li> </ul>
Year 2	<ul style="list-style-type: none"> <li>• Less than 15% cover by target non-native species (relevé cover class 3a or less).</li> <li>• Less than 15% cover by other non-native species (relevé cover class 3a or less).</li> <li>• Native plant species are present in previously cleared/treated areas and appear to be increasing in size and number.</li> <li>• Minimum 15% native absolute cover (relevé cover class 3b or greater).</li> </ul>	<ul style="list-style-type: none"> <li>• Same as above, as necessary</li> </ul>
Year 3	<ul style="list-style-type: none"> <li>• Less than 5% cover by target non-native species (relevé cover class 2 or less).</li> <li>• Less than 15% cover by other non-native species (relevé cover class 3a or less).</li> <li>• Native plant species are present in previously cleared/treated areas and appear to be increasing in size and number.</li> <li>• Minimum 15% native absolute cover (relevé cover class 3b or greater).</li> </ul>	<ul style="list-style-type: none"> <li>• Same as above, as necessary</li> </ul>
Year 4	<ul style="list-style-type: none"> <li>• Less than 1% cover by target non-native species (relevé cover class 1).</li> <li>• Less than 15% cover by other non-native species (relevé cover class 3a or less).</li> <li>• Native plant species are present in previously cleared/treated areas and appear to be increasing in size and number.</li> <li>• Minimum 25% native absolute cover (relevé cover class 4 or greater).</li> </ul>	<ul style="list-style-type: none"> <li>• Same as above, as necessary</li> </ul>

**Table 10**  
**Performance Standards and Potential Remedial Measures**

Milestone	Performance Standards <sup>1</sup>	Remedial Measures
Year 5	<ul style="list-style-type: none"> <li>• No target non-native species are observed in the enhancement area (relevé cover class of 0).</li> <li>• Less than 15% cover by other non-native species (relevé cover class 3a or less)</li> <li>• Native plant species are present in previously cleared/treated areas and appear to be increasing in size and number.</li> <li>• Minimum 25% native absolute cover (relevé cover class 4 or greater).</li> </ul>	<ul style="list-style-type: none"> <li>• Same as above, as necessary</li> </ul>

<sup>1</sup> Refer to Section 6.3.2 for the explanation of relevé cover classes.

### 6.3 MONITORING METHODS

The goal of the monitoring program is to proactively assess site conditions in order to address observations before they become a problem. Because the goal of the enhancement program is to remove non-native species, the monitoring program will consist of visiting each enhancement site and evaluating it for re-emergence of non-native species. Re-emergence may consist of new plant establishment or re-sprouts from plants that were treated. Each site will also be visually assessed to determine the extent of native species colonization of these areas. The percent of treated invasive plants that are observed with re-sprouts will also be recorded. The restoration specialist will develop a horticultural monitoring checklist to be filled out during each site inspection. The restoration specialist must retain copies of all checklists and field notes in order to compile memos and annual monitoring reports.

An important function of the monitoring effort is to closely coordinate with the landscape contractor to exchange information, provide feedback, and agree on priority maintenance items and potential remedial measures during different stages of the mitigation work to ensure that the enhancement plan meets the final performance standards. Maintenance will only be done at the recommendation of the restoration specialist and only where requested. Maintenance methods will be identical to those used during initial non-native species removal (Section 4.5).

The results of each visit will be summarized in a memo along with weed maintenance needs and sent to the landscape contractor and City project manager within five working days of each site visit. Any problems identified by the restoration specialist will be immediately brought to the attention of the landscape contractor and City, with corrective measures taken within seven working days of the problem being relayed to the landscape contractor.

### 6.3.1 Photographic Documentation

Photographs will be taken to document the progress of the enhancement areas throughout the five-year monitoring period. Photographs will be taken from similar angles and locations so that comparisons can be made through time. The GPS coordinates of these locations will be collected and presented in the annual monitoring report. Formal photo-documentation of each enhancement area will occur before enhancement activities, immediately following enhancement activities, and at least annually for the remainder of the monitoring period.

### 6.3.2 Vegetation Analysis

Annual monitoring in spring of each year will be conducted to evaluate native and non-native vegetative cover within the primary enhancement area. The primary enhancement area will be quantitatively assessed by estimating native and non-native vegetation cover using the relevé method (CNPS 2007). Twenty 10m<sup>2</sup> representative sampling plots will be established within the 8.8-acre primary enhancement area to determine and assign cover classes (1: <1%, 2: 1-5%, 3a: >5-15%, 3b: >15-25%, 4: >25-50%, 5: >50-75%, 6: >75%) to native and non-native vegetation, as well as list dominant species present and note the presence/absence of invasive weed species. The locations of the sampling plots will be established throughout the 8.8-acre enhancement area during the first year of monitoring and will be documented with a GPS unit with submeter accuracy.

### 6.3.3 Functional Assessment

A functional assessment has been developed to meet requirements of the RWQCB Water Quality Certification (WQC) No. R9-2013-0116. For the portion of the enhancement that is required as compensatory mitigation under the WQC, the following methods and performance standards will be implemented prior to mitigation site implementation, annually, and immediately prior to mitigation site-off. Figure 3 illustrates a conceptual layout of functional assessment areas. The function-based goals in Table 11 apply only to the Primary Enhancement Area (Functional Assessment Area 1; Figure 3).

For evaluating the functional condition of the wetlands mitigation site, evaluation criteria will serve as indicators of functional capacity. Scores are assigned to various habitat types within the mitigation site based on the condition of the site relative to the expected condition of a functionally mature site. The categories that will be used to evaluate functional conditions of the wetlands mitigation include:

#### 1. **Habitat - Structural Diversity**

Patches of willow scrub vegetation must be structurally diverse and contain riparian trees (defined as greater than three inches diameter at breast height [DBH]), saplings (defined as less than three inches DBH), and seedlings, as well as a native shrub understory, herbaceous layer, and/or leaf litter from the riparian canopy. Structural diversity in mule fat scrub habitat shall be slightly less structurally diverse than in willow scrub, with a predominance of shrubs, and potentially, an occasional tree. Freshwater marsh and cismontane alkali marsh shall be much more limited in structural diversity, with occasional shrubs or trees potentially occurring within or adjacent to these habitat types, with the predominant structure as an herbaceous layer. The

creation and enhancement of structurally diverse habitats will provide higher value nesting and foraging habitat for wildlife.

**2. Habitat - Coverage and Spatial Diversity**

Riparian vegetation must be diverse and contain at least three different genera of riparian vegetation. Coverage must be spatially diverse, and include a mosaic of areas dominated by these different species of riparian vegetation. The creation and enhancement of spatially diverse habitat will provide higher value nesting and foraging habitat for wildlife.

**3. Percent of Exotic, Invasive Vegetation**

This criterion addresses only exotic vegetation in the tree, sapling, and shrub layers when used for riverine systems. Exotic grasses or forbs should not be counted in the calculation of percent cover of exotic vegetation. However, in this report, all vegetation, including grasses and forbs, will be evaluated to assess the percent cover of exotic, invasive vegetation in each habitat type.

**4. Hydrologic Regime of Riparian Zone**

The mitigation sites must contain some evidence of riparian processes such as overbank flow, scour, or deposition (*i.e.*, rack lines). This criterion applies to the entire drainage system, and will only be assessed in willow scrub and mule fat scrub habitats.

**5. Micro- and Macro-Topographic Complexity**

The mitigation sites must contain some evidence of micro- and macro-topographic complexity such as pits, ponds, hummocks, bars, rills, large boulders, meanders, bars, braiding, secondary channels, backwaters, and terraces. Topographic complexity will provide greater flood flow modification and flood storage functions.

**6. Biogeochemical Processes**

The mitigation sites must contain woody debris, leaf litter, or detritus. Expansion of riparian areas will increase natural water quality functions such as uptake of nutrients and toxicants and sediment trapping.

***Functional Capacity Evaluation Criteria***

The evaluation criteria with associated scores for each of the functional categories are described below.

**Habitat – Structural Diversity**

<u>Score</u>	<u>Evaluation Criteria</u>
0	Site permanently converted to land use which will not be able to support native riparian vegetation, such as housing, agricultural, or concrete channel.
0.2	No existing riparian vegetation (e.g., covered with annual grasses and scrub, bare ground). However, site has the potential for revegetation without extensive structural modification.
0.4	Vegetated areas of the site contain sparse, scattered, patchy or remnant riparian vegetation which is immature and/or lacks structural (vertical) diversity.

**Habitat – Structural Diversity**

<u>Score</u>	<u>Evaluation Criteria</u>
0.6	The patches of riparian vegetation on the site contain riparian trees and saplings (i.e., perennial dicots), but contain no or poorly developed shrub understory.
0.8	The patches of riparian vegetation on the site contain riparian trees and saplings (for willow scrub), plus a well-developed native shrub understory.
1.0	The patches on the site are structurally diverse. They contain riparian trees and saplings (for willow scrub), and native seedlings, as well as developed native shrub understory and herbaceous wetlands.

**Habitat – Coverage and Spatial Diversity**

<u>Score</u>	<u>Evaluation Criteria</u>
0	Site permanently converted to land use which will not be able to support native riparian vegetation, such as housing, agricultural, or concrete channel.
0.2	No existing riparian vegetation (e.g., covered with annual grasses and scrub, bare ground). However, site has the potential for revegetation without extensive structural modification.
0.4	Patches of monotypic riparian vegetation covering up to 50 percent of the site, interspersed among grasses or bare ground.
0.6	Patches of diverse riparian vegetation covering up to 30 percent of the site, interspersed among grasses, exotic plants, or bare ground; AND/OR greater than 50 percent of the site covered with monotypic patch(es) of riparian vegetation, interspersed among grasses or bare ground.
0.8	Diverse riparian vegetation covering between 30 percent and 70 percent of the site, e.g., strips or islands of riparian habitat interspersed in open space.
1.0	Diverse riparian vegetation (e.g., at least three different genera of riparian vegetation present) covering between 70 percent and 100 percent of the site, interspersed in open space.

**Percent Exotic, Invasive Vegetation**

<u>Score</u>	<u>Evaluation Criteria</u>
0	Site is covered with pure stands of exotic vegetation or lacks any riparian vegetation.
0.2	Site is covered by 70 to 99 percent exotic vegetation.
0.4	Site is covered by 40 to 69 percent exotic vegetation.
0.6	Site is covered by 10 to 39 percent exotic vegetation.
0.8	Site is covered by 5 to 9 percent exotic vegetation.
1.0	Site is covered by less than 5 percent exotic vegetation.



**Hydrologic Regime of Riparian Zone**

<u>Score</u>	<u>Evaluation Criteria</u>
0	No regular supply of water to the site. Site not associated with any water source, surface drainage, impoundment, or groundwater discharge.
0.2	Water supply to the site is solely from artificial irrigation (e.g., sprinklers, drip irrigation). No natural surface drainage, natural impoundment, groundwater discharge or other natural hydrologic regime.
0.5	Site is sustained by natural source of water, but is not associated with a stream, river or other concentrated flow conduit. For example, the site is sustained by groundwater, or urban runoff. There is no evidence of riparian processes, such as overbank flow or scour or deposition.
0.7	Site is within or adjacent to an impoundment on a natural water course which is subject to fluctuations in flow or hydroperiod.
1.0	Site is within or adjacent to a stream, river or other concentrated flow conduit, which provides the primary source of water to the site. This site contains some evidence of riparian processes such as an overbank flow or scour or deposition.

**Micro- and Macro-Topographic Complexity**

<u>Score</u>	<u>Evaluation Criteria</u>
0	Channel is contained in a concrete-lined channel, culvert, etc.
0.2	Flood-prone area is characterized by a homogenous, flat earthen surface with little to no micro- and macro-topographic features.
0.5	Flood-prone area contains micro- and/or macro-topographic features such as meanders, bars, braiding, secondary channels, backwaters, terraces, pits, ponds, hummocks, but is predominantly homogenous or flat surfaces.
0.8	Floodplain is not predominantly homogenous but is characterized by micro-topographic features such as pits, ponds, hummocks, bars. However, there are no macro-topographic features such as braiding, secondary channels, or backwaters.
1.0	Flood-prone area is characterized by micro- and macro-topographic complexity such as meanders, bars, braiding, secondary channels, backwaters, terraces, pits, ponds, hummocks, etc.

**Biogeochemical Processes – Vegetation Roughness and Organic Carbon**

<u>Score</u>	<u>Evaluation Criteria</u>
0	Site is contained in a concrete-line channel, culvert, etc., with little to no vegetation or detritus.
0.2	Site can support grasses, forbs, or other herbaceous vegetation and there is woody debris, leaf litter, or detritus present in the channel.

**Biogeochemical Processes – Vegetation Roughness and Organic Carbon**

<u>Score</u>	<u>Evaluation Criteria</u>
0.4	Site supports at least 25 percent relative cover of grasses, forbs, herbaceous, or riparian vegetation and there is at least 10 percent relative cover of woody debris, leaf litter, or detritus in the channel.
0.6	Site contains between 25 percent and 50 percent relative cover of any strata of riparian vegetation and between 10 percent and 40 percent relative cover with woody debris, leaf litter, or detritus.
0.8	Site contains between 50 percent and 75 percent relative cover of any strata of riparian vegetation and between 40 percent and 60 percent relative cover with woody debris, leaf litter, or detritus.
1.0	Site contains greater than 75 percent relative cover of any strata of riparian vegetation and greater than 60 percent relative cover with woody debris, leaf litter, or detritus.

**Table 11**  
**Function-Based Goals for Success of the Primary Enhancement Area**

Evaluation Criteria	Pre-Project Conditions <sup>1</sup>	Interim Target Score (Year 3)	Ultimate Target Score (Years 4 & 5)	Pre-Post Functional Lift
Structural Diversity	0.4	0.4	0.4	+0.0
Spatial Diversity	0.4	0.4	0.4	+0.0
Exotic Vegetation	0.65	0.8	1.0	+0.35
Hydrologic Regime	1.0	1.0	1.0	+0.0
Topographic Complexity	1.0	1.0	1.0	+0.0
Biogeochemistry	0.4	0.4	0.4	+0.0

<sup>1</sup>Pre-Projection Conditions are taken from the scores provided in the Final Baseline Functional Assessment (AMEC 2014).

**6.4 REPORTING PROGRAM****6.4.1 Progress Reports**

Progress reports in memo format with attached photo-documentation will be completed after each qualitative monitoring visit. The purpose of this memo is to note the results of horticultural monitoring results such as the identification of weed maintenance needs, as well as other potential problems (soil erosion, flood damage, vandalism, and pest problems). This memo will be completed within five working days of each visit and sent to the landscape contractor and City project manager.

#### 6.4.2 Annual Reports

Annual monitoring reports will summarize the findings of the progress memos and contain an assessment of the progress of the enhancement plan relative to performance standards, and a review of maintenance activities and any remedial measures (e.g., supplemental planting) undertaken during the year. Monitoring and maintenance field data shall be included as an addendum to each report. Progress and annual technical reports shall be submitted to the USACE, CDWF, RWQCB, CCC, and City.

## **SECTION 7 COMPLETION OF MITIGATION**

### **7.1 NOTIFICATION OF COMPLETION**

The City will notify/coordinate with the appropriate resource agencies to seek concurrence that the final performance standards have been met through the submittal of the final monitoring report and a letter requesting a Notification of Completion. The final report will include an analysis of the non-native species removal program and will clearly illustrate that the final performance standards have been met. The site may qualify for early approval if final performance standards have been met prior to year five and the mitigation site is accepted as complete by USACE, CDFW, RWQCB, CCC, and City.

### **7.2 AGENCY CONFIRMATION**

Following the submission of the final annual report and receipt of the Notification of Completion, the resource agencies may visit the Site for confirmation. Once the agencies confirm the completion of the mitigation program in writing, maintenance and monitoring of the Site will cease.

### **7.3 LONG-TERM MANAGEMENT**

The City of San Diego is the owner of the property used as mitigation within the Los Peñasquitos Canyon Preserve, which has an approved Natural Resources Management Plan (NRMP). Additionally the area is part of the MSCP which has development restrictions. In addition the primary enhancement site is within the MHPA, the City's preserved lands. Once the Site has met the five-year success criteria and has been signed off by the regulatory agencies, City of San Diego Park and Recreation Staff will review the final annual report and may visit the Site prior to accepting long-term management responsibility.

The City Park and Recreation Department will manage the primary enhancement area once it is accepted by the permitting agencies. The Park and Recreation Department is managing the Los Peñasquitos Canyon Preserve, in accordance with the NRMP, utilizing the funds specified in the City's annual budget. The City Park and Recreation Department would incorporate the primary enhancement area into its overall management of the Los Peñasquitos Canyon Preserve. The specific management activities for the primary enhancement area include providing long-term maintenance and monitoring, trash removal, non-native vegetation control, and wildlife habitat monitoring, as described below.

The City will provide long-term protection of the mitigation site through a real estate instrument or other long-term protection mechanism, as approved by USACE. The City of San Diego is obligated to protect and manage the Los Peñasquitos Canyon Preserve enhancement site for purposes of native habitat and species conservation in accordance with the MSCP Implementing Agreement (City of San Diego et al. 1997) and the NRMP. Section 10.2 of the Implementing Agreement requires the City to preserve lands within the MHPA. Sections 10.3, 10.4, and 10.5 require the implementation of preserve guidelines, land use adjacency guidelines, and planning policies and design guidelines. These policies have been incorporated into the City's Land Development Code and serve to protect lands within the MHPA from direct and indirect habitat degradation. Section 10.6 of the Implementing Agreement defines the City's responsibilities for Preserve Management and refers to the MSCP Framework Management Plan which is Section 1.5 of the City's Subarea Plan (City of San Diego 1997).

Section 21.3 of the Implementing Agreement states that “notwithstanding the stated term as herein set forth, the Parties agree and recognize that once Take of a Covered Species has occurred and/or their habitat modified within the Subarea, such Take and habitat modification will be permanent. The Parties, therefore, agree that the preservation and maintenance of the habitat provided for under this Agreement shall likewise be permanent and extend beyond the term of this Agreement.” Therefore, although the Term of the MSCP is 50 years (1997 – 2047), the preservation of lands within the MHPA, especially in areas where preserved lands are specifically required due to a permanent impact/take, is explicitly permanent.

Additionally, three City Council Resolutions were approved in 1991 and 2007 to provide guidance for the management, protection and preservation of natural resources in the Los Peñasquitos Canyon Preserve.

City Council Resolutions R-O-17698 and R-278894 were approved on October 7 and 22, 1991, acquiring the Los Peñasquitos Canyon Preserve, including portions of Lopez Canyon, for open space purposes. City Council Resolution R-290948 was approved on November 10, 1998 and adopted the Los Peñasquitos Canyon Preserve Master Plan and the Los Peñasquitos Natural Resource Management Plan. These documents provide guidance for the management of the area for the protection and preservation of natural resources.

City Council Resolution R-303253 was approved on December 18, 2007 and formally dedicated 6,600 acres of City-owned land as “dedicated open space.” According to the resolution, these lands are “dedicated in perpetuity for park and recreational purposes and [the resolution] restricts “public service easements through the dedicated property” to those which “do not significantly interfere with the park and recreational use of the property.” Amongst other provisions, this formal dedication commits that the lands “shall not be used for any but park and recreation purposes without a changed use or purposes being authorized by a two-thirds vote of the people.”

Once the Site has met the five-year success criteria and has been signed off by the regulatory agencies, City biologists and/or designated staff will review the final annual report and may visit the Site prior to accepting long-term management responsibility. Long-term management of the Site will be consistent with MSCP objectives and the Los Peñasquitos Canyon Preserve. Long-term management actions are expected to include removal of transient camps, trash and debris, invasive species, and fencing or signage if applicable as outlined in the MSCP Subarea Plan (City 1997) and the Los Peñasquitos Canyon Preserve Natural Resource Management Plan (City 1998). In addition, the City conducts biological monitoring in coordination with the resource agencies on a regional basis to assess the status of MSCP covered species, including species such as least Bell’s vireo that are expected to utilize habitat development by this mitigation project. Regional monitoring may or may not include specific species monitoring on this site, but would include monitoring of species within the Los Peñasquitos Preserve.

The City has established protections for lands within the MHPA, in conformance with the Implementing Agreement, through Section 143.0101 of the City’s Land Development Code (Environmentally Sensitive Lands Regulations). This section of the Land Development Code incorporates Sections 1.4.1 and 1.4.2 of the MSCP Subarea Plan that restricts uses within the MHPA in a similar fashion as a conservation easement or deed restriction. The Land Development Code also incorporates Section 1.4.3 of the MSCP Subarea Plan that restricts land uses adjacent to the MHPA, include establishment of potential adverse drainage conditions, toxic chemical uses, lighting, noise, and invasive species. These restrictions in

particular, provide greater site protection and ensure a higher degree of long-term sustainability than typical conservation easements and/or deed restrictions.

#### *Site Access*

City biologists, park rangers, and designated maintenance staff shall have access to the site for maintenance and monitoring related activities.

#### *Maintenance and Monitoring Parameters*

City biologists will be responsible for directing and/or conducting all long-term monitoring efforts and remedial measures. City biologists and designated maintenance staff will ensure any remedial and management actions are consistent with MSCP and MHPA guidelines and regulations.

#### *Trash*

Anthropogenic trash, as well as non-native plant species biomass shall be removed from the site, and disposed of in a legal and appropriate manner. Biomass originating from native plant species shall remain on site for carbon cycling, and is not considered “trash”.

#### *Non-Native Vegetation Control*

Non-native plant species, particularly perennial species which have historically shown to be highly invasive, shall be controlled. Control may involve hand pulling prior to seed-set (for species where the entire root mass may be removed), herbicide application, cutting, mechanical removal, or a combination thereof. Any herbicide use shall be conducted following the manufacturer's recommendations, and applied in a manner compatible with applicable federal, state, and local regulations, consistent with MSCP management guidelines. Biomass from non-native vegetation shall be removed from the site, and disposed of in a legal and appropriate manner. Care should be taken to avoid spreading root, shoot or seed material around the site or in the stream which may provide opportunity for dissemination or additional colonization. No slash shall be stored onsite, or within the floodplain where it is in danger of being washed downstream.

Treatment and/or removal of non-native vegetation with significant structure to provide habitat for special status wildlife should be evaluated for absence/presence prior to engaging the control methods, particularly during the nesting/breeding season (generally March 15 through September 15). All federal, state and local work restrictions for native wildlife habitat shall be followed.

#### *Other Potential Environmental Stressors*

Other stressors which have the potential to negatively affect the habitat quality of the site include, but are not limited to: fire, flood, excessive erosion or aggradation, significant streambed migration, or effects from adjacent or upstream land uses.

Should effects from environmental stressors or events be observed, City biologists shall perform an analysis to identify the effects of the stressor(s), and formulate remedial action(s) intended to support dynamic habitat equilibrium and wildlife use of the site. Depending on the nature of the stressor,

consultation with additional regulatory agencies and/or specialists may be warranted. Any adaptive management, remedial action or regular management activity performed shall be implemented in accordance with applicable regulatory guidelines.

### *Wildlife Habitat Monitoring*

Ongoing and collaborative biological monitoring between City staff and California Department of Fish and Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS) may or may not include specific species monitoring on this site, but may include monitoring of species within the general segment of Los Peñasquitos Creek, as part of the MSCP and MHPA.

### *Funding*

The City's General Fund, Environmental Growth Fund, and Special Funds in the Park and Recreation Department (P&R) long-term accounts provide for maintenance and management of City owned lands in the Los Peñasquitos Canyon Preserve through the budget process with approval from the City Council. Following acceptance of the mitigation site following completion of the five-year maintenance and monitoring program, ongoing management will be provided by the Open Space Division of the P&R. P&R's annual budget for open space in FY 2015 includes approximately \$11.2 million for management of approximately 26,000 acres of open space and preserve lands, averaging \$430 per acre per year. For further granularity, P&R expenditures in City-owned and managed lands in Los Peñasquitos Canyon, Del Mar Mesa, and Carmel Mountain Preserves totaled \$474,741 for FY 15. The approximately 4,500 acres in these three preserves are managed by the same staff and total \$106 per acre. This calculation may not include some City-wide MSCP efforts, such as species-specific rare plant monitoring. Using the greater of the two per-acre cost estimates equates to roughly \$2,855.20 for the approximately 6.64-acre Enhancement Site. Estimated long term maintenance costs represent approximately 0.03% of the annual P&R budget for City-wide open space and approximately 0.6% of the FY 15 budget for City-owned and managed lands in Los Peñasquitos Canyon, Del Mar Mesa, and Carmel Mountain Preserves.

Long term management of the site will be conducted in accordance with the Los Peñasquitos Canyon Preserve Natural Resource Management Plan (City 1998), which describes the requirements for preserve maintenance, including maintenance of weeds, closure of trails, and control of public access. Maintenance of the mitigation site will include the existing management functions being conducted by P&R within the Los Peñasquitos Canyon Preserve. The City summarizes the management actions completed each year within their open space areas as part of MSCP Management Actions Reports. In the latest published annual report (City 2013), P&R completed the following Stewardship Management Actions in the Los Peñasquitos Canyon Preserve: park-wide trail monitoring and maintenance (monthly); removal of illegal encampments; invasive species removal; repair of trail damage; installation of signage; and general weed removal. Long-term management of the mitigation site will include weed maintenance, trash removal, and access control.

Because the mitigation site would be added to the overall management of the open space preserve in Los Peñasquitos Canyon Preserve, and due to the small share of P&R's annual budget that would be allocated to long-term management for this mitigation site, the existing budget and policy framework for Los Peñasquitos Canyon Preserve will adequately cover long-term management requirements of the mitigation site following agency acceptance.

**SECTION 8 CONTINGENCY MEASURES**

This section describes contingency measures that might be invoked in the event that all, or a portion of the Project, does not meet performance standards in any given year of the 5-year maintenance and monitoring program. If performance standards are not met, maintenance and monitoring obligations will continue until the criteria are met and the resource agencies issue a confirmation of final Project approval.

**8.1 INITIATING PROCEDURES**

If the yearly performance standards are not met, the City will work with the restoration specialist and the contractor to implement additional measures to help ensure success of the mitigation effort. If final performance standards are not met and the agencies do not accept the restoration as being complete, the restoration specialist, in consultation with the agencies, shall prepare an analysis of the cause(s) of failure and a supplemental mitigation plan will be created for approval. In the event that wildfire, flood, or other force results in major damage to the Site before documentation that the required 5 year monitoring period and fifth year performance standards are met, and the Site could not meet performance standards in the post-event condition, then the City would be required to take the necessary contingency measures to fulfill their mitigation obligations unless the regulatory agencies at their discretion agree to sign-off without those remedial measures being taken.

**8.1.1 Funding Mechanism**

The City is responsible for covering all costs associated with planning, implementation, and monitoring of contingency measures needed if the Site fails to meet its stated performance criteria.



**SECTION 9 REFERENCES**

- AMEC Environment & Infrastructure, Inc. (AMEC). 2014. Final Baseline Functional Assessment, Los Peñasquitos Canyon Preserve Wetland Enhancement Plan, Master Storm Water System Maintenance Program, Sorrento Valley, California. June.
- Bossard et al. 2000. Invasive Plants of California's Wildlands. University of California Press. Berkeley, CA. 360 pp.
- California Coastal Commission (CCC). 2012. Coastal Development Permit, Application No. A-6-NOC-11-086. November 29.
- California Native Plant Society (CNPS) Vegetative Committee. 2000. CNPS Relevé Protocol. October 20 (Revised August 23, 2007).  
URL: [https://www.cnps.org/cnps/vegetation/pdf/cnps\\_releve\\_protocol\\_20070823.pdf](https://www.cnps.org/cnps/vegetation/pdf/cnps_releve_protocol_20070823.pdf)
- City of San Diego. 2011. Master Storm Water System Maintenance Program, Final Program Environmental Impact Report. SCH. NO. 2004101032, Project No. 42891. October 24.
- City of San Diego. 2010a. Industrial Court Channel Maintenance Activity Report. November.
- City of San Diego. 2010b. Tripp Court Channel Maintenance Activity Report. November.
- City of San Diego. 1998. Los Peñasquitos Canyon Preserve Master Plan. Resolution No. R-290948. Adopted by City Council on November 10, 1998.
- City of San Diego. 1997. Multiple Species Conservation Program – City of San Diego MSCP Subarea Plan. March 1997. Accessed at:  
<http://www.sandiego.gov/planning/programs/mscp/pdf/subareafullversion.pdf>
- DUDEK, Inc. 2013. *Freshwater Marsh Mitigation Assessment – Sorrento Valley Channel Facilities Reaches 3 and 7*. Memo from Vipul Joshi (Dudek) to Anne Jarque and Stephanie Bracci (City of San Diego, Transportation & Storm Water Department) dated October 17.
- DUDEK, Inc. 2012. *Summary Regulatory Evaluation for Three Priority Coastal Zone Channel Maintenance Areas – Sorrento Valley, Tijuana River Valley, and Mission Bay High School*. Memo from Vipul Joshi (Dudek) to Stephanie Bracci (City of San Diego, Transportation & Storm Water Department) dated July 26.
- HELIX Environmental Planning, Inc. (HELIX). 2012. Master Storm Water System Maintenance Program, Priority Facility Mitigation Within The Coastal Zone. May 9.
- HELIX. 2010. Biological Technical Report for the City's Master Storm Water System Maintenance Program. Appendix B.1 to the Final Program EIR. Prepared for the City of San Diego Storm Water Department. March.

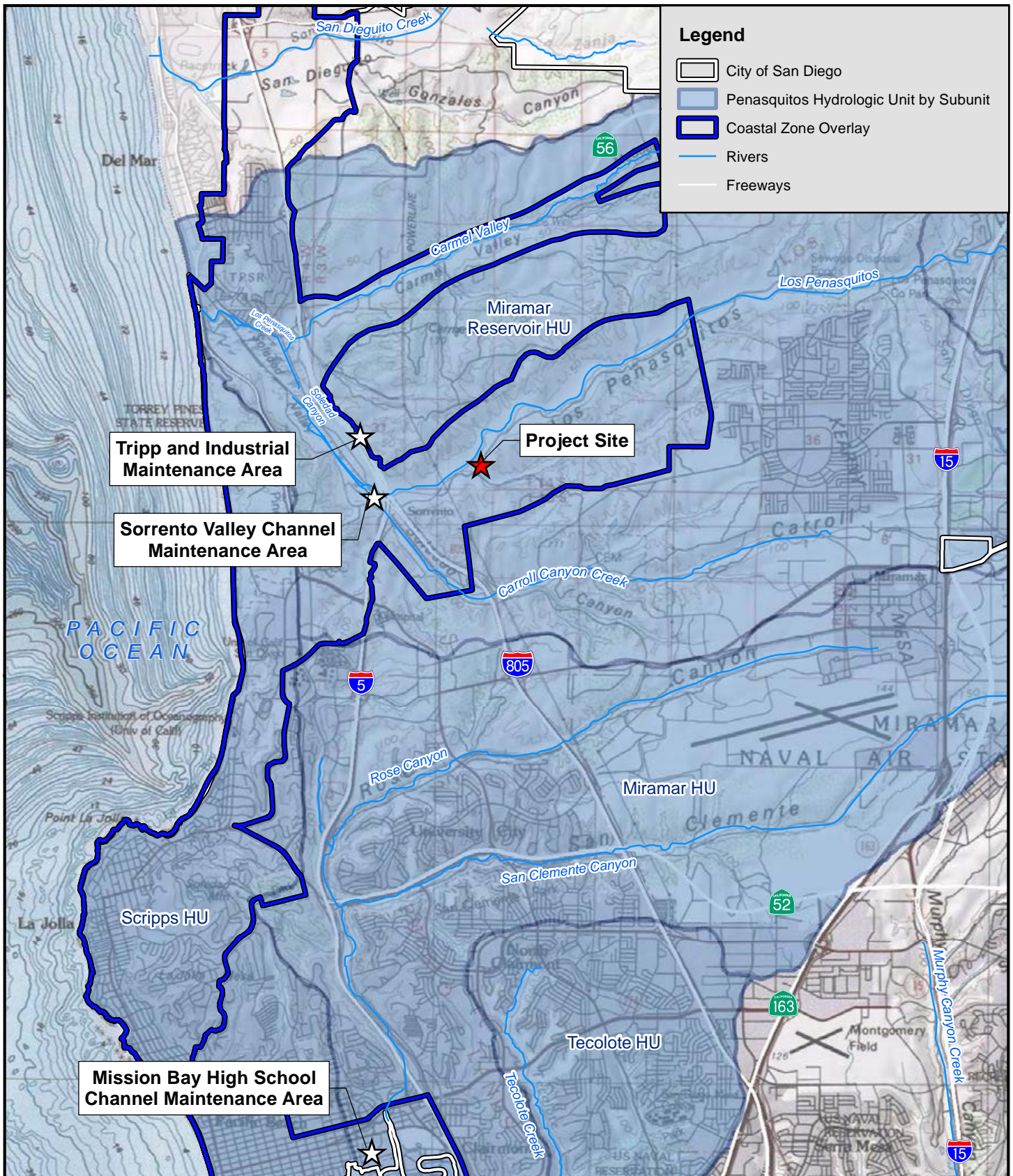
Holland, R.F, 1986, Preliminary Descriptions of the Terrestrial Natural Communities of California, State of California, The Resources Agency.

URS, Inc. (URS). 2015. El Cuervo del Sur Conceptual Wetland Habitat Mitigation and Monitoring Plan. February 28, 2014, updated February 25, 2015.

U.S. Army Corps of Engineers (USACE). 2008. Compensatory Mitigation Rule webpage. Retrieved from [http://water.epa.gov/lawsregs/guidance/wetlands/wetlandsmitigation\\_index.cfm](http://water.epa.gov/lawsregs/guidance/wetlands/wetlandsmitigation_index.cfm). Accessed June 2013.



Path: G:\gis\projects\1577\2767905\map\_docs\mxd\PO\_Canyon\_Mitigation\Wetland\_Enhancement\_Plan\Regional\_Map.mxd, colin\_mattison, 6/13/2013, 3:07:09 PM



**Legend**

- City of San Diego
- Penasquitos Hydrologic Unit by Subunit
- Coastal Zone Overlay
- Rivers
- Freeways

**Tripp and Industrial Maintenance Area**

**Sorrento Valley Channel Maintenance Area**

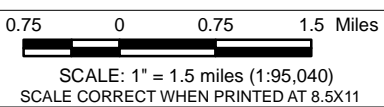
**Project Site**

**Mission Bay High School Channel Maintenance Area**



SOURCES: Roads, Rivers, Coastal Zone (SanGIS, 2011). USGS Topo (NGS, 2011).

**REGIONAL MAP  
LOS PEÑASQUITOS CANYON PRESERVE  
CONCEPTUAL WETLAND ENHANCEMENT PLAN**



CREATED BY: DA

DATE: 6/13/2013

FIG. NO:

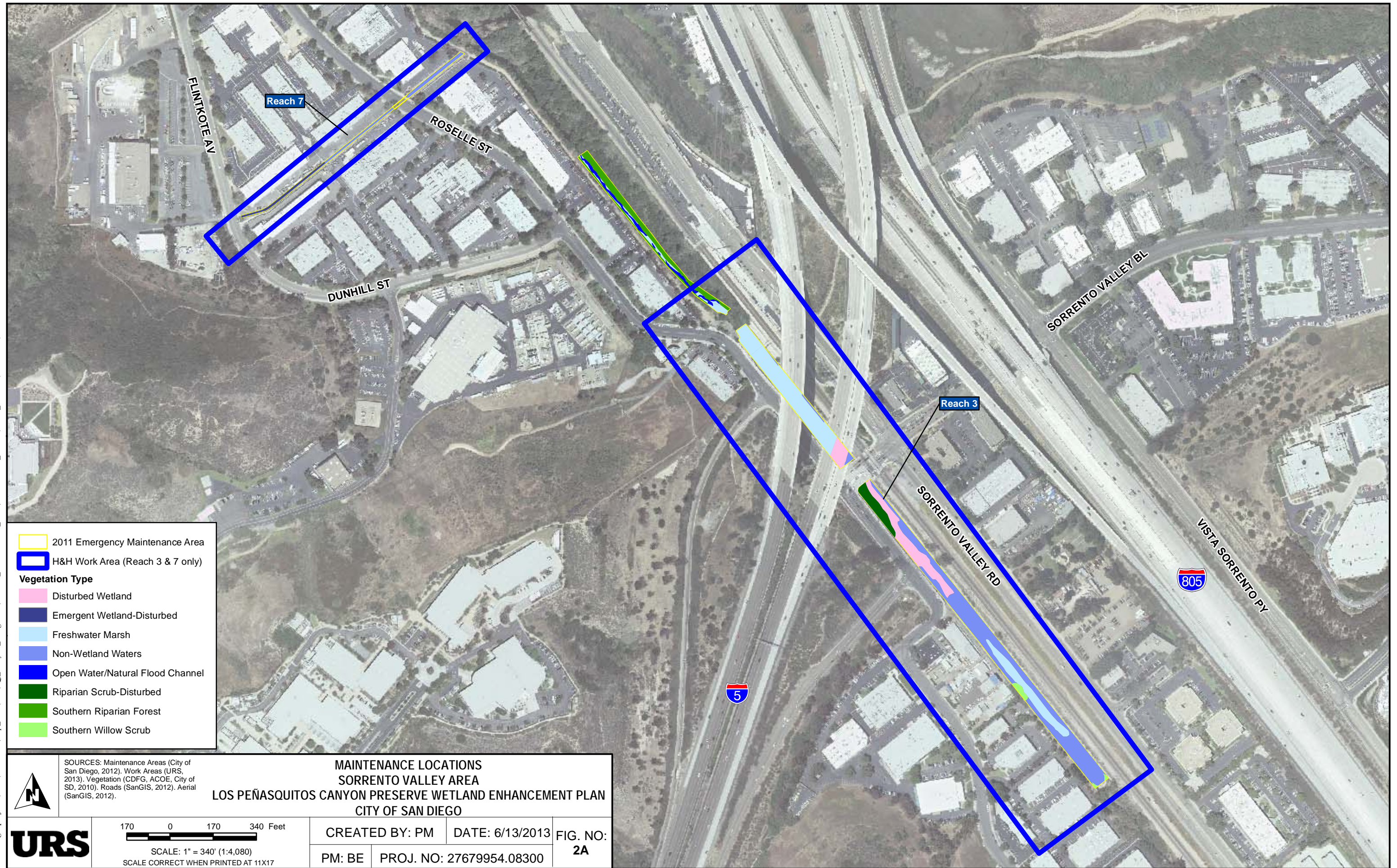
PM: MT

PROJ. NO: 27679954.08100

**1**



Path: G:\gis\projects\15772767905\map\_docs\map\FQ\_Canyon\_Mitigation\Wetland\_Enhancement\_Plan\Maintenance\_2a.mxd, 6/13/2013, 3:27:12 PM



- 2011 Emergency Maintenance Area
- H&H Work Area (Reach 3 & 7 only)
- Vegetation Type**
- Disturbed Wetland
- Emergent Wetland-Disturbed
- Freshwater Marsh
- Non-Wetland Waters
- Open Water/Natural Flood Channel
- Riparian Scrub-Disturbed
- Southern Riparian Forest
- Southern Willow Scrub

SOURCES: Maintenance Areas (City of San Diego, 2012). Work Areas (URS, 2013). Vegetation (CDFG, ACOE, City of SD, 2010). Roads (SanGIS, 2012). Aerial (SanGIS, 2012).

**MAINTENANCE LOCATIONS  
SORRENTO VALLEY AREA  
LOS PEÑASQUITOS CANYON PRESERVE WETLAND ENHANCEMENT PLAN  
CITY OF SAN DIEGO**

**URS**

170 0 170 340 Feet

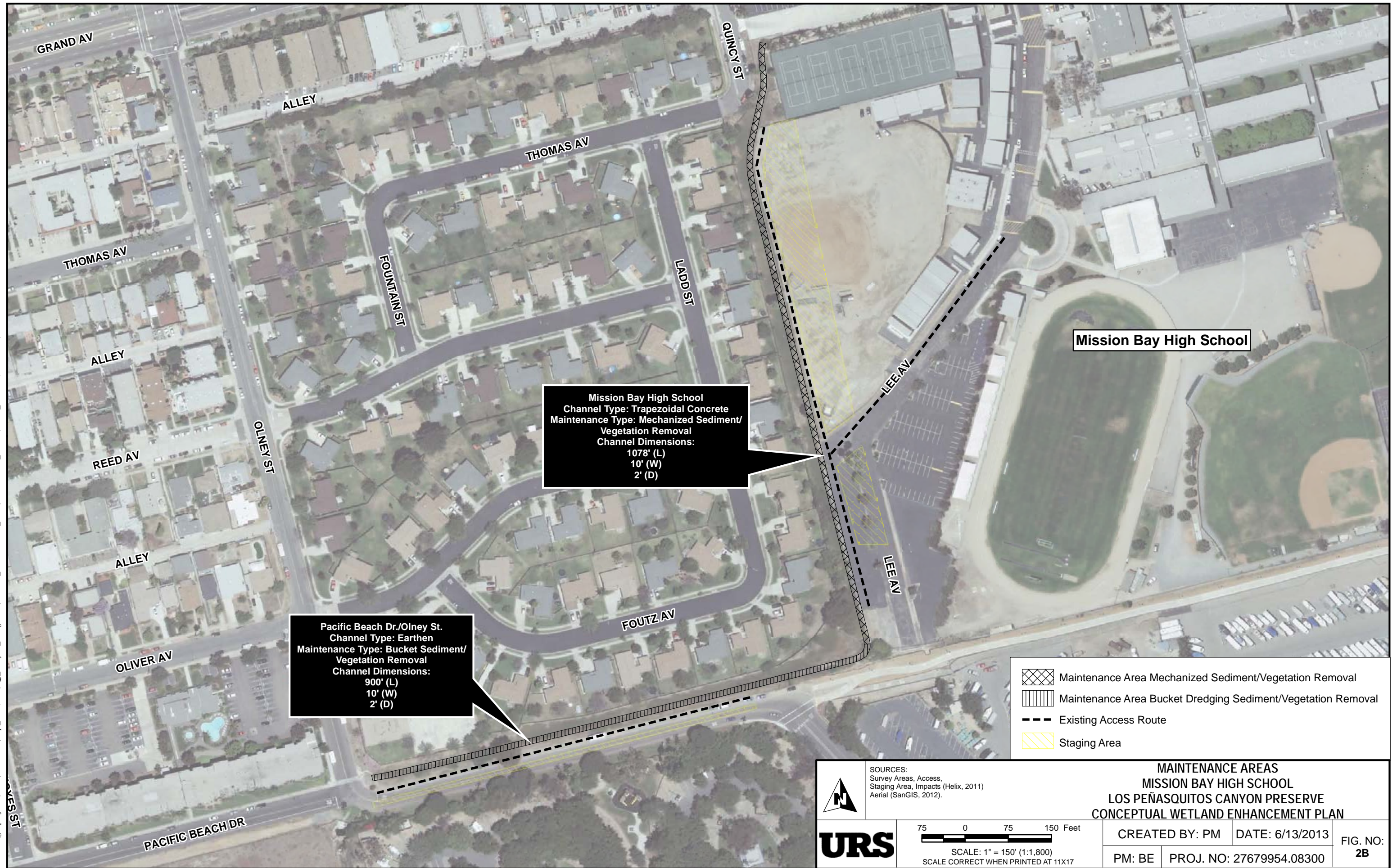
SCALE: 1" = 340' (1:4,080)

SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: 6/13/2013	FIG. NO: 2A
PM: BE	PROJ. NO: 27679954.08300	



Path: G:\gis\projects\15772767905\map\_docs\map\PO\_Canyon\_Mitigation\Wetland\_Enhancement\_Plan\Maintenance\_2b.mxd, colin\_mattison, 6/13/2013, 3:50:33 PM



**Mission Bay High School**  
 Channel Type: Trapezoidal Concrete  
 Maintenance Type: Mechanized Sediment/  
 Vegetation Removal  
 Channel Dimensions:  
 1078' (L)  
 10' (W)  
 2' (D)

**Pacific Beach Dr./Olney St.**  
 Channel Type: Earthen  
 Maintenance Type: Bucket Sediment/  
 Vegetation Removal  
 Channel Dimensions:  
 900' (L)  
 10' (W)  
 2' (D)

- Maintenance Area Mechanized Sediment/Vegetation Removal
- Maintenance Area Bucket Dredging Sediment/Vegetation Removal
- Existing Access Route
- Staging Area

 <b>URS</b>	SOURCES: Survey Areas, Access, Staging Area, Impacts (Helix, 2011) Aerial (SanGIS, 2012).	<b>MAINTENANCE AREAS</b> <b>MISSION BAY HIGH SCHOOL</b> <b>LOS PEÑASQUITOS CANYON PRESERVE</b> <b>CONCEPTUAL WETLAND ENHANCEMENT PLAN</b>		
	 SCALE: 1" = 150' (1:1,800) SCALE CORRECT WHEN PRINTED AT 11X17	CREATED BY: PM    DATE: 6/13/2013	FIG. NO: <b>2B</b>	
		PM: BE    PROJ. NO: 27679954.08300		



**Channel Maintenance Area**

Channel Maintenance Area

Concrete

Earthen

**Habitat**

Developed

Freshwater Marsh

**SOURCES:**  
 Survey Areas, Access,  
 Staging Area, Impacts (Helix, 2011)  
 Aerial (SanGIS, 2012).

**URS**

100 0 100 200 Feet

SCALE: 1" = 200' (1:2,400)  
 SCALE CORRECT WHEN PRINTED AT 11X17

**MAINTENANCE AREAS  
 TRIPP AND INDUSTRIAL  
 LOS PEÑASQUITOS CANYON PRESERVE  
 CONCEPTUAL WETLAND ENHANCEMENT PLAN**

CREATED BY: PM    DATE: 6/13/2013    FIG. NO: 2C

PM: BE    PROJ. NO: 27679954.08300

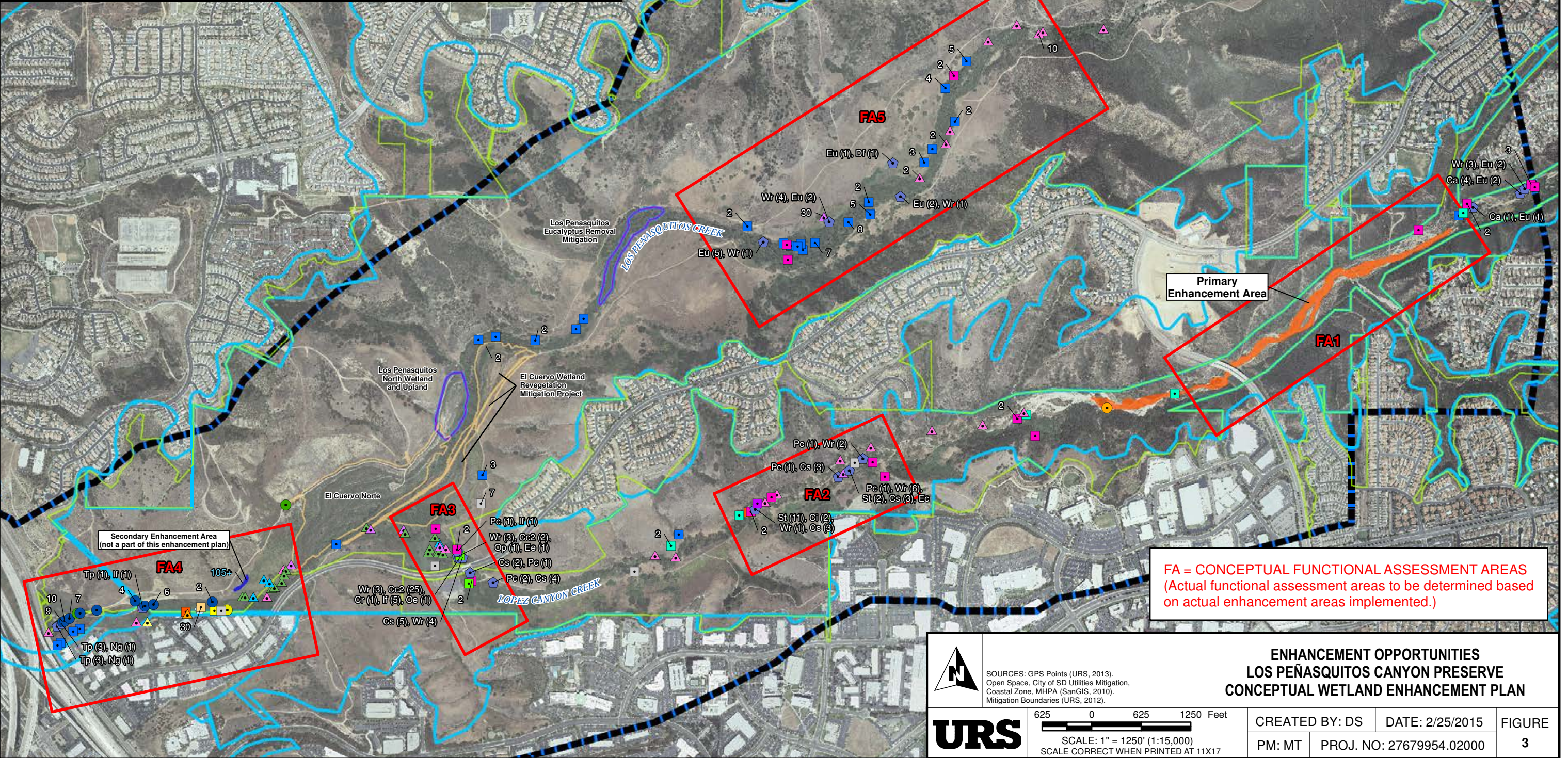


Path: G:\gis\projects\15772767905\map\_docs\mx\A\PO\_Canyon\_Mitigation\Wetland\_Enhancement\_Plan\Maintenance\_2.c.mxd, colin\_mattison, 6/13/2013, 3:48:51 PM



Path: G:\gis\projects\157267905\map\_docs\map\PO\_Canyon\_Mitigation\Wetland\_Enhancement\_Plan\Penasquitos\_Canyon\_Enhancement\_Opportunities.mxd, daniel\_arsillano, 2/25/2015, 6:00:10 PM

Enhancement Areas		Trees*		Shrubs*		Vine*		Other	
<b>Primary Enhancement Area</b>		<i>Eucalyptus sp.</i> (Eu)	<i>Schinus terebinthifolius</i> (St)	<i>Acacia sp.</i> (Ac)	<i>Cortaderia selloana</i> (Cs)	<i>Hedera helix</i> (Hh)	*Count indicated when greater than 1.		
<i>Glebionis coronaria</i> (Gc)	<i>Callistemon sp.</i> (Ca)	<i>Cinnamomum camphora</i> (Cc2)	<i>Cynara cardunculus</i> (Cc)	<i>Echium sp.</i> (Ec)	<i>Cynara cardunculus</i> (Cc)	<i>Hedera helix</i> (Hh)			
<b>Secondary Enhancement Area</b>		<i>Cinnamomum camphora</i> (Cc2)	<i>Cyperus involucreatus</i> (Ci)	<i>Nicotiana glauca</i> (Ng)	<i>Asphodelus fistulosus</i> (Af)	<i>Tamarix parviflora</i> (Tp)	Multiple species (see abbreviation and count)		
<i>Cynara cardunculus</i> (Cc)	<i>Cinnamomum camphora</i> (Cc2)	<i>Rhus lancea</i> (Rl)	<i>Paspalum dilatatum</i> (Pd)	<i>Nicotiana glauca</i> (Ng)	<i>Asphodelus fistulosus</i> (Af)	<i>Tamarix parviflora</i> (Tp)			
<b>Other</b>		<i>Cinnamomum camphora</i> (Cc2)	<i>Paspalum dilatatum</i> (Pd)	<i>Nicotiana glauca</i> (Ng)	<i>Asphodelus fistulosus</i> (Af)	<i>Tamarix parviflora</i> (Tp)	Multiple species (see abbreviation and count)		
Open Space Los Peñasquitos/Lopez Canyon	El Cuervo Mitigation Site	<i>Cinnamomum camphora</i> (Cc2)	<i>Paspalum dilatatum</i> (Pd)	<i>Nicotiana glauca</i> (Ng)	<i>Asphodelus fistulosus</i> (Af)	<i>Tamarix parviflora</i> (Tp)			
El Cuervo Mitigation Site	City of San Diego Public Utilities Mitigation Site	<i>Cinnamomum camphora</i> (Cc2)	<i>Paspalum dilatatum</i> (Pd)	<i>Nicotiana glauca</i> (Ng)	<i>Asphodelus fistulosus</i> (Af)	<i>Tamarix parviflora</i> (Tp)	Multiple species (see abbreviation and count)		
City of San Diego Public Utilities Mitigation Site	Coastal Zone Overlay	<i>Cinnamomum camphora</i> (Cc2)	<i>Paspalum dilatatum</i> (Pd)	<i>Nicotiana glauca</i> (Ng)	<i>Asphodelus fistulosus</i> (Af)	<i>Tamarix parviflora</i> (Tp)			
Coastal Zone Overlay	Multi-Habitat Planning Area	<i>Cinnamomum camphora</i> (Cc2)	<i>Paspalum dilatatum</i> (Pd)	<i>Nicotiana glauca</i> (Ng)	<i>Asphodelus fistulosus</i> (Af)	<i>Tamarix parviflora</i> (Tp)	Multiple species (see abbreviation and count)		
Multi-Habitat Planning Area	Water Main	<i>Cinnamomum camphora</i> (Cc2)	<i>Paspalum dilatatum</i> (Pd)	<i>Nicotiana glauca</i> (Ng)	<i>Asphodelus fistulosus</i> (Af)	<i>Tamarix parviflora</i> (Tp)			
Water Main	Sewer Main	<i>Cinnamomum camphora</i> (Cc2)	<i>Paspalum dilatatum</i> (Pd)	<i>Nicotiana glauca</i> (Ng)	<i>Asphodelus fistulosus</i> (Af)	<i>Tamarix parviflora</i> (Tp)	Multiple species (see abbreviation and count)		
Sewer Main		<i>Cinnamomum camphora</i> (Cc2)	<i>Paspalum dilatatum</i> (Pd)	<i>Nicotiana glauca</i> (Ng)	<i>Asphodelus fistulosus</i> (Af)	<i>Tamarix parviflora</i> (Tp)			

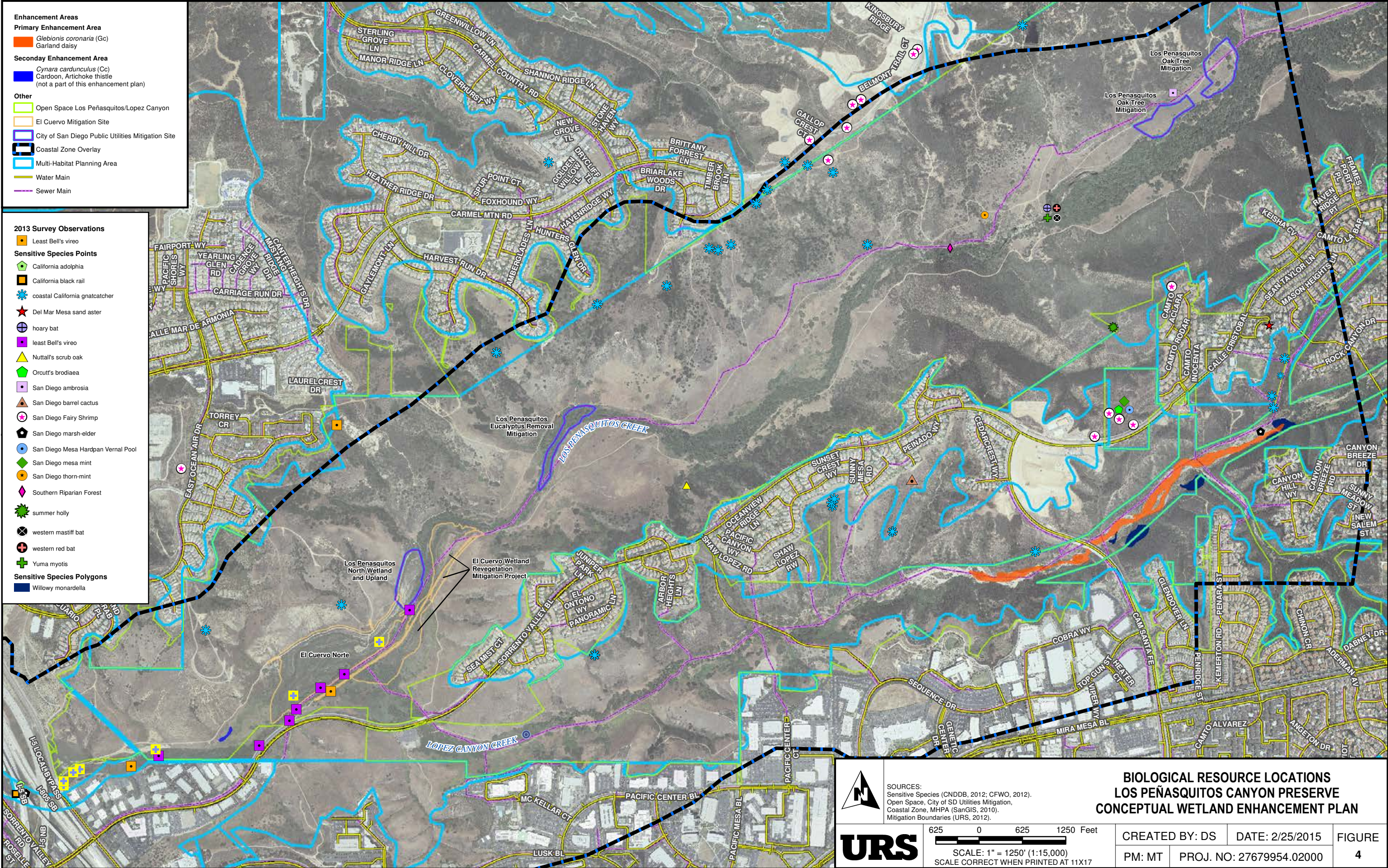


**FA = CONCEPTUAL FUNCTIONAL ASSESSMENT AREAS**  
 (Actual functional assessment areas to be determined based on actual enhancement areas implemented.)

	SOURCES: GPS Points (URS, 2013). Open Space, City of SD Utilities Mitigation, Coastal Zone, MHPA (SanGIS, 2010). Mitigation Boundaries (URS, 2012).		<b>ENHANCEMENT OPPORTUNITIES</b> <b>LOS PEÑASQUITOS CANYON PRESERVE</b> <b>CONCEPTUAL WETLAND ENHANCEMENT PLAN</b>	
	625 0 625 1250 Feet 	CREATED BY: DS	DATE: 2/25/2015	FIGURE <b>3</b>
SCALE: 1" = 1250' (1:15,000) SCALE CORRECT WHEN PRINTED AT 11X17		PM: MT	PROJ. NO: 27679954.02000	



Path: G:\projects\15772767905\map\_docs\mxd\PO\_Canyon\_Mitigation\Wetland\_Enhancement\_Plan\Penasquitos\_Biological\_Resource\_Locations.mxd, 2/25/2015, 6:19:36 PM



- Enhancement Areas**
- Primary Enhancement Area**
- Glebionis coronaria (Gc)
  - Garland daisy
- Secondary Enhancement Area**
- Cynara cardunculus (Cc)
  - Cardoon, Artichoke thistle (not a part of this enhancement plan)
- Other**
- Open Space Los Peñasquitos/Lopez Canyon
  - El Cuervo Mitigation Site
  - City of San Diego Public Utilities Mitigation Site
  - Coastal Zone Overlay
  - Multi-Habitat Planning Area
  - Water Main
  - Sewer Main

- 2013 Survey Observations**
- Least Bell's vireo
- Sensitive Species Points**
- California adolphia
  - California black rail
  - coastal California gnatcatcher
  - Del Mar Mesa sand aster
  - hoary bat
  - least Bell's vireo
  - Nuttall's scrub oak
  - Orcutt's brodiaea
  - San Diego ambrosia
  - San Diego barrel cactus
  - San Diego Fairy Shrimp
  - San Diego marsh-elder
  - San Diego Mesa Hardpan Vernal Pool
  - San Diego mesa mint
  - San Diego thorn-mint
  - Southern Riparian Forest
  - summer holly
  - western mastiff bat
  - western red bat
  - Yuma myotis
- Sensitive Species Polygons**
- Willow monardella



SOURCES:  
 Sensitive Species (CNDDB, 2012; CFWO, 2012).  
 Open Space, City of SD Utilities Mitigation,  
 Coastal Zone, MHPA (SanGIS, 2010).  
 Mitigation Boundaries (URS, 2012).



625 0 625 1250 Feet  
 SCALE: 1" = 1250' (1:15,000)  
 SCALE CORRECT WHEN PRINTED AT 11X17

**BIOLOGICAL RESOURCE LOCATIONS  
 LOS PEÑASQUITOS CANYON PRESERVE  
 CONCEPTUAL WETLAND ENHANCEMENT PLAN**

CREATED BY: DS	DATE: 2/25/2015	FIGURE
PM: MT	PROJ. NO: 27679954.02000	4