FINAL HABITAT MITIGATION AND MONITORING PLAN

LIGHTNER MITIGATION SITE

SUNRISE POWERLINK

CORPS FILE NO. 2007-00704-SAS
SWRCB 401 CERTIFICATION FILE NO. SB090151N
CDFG STREAMBED ALTERATION AGREEMENT NO. 1600-2009-0365-R5

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List of Acronyms

AA(s)	Assessment Area(s)
APN	Assessor Parcel Number
BMPs	Best Management Practices
Cal-IPC	California Invasive Plant Council
CDFG	California Department of Fish and Game
CNF	Cleveland National Forest
Corps	U.S. Army Corps of Engineers
CRAM	California Rapid Assessment Method
CWA	Clean Water Act
CWMW	California Wetlands Monitoring Workgroup
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
GIS	Geographic Information System
HAP/HMP	Habitat Acquisition Plan and Habitat Management Plan
HMMP	Habitat Mitigation and Monitoring Plan
HSA	Hydrologic Subarea
kV	kilovolt
LSAA	Lake and Streambed Alteration Agreement
MSCP	Multiple Species Conservation Plan
NGVD	National Geodetic Vertical Datum
OHV	Off-highway Vehicle
OHWM	Ordinary High Water Mark
PAR	Property Analysis Record
PCN	Pre-Construction Notification
PJD	Preliminary Jurisdictional Determination
ROW	Right-of-Way
SCCWRP	Southern California Coastal Water Research Project
SDG&E	San Diego Gas and Electric
SRPL	Sunrise Powerlink
SWRCB	State Water Resources Control Board
TOB	Top of Bank
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WOS	Waters of the State
WOUS	Waters of the United States

1.0 INTRODUCTION AND PURPOSE

San Diego Gas and Electric (SDG&E) is constructing a new 500/230 kilovolt (kV) electric transmission line that would traverse approximately 120 miles between the El Centro area of Imperial County and southwestern San Diego County, in southern California (Figure 1). Construction of this transmission line, along with associated roads, facilities, and maintenance areas, will result in impacts to areas under the jurisdiction of the U.S. Army Corps of Engineers (Corps), the State Water Resources Control Board (SWRCB), and the California Department of Fish and Game (CDFG). State and federal regulations require mitigation for impacts to "waters of the United States" (WOUS) and "waters of the State" (WOS).

Mitigation for permanent impacts to WOUS and WOS is being accomplished through preservation, restoration, and enhancement of wetlands and waters within five mitigation sites, as described in the approved Conceptual Habitat Mitigation and Monitoring Plan (Conceptual HMMP; WRA 2010b). A Final HMMP for each site is a requirement of the authorizations issued by the Corps, SWRCB, and CDFG. The Final HMMP describes the specific and detailed mitigation activities and plans, performance criteria to measure success, initial monitoring and management actions, long-term management activities, and estimated costs for the Lightner Mitigation Site in San Diego County, California. The Lightner Mitigation Site is one component of the overall mitigation program for unavoidable impacts to wetlands and waters from the Sunrise Powerlink (SRPL) Project.

This Final HMMP has been prepared and formatted to meet the permit conditions of the Corps of Engineers (Clean Water Act Section 404), the SWRCB (Clean Water Act Section 401), and the CDFG (Fish and Game Code 1602).

1.1 Responsible Parties and Easement Holders

SDG&E is responsible for implementing mitigation for the SRPL Project. WRA, Inc. is the applicant's authorized agent and preparer of this HMMP for mitigation to WOUS and WOS.

Primary contact information for these parties is below:

Project Applicant:	SDG&E 8315 Century Park Court, CP21G San Diego, California 92123-1548 Contact: Alan Colton Contact Phone: (858) 654-8727
Authorized Agent:	WRA, Inc. 2169-G East Francisco Blvd. San Rafael, CA 94901 Contact: Michael Josselyn, PhD, PWS Contact Phone: (415) 454-8868
Entity Responsible for Long Term Management:	Conservancy to be determined prior to end of 5-year monitoring period

Figure 1. Project Area Location Map

Sunrise Powerlink
San Diego/Imperial County, California

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Map Date: June 2010
Map By: Derek Chan
Base Source: ESRI
Filepath: L:\Acad 2000 Files\17000\17128-3\GIS\ArcMap\Mitigation\Fig1_LocMap_20100630.mxd

SDG&E will be responsible for implementing the project mitigation through completion of the initial monitoring period. SDG&E will convey the lands to a conservancy or otherwise approved entity (to be determined and approved by the USFWS, CDFG, BLM and CPUC). This process is detailed in G-CM-17 of the project Biological Opinion FWS-08B04233-11F0047 (USFWS 2010) and included in Section 4.0.

The Agency-approved management entity will be responsible for long-term management of the Lightner Mitigation Site. The description of the long-term management for this mitigation site, the restrictions to be placed on the site, and the financial commitments are summarized in Sections 10.0 and 12.0 and within the HAP/HMP prepared for this mitigation site (SDG&E 2010).

1.2 Document Overview and Purpose

The purpose of the Final HMMP is to describe the mitigation, monitoring, and management of wetlands and waters provided as mitigation within the Lightner Mitigation Site. Restoration of temporary impacts to streams, wetlands, and desert dry washes within the construction footprint is described as part of the Restoration Plan for Temporary Impacts to Waters contained in Appendix A of the Conceptual HMMP (WRA 2010b) and is therefore not addressed here.

The intention of this document is to follow the regulation set forth in the 2008 Clean Water Act (CWA) Section 404 Final Compensatory Mitigation Rule. As such, language and requirements may differ from that of the 2004 Los Angeles District Final Mitigation Guidelines and Monitoring Requirements. In addition, we provide information requested by the Los Angeles District Corps office and the SWRCB related to the functional assessment of the impact and mitigation sites using the California Rapid Assessment Method (CRAM).

Mitigation for the impacts associated with “single and complete projects” will be implemented at five mitigation sites. Four of these sites are located along the SRPL project alignment, and one (Desert Cahuilla) is located in the desert area north of the alignment (see Figure 2). These locations are also part of an overall mitigation program addressing a variety of habitat and special status species requirements for the SRPL. The mitigation sites that are proposed to address impacts to WOUS and WOS are:

- Desert Cahuilla Mitigation Site
- Suckle Mitigation Site
- Long Potrero Mitigation Site
- Lightner Mitigation Site
- Chocolate Canyon Mitigation Site

This Final HMMP addresses only the Lightner Mitigation Site. The remaining properties are addressed in separate HMMP documents by Mitigation Site. The mitigation, monitoring, and management activities described in this HMMP are intended to meet the permit requirements of the Corps, CDFG, and SWRCB, as well as the Corps regulatory requirements for preparation of mitigation plans set forth in 33 CFR 332.4(c). The regulatory requirements contained in 33 CFR 332.4(c), as issued by the Corps in 2008, generally encompass the requirements of mitigation and monitoring plans for all of the resource agencies (Corps 2008b). We have included additional information described in the 2004 Los Angeles District final Mitigation Guidelines and Monitoring Requirements and information required in the forthcoming mitigation guidelines, as feasible.

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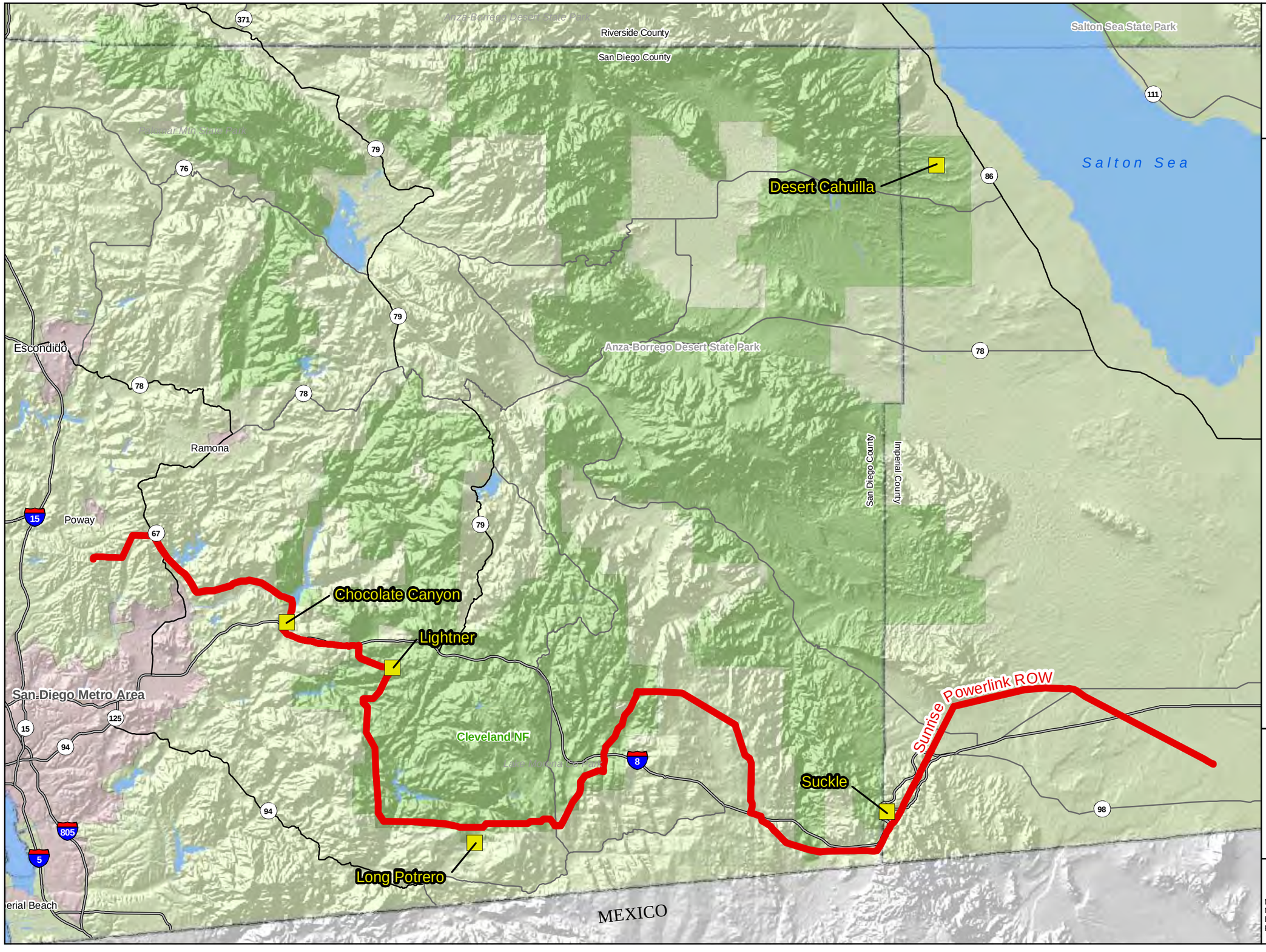
Sunrise Powerlink

San Diego/Imperial County, California

Figure 2.

Overview of Mitigation Area Locations



Legend

- Mitigation Area
- Sunrise Powerlink ROW

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Map Date: June 2010
Map By: Derek Chan
Base Source: ESRI
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The 2008 regulations require an HMMP to include:

- *Mitigation Objectives, including resource type, amounts, and methods of compensation (see Section 2.0)*
- *Site Selection, including key factors for providing mitigation at a site (see Section 3.0)*
- *Site Protection Instrument (see Section 4.0)*
- *Baseline Information, including ecological characteristics of impacted and mitigation sites (see Section 5.0)*
- *Determination of Credits, including a description of how the mitigation will provide compensatory mitigation for impacts (see Section 6.0)*
- *Mitigation Work Plan, including detailed descriptions of the work to be performed in implementing mitigation (see Section 7.0)*
- *Maintenance Plan, including maintenance activities to ensure continued viability of the mitigation site (see Section 8.0)*
- *Ecologically-based Performance Standards (see Section 9.0)*
- *Monitoring Requirements and Methods (see Section 9.0)*
- *Long-term Management Plan, (see Section 10.0)*
- *Adaptive Management Plan (see Section 11.0)*
- *Financial Assurances to ensure project mitigation will be effectively implemented and maintained (see Section 12.0)*

Project impacts were described in the Pre-Construction Notification (PCN) prepared for the Corps, as part of the Lake and Streambed Alteration Agreement (LSAA) Notification Package prepared for the CDFG, as part of the Water Quality Certification Application prepared for the SWRCB, and as modified by subsequent submittals. All permit application documents contain a complete project description. Project modifications have been made throughout the permit process to further reduce environmental impacts, including those to streams, wetlands, and desert dry washes.

2.0 MITIGATION GOALS AND OBJECTIVES FOR THE LIGHTNER MITIGATION SITE

The goals of mitigation at the Lightner Mitigation Site are to:

- Preserve and manage aquatic resources and associated uplands in perpetuity as a "watershed" approach to mitigation
- Restore and enhance stream and wetland functions, including buffer and wildlife habitat functions
- Provide the legal structure and funding for long-term management of weeds, trash, vandalism, trespassing and any other human-induced disturbances in perpetuity through a non-wasting endowment

Mitigation activities include preservation, enhancement, and restoration of 0.68 acre of mountain ephemeral and intermittent streams and 19.89 acres of riparian habitat. Activities will also include preservation and enhancement of 0.83 acre of wetland habitat. Mitigation actions being implemented at the Lightner Mitigation Site are defined in the Corps 2008 Mitigation Rule (Corps 2008b) and described below:

- **Preservation:** The permanent protection of ecologically important wetlands or other aquatic resources through the implementation of appropriate legal and physical mechanisms (i.e. conservation easements, title transfers). Preservation may include protection of upland areas adjacent to wetlands as necessary to ensure protection or enhancement of the aquatic ecosystem. Preservation does not result in net gain of wetland acres and may only be used in certain circumstances, including when the resources to be preserved contribute significantly to the ecological sustainability of the watershed.

- **Enhancement**: Activities conducted within existing wetlands that heighten, intensify, or improve one or more wetland functions. Enhancement is often undertaken for a specific purpose such as to improve water quality, flood water retention or wildlife habitat. Enhancement results in a gain in wetland function but does not result in a net gain in wetland acres.

- **Restoration**: Re-establishment or rehabilitation of a wetland or other aquatic resource with the goal of returning natural or historic functions and characteristics to a former or degraded wetland. Restoration may result in a gain in wetland function or wetland acres, or both. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: reestablishment and rehabilitation. *Re-establishment* means 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. *Rehabilitation* means 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.

For the purposes of this report, we refer to all re-establishment and rehabilitation activities resulting in habitat creation as restoration as the distinction between “natural/historic” and degraded is not easily provided.

2.1 Resource Functions of the Mitigation Project

The Lightner Mitigation Site supports a mixture of ephemeral and intermittent streams along with riparian and wetland habitat (Figure 3). At present, the Lightner Mitigation Site is zoned for development and rural residences. The acquisition of this site ensures that the headwaters on the site are preserved for continued natural resource function and value. Section 3.0 describes the rationale for selecting this site to be included in the SRPL mitigation project, and it includes a description of the mitigation site’s watershed context. Section 5.0 provides further discussion of the functions and values of this mitigation site based on CRAM evaluation; projected CRAM scores estimate how these values are expected to change after 5 years of preservation. An overview of habitat values is also provided in the HAP/HMP (SDG&E 2010).

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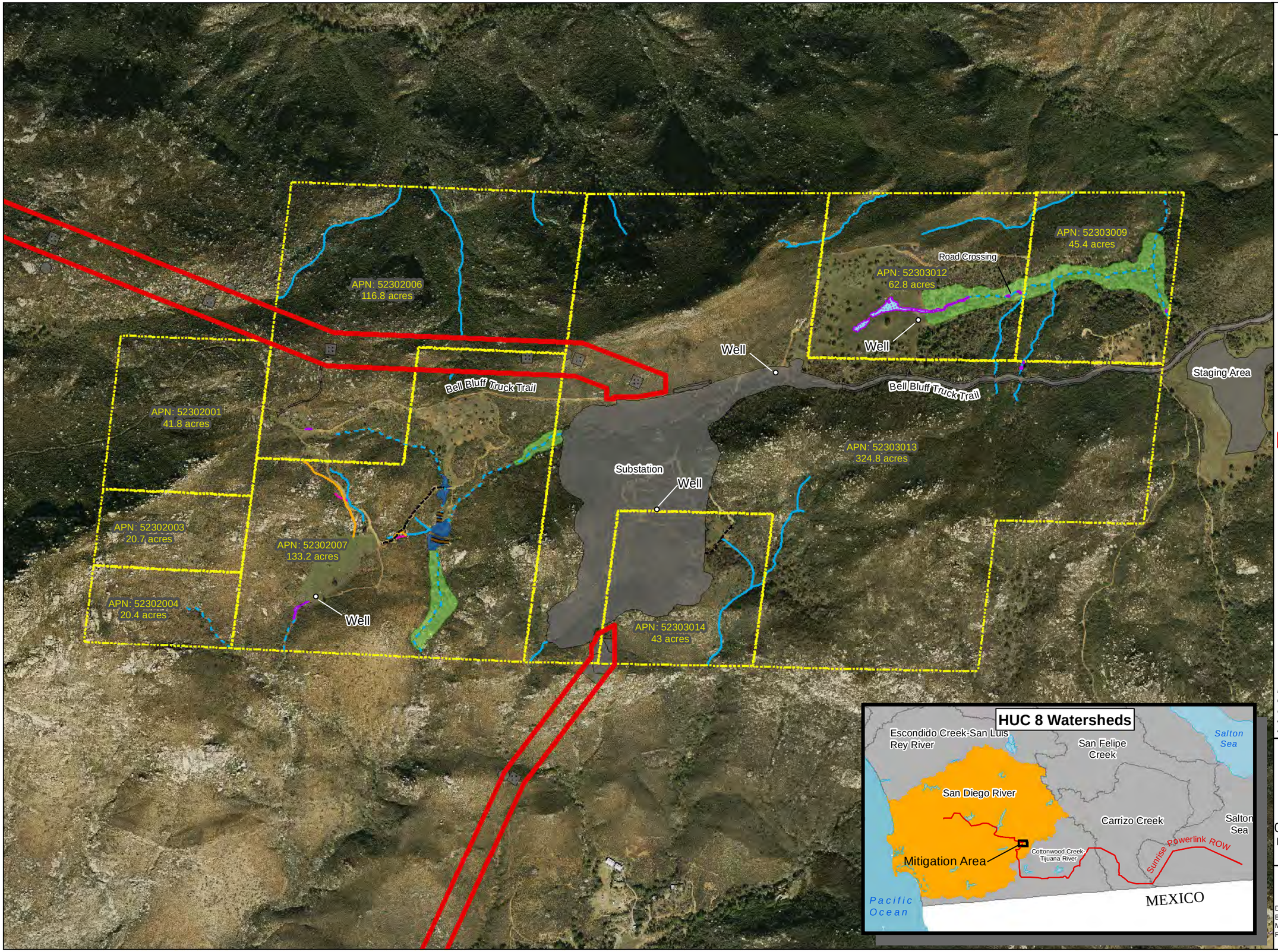
Sunrise Powerlink

San Diego County, California

Figure 3.

Existing Conditions on Lightner Mitigation Site



Legend

- Parcel Boundary
- Sunrise Powerlink ROW
- Construction Impact Area
- Mapped Riparian Habitat (15.83 acres)
- Wetlands (0.83 acres)
- Man-made Ponds (1.10 acres)
- Non-jurisdictional Ditch (0.05 ac.; 1,013 ln. ft.)
- Historic Drainage (0.03 ac.; 273 ln. ft.)
- Dirt Roads (to be removed)
- Earthen Dams/Berms

Streams

- Ephemeral (0.38 ac.; 12,824 ln. ft.)
- Intermittent (0.26 ac.; 7,888 ln. ft.)

Note: *Stream and Riparian acreage calcuations do not include areas within the Sunrise Powerlink ROW or Construction Impact Areas. Stream acreages are based on OHWM width. Riparian areas are based on CDFG riparian dripline.*

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Date: November 2010
Base Source: NAIP, 2005; San Diego County
Map By: Derek Chan
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2.2 Basis for Request to Include Preservation as Part of Compensatory Mitigation

The basis for preservation to be included for each mitigation site is based upon requirements from the Corps 2008 Mitigation Rule 332.3(h): (h) Preservation (Corps 2008b):

(1) Preservation may be used to provide compensatory mitigation for activities authorized by [Corps] *permits when all the following criteria are met:*

- *(i) The resources to be preserved provide important physical, chemical, or biological functions for the watershed;*
- *(ii) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, the district engineer must use appropriate quantitative assessment tools, where available;*
- *(iii) Preservation is determined by the district engineer to be appropriate and practicable;*
- *(iv) The resources are under threat of destruction or adverse modifications; and*
- *(v) The preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust).*

(2) Where preservation is used to provide compensatory mitigation, to the extent appropriate and practicable the preservation shall be done in conjunction with aquatic resource restoration, establishment, and/or enhancement activities.

Corps criteria i through v (above) are satisfied by the habitat and mitigation activities planned for the Lightner Mitigation Site. Specifically, the Lightner Mitigation Site:

(i) Ensures top of watershed is preserved and managed for natural resource values. Includes large native grassland area and riparian areas.
(ii) United States Fish and Wildlife Service (USFWS) and CDFG accepted "keystone property" for City/County Multiple Species Conservation Plan (MSCP) program (and see above).
(iii) Restoration and enhancement actions are proposed for the mitigation site to remove old stockponds, farm roads, and to remove invasive and restore native vegetation and riparian areas along streams.
(iv) Entire property zoned for development and slated for rural residences (evidence of test wells and dams for stock ponds). Has been subject to livestock grazing previously resulting in alteration of stream hydrology.
(v) Will be protected under title transfer or conservation easement.

3.0 SITE SELECTION

The Lightner Mitigation Site was selected as mitigation based on the presence of a large intact watershed area containing ephemeral and intermittent streams along with wetlands supporting emergent vegetation. The site creates a contiguous area of protected lands, connecting with the Cleveland National Forest (CNF). The site is important to watershed health as it contains the headwaters of several streams which become significant south of the site. Improving site conditions will enhance the overall health of the entire watershed. It also supports a diverse number of habitats including pristine Engelmann oak (*Quercus engelmannii*) woodland habitat

(a sensitive community in San Diego County) and habitat for the Hermes copper butterfly (*Lycaena hermes*).

As stated in Section 2.1, the entire mitigation site is zoned for development, with potential for rural residential development as evidenced by test wells. In addition, the mitigation site has historically been subjected to livestock grazing, resulting in the alteration of stream hydrology, change in vegetation communities, and the construction of several stock ponds. Protection of the site ensures the preservation of a large portion of the upper watershed. The presence of the Suncrest Substation within the site offers the opportunity to manage long-term preservation of habitat values in the area directly surrounding one of the project's largest impact areas. Additionally, the USFWS and CDFG have accepted the site as a "keystone property" for the San Diego MSCP program. The mitigation site will be managed by a conservancy to be determined at the end of the 5-year monitoring period. A title transfer or conservation easement will ensure protection of the upper watershed, including a large wetland area, riparian areas, and Engelmann oak woodland.

The site offers a variety of restoration opportunities including the removal of abandoned stockponds, partial opening of earthen dams along streams, enhancement of riparian and wetland areas through planting and revegetation, and removal and management of invasive species. In addition, some roads on the site will be removed, regraded, and planted with native vegetation.

3.1 Watershed Setting and Context

The Lightner Mitigation Site occurs within the Loveland hydrologic subarea (HSA) and forms a contiguous rural landscape with its surroundings. It is surrounded on the north, south, and west by the CNF and to the east by private lands. Recreational uses in the CNF include target shooting, camping, biking, hiking, designated off-highway vehicle (OHV) areas, and hunting. The private lands to the east are generally designated as rural residential (SDG&E 2010). Implementation of the proposed mitigation activities at this site would protect and enhance the headwaters within the watershed, as well as ensure the hydrological and ecological connectivity of the site with its surrounding rural landscape. Specific information on the Lightner Mitigation Site location is listed below in Table1.

Table 1. Lightner Mitigation Site Mitigation Site Location Details

Mitigation Site Location	1.5 miles south of Interstate 8 off of Japatul Valley Road and Bell Bluff Truck Trail
Mitigation Site Latitude/Longitude	116º 40’ 48” W / 32º 48’ 41” N
Name of Watershed and Hydrologic Unit	Loveland HSA (909.31)
Mitigation Site City and County	Alpine, San Diego County

3.2 Beneficial Uses Provided

Beneficial uses and water quality objectives are required to be established for all WOS, including both surface and ground waters. Beneficial uses of the surface and ground waters of the San Diego Region are discussed in the Water Quality Control Plan for the San Diego Basin 9 (San Diego RWQCB 1994). Beneficial uses for surface waters are designated under section 303 of the CWA (40 CFR 131) and under the Porter-Cologne Act (California Water Code section 13050[f]). The State is required to specify appropriate water uses to be achieved and protected. Definitions and abbreviations for beneficial uses provided by WOS are summarized in Table 2.

Waters located within the Lightner Mitigation Site are part of the Loveland HSA watershed and are considered inland surface waters as defined by the San Diego RWQCB (1994). According to this document:

> *Beneficial uses of inland surface waters generally include REC-1 (swimmable) and WARM or COLD. Additionally, inland waters are usually designated as IND, PRO, REC-2, WILD, and are sometimes designated as BIOL and RARE. Inland surface waters that meet the criteria mandated by the* Sources of Drinking Water Policy *are designated MUN. Unless otherwise designated by the San Diego RWQCB, all inland surface waters in the Region are considered suitable or potentially suitable as a municipal and domestic water supply.*

For the Loveland HSA watershed in which the Lightner Mitigation Site occurs, the San Diego RWQCB has designated the following beneficial uses (see Table 3): Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Service Supply (IND), Industrial Process Supply (PROC), Hydropower Generation (POW), Freshwater Replenishment (FRSH), Water Contact Recreation (REC1), Noncontact Water Recreation (REC2), and Preservation of Biological Habitats of Special Significance (BIOL). The Lightner Mitigation Site primarily contains headwaters of larger water bodies within its watershed, and the watershed as a whole provides the nine above-mentioned beneficial uses. Table 2 contains definitions of additional beneficial uses which have not been designated for this mitigation site, but they are included in the table as references for Table 3.

Table 2. Definitions for Beneficial Uses of Waters of the State.

State Recognized Beneficial Uses	Description
Municipal and Domestic Supply (MUN)	Uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply.
Agricultural Supply (AGR)	Uses of water for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
Industrial Service Supply (IND)	Includes uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
Industrial Process Supply (PROC)	Uses of water for industrial activities that depend primarily on water quality.
Hydropower Generation (POW)	Uses of water for hydropower generation.
Freshwater Replenishment (FRSH)	Uses of water for natural or artificial maintenance of surface water quantity or quality.
Ground Water Recharge (GWR)	Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting salt water intrusion into fresh water aquifers.
Water Contact Recreation (REC1)	Uses of water for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, and uses of natural hot springs.
Noncontact Water Recreation (REC2)	Uses of water for recreational activities involving proximity to water, but not normally involving contact with water where water ingestion is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

Table 2. Definitions for Beneficial Uses of Waters of the State.

State Recognized Beneficial Uses	Description
Preservation of Biological Habitats of Special Significance (BIOL)	Includes uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.
Wildlife Habitat (WILD)	Uses of waters that support wildlife habitats, including, but not limited to, the preservation and enhancement of vegetation and prey species used by wildlife, such as waterfowl.
Cold Freshwater Habitat (COLD)	Uses of water that support cold water ecosystems, including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Warm Freshwater Habitat (WARM)	Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Aquaculture (AQUA)	Includes the uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.
Inland Saline Water Habitat (SAL)	Includes uses of water that support inland saline water ecosystems including, but not limited to, preservation or enhancement of aquatic saline habitats, vegetation, fish, or wildlife, including invertebrates.
Estuarine Habitat (EST)	Includes uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).
Marine Habitat (MAR)	Includes uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).
Rare, Threatened, or Endangered Species (RARE)	Includes uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.
Migration of Aquatic Organisms (MIGR)	Includes uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.
Spawning, Reproduction, and/or Early Development (SPWN)	Includes uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. This use is applicable only for the protection of anadromous fish.
Shellfish Harvesting (SHELL)	Includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial, or sport purposes.

One goal of the overall SRPL mitigation program is to compensate for SRPL-related impacts to WOS and their beneficial uses. Beneficial uses of WOS within the Lightner Mitigation Site will be preserved, enhanced, and/or restored to mitigate a portion of the beneficial uses affected by SRPL project activities; mitigation activities on the other four mitigation sites are intended to compensate for any remaining beneficial uses not provided by the Lightner site (i.e., there will be no net loss of beneficial use from any project activity). All designated beneficial uses of WOS potentially impacted by SRPL activities are summarized in Table 3; however, not all uses listed in Table 3 are necessarily affected by the SRPL Project. Only those that are marked as such have the potential to be affected.

Table 3. Beneficial Uses of WOS That May Be Affected by the SRPL Project.

SAN DIEGO REGION INLAND SURFACE WATERS	Hydrologic Unit Basin Number	MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Diego River Watershed	907.31	X	X	X	X				X	X		X	X	X		
Conejos Creek 7.31	907.31	X	X	X	X				X	X		X	X	X		
Alpine Creek	907.31	X	X	X	X				X	X		X	X	X		
Chocolate Canyon	907.33	X	X	X	X				X	X		X	X	X		
Chocolate Canyon	907.31	X	X	X	X				X	X		X	X	X		
Sweetwater River	909.31	X	X	X	X				X	X		X	X	X		X
Viejas Creek	909.31	X	X	X	X				X	X		X	X	X		
Viejas Creek	909.33	X	X	X	X				X	X		X	X	X		
Taylor Creek	909.31	X	X	X	X				X	X		X	X	X		
Tijuana Hydroloigic Unit	911															
Cottonwood Creek	911.23	+							X	X		X		X		
Dry Valley	911.23	+							X	X		X		X		
Bob Owens Canyon	911.23	+							X	X		X		X		
McAlmond Canyon	911.24	+							X	X		X		X		
McAlmond Canyon	911.23	+							X	X		X		X		
Rattlesnake Canyon	911.23	+							X	X		X		X		
Potrero Creek	911.25	+							X	X		X		X		
Potrero Creek	911.23	+							X	X		X		X		
Bee Creek	911.23	+							X	X		X		X		
Cottonwood Creek	911.30	X	X	X	X		X		X	X		X	X	X	X	X
Hauser Creek	911.30	X	X	X	X		X		X	X		X	X	X		X
Pine Valley Creek	911.30	X	X	X	X		X		X	X		X	X	X		X
Wilson Creek	911.30															
Pats Canyon	911.30															
La Posta Creek	911.70	X	X	X	X		X		O	X		X	X	X		
Simmons Canyon	911.70	X	X	X	X		X		O	X		X	X	X		
Diablo Canyon	911.84	+														
Reservoirs & Lakes																
El Capitan Reservoir	907.31	X	X	X	X			X[1]	X	X	X	X				
Loveland Reservoir	909.31	X	X	X	X		X	X	X	X	X					
Barrett Lake	911.30	X	X	X	X		X	X	X	X	X	X	X			
San Vicente Reservoir	907.20	X	X	X	X		X	X	X	X	X	X				

COLORADO RIVER BASIN REGION	Water Board Hydrologic Unit Code	MUN	AGR	AQUA	FRSH	IND	GWR	RECI	RECII	WARM	COLD	WILD	POW	RARE
Tule Creek	22.71, 22.72	P	X				X	X	X	X		X		
Unlisted Perennial and Intermittent Streams		P [11]			I X [12]		I X	I P X	I X	I X		I X		I X [13]
Washes (Ephemeral Streams)					I [12]		I		I	see note 7		I		

Key:
X = Existing Beneficial Use
0 = Potential Beneficial Use
I = Intermittent Uses
+ = Excepted from MUN. The water body has been exempted by the Regional Board from the municipal use designation under the terms and conditions of State Board Resolution No. 88-63, *Sources of Drinking Water* Policy.)

Note 1: Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.)
Note 2: Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

FOOTNOTES: Footnotes are numbered as found in the Basin Plan.
7. Use, if any, to be determined on a case-by-case basis.
11. Potential use designations will be determined on a case-by-case basis as necessary in accordance with the "Sources of Drinking Water Policy".
12. Applies only to tributaries to Salton Sea.
13. Rare, endangered, or threatened wildlife exists in or utilizes some of these waterway(s). If the RARE beneficial use may be affected by a water quality control decision, responsibility for substantiation of the existence of rare, endangered, or threatened species on a case-by-case basis is upon the CDFG on its own initiative and/or at the request of the Regional Board; and such substantiation must be provided within a reasonable time frame as approved by the Regional Board.

4.0 LONG-TERM SITE PROTECTION

Consistent with the MMRCP (Mitigation and Monitoring, Reporting, and Compliance Program) and the Biological Opinion (USFWS 2010), SDG&E will convey the entire Lightner Mitigation Site exclusive of the Suncrest Substation and access road to a conservancy or other approved management entity such as the County of San Diego. The timing and approval process is detailed in G-CM-17 of the project Biological Opinion FWS-08B04233-11F0047 (USFWS 2010). This measure is as follows:

G-CM-17: *This conservation measure has been changed to reflect updated information and progress made in acquiring off-site conservation.*

(a) Prior to initiating ground- or vegetation-disturbing project activities, SDG&E will provide and implement the following assurance:

- *Unless already acquired, SDG&E will provide assurances (e.g., performance bond, letter of credit, or escrow account) to fund the acquisitions listed below in (c).*

(b) SDG&E will fully fund an endowment for in-perpetuity management of all parcels acquired in (c) within 3 months of the Wildlife Agencies' approval of the final endowment amounts.

(c) Unless otherwise authorized by the Wildlife Agencies, no later than 18 months from the date of the revised 2010 biological and conference opinion, SDG&E will acquire and permanently preserve the nine (9) parcels identified in the September 2010 Habitat Acquisition Plan and Habitat Management Plan (HAP/HMP; referenced by name as Nabi, Lakeside Ranch, Hamlet, El Capitan, Chocolate Canyon, Lightner, Long Potrero, Suckle, and Desert Cahuilla) in a manner consistent with the HAP/HMP and the following provisions:

- *The land-owner, land management entity, conservation easement grantee, and endowment fund manager for each property will be approved by the Wildlife Agencies. SDG&E will coordinate efforts with the Wildlife Agencies to identify potential candidates and review their qualifications to hold and manage lands and/or endowment funds. This task will be completed within 6 months of issuance of the 2010 revised biological and conference opinion.*

- *SDG&E will conduct a revised Property Analysis Record (PAR) or PAR-like analysis for each property once the land management entity for individual properties has been identified and approved by the Wildlife Agencies. This revised PAR will be used to determine the final endowment amount SDG&E will provide for in-perpetuity habitat management of each property.*

- *Conservation easement language, or its equivalent where an easement is not allowed by the land manager (State Parks), for all properties will be approved by the Wildlife Agencies prior to easement recordation; and*

- *SDG&E will complete the required acquisition, protection, and transfer of all properties and record the required conservation easements in favor of DFG, or other entity approved by the Wildlife Agencies, no later than 18 months after the start of the ground- or vegetation-disturbing activities.*

The HAP/HMP provides a description of the long-term management activities at the Lightner Mitigation Site that will proceed after performance standards have been achieved. A summary of long-term management activities is provided in Section 10.0, below. Long-term financing mechanisms are also provided in the HAP/HMP (SDG&E 2010) and in Section 12.0, below.

5.0 BASELINE INFORMATION

5.1 Preliminary Jurisdictional Determination and Functional Assessment of Impact Sites

A preliminary jurisdictional determination (PJD) of the extent of wetlands and waters along the SRPL Right-of-Way (ROW) (WRA 2010a) has been approved by the Corps and is included in permit application packages for the Project. The PJD was used during Project planning to avoid unnecessary impacts to WOUS and WOS and to quantify unavoidable impacts to wetlands and waters. Impacts to unvegetated waters included perennial, intermittent, and ephemeral streams. Ephemeral streams were described using two subcategories, including desert dry washes and mountain ephemeral streams. Vegetated wetlands delineated using the Corps three-parameter approach (Environmental Laboratory 1987) also occur at two impact sites along the margins of intermittent streams.

A functional assessment of 30 impact sites along the SRPL ROW was performed using CRAM methodology, covering both existing conditions and projected post-project conditions. The Conceptual HMMP (WRA 2010b) describes the results of the CRAM functional assessment of impact sites in full detail. Combined average CRAM scores for impacted jurisdictional areas are summarized in Table 4. CRAM scores for existing conditions will be used as baseline data, while CRAM scores for post-project conditions were estimated as a means to predict the effects of impacts to wetland functions and services. An estimate of the reduction in functions and services provided by impacted WOUS and WOS was generated by comparing existing and projected post-project CRAM scores at impacted sites. All assessments of impact sites used the CRAM methodology for riverine wetlands, although ephemeral streams and Corps wetlands were also included in the assessments. Further detail on the assessments and CRAM methodology can be found in the Conceptual HMMP (WRA 2010b). Raw CRAM scores for all impact and mitigation assessment areas (AAs) are presented in Appendix A.

As outlined in the Conceptual HMMP, the combined average CRAM score of representative impact sites for SRPL is expected to decrease by an average of 3 percentage points from project implementation. This represents the average decrease in functions and services resulting from impacts to WOUS and WOS from the Project. The CRAM score for the one

Table 4. Combined Average CRAM Scores for Existing and Post-Project Conditions at Impact Sites along the SRPL ROW.

CRAM Index and Attributes	Existing (Baseline) Mean Scores	Projected Post-Project Mean Scores	Decrease Between Existing and Projected Post-Project Conditions (percentage points)
Overall Index Score	72.3%	69.3%	3.0
Landscape Context	93.4%	89.0%	4.4
Hydrology	88.6%	82.8%	5.8
Physical Structure	47.5%	46.3%	1.2
Biotic Structure	59.7%	59.3%	0.4

perennial stream within the ROW is not expected to measurably decrease. The majority of individual projected impacts would result from aggradation/degradation of stream channels and degradation of wetland buffer areas.

While impacts to Buffer Condition and Channel Stability are likely to be common among desert dry wash and mountain ephemeral impact locations, these combined stream categories saw a decline of less than 2 percentage points in overall projected CRAM scores. The largest decline in CRAM score came from one intermittent stream on the Lightner Mitigation Site where the Suncrest Substation is proposed, causing a loss of both stream channel and adjacent riparian habitat. The drop in overall CRAM score of 38.7 percentage points for this Assessment Area (AA) (accounting for the majority of an 11.6-point drop for all intermittent streams combined) is the most substantial single impact of the SRPL project as reflected in projected CRAM scores. Substantial restoration and enhancement activities at the Lightner Mitigation Site, in combination with mitigation at other sites included in the overall mitigation package, are intended to offset these impacts to functions and services.

5.2 Baseline Condition and CRAM Assessment of the Lightner Mitigation Site

The Lightner Mitigation Site totals approximately 697 acres[1] and is comprised of 9 parcels. It is located within the central portion of the San Diego River Watershed (Figure 4), approximately 1.5 miles south of Interstate 8 off of Japatul Valley Road and Bell Bluff Truck Trail in San Diego County, California. The Suncrest Substation of the SRPL Project is located in the central portion of the mitigation site spanning two parcels (Assessor Parcel Number [APN] 52303013 and 52303014). This mitigation site is surrounded on all sides by mountainous terrain with no urban development in close proximity. This site ranges from 2,240 to 3,080 feet NGVD (National Geodetic Vertical Datum) in elevation.

The acreage and length of ephemeral and intermittent streams and wetlands is outlined in Table 5 below.

Table 5. Jurisdictional Areas at the Lightner Mitigation Site

	Area (acres)	Length (linear feet)
Ephemeral Streams	0.38	12,064
Intermittent Streams	0.26	7,623
Emergent Wetlands	0.83	-
TOTAL:	1.47	19,868

Soils: The dominant soil type found within this mitigation site is Cieneba very rocky coarse sandy loam, 30 to 75 percent slopes. Additional soil types on the mitigation site include Fallbrook rocky sandy loam, 9 to 30 percent slopes; Fallbrook sandy loam, 9 to 15 percent slopes, eroded; Cieneba coarse sandy loam, 30 to 65 percent slopes, eroded; Cieneba-Fallbrook rocky sandy loams, 30 to 65 percent slopes, eroded; Acid igneous rock land; and Cieneba rocky coarse sandy loam, 9 to 30 percent slopes, eroded. These soil series are well to

[1] All acreages reported for mitigation areas are exclusive of the transmission ROW or other transmission facilities.

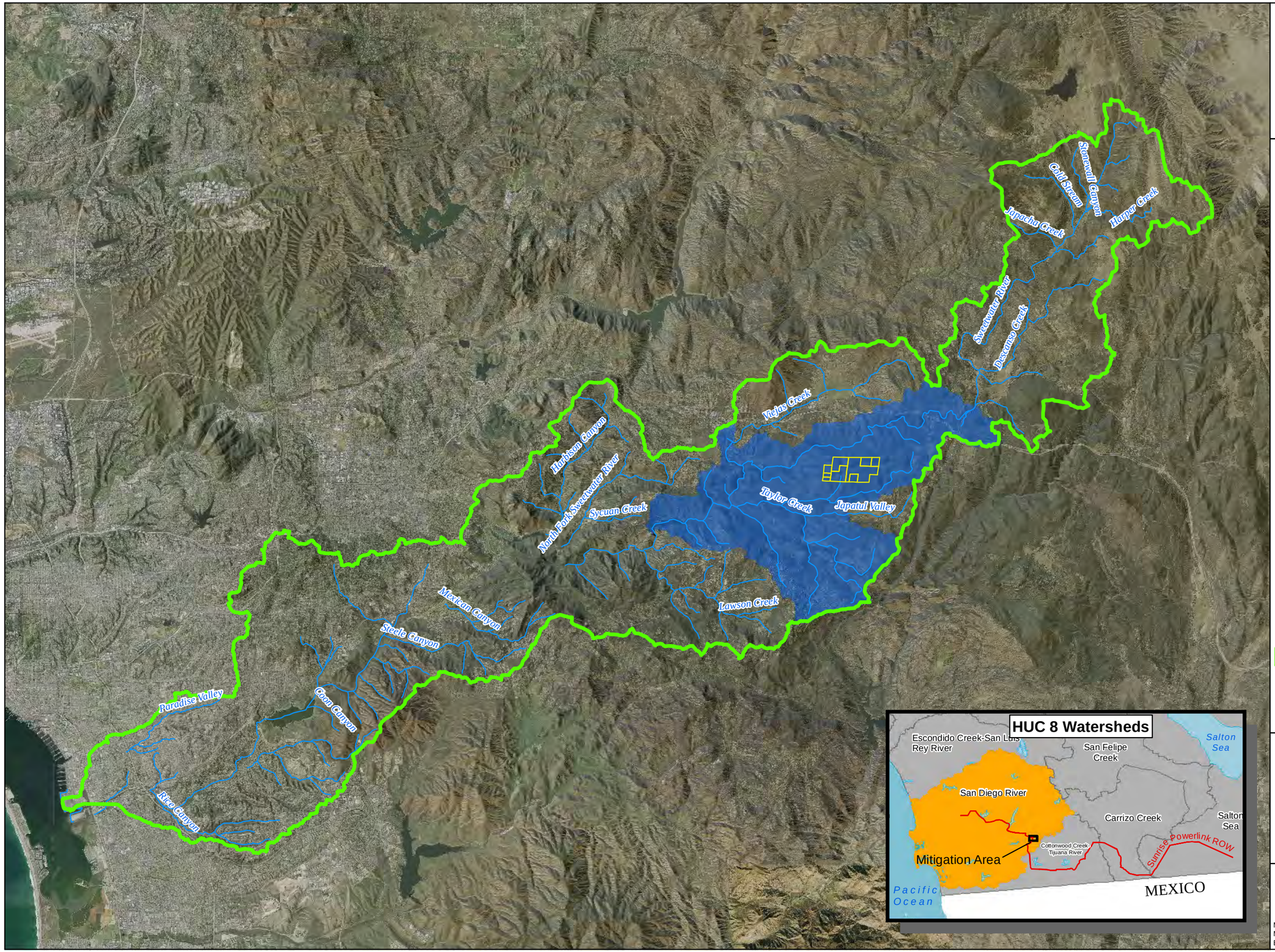

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Figure 4.

Lightner Mitigation Site:

Watersheds

Legend

- Parcel Boundary
- Sweetwater River Watershed
- Upper Sweetwater Watershed (HUC 12)
- USGS Blueline Streams

N
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0 1 2 4 6
Miles

Map Date: November 2010
Map By: Derek Chan
Base Source: San Diego County photo

Path: L:\Acad 2000 Files\17000\17128-3\GIS\ArcMap\Watershed Maps\Lightner_Watersheds_20100916.mxd

somewhat excessively drained, ranging from low to rapid runoff with moderately rapid permeability (USDA 2010a). None of the soil series listed above appear on the San Diego County hydric soils list (USDA 2010b).

Vegetation: The majority of the Lightner Mitigation Site is dominated by chaparral and oak woodlands except in areas where emergent wetlands were observed. All ephemeral streams and all but one intermittent stream observed were surrounded by southern mixed chaparral species. Dominant plant species observed within this community include scrub oak (*Quercus berberidifolia*), chamise, California buckwheat (*Eriogonum fasciculatum*), various manzanita species, and a variety of lilac species (*Ceanothus* spp.). One intermittent stream in the western half of the mitigation site contains predominantly southern mixed chaparral vegetation; however, low densities of riparian species including western sycamores (*Platanus racemosa*), coast live oak, and mule fat (*Baccharis salicifolia*) were found adjacent to this stream. These riparian species are representative of southern coast live oak riparian forest in San Diego County. Dominant plants found in emergent wetlands were Mariposa rush (*Juncus dubius*) and common toad rush (*Juncus bufonius*). Hyssop loosestrife (*Lythrum hyssopifolium*) was also a dominant wetland plant species, but was only found to occur in one of the eastern wetlands on the mitigation site. Non-native, invasive plant species observed on-site include short pod mustard (*Hirschfeldia incana*) and tocalote (*Centaurea melitensis*).

Hydrology: Precipitation and resulting runoff from adjacent lands are the main sources of hydrology for ephemeral streams on this mitigation site. Intermittent streams rely on precipitation and runoff as well but are also spring-fed which contributes to the increased duration of water flow. On average, this region receives 18.6 inches of rain per year (USDA 2010c). Natural hydrology for portions of the site has been altered through the construction and placement of earthen dams/berms and road crossings. Several earthen dams/berms are located in the western region of the mitigation site (APN # 52302007), altering sediment dynamics and hydrologic regimes in the downstream areas. A road crossing is located on the eastern boundary of APN # 52303012, bisecting an emergent wetland.

5.2.1 Baseline CRAM Functional Assessment of the Lightner Mitigation Site

Functional assessments were performed at the Lightner Mitigation Site to establish baseline conditions within jurisdictional areas and to predict future conditions following the implementation of mitigation activities. The assessments provide scores which quantify the existing condition and functional capacity of streams and wetlands being used as mitigation for impacts to WOUS and WOS along the SRPL ROW. Functional assessments at the Lightner Mitigation Site included three out of the seven mitigation CRAM assessments, two for intermittent streams (riverine wetland CRAM methodology) and one for a depressional wetland. Assessments were conducted at the Lightner Mitigation Site in September 2010.

Intermittent streams on the Lightner Mitigation Site were used as representative functional assessment sites, rather than ephemeral streams. This decision was based on possible limitations of CRAM methodology in ephemeral stream systems. As described in the CRAM Technical Bulletin (CWMW 2009), seasonal wetlands and headwater streams often have naturally lower complexity [than higher-order streams or perennial wetlands] and may inherently produce lower scores under the current CRAM methodology. Or, as described in the CRAM User's Manual (Collins *et al*. 2008a), there may be a limit to the applicability of CRAM in low order (i.e., headwater) streams in very arid environments that tend not to support species-rich plant communities with complex horizontal and vertical structure. The decision to assess only intermittent streams was made in conjunction with staff from the Corps.

The baseline CRAM depressional wetland assessment at the Lightner Mitigation Site was applied to areas where wetland enhancement is proposed as part of mitigation. Depressional wetlands are distinctly different from riverine wetlands according to CRAM guidance, and must be assessed using specialized CRAM methodology for depressional wetlands (Collins *et al.* 2008b), which relies on a different statewide standard for wetland condition than other wetland types (CWMW 2009). For this reason, CRAM scores for depressional wetlands at SRPL mitigation sites should not be directly compared to riverine CRAM scores for SRPL impact and mitigation AAs. In addition, reference data for depressional wetlands are currently unavailable, so comparison to ambient or statewide conditions is not possible. However, CRAM data for depressional wetlands at mitigation sites are useful for comparing existing conditions to future conditions, using both projected scores and future monitoring data.

Of the seven intermittent streams and eight wetlands present on the Lightner Mitigation Site, two streams and one wetland were chosen as representative features to be assessed using CRAM (Figure 5). The first stream, L-S-1, is located in the northeastern portion of the mitigation site, while the second, L-S-10, is located in the southwestern portion of the site. Both of these streams received relatively high overall CRAM scores, with L-S-1 scoring a 78.5% and L-S-10 scoring an 81.3%. The wetland assessed on the Lightner Mitigation Site, L-W-2, was also located in the northeastern portion of the site. This wetland is characterized as seasonal and portions of the eastern edge are fringe wetlands surrounding L-S-1. The overall score for this AA was 65.0%.

Buffer & Landscape Context

Both streams scored a 93.3% for the Buffer and Landscape Context attribute. The streams both received a “B” for the Buffer Condition submetric, due to the presence of non-native vegetation in the buffer. The streams received an “A” for all other metrics and submetrics, due to the site’s relatively remote setting and undisturbed surroundings.

Wetland L-W-2 received a 55.8% for the Buffer and Landscape Context attribute. In order for a depressional wetland to receive a high score for the Landscape Connectivity metric, it must have a high proportion of wetland habitat in its surroundings, rather than the undisturbed riparian corridor required for riverine wetlands. Since wetland habitat is minimal in the vicinity of the Lightner Mitigation Site, L-W-2 received a “D” for this metric, contributing to the low attribute score. L-W-2 received a “B” for the buffer condition submetric, due to the presence of nonnative vegetation in the buffer. The wetland scored an “A” for the Percent of AA with Buffer and Average Buffer Width submetrics.

Hydrology

Stream L-S-1 and wetland L-W-2 both received a 100% for the Hydrology attribute, scoring an “A” for all hydrology metrics.

Stream L-S-10 received an 83.3% for the Hydrology attribute. This AA received a “C” for Water Source, because a large dam immediately upstream of the AA currently impounds all surface flow in the stream and only contributes to downstream flow with water that seeps through the dam. L-S-10 received an “A” for the Channel Stability and Hydrologic Connectivity metrics.

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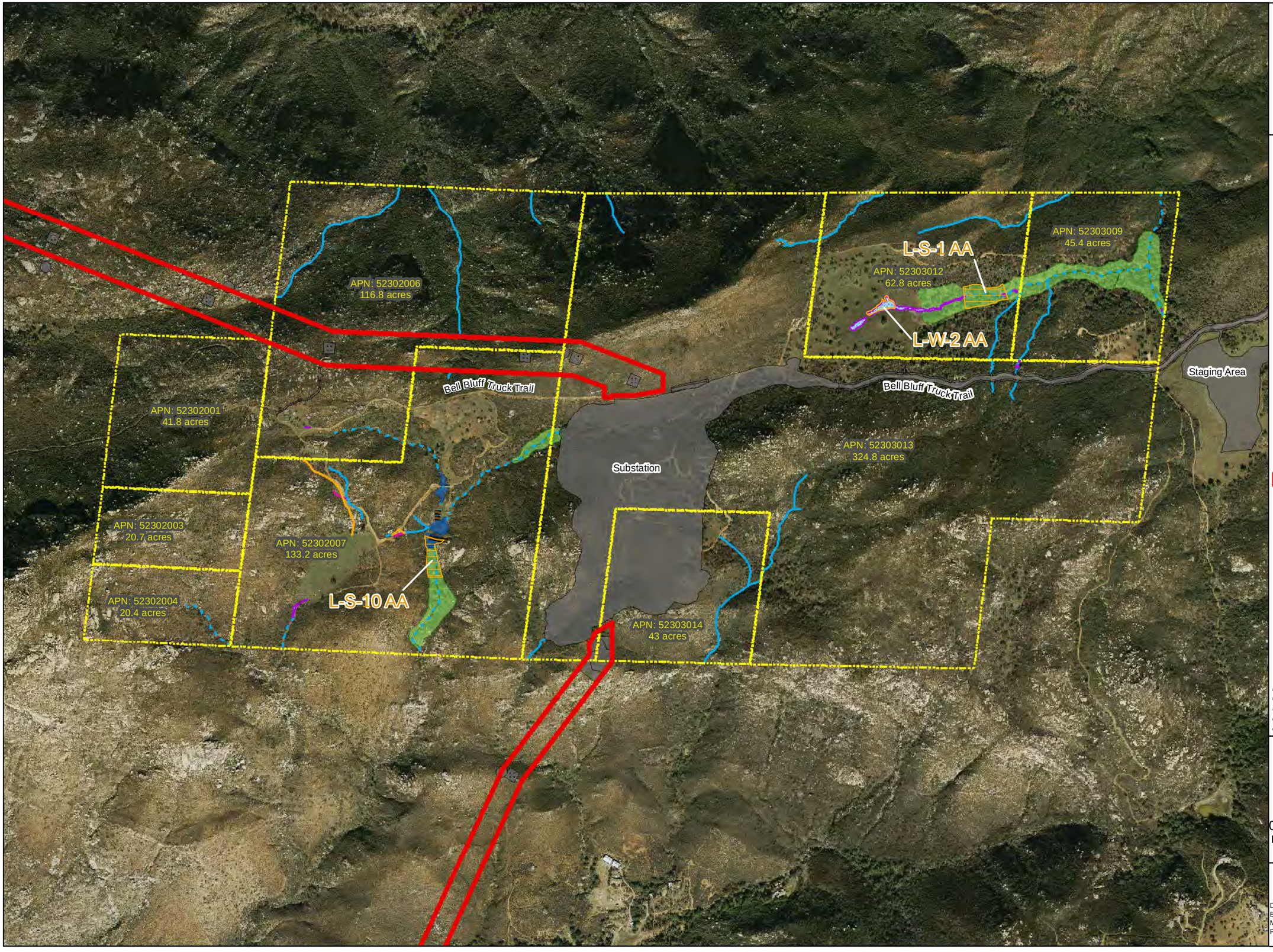
Figure 5.

CRAM within the Lightner Mitigation Site



Legend

- CRAM Assessment Areas
- Parcel Boundary
- Sunrise Powerlink ROW
- Construction Impact Area
- Mapped Riparian Habitat (15.82 acres)
- Wetlands (0.83 acres)
- Man-made Ponds (1.10 acres)
- Non-jurisdictional Ditch (0.05 ac.; 1,013 ln. ft.)
- Historic Drainage (0.03 ac.; 273 ln. ft.)
- Earthen Dams/Berms

Streams

- Ephemeral (0.38 ac.; 12,824 ln. ft.)
- Intermittent (0.26 ac.; 7,888 ln. ft.)

Note: *Stream and Riparian acreage calcuations do not include areas within the Sunrise Powerlink ROW or Construction Impact Areas. Stream acreages are based on OHWM width. Riparian areas are based on CDFG riparian dripline.*

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0 400 800 1,600
Feet

Date: November 2010
Base Source: NAIP, 2005; San Diego County
Map By: Derek Chan
Filepath: L:\Acad 2000 Files\17000\17128-3\GIS\ArcMap\CRAM\Lightner_CRAM_20101119.mxd

Physical Structure

Stream L-S-1 received a 37.5% for the Physical Structure attribute, while stream L-S-10 received a 62.5%. Stream L-S-1 did not have enough microhabitat "patch types" to score better than a "D," while L-S-10 received a "B." Both streams scored a "C" for the Topographic Complexity metric.

Wetland L-W-2 received a 37.5% for the Physical Structure attribute. The wetland had only enough patch types to receive a "C," and not enough topographic complexity to score better than a "D."

Biotic Structure

Stream L-S-1 scored an 83.3% for the Biotic Structure attribute, while stream L-S-10 scored an 86.1%. The AA for L-S-1 scored a "C" for Number of Co-dominant Species compared to a score of "B" for L-S-10. The two streams received identical scores in all other areas, including an "A" for Number of Plant Layers and Vertical Biotic Structure, and a "B" for Percent Invasion and Horizontal Interspersion/Zonation.

Wetland L-W-2 scored a 66.7% for Biotic Structure. The wetland received a "D" for Number of Co-Dominant Species, and a "C" for both Number of Plant Layers and Horizontal Interspersion/Zonation. This AA received a "B" for Percent Invasion and an "A" for Vertical Biotic Structure.

5.2.2 Projected CRAM Scores Following Mitigation Implementation at the Lightner Mitigation Site

Using proposed mitigation plans and data collected at mitigation sites for the SRPL project, CRAM was used to predict how these sites may improve following mitigation activities. These projected scores are based on conditions anticipated approximately 5 years after project implementation, as not all benefits of mitigation actions may be evident immediately upon completion. As soil disturbance and human activity becomes less evident, mitigation AAs should improve their scores for the Buffer Condition submetric, and metric and submetric scores for the Biotic Structure attribute will increase as mitigation plantings grow. Aspects of the Hydrology and Physical Structure attributes should also improve during the slow process of natural development following mitigation implementation. Some of these processes may take longer than 5 years before the full benefit of mitigation actions is evident in CRAM scores, particularly for the Physical Structure attribute. Because development of habitat characteristics at the mitigation AAs is expected to continue beyond the initial five year monitoring period, the final increase in CRAM scores resulting from implementation of mitigation may be higher than what was initially indicated by the projected scores.

A number of mitigation actions will take place on the Lightner Mitigation Site that will contribute to higher CRAM scores for streams and wetlands on the site. These activities are detailed in Section 7 and Figure 6, but generally include the following activities with regard to areas assessed using CRAM: The earthen dams upstream of stream L-S-10 will be notched, removed, or lowered to restore more natural hydrology, and the disturbed area around the dams will be revegetated and restored. An access road crossing will be removed, and revegetation with native species will occur at the downstream end of the AA for L-S-1. A large area surrounding wetland L-W-2 will be planted with native riparian vegetation, including plantings within the L-W-2 AA.

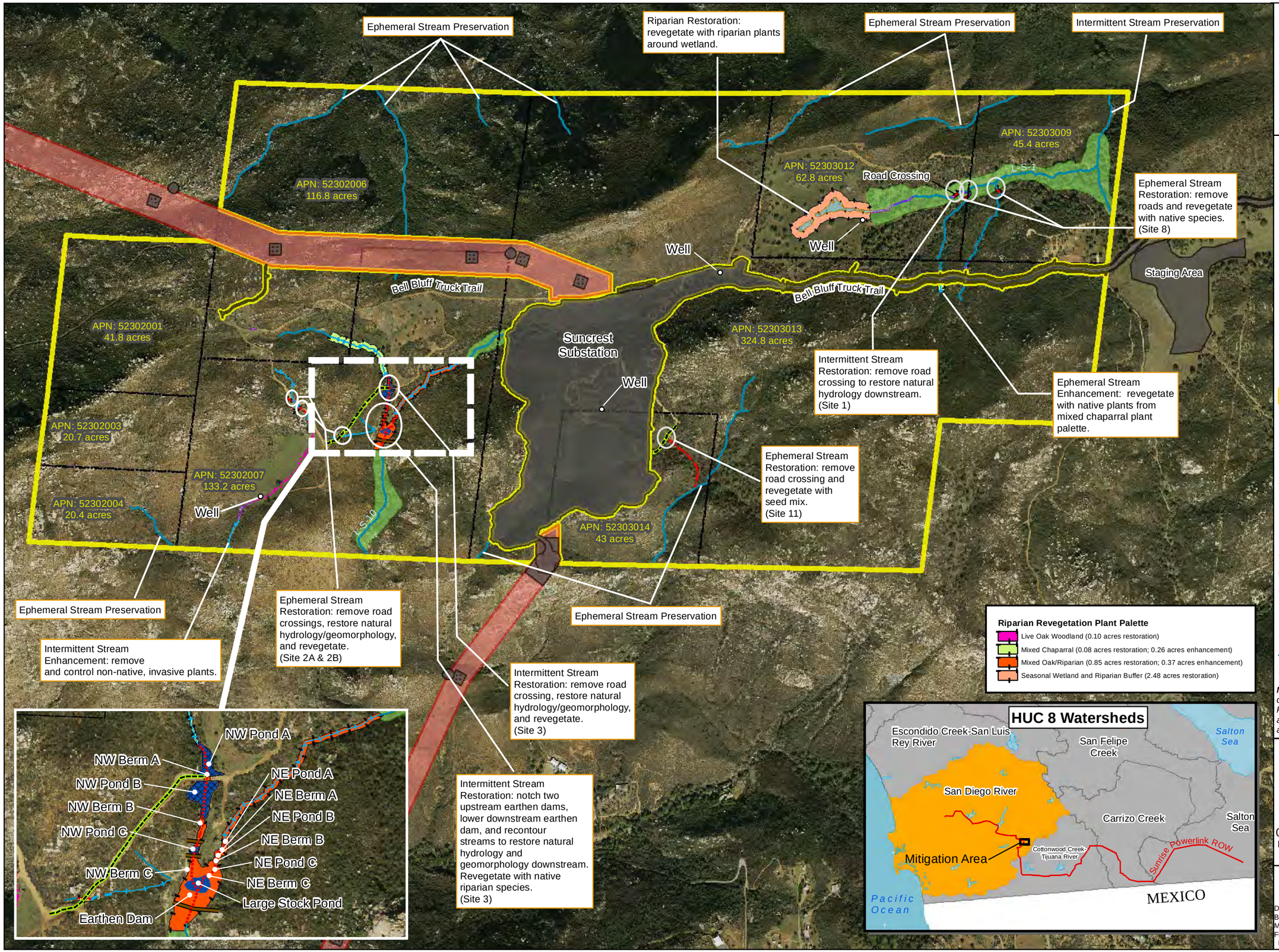

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Figure 6.

Mitigation Activity at the Lightner Mitigation Site

Legend

- Preservation Boundary
- Parcel Boundary
- Sunrise Powerlink ROW
- Construction Impact Area
- Preserved Riparian Habitat (15.83 acres)
- Enhanced Wetlands (0.63 acres)
- Preserved Wetlands (0.20 acres)
- Man-made Pond (to be removed)
- Man-made Pond (to be enhanced)
- Dirt Roads (to be removed)
- Earthen Dams/Berms (to be removed)
- Non-defined Channel

Streams

Mitigation Action:

- Enhancement (0.09 ac.; 2,751 ln. ft.)
- Preservation (0.55 ac.; 17,117 ln. ft.)
- Restoration (0.04 ac.; 1,117 ln. ft.)

Note: *Stream and Riparian acreage calcuations do not include areas within the Sunrise Powerlink ROW or Construction Impact Areas. Stream acreages are based on OHWM width. Riparian areas are based on CDFG riparian dripline.*

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0 400 800 1,600
Feet

Date: November 2010
Base Source: NAIP, 2005; San Diego County
Map By: Derek Chan
Filepath: L:\Acad 2000 Files\17000\17128-3\GIS\ArcMap\Mitigation\Lightner\Lightner_Mitigation_20101119.mxd

Buffer & Landscape Context

Following mitigation activities at the Lightner site, the Buffer Condition submetric score for streams L-S-1 and L-S-10 are expected to increase from a "B" to an "A." This increase would be due decommissioning of access roads, planting with native species, and other vegetation management activities. This improvement would cause the Buffer & Landscape Context score for both streams to increase from a 93.3% to a 100.0%.

The Buffer & Landscape Context score for wetland L-W-2 is not expected to change following mitigation actions because the percentage of surrounding areas containing wetland habitat will not change.

Hydrology

Stream L-S-10 will have its natural hydrology partially restored at the Lightner Mitigation Site. The large dam immediately upstream of the L-S-10 AA will be lowered, allowing the pond to remain for wildlife habitat, but permitting surface flow over a restored spillway during the rainy season. The dam will not be actively managed to control hydrology, although it will continue to impound a portion of the stream's flow for the foreseeable future. Smaller dams upstream will also be notched, allowing more natural flow in these areas and retaining the wetland habitat behind the dams. Thus, L-S-10 will receive a "B" for the Water Source Metric under future conditions, improving this AA's Hydrology attribute score from an 83.3% to a 91.7%.

Stream L-S-1 and wetland L-W-2 received scores of 100.0% under existing conditions and are not anticipated to change in the future.

Physical Structure

Mitigation AAs at the Lightner Mitigation Site assessed using CRAM are not anticipated to improve their scores for the Physical Structure attribute by the end of the 5-year period projected for this study. As discussed in Section 2.4.5 of the Conceptual HMMP (WRA 2010b), low-order streams and seasonal wetlands such as those on the Lightner Mitigation Site have a higher likelihood of scoring low on structure attributes. Thus, the low scores at the Lightner mitigation AAs may reflect normal conditions for such streams and wetlands, and are not anticipated to improve within 5 years of mitigation implementation. However, mitigation actions could contribute to increases in CRAM score for the Physical Structure attribute over a longer period of time.

All three mitigation AAs assessed at the Lightner Mitigation Site have potential to improve their Physical Structure CRAM scores beyond the 5-year monitoring period. Revegetation could contribute to higher scores at stream L-S-1 and wetland L-W-2, with vegetation contributing to an increase in Topographic Complexity and potentially adding such patch types as standing snags, plant hummocks, and abundant wrackline. After natural hydrology is restored to stream L-S-10 following dam removal, a similar increase in patch types may occur, including bank slumps, point bars, plant hummocks, and other features. The CRAM score for Topographic Complexity may also increase for stream L-S-10 once natural hydrology is restored. A stream cross-section with two or more benches and abundant microtopography is considered to have ideal Topographic Complexity according to CRAM, and these features may develop in stream L-S-10 over the long term once natural hydrology is restored.

Biotic Structure

Scores for the Biotic Structure attribute are not expected to change for the two assessed streams on the Lightner Mitigation Site following mitigation activities. These areas already have healthy communities of mostly native vegetation, and major revegetation actions are not proposed in these areas.

The Biotic Structure score for wetland L-W-2 is expected to increase from a 66.7% to an 83.3%, in response to the planting of the surrounding area with native riparian plants (Section 7.1.3; Figure 6). A portion of these plants will be planted within the AA. It was assumed that the benefits of the planting should be sufficient to raise the CRAM score by one letter grade in applicable areas, including Number of Co-dominant Species, Number of Plant Layers, and Horizontal Interspersion. Percent Invasion was also raised by one letter grade, as vegetation management and increased native cover should result in lower prevalence of invasive species. While Biotic Structure scores for L-W-2 were projected to have modest increases at the end of the 5-year monitoring period, all Biotic Structure metrics have the potential to increase to an "A" over a longer period of time, as plantings continue to grow and long-term management actions are performed at the Lightner Mitigation Site.

5.3.3 Conclusions of CRAM Functional Assessment for Mitigation at the Lightner Mitigation Site

Mitigation activities for SRPL should provide improvements in the same areas of functional capacity that are likely to be impacted by the Project, as reflected in CRAM scores. Comparing existing CRAM scores to projected scores, it is possible to consider the nature and magnitude of likely improvements to functional capacity at the Lightner mitigation sites. Average CRAM scores for the Lightner Mitigation Site are summarized in Table 6 and detailed in Table 7. Raw CRAM scores are presented in Appendix A, and further information on the CRAM assessments can be found in Appendix B of the Conceptual HMMP (WRA 2010b).

Table 6. Average CRAM Attribute and Overall Scores for Proposed Mitigation Sites at the Lightner Mitigation Site.

	STREAMS			**DEPRESSIONAL WETLAND**		
CRAM Index and Attributes	Existing (Baseline) Mean Scores	Projected Post-Project Mean Scores	Projected Increase Following Mitigation Implementation (percentage points)	Existing (Base-line) Mean Scores	Projected Post-Project Mean Scores	Projected Increase Following Mitigation Implementation (percentage points)
Overall Index Score	79.9%	82.6%	2.7	68.9%	73.1%	4.2
Landscape Context	93.3%	100.0%	6.7	71.6%	71.6%	0
Hydrology	91.7%	95.8%	4.2	100.0%	100.0%	0
Physical Structure	50.0%	50.0%	0	37.5%	37.5%	0
Biotic Structure	84.7%	84.7%	0	66.7%	83.3%	16.7

All CRAM attributes at impact sites are projected to have some level of decrease as a result of the Project, but the largest impacts would be in the areas of Hydrology and Buffer & Landscape Context (Table 4). Mitigation actions at the Lightner Mitigation Site should allow improvements in the areas of Buffer & Landscape Context, Hydrology, and Biotic Structure that are apparent

Table 7. Average CRAM Scores for Mitigation Sites at the Lightner Mitigation Site.

	Average Intermittent Stream Scores				Depresional Wetland Scores			
CRAM Projection	**Original Avg. Scores**	**Projected Average Scores**	**Impact delta**	**Percent Increase**	**Original Avg. Scores**	**Projected Average Scores**	**Impact delta**	**Percent Increase**
Buffer and Landscape Connectivity								
Landscape Connectivity	12.0	12.0	0.0	0.0%	12.0	12.0	0.0	0.0%
% of AA with Buffer	12.0	12.0	0.0	0.0%	9.0	9.0	0.0	0.0%
Average Buffer Width	12.0	12.0	0.0	0.0%	0.6	0.6	0.0	0.0%
Buffer Condition	9.0	12.0	3.0	33.3%	12.0	12.0	0.0	0.0%
Raw Score	22.4	24.0	1.6	7.2%	17.2	17.2	0.0	0.0%
Final Score	93.3	100.0	6.7	7.2%	71.6	71.6	0.0	0.0%
Hydrology								
Water Source	9.0	10.5	1.5	16.7%	12.0	12.0	0.0	0.0%
Hydroperiod/Channel Stability	12.0	12.0	0.0	0.0%	12.0	12.0	0.0	0.0%
Hydrologic Connectivity	12.0	12.0	0.0	0.0%	12.0	12.0	0.0	0.0%
Raw Score	33.0	34.5	1.5	4.5%	36.0	36.0	0.0	0.0%
Final Score	91.7	95.8	4.2	4.5%	100.0	100.0	0.0	0.0%
Physical Structure								
Structural Patch Richness	6.0	6.0	0.0	0.0%	6.0	6.0	0.0	0.0%
Topographic Complexity	6.0	6.0	0.0	0.0%	3.0	3.0	0.0	0.0%
Raw Score	12.0	12.0	0.0	0.0%	9.0	9.0	0.0	0.0%
Final Score	50.0	50.0	0.0	0.0%	37.5	37.5	0.0	0.0%
Biotic Structure								
PC: No. of plant layers	12.0	12.0	0.0	0.0%	6.0	9.0	3.0	50.0%
PC: No. of condominants	7.5	7.5	0.0	0.0%	3.0	6.0	3.0	100.0%
PC: Percent Invasion	9.0	9.0	0.0	0.0%	9.0	12.0	3.0	33.3%
Horizontal Interspersion/Zonation	9.0	9.0	0.0	0.0%	6.0	9.0	3.0	50.0%
Vertical Biotic Structure	12.0	12.0	0.0	0.0%	12.0	12.0	0.0	0.0%
Raw Score	30.5	30.5	0.0	0.0%	24.0	30.0	6.0	25.0%
Final Score	84.7	84.7	0.0	0.0%	66.7	83.3	16.7	25.0%
Overall AA Score	79.9	82.6	2.7	2.9%	68.9	73.1	4.2	6.3%

within 5 years of mitigation implementation. In addition, there is a high potential for further increases in stream and wetland condition leading to increases in CRAM scores, particularly in the areas of Physical and Biotic Structure. However, indicators that would allow a higher CRAM score for these attributes may take longer to develop than the 5-year period discussed in this report.

As seen in Figure 7, stream mitigation actions at the Lightner Mitigation Site will contribute to improvements of a similar nature and magnitude to stream impacts along the ROW. Intermittent streams on the Lightner Mitigation Site, in particular, are projected to have sizeable average increases in CRAM score for the Buffer & Landscape Context and Hydrology attributes.

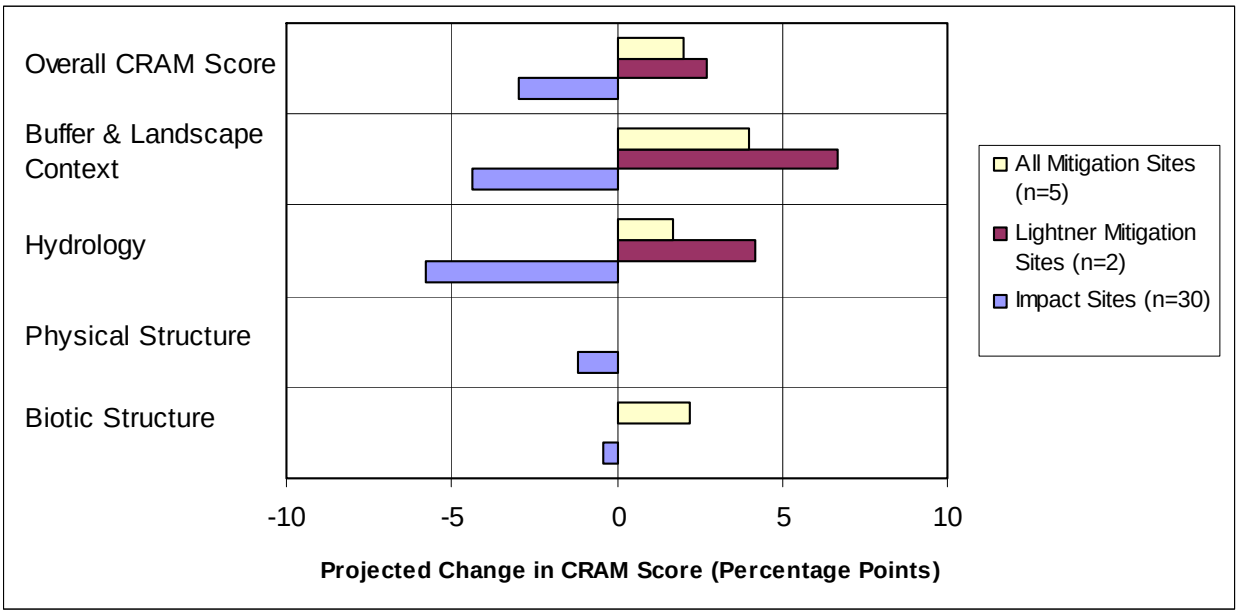


Figure 7. Projected Average Changes in CRAM Score at Stream Impact Sites and Stream Mitigation Sites 5 Years after Mitigation Implementation

The proposed restoration of native vegetation around the depressional wetland at the Lightner Mitigation Site is projected to result in a substantial increase in the CRAM score for the Biotic Structure attribute. This increase in wetland condition, though not directly comparable to riverine scores (Section 5.2.1), would nonetheless be beneficial to its watershed in many areas. In addition to improving habitat for wildlife and other forms of life, plants strongly influence the quantity, quality, and spatial distribution of water and sediment within wetlands, and also provide a primary source of essential nutrients through plant detritus (Collins *et al.* 2008a). Mitigation actions that enhance this area of wetland function therefore enhance the habitat value of both the Lightner Mitigation Site and the Upper Sweetwater watershed.

In conclusion, CRAM provides a basis for comparing impacts along the SRPL ROW to proposed mitigation actions. The proposed actions at the Lightner Mitigation Site contribute to the overall mitigation package to compensate for the areas of functionality that are impaired by the SRPL project. These mitigation actions taking place at the Lightner Mitigation Site, in combination with other mitigation sites, demonstrate more than adequate compensation for impacts to jurisdictional areas occurring as a result of the SRPL project.

6.0 DETERMINATION OF CREDITS

The Lightner Mitigation Site contains several habitat types which will contribute to the overall mitigation acreage contained in the five mitigation properties. Within this mitigation site, compensation for permanent impacts to ephemeral and intermittent streams, wetlands, and riparian habitat will be provided. Mitigation acreages and credits are discussed in more detail in the following sections.

6.1 Mitigation Credits within the Lightner Mitigation Site

The Lightner Mitigation Site provides 15% of the total SRPL mitigation acreage for intermittent and ephemeral streams, 4% of the project mitigation for wetlands, and 42% of the project mitigation for riparian habitat. Additional credits for these habitat types are provided by the Long Potrero, Chocolate Canyon, and Suckle mitigation sites. A summary of mitigation acres provided by the Lightner Mitigation Site is presented in Table 8 below. A summary of collective mitigation acres provided by the entire mitigation program at all five sites is presented in Section 6.2.

Table 8. Summary of Sunrise Powerlink Aquatic Resource Mitigation at the Lightner Mitigation Site

Site	Resource Type	Mitigation Area [acres; linear feet (l.f.) for streams]			
		Preservation	Enhancement	Restoration	Total
Lightner Mitigation Site	Intermittent and Ephemeral Streams	0.55 (16,310)	0.09 (3,558)	0.04 (1,117)	0.68 (20,985)
	Wetlands	0.20	0.63	-	0.83
	Riparian	15.83	0.63	3.43	19.89
Totals		**16.58**	**1.35**	**3.47**	**21.40**

6.2 Summary of Mitigation Credits for Entire Mitigation Program at all Sites

A summary of total mitigation for permanent and temporary impacts for each resource type is detailed in Table 9 for WOUS and in Table 10 for WOS. In addition, a summary of mitigation activities at each mitigation site for the SRPL project is contained in Table 11. On an acreage basis, the SRPL project provides more than adequate mitigation to compensate for unavoidable permanent impacts to jurisdictional areas. In addition, enhancement and restoration activities at four of the five mitigation sites will increase the functions and services provided by jurisdictional areas at the mitigation sites. Cumulatively, this provides ample mitigation to compensate for reduced functions and services in temporarily and permanently impacted jurisdictional areas.

Proposed mitigation activities for SRPL will provide improvements in the same areas of functional capacity that are likely to be impacted by the Project. Overall, the average projected decrease of 3 CRAM percentage points at stream impact sites will be offset by an average increase of 2 percentage points at stream mitigation sites at the end of the 5-year monitoring period, together with restoration, enhancement, and preservation of these areas at a cumulative 35:1 ratio by acreage for permanent impacts and 2:1 ratio for temporary impacts. CRAM scores for the Physical Structure and Biotic Structure attributes are likely to increase as the habitat areas develop over the long term, thus raising average overall CRAM scores further than are indicated herein for the term of the 5 year monitoring program.

Projected CRAM data at mitigation sites is intended to serve as a guide for comparison of mitigation and impacts, and should not be directly applied to mitigation ratios. The results of multiplying CRAM score by any dimension of size, such as wetland area, length, or perimeter, might distort the scaling of some metrics, weight the values of other metrics in unintended ways, and thus lead to erroneous results (CWMW 2009). Furthermore, areas of habitat preservation were not included in the CRAM analyses, but are valuable in maintaining the overall condition of their watersheds and protecting the mitigation jurisdictional features from negative external stressors such as edge effects.

Table 9. Summary of Total Mitigation for Permanent and Temporary Impacts per Resource Type (based on OHWM)

Resource Type		Temporary Impacts		On-Site Mitigation (acres)	Permanent Impacts	Offsite Mitigation (acres)			TOTAL MITIGATION (acres)
		Impact (acres)	Mitigation Ratio		Impact (acres)	Preservation	Enhancement	Restoration	
Desert Dry Washes		6.53	1:1	6.53	2.45	84.13 (DC)	(DC)	(DC)	**98.13**
						3.43 (S)	4.04 (S)	(S)	
						(LP)	(LP)	(LP)	
						(L)	(L)	(L)	
						(CC)	(CC)	(CC)	
					Subtotal	**87.56**	**4.04**	**-**	
Other Streams		0.55	1:1	0.55	0.35	(DC)	(DC)	(DC)	**4.94**
						(S)	(S)	(S)	
						1.39 (LP)	0.96 (LP)	(LP)	
						0.55 (L)	0.09 (L)	0.04 (L)	
						0.28 (CC)	1.08 (CC)	(CC)	
					Subtotal	**2.21**	**2.14**	**0.04**	
Wetlands		0	2:1	0	0.08	(DC)	(DC)	(DC)	**18.63**
						(S)	0.88 (S)	(S)	
						9.92 (LP)	5.99 (LP)	(LP)	
						0.20 (L)	0.63 (L)	(L)	
						0.99 (CC)	0.02 (CC)	(CC)	
					Subtotal	**11.11**	**7.52**	**-**	

Abbreviations for Mitigation Sites:
DC= Desert Cahuilla Mitigation Site
S= Suckle Mitigation Site
LP= Long Potrero Mitigation Site
L= Lightner Mitigation Site
CC= Chocolate Canyon Mitigation Site

Table 10. Summary of Total Mitigation for Permanent and Temporary Impacts per Resource Type (based on TOB)

Resource Type	Temporary Impacts		On-Site Mitigation (acres)	Permanent Impacts	Offsite Mitigation (acres)			TOTAL MITIGATION (Onsite and Offsite acres)
	Impact (acres)	Ratio		Impact (acres)	Preservation	Enhancement	Restoration	
Desert Dry Washes	7.30	1:1	7.22	2.72	84.13 (DC)	(DC)	(DC)	**98.90**
					3.43 (S)	4.04 (S)	(S)	
					(LP)	(LP)	(LP)	
					(L)	(L)	(L)	
					(CC)	(CC)	(CC)	
				Subtotal	**87.56**	**4.04**	**-**	
Streams with No Riparian Vegetation	0.91	1:1	0.97	0.37	(DC)	(DC)	(DC)	**5.30**
					(S)	(S)	(S)	
					1.39 (LP)	0.96 (LP)	(LP)	
					0.55 (L)	0.09 (L)	0.04 (L)	
					0.28 (CC)	1.08 (CC)	(CC)	
				Subtotal	**2.21**	**2.14**	**0.04**	
Streams with Riparian Vegetation[2]	0	2:1 or 3:1	0.02 or 0.03	2.34	(DC)	(DC)	(DC)	**47.01**
					(S)	(S)	(S)	
					12.62 (LP)	3.95 (LP)	(LP)	
					15.83 (L)	0.63 (L)	3.43 (L)	
					10.25 (CC)	0.30 (CC)	(CC)	
				Subtotal	**38.70**	**4.88**	**3.43**	
Wetlands	0	2:1	0	0.08	(DC)	(DC)	(DC)	**18.63**
					(S)	0.88 (S)	(S)	
					9.92 (LP)	5.99 (LP)	(LP)	
					0.20 (L)	0.63 (L)	(L)	
					0.99 (CC)	0.02 (CC)	(CC)	
				Subtotal	**11.11**	**7.52**	**-**	

Abbreviations for Mitigation Sites:
DC= Desert Cahuilla Mitigation Site
S= Suckle Mitigation Site
LP= Long Potrero Mitigation Site
L= Lightner Mitigation Site
CC= Chocolate Canyon Mitigation Site

[2] Mitigation acreages for SRV's are referred to on figures and in text as "Riparian Habitat" preservation, enhancement, and restoration.

Table 11. Summary of Sunrise Powerlink Aquatic Resource Mitigation

Site	Resource Type	Mitigation Area [acres; linear feet (l.f.) for streams]			
		Preservation	**Enhancement**	**Restoration**	**Total**
Desert Cahuilla	Desert Dry Washes	84.13 (24,400)			84.13 (24,400)
	Streams				
	Wetlands				
	Riparian				
Suckle	Desert Dry Washes	3.43 (7,000)	4.04 (4,200)		7.47 (11,200)
	Streams				
	Wetlands	0.48	0.40		0.88
	Riparian				
Lightner	Desert Dry Washes				
	Intermittent and Ephemeral Streams	0.55 (17,117)	0.09 (2,751)	0.04 (1,117)	0.68 (20,985)
	Wetlands	0.20	0.63		0.83
	Riparian	15.83	0.63	3.43	19.89
Long Potrero	Desert Dry Washes				
	Intermittent and Ephemeral Streams	1.39 (16,857)	0.96 (6,054)		2.35 (22,911)
	Wetlands	9.92	5.99		15.91
	Riparian	12.62	3.95		16.57
Chocolate Canyon	Desert Dry Washes				
	Perennial and Intermittent Streams	0.28 (9,051)	1.08 (3,162)		1.36 (12,213)
	Wetlands	0.99	0.02		1.01
	Riparian	10.25	0.30		10.55
Totals	**Desert Dry Washes**	**87.56**	**4.04**		**91.60**
	Streams	**2.22 (43,025)**	**2.13 (11,967)**	**0.04 (1,117)**	**4.39 (56,109)**
	Wetland	**11.11**	**7.52**		**18.63**
	Riparian	**38.70**	**4.88**	**3.43**	**47.01**

7.0 MITIGATION WORK PLAN

This section of the HMMP is divided into two parts. The first part provides a description of mitigation implemented for this mitigation site, with maps and tables showing acreages and locations of mitigation within the site. The second section describes implementation methods for general mitigation activities that will be performed at the mitigation site.

7.1 Activities Planned at the Mitigation Site

Preservation, restoration, and enhancement activities planned for this mitigation site are described in the following sections. Details regarding site preparation and Best Management Practices (BMPs) used throughout all of the mitigation sites are described in Section 7.2. Construction drawings for the stream restoration and riparian planting activities at the Lightner Mitigation Site are included in Appendix B, and planned mitigation activities are shown in Figure 6. Mitigation acreage within the Lightner Mitigation Site is separated by mitigation activity and presented in Table 12 below.

As described above in Section 3.0, the Lightner Mitigation Site was selected for mitigation based on a number of opportunities for restoration of natural stream hydrology and geomorphology in areas previously altered by human activities such as grazing, road construction, and pond creation. The Lightner Mitigation Site offers the opportunity to mitigate for project impacts to ephemeral and intermittent streams, wetlands, and riparian vegetation. Mitigation implementation proposed at the Lightner Mitigation Site includes:

- Preservation of streams, wetlands, and riparian habitat
- Restoration of stream and riparian habitat, including:
    - removal of abandoned roads and road/stream crossings
    - removal and alteration of dams
    - planting of native vegetation to improve vegetation diversity and structure
- Enhancement of stream, wetland, and riparian habitat, including:
    - removal of non-native, invasive plant species
    - planting of native vegetation to improve vegetation diversity and structure

Table 12. Mitigation Acreage by Mitigation Activity at the Lightner Mitigation Site

Mitigation Action	Area (acres)	Length (linear feet)
Streams		
Stream Preservation	0.55	17,117
Stream Enhancement and Preservation	0.09	2,751
Stream Restoration and Preservation	0.04	1,117
Total Streams	**0.68**	**20,985**
Wetlands		
Wetland Preservation	0.20	-
Wetland Enhancement and Preservation	0.63	-
Total Wetlands	**0.83**	**-**
Riparian		
Riparian Preservation	15.83	-
Riparian Enhancement and Preservation	0.63	-
Riparian Restoration and Preservation	3.43	-
Total Riparian	**19.89**	**-**

Descriptions of mitigation activities at the Lightner Mitigation Site have been separated into three categories: preservation, restoration, and enhancement. Descriptions are provided in the following sections, and construction drawings detailing their implementation are provided in Appendix B.

7.1.1 Preservation

A total of 0.2 acre of wetlands, 0.54 acre of ephemeral and intermittent streams, and 15.83 acres of riparian habitat within the Lightner Mitigation Site will be preserved through this mitigation action. Land use restrictions and long-term financing mechanisms will ensure that these waters and their surrounding habitats are preserved in perpetuity.

7.1.2 Restoration

Restoration activities which will take place within the Lighter Mitigation Site are described in detail below and illustrated in Figures 8 through 34. Restoration activities at this mitigation site will include the following:

- Stream Channel Restoration, including:
    - Road Crossing Removal and Stream Restoration in Northeast – Sites 1 and 8
    - Road Crossing Removal and Restoration of the Stream Channel above the Southwest Grassland – Site 2-A
    - Road Crossing Removal and Restoration of the Stream Channel West of the Stock Pond – Site 2-B
    - Road Crossing Removal and Stream Restoration East of the Substation – Site 11
    - Removal and Alteration of Dams and Associated Stream Channel Restoration – Site 3
- Riparian Restoration, including:
    - Riparian Revegetation for the Seasonal Wetland in the Northeast

7.1.2.1 Stream Channel Restoration

Stream restoration activities at the Lightner Mitigation Site include the restoration of natural stream hydrology by decommissioning dirt roads, restoration of stream channel areas currently impacted by the presence of earthen dams and culverts, and replanting restored intermittent streams with riparian vegetation and ephemeral streams with adjacent chaparral vegetation.

Road Crossing Removal and Stream Restoration in Northeast – Sites 1 and 8

As part of the mitigation plan for the Lightner Mitigation Site, the road crossing at Site 1 will be removed and the two road crossings at Site 8 will be modified to restore the natural stream hydrology and morphology of the respective stream courses. Near the northeastern corner of the mitigation site (APNs: 5230312 and 52303009), a narrow, unpaved road crosses an intermittent stream (Site 1) and two ephemeral tributaries (Site 8). These three locations are shown in Figure 8. The 18-inch diameter culvert installed along the intermittent stream beneath the road is currently blocked at Site 1, and earthen materials (silts, sands, and some boulders) at the crossing impounds water upstream, forming a seasonal pond during wet years. The stored water remains even when the culvert is cleared because the bottom elevation of the pond is lower than the base of the culvert opening. The ponded water was recently measured to be about 2 feet in maximum depth and about 500 square feet in water surface area.

As viewed in field photos taken at this road crossing (Figures 9 and 10), the channel morphology immediately upstream and downstream of the crossing can be characterized as a small (5 to 8

feet wide x 0.5 to 1-foot deep), steep (~6 percent gradient) channel, densely covered with herbaceous and wetland vegetation, with some riparian vegetation farther upstream and downstream from the road crossing. The valley bottom in this reach is somewhat confined, while the pond area is relatively wider, with upland surfaces sloping down to the active channel in a concave profile (10 to 35 percent gradient). The channel and valley bottom geometry is clearly expressed in three cross-sections that were surveyed upstream of the pond, across the pond, and downstream of the road crossing (Figure 11). The pond area and road crossing are also represented in a longitudinal profile of this reach (Figure 12), where one can see the channel drops down into the pond, which further suggests that the pond was excavated, possibly to provide road construction materials, water supply for livestock, or both.

The channel morphology and riparian vegetation characteristics along the two ephemeral streams at Site 8 are very similar to those along the intermittent stream at Site 1 (Figures 13 and 14). The key difference here is that the road crossings are not built up significantly above their respective channel bed (<2 feet high) and no culverts are present to carry flow beneath the road. It is evident that water ponds on the upstream side of these crossings, albeit at a lesser degree than at the Site 1 crossing.

At the intermittent stream road crossing (Site 1), this relatively larger stream impediment will be wholly removed, and recontouring of the stream reach upstream in the pond area will occur to restore a more constant channel and valley bottom geometry (in cross-section view) and gradient (in longitudinal profile view). The dip-section crossings at the two ephemeral stream channels (Site 8) will also be removed by digging a small pilot channel through the road at the crossing, sized appropriately to the channel geometry of the upstream and downstream stream reaches. At Site 1, road cuts that are present adjacent to the crossings will be recontoured to restore the natural upland topography and to avoid road drainage impacts to the restored stream course. Plantings along disturbed and re-contoured surfaces will stabilize slopes and minimize excessive fine sediment runoff. Overall, it is important that these streams and adjacent upland areas be restored in this recommended fashion to: (1) re-establish hydrologic connectivity through the respective stream reaches; and (2) avoid channel instabilities that could lead to differential erosion and/or sedimentation, which would likely undermine the success of the stream restoration actions.

Following the removal of road crossings in this area, streams will be revegetated with a native live oak woodland riparian plant palette within the restoration activity footprint. Planting areas are shown in Figure 6, and detailed construction drawings are presented in Appendix B. Methods to implement vegetation activities are described in Section 7.2.2, and the planting palette used in this area is presented in Table 15.

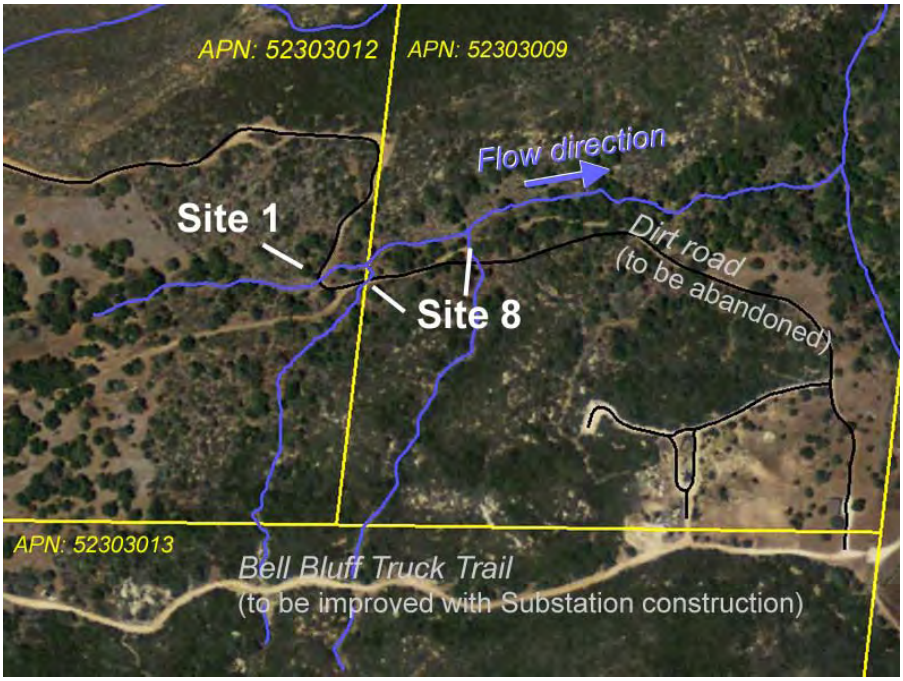
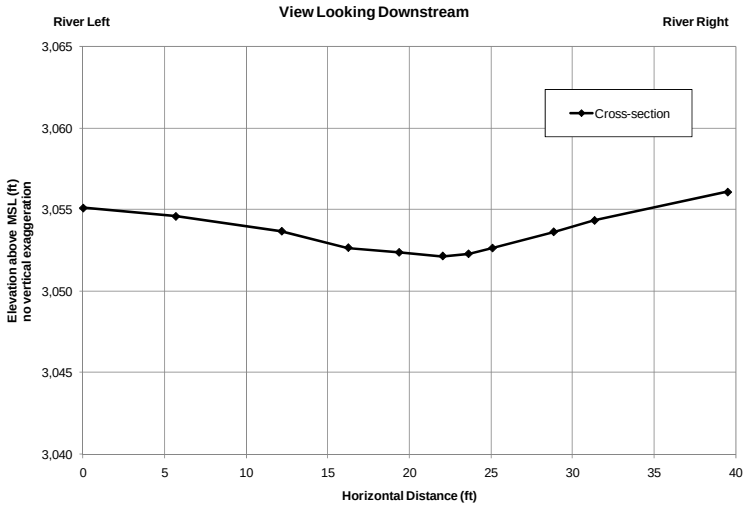


Figure 8. View of existing road crossings at Sites 1 and 8 (aerial photograph taken 25 May 2009, source: Google Earth, accessed 2010). Present day road alignment shown in black and streams shown in blue.

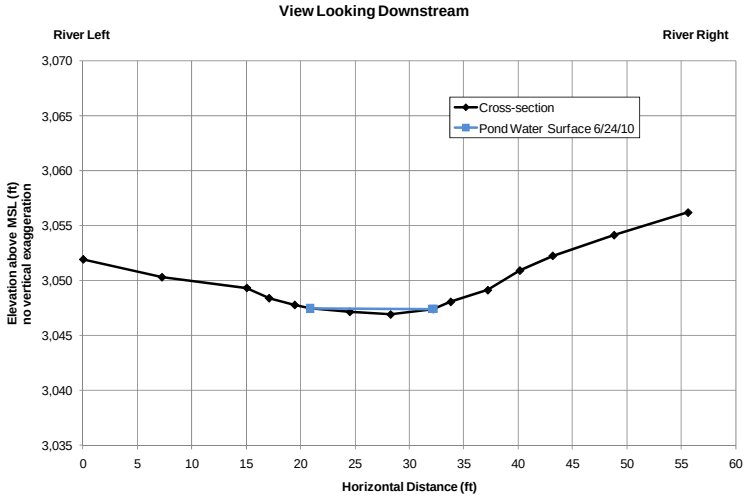
Figure 9. At Site 1 looking upstream from the road crossing at a wetland impoundment.

Figure 10. At Site 1 looking downstream from the road crossing at the downstream reach of the intermittent stream channel.

a)



b)



c)

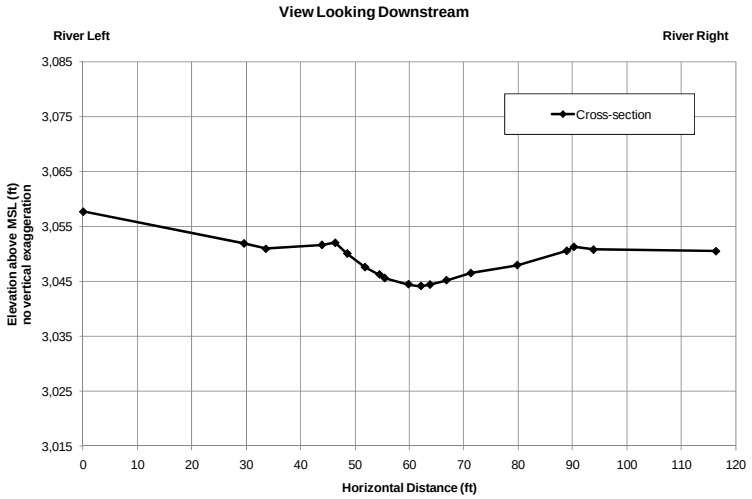


Figure 11. Cross-sections along the intermittent stream channel at Site 1: upstream of the road crossing (a), across the pond upstream of the crossing (b), and downstream of the road crossing (c).

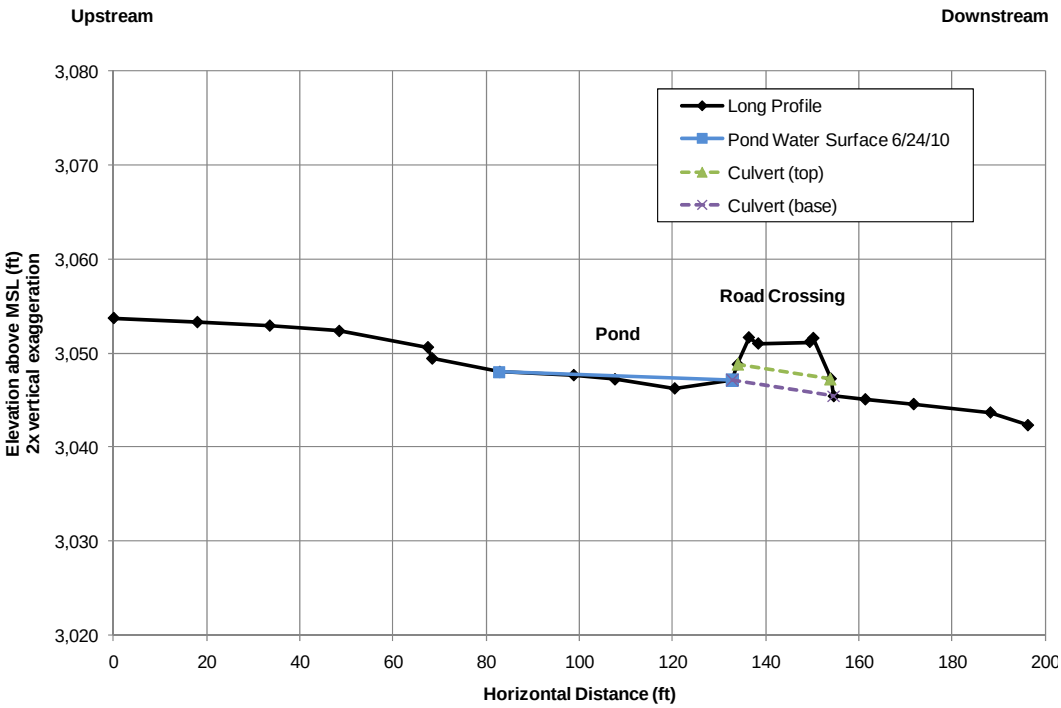


Figure 12. Longitudinal profile along the intermittent stream channel at Site 1, with flow moving downstream from left to right. The road crossing presently impounds water on its upstream side forming a seasonal pond with wetland vegetation.

Figure 13. At Site 8 looking east along the existing road at the crossing of the western ephemeral stream (flow is right to left). Note that there is minimal impoundment on the upstream side of the crossing (right side of photo) and minimal channel drop on the downstream side (left side of image).

Figure 14. At Site 8 looking east along existing road at the crossing of the eastern ephemeral stream (flow is right to left); similar morphology as the western ephemeral stream crossing (see Figure 13).

Road Crossing Removal and Restoration of the Stream Channel above the Southwest Grassland – Site 2-A

Site 2-A is located in the southwestern portion of the Lightner Mitigation Site (Figure 15), just north of a lower lying grassland area. At this site, an existing ephemeral stream has been diverted through historical construction of the roadways to flow within a roadside ditch instead of the natural stream channel. Though no historic aerial photographs were found that show the area prior to the creation of the roadway system, a series of longitudinal profiles and cross-sections surveyed in the valley bottom (Figures 16 and 17), clearly show that the natural historical stream channel lies at a lower elevation than the adjacent roadside ditches. This strongly indicates that the removal of the road crossings and filling of the ditches along the abandoned road will restore what was once a natural channel that has been altered by anthropogenic activities. This restoration will increase the total drainage area of the ephemeral stream and the amount of water conveyed by the stream.

To reconnect the western half of the natural drainage area to the historical ephemeral stream channel, the existing road will be removed nearly in its entirety. Specifically, the two road crossings shown in Figure 15 will be removed and a channel will be created through the area of the upper road crossing to reconnect the upstream and downstream historical channel reaches. Additionally, the surfaces adjacent to the crossings will be recontoured to restore a more natural topography, which will ultimately ensure that the drainage basin is effectively connected with the active stream channel. Removal of the upper road crossing will reconnect the headwaters (swale) to the active stream channel (add about 10 feet [road width] in stream length). Removal of the lower crossing will similarly add about 10 feet of restored stream. The final restoration action

will be to extend the stream channel an additional 25 to 40 feet from its existing mouth (or fan) to avoid discharging flow directly at a large, old Engelmann oak tree and the historic dwelling structures. Restoration plans are further illustrated in Figures 18 through 21, below.

Following the removal of road crossings and the restoration of stream channels in this area, streams will be revegetated with a native mixed chaparral plant palette within the restoration activity footprint. Planting areas are shown in Figure 6 and detailed construction drawings are presented in Appendix B. Methods to implement vegetation activities are described in Section 7.2.2, and the planting palette used in this area is presented in Table 16.

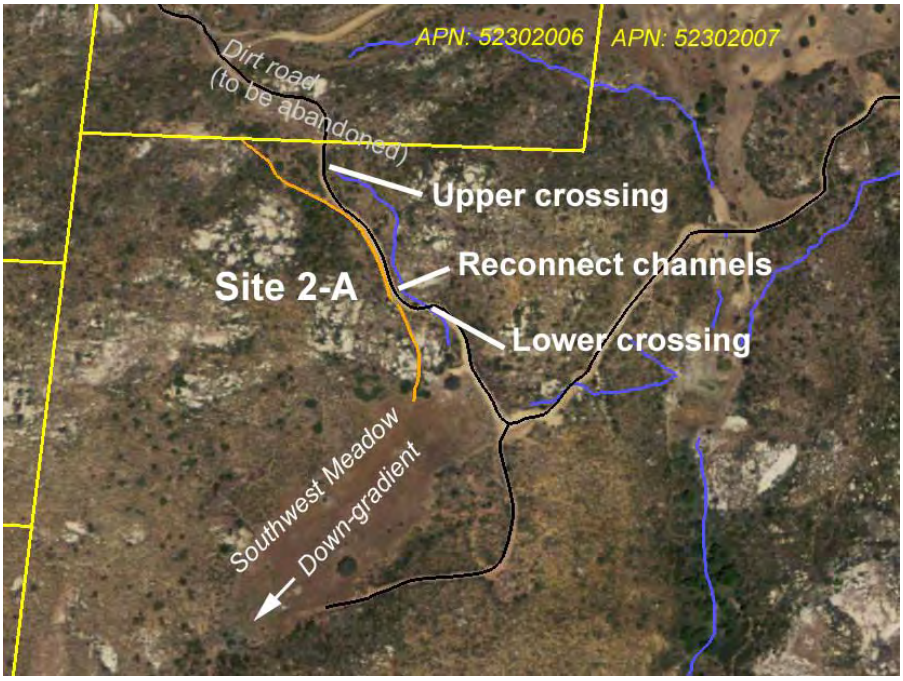


Figure 15. View of existing road crossings at Site 2-A along the stream channel that drains to the southwest grassland/meadow (aerial photograph taken 25 May 2009, source: Google Earth, accessed 2010). Present day road alignment shown in black, abandoned road and ditch shown in orange, and streams shown in blue.

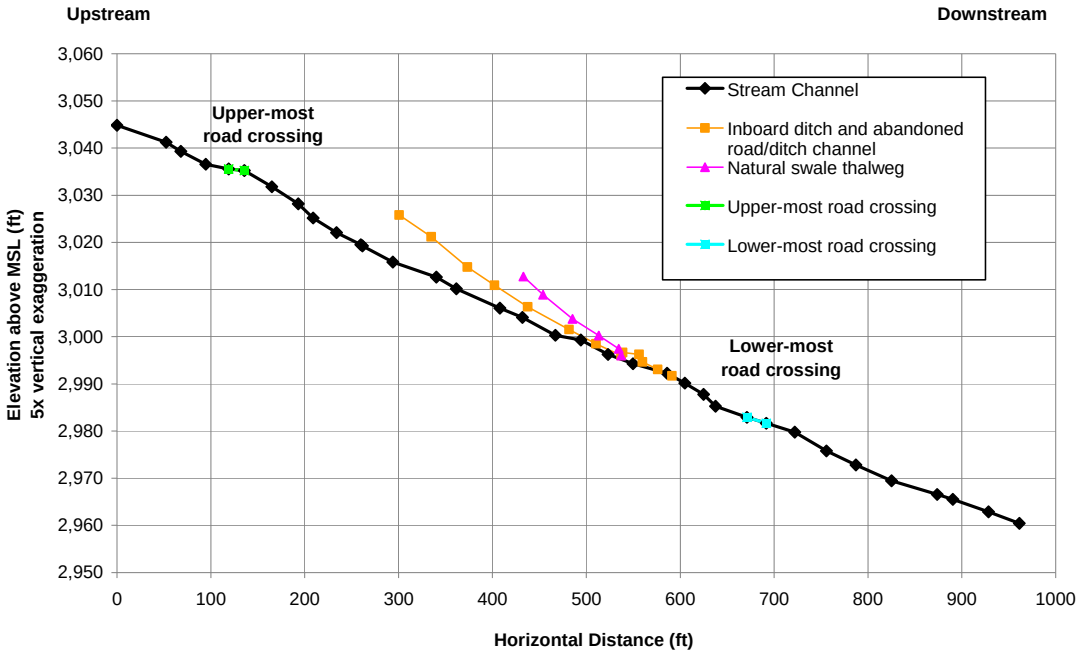
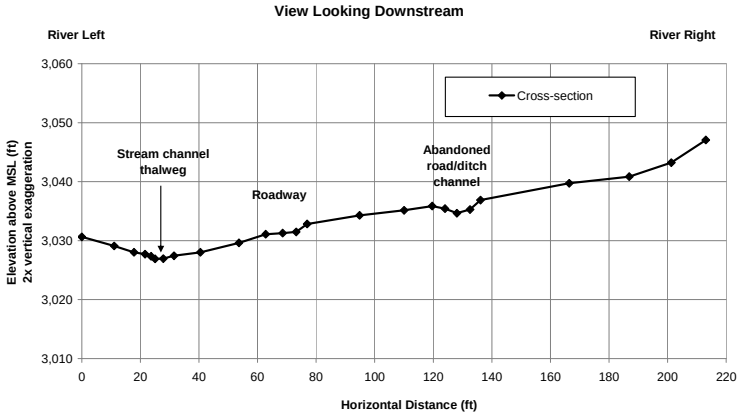
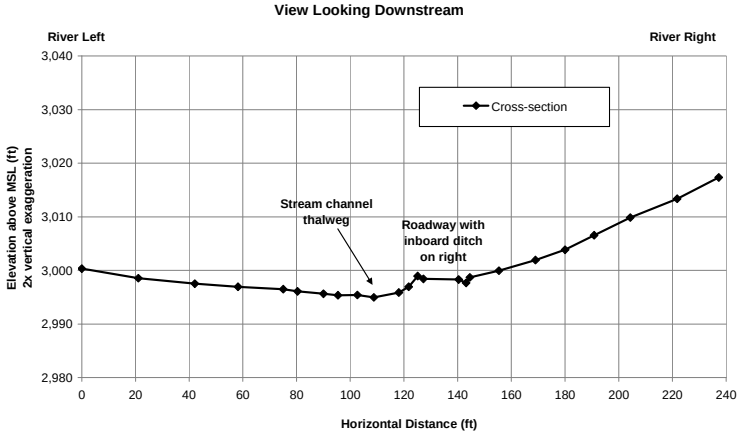


Figure 16. Longitudinal profile along the intermittent stream channel at Site 2-A, with flow moving downstream from left to right. The road crossing presently impounds water on its upstream side forming a seasonal pond with wetland vegetation.

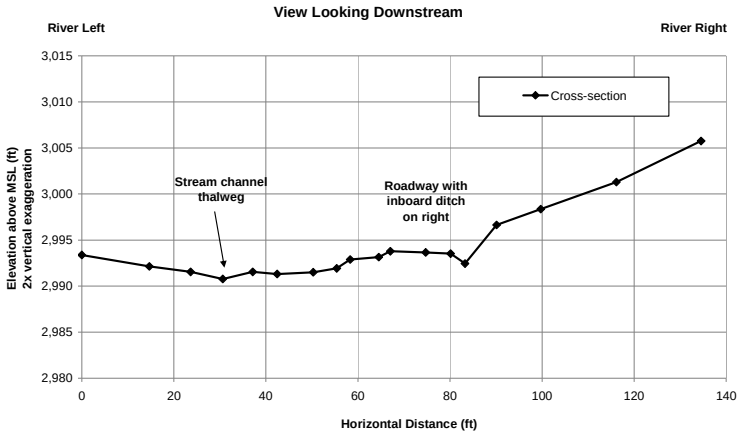
a)



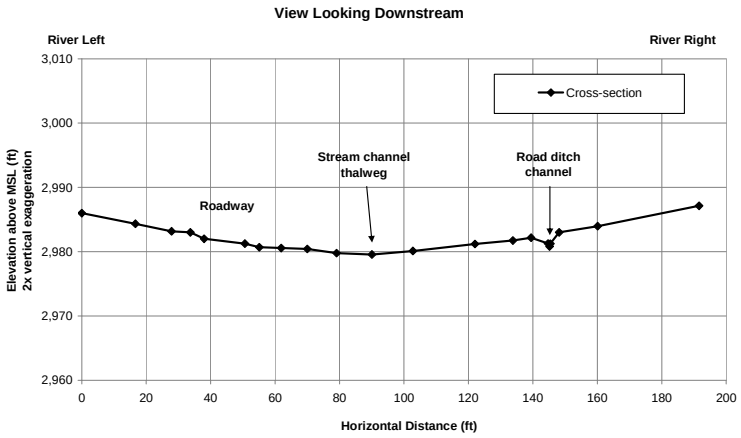
b)



c)



d)



e)

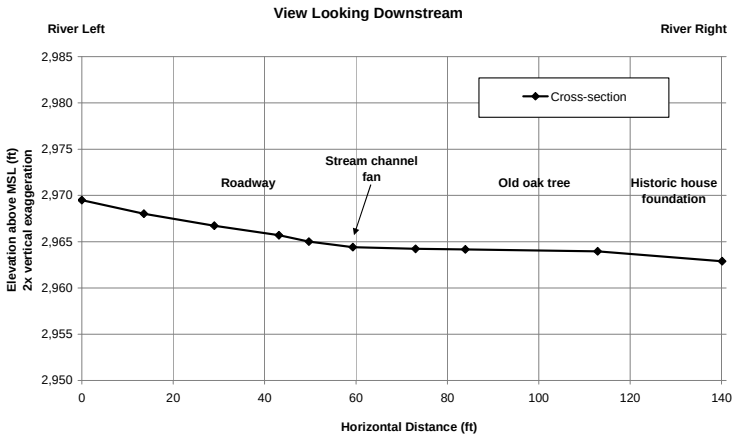


Figure 17. Cross-sections at site 2-A: upstream of the upper-most road crossing (a), upstream of the confluence with a natural ephemeral swale confluence and the proposed stream and ditch channel confluence (b), downstream of the proposed stream and ditch channel confluence (c), downstream of the lower-most road crossing (d), and across the fan of the stream channel at the upstream end of the southwestern grassland/meadow.

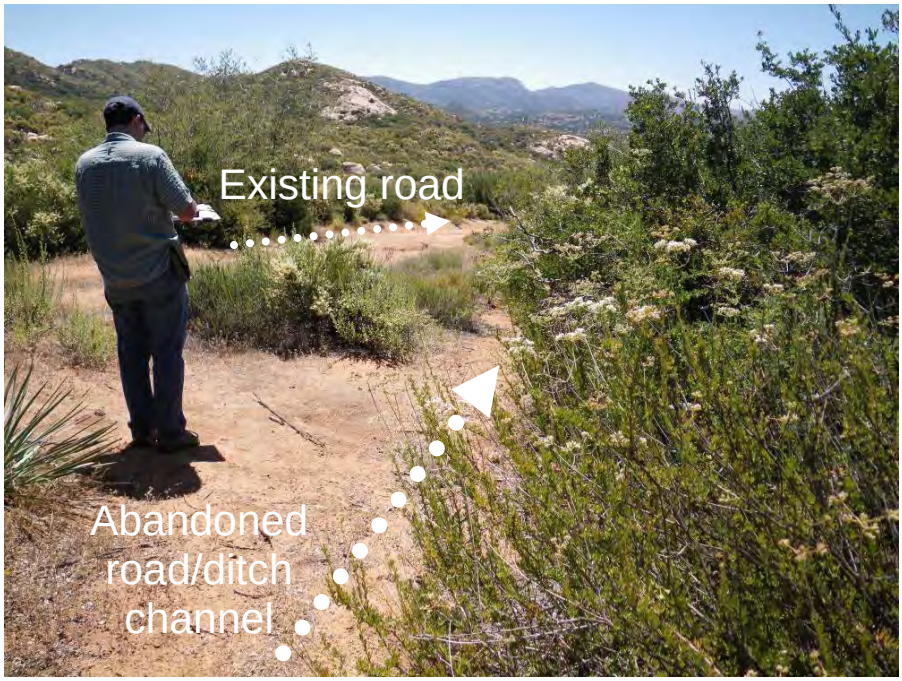


Figure 18. At Site 2-A looking downstream along abandoned road/ditch channel towards its confluence with the existing roadway. At the road, this channel continues along an inboard ditch.

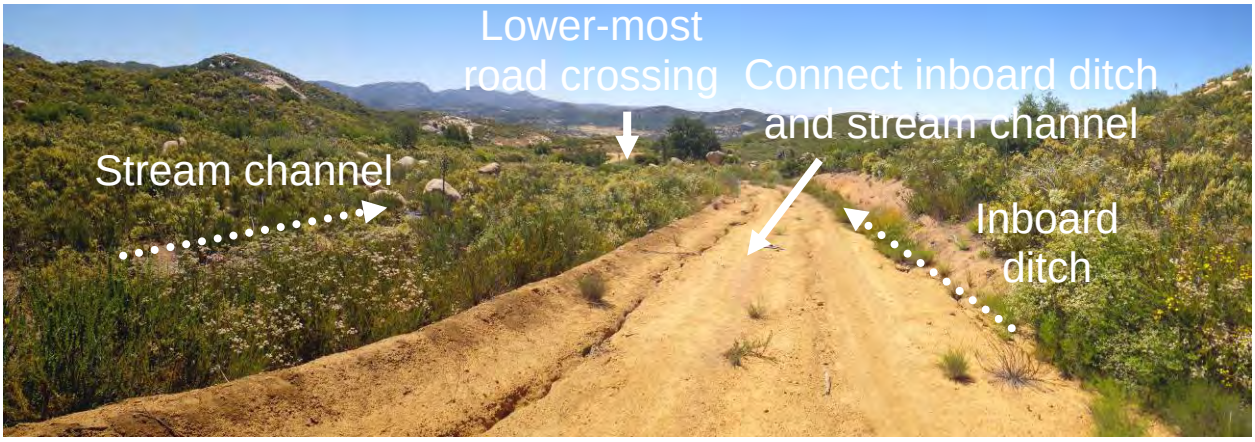


Figure 19. At Site 2-A looking down-gradient along the roadway with the stream channel running parallel to the left and an inboard ditch running on the right. The inboard ditch connects the abandoned road/ditch channel upstream to the ditch channel downstream.

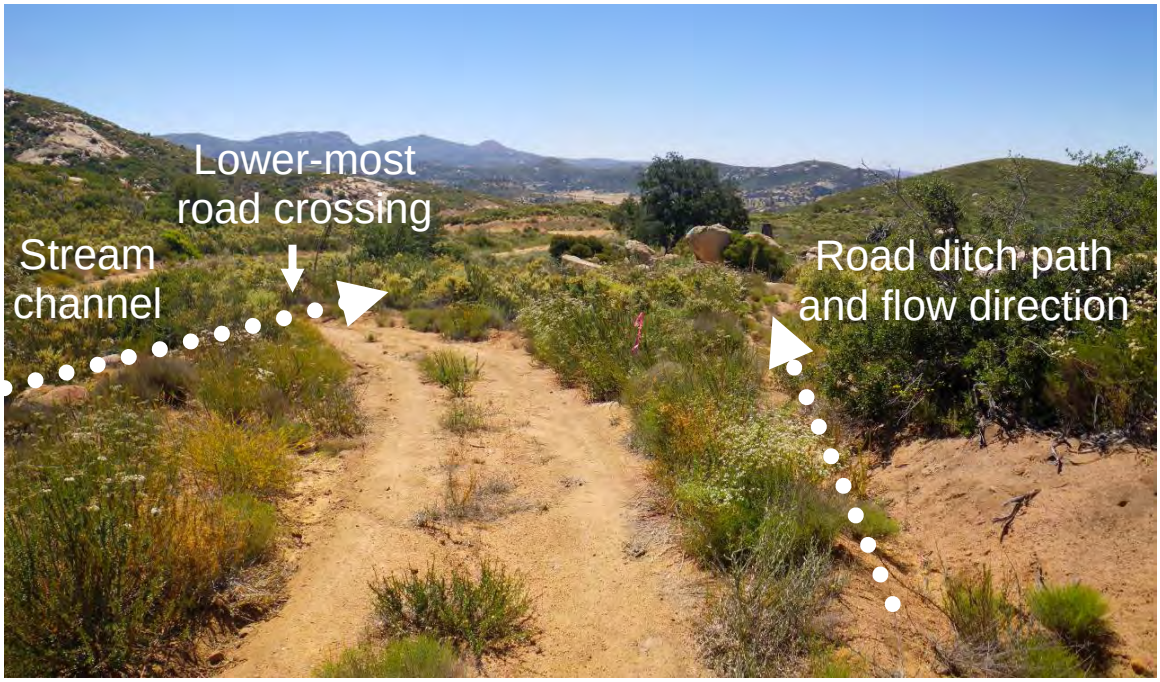


Figure 20. At Site 2-A looking down-gradient along the roadway with the inboard ditch diverting away to the right and the stream channel crossing on the left.

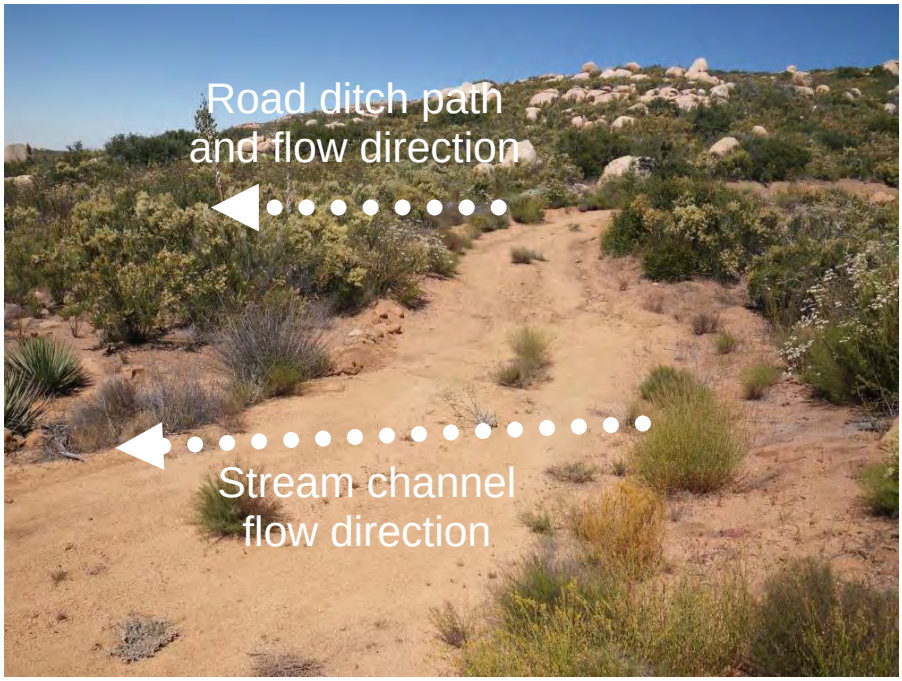


Figure 21. At Site 2-A looking at the lower-most road crossing of the stream channel that drains to the southwest grassland/meadow. The road ditch is also shown here.

Road Crossing Removal and Restoration of the Stream Channel West of the Stock Pond – Site 2-B

At site 2B, two existing road crossings will be removed, restoring natural hydrology to two ephemeral stream channels in that area (Figure 22). Both of these streams drain the same steep-sided hillside before discharging in the large stock pond. The channels are poorly defined and densely covered by chaparral, thereby making field assessments difficult. The southwestern stream channel extends above the road crossing while the northeastern stream does not currently extend above the roadway (Figures 23 and 24).

The roadway was cut into the steep hillside and a small berm (<2 feet high) lies along the outboard side. Rilling is pervasive on this road surface indicating that runoff concentrates and erodes the surface before eventually reaching a water break or cut in the road berm and flowing down-gradient to the large stock pond.

The road will be decommissioned in its entirety from the ridge line west of the two stream channels and to the northeast where it forms a small stock pond. The best approach to remove the road and ensure successful reconnection and/or enhancement of the two stream channels will be to effectively restore the natural topography. This will entail filling in the road cut sections and excavating the areas of the road that have been built above the adjacent, natural topography. Additionally, cuts will be made across the roadway to re-connect the downstream and upstream sections of the southwestern stream channel. In the restored hillside above the northeastern stream channel, the channel will be extended upslope by cutting an equally sized channel into the re-contoured surface in the area of the road. In total, this action will add approximately 25 feet of stream length and will restore and/or enhance the natural hydrology (i.e., drainage area). This action will also prevent further fine sediment erosion into the existing road surface, which likely has been accumulating down-gradient in the large stock pond.

Following the removal of road crossings and the restoration of stream channel in this area, streams will be revegetated with a native mixed chaparral plant palette within the restoration activity footprint. Planting areas are shown in Figure 6 and detailed construction drawings are presented in Appendix B. Methods to implement vegetation activities are described in Section 7.2.2, and the planting palette used in this area is presented in Table 16.

Figure 22. View of existing road crossings at Site 2-B along two ephemeral stream channels that drain eastward to the large stock pond (aerial photograph taken 25 May 2009, source: Google Earth, accessed 2010). Present day road alignment shown in black and streams shown in blue.

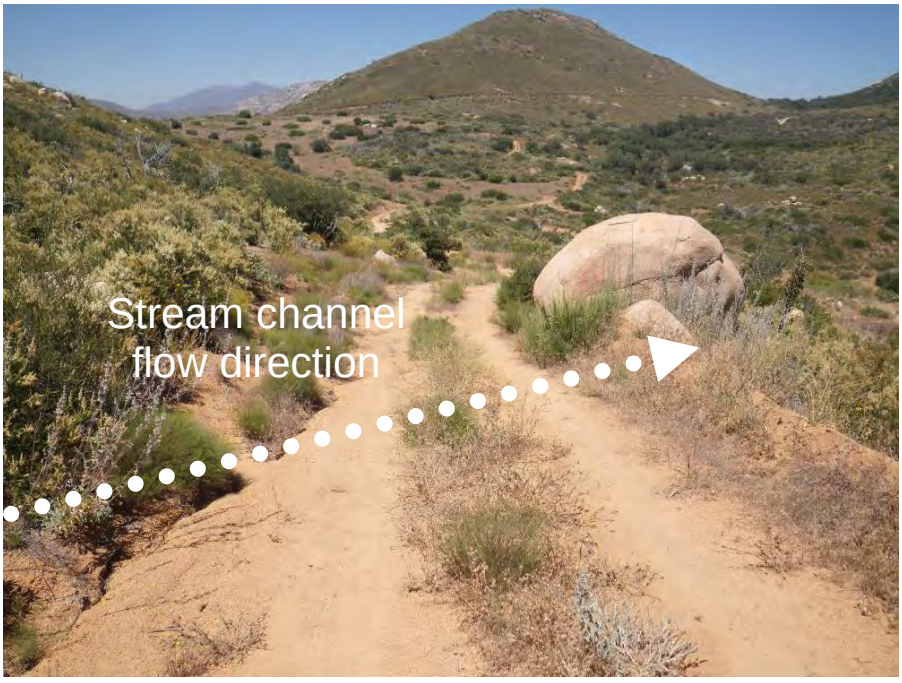


Figure 23. View of existing road crossing (southwestern stream channel) at Site 2-B. Removal of road will re-connect the upstream and downstream reaches of this ephemeral stream channel.

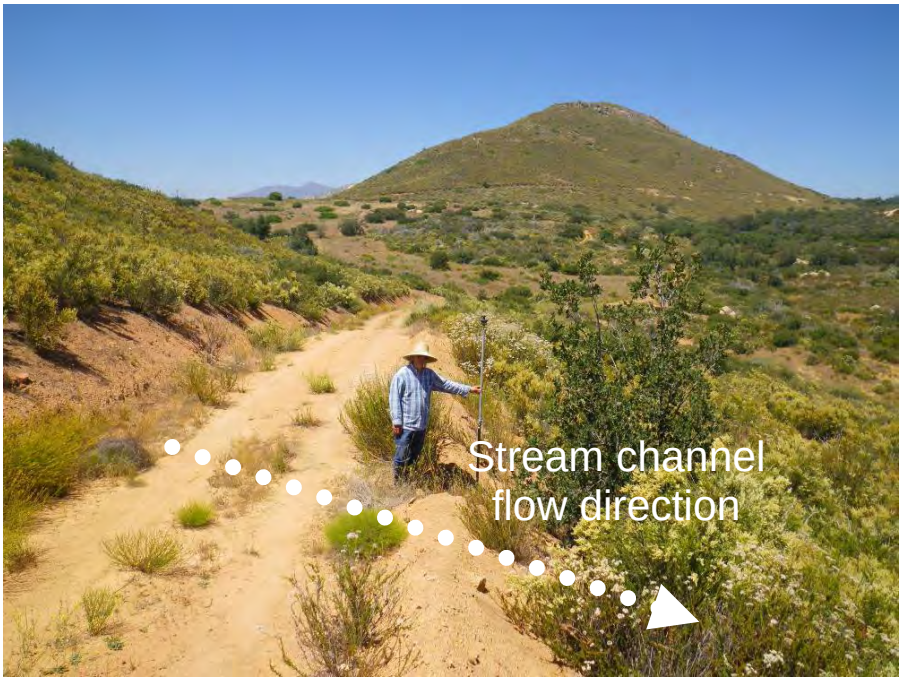


Figure 24. View of existing road crossing (northeastern stream channel) at Site 2-B. Removal of road will extend the ephemeral stream slightly farther up-gradient.

Road Crossing Removal and Stream Restoration East of the Substation – Site 11

Restoration at Site 11 consists of removing an existing roadway section that currently blocks flow from the upper watershed portion of a weakly defined ephemeral stream (Figures 25 through 27). The roadway is built up approximately 4 to 8 feet higher than the upstream headwater swale at the site of the crossing. This road intercepts runoff from the upper watershed of the ephemeral stream, cutting off the ephemeral stream from a large portion of its drainage area. A weakly defined channel is present immediately down-gradient from the crossing that is about 2-feet-wide and less than 0.5-foot-deep. This channel form continues down to the stream's confluence with another ephemeral stream channel approximately 500 feet downstream from the road crossing at Site 11.

The crossing will be completely removed within the drainage boundaries of the ephemeral stream. At the actual crossing where the road is built up, the roadway will be excavated down to the natural ground surface elevation. Ditches along the roadway will also be filled to restore natural runoff patterns that lead towards the stream channel rather than down the adjacent upland areas along the roadway as is presently occurring. This restoration action will directly increase the stream length by about 12 feet (road width) and will enhance the hydrologic connectivity between the stream and its headwaters.

Following the removal of road crossings in this area, streams will be revegetated with a native mixed chaparral plant palette and seed mix (where appropriate) within the restoration activity footprint. Planting areas are shown in Figure 6 and detailed construction drawings are presented in Appendix B. Methods to implement vegetation activities are described in Section 7.2.2, the planting palette used in this area is presented in Table 16, and the seed mix used throughout the site is shown in Table 14.

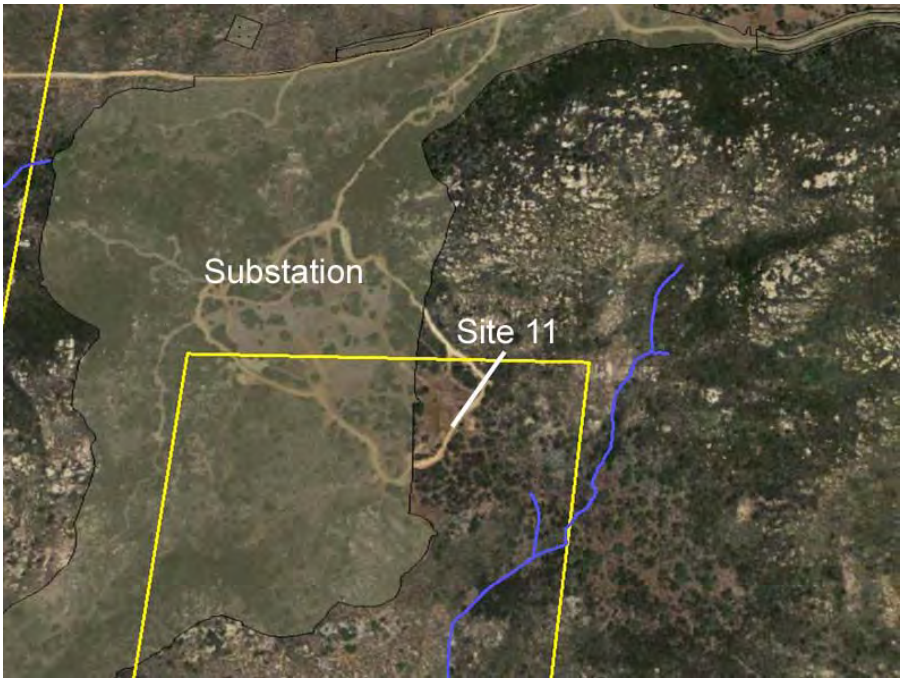


Figure 25. View of existing road crossing at Site 11 above an ephemeral stream channel and situated on the east-side of the substation (aerial photograph taken 25 May 2009, source: Google Earth, accessed 2010). Present day road-loop alignment seen in the aerial photograph and streams shown in blue. Flow direction is to the southeast from Site 11.

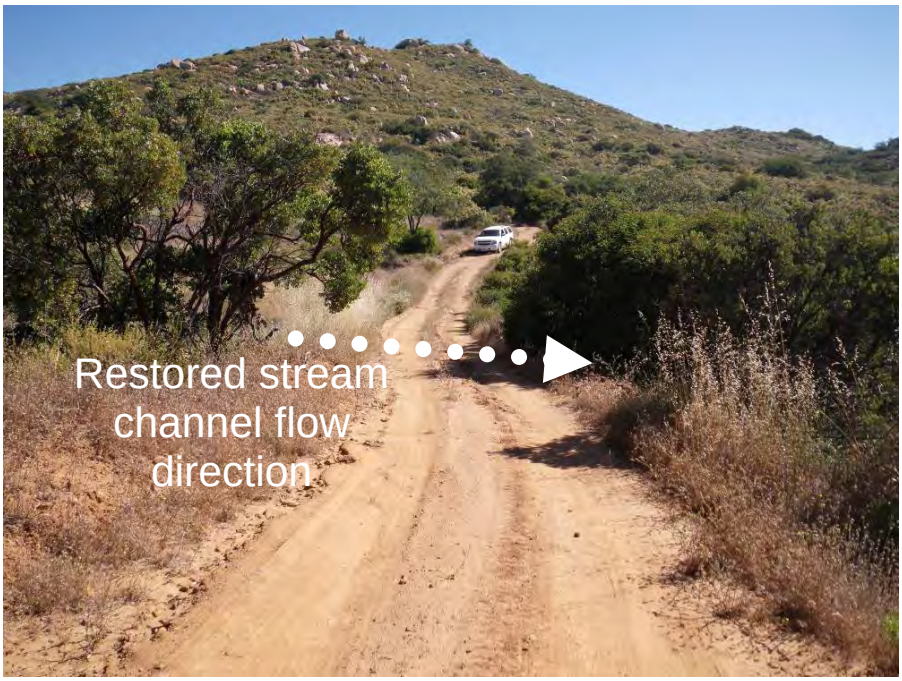


Figure 26. View of existing road crossing at Site 11. Removal of road will re-connect the upstream and downstream reaches of this ephemeral stream channel, in addition to re-focusing the headwater drainage to the stream channel.

Figure 27. View of same road crossing shown in Figure 26 at Site 11. Road cut areas will be filled to restore the natural topography surrounding the stream channel valley.

Removal and Alteration of Dams and Associated Stream Channel Restoration – Site 3

Site 3 consists of restoration of an intermittent stream channel in an area containing many berms and a dam historically created for agricultural stock ponds (Figures 28 through 30). This area receives runoff from a contributing drainage area of approximately 0.21 square miles. Two intermittent streams drain into the stock pond, referred to herein as the northwestern and northeastern stream channels (Figure 31). The northwestern stream channel is crossed by a narrow, unpaved roadway which restricts natural flow patterns in the area. The headwaters of the northeastern stream channel will be modified by the construction of the substation (see Figure 6). Both streams have three berms that each impound a stock pond.

Presently, a few of the ponds store standing water in wet years. The "wet" ponds observed in recent June 2010 surveys of the site were NW Pond C (the downstream-most pond on the northwestern stream channel) and NE Pond A (the upstream-most pond on the northeastern stream channel). The large stock pond had several feet in depth of stored water at the time of the survey. The berms, ponds, large stock pond, and dam are shown in greater detail in longitudinal profiles of the two streams and farther downstream beyond the dam (Figure 31).

The two stream channels upstream of their ponds and berms share similar characteristics, namely they have comparable drainage areas, stream gradients (~6 percent), valley morphologies, and channel geometries: bankfull width and depth of about 2 and 0.5 feet, respectively (Figures 32a, 33a. and 34). The bed and bank substrates are comprised mostly of silty sand, with rare occurrences of gravels, cobbles, and even boulders and bedrock. Dense chaparral vegetation covers much of both streams, while the northeastern stream channel supports a relatively more established riparian corridor as it is somewhat shielded to the north of a rocky butte.

Because the large stock pond supports habitat for migratory birds in the spring, this feature will remain and the stream channel will not be restored to a completely natural condition here.

However, lowering of the dam to an elevation just above the determined Ordinary High Water Mark (OHWM) elevation of about 2,860 feet above mean sea level NGVD is recommended (Figure 31). This restoration action will retain waters in the stock pond during spring while improving hydrologic connectivity between the upstream reaches and downstream of the existing dam. Additionally, the road crossing at NW Berm A will be removed completely and the previously excavated upland slopes adjacent to the historic stream channel will be filled to restore channel and valley cross-section geometries and longitudinal gradients that are consistent with those above NW Pond A (Figure 32a). This channel geometry will need to broaden as it approaches the large stock pond.

The other berms and ponds along the northwestern stream will be removed, while the berms along the northeastern stream will be notched to improve hydrological connectivity along these stream courses (Figure 31). Along the northwestern stream, the channel and valley bottom cross-section geometries and longitudinal gradients will be restored to a more natural configuration as much as possible to avoid inducing erosion and/or sedimentation processes that could negatively impact the stream's post-restoration morphologic, hydrologic, and ecologic conditions (Figure 32). The berms along the northeastern stream will be notched slightly in order to: (1) retain, in part, the seasonal, wetland ponds present; and (2) intercept any fine sediment delivered from the substation drainage outlet located upstream, which will serve to limit the amount of fine sediment reaching and accumulating within the large stock pond that will continue to support habitat for migratory birds in the spring [see Appendix D of the Conceptual HMMP (WRA 2010b)].

Following the removal/alteration of dams in this area, streams will be revegetated with a native mixed oak/riparian plant palette and a mixed chaparral plant palette within the restoration activity footprint. Planting areas are shown in Figure 6 and detailed construction drawings are presented in Appendix B. Methods to implement vegetation activities are described in Section 7.2.2, and the planting palettes used in this area are presented in Tables 16 and 17.

Figure 28. View of the large stock pond (reservoir), dam, road crossing, and northwestern and northeastern stream channels at Site 3 (aerial photograph taken 25 May 2009, source: Google Earth, accessed 2010). Present day road alignment shown in black and streams shown in blue.

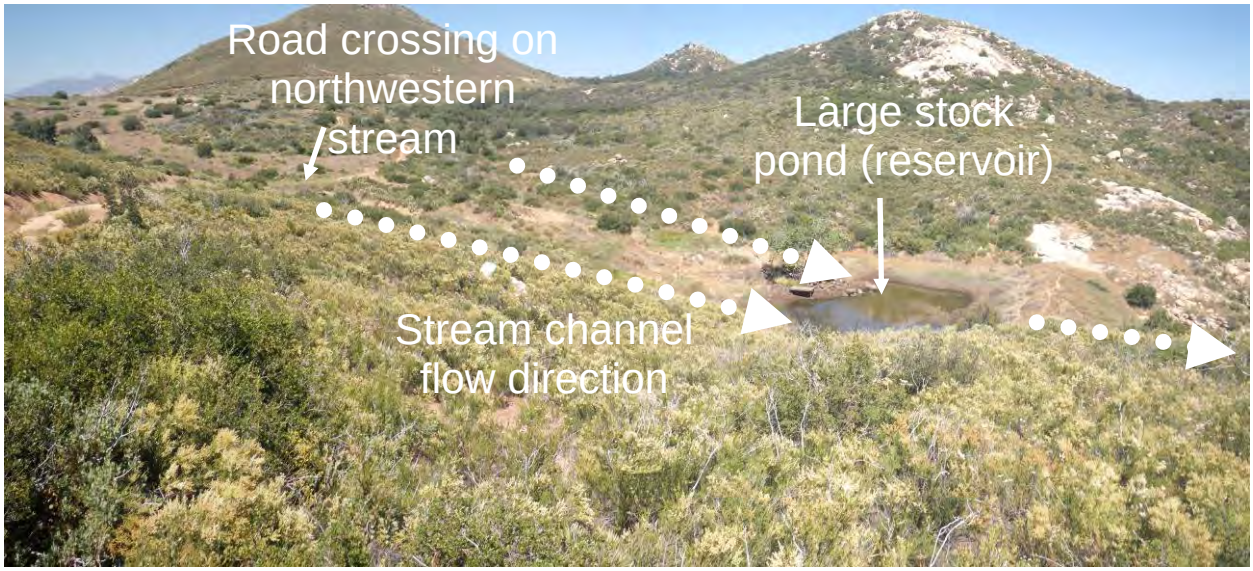
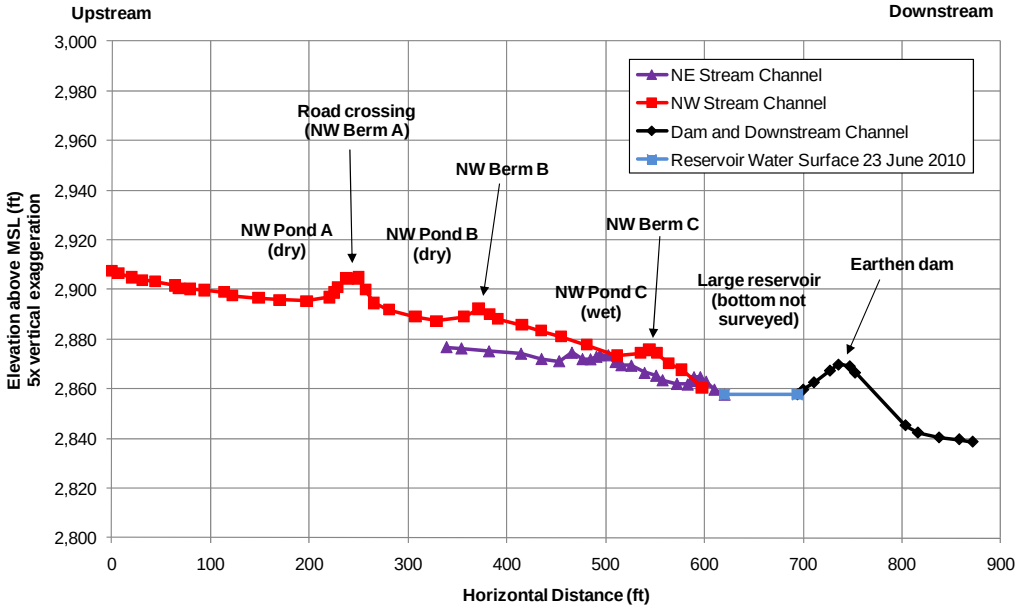


Figure 29. Eastward view of the large stock pond (reservoir), dam, road crossing, and northwestern and northeastern stream channels at Site 3. Removal of road crossing and pond storage berms and lowering of the large stock pond (reservoir) dam will enhance hydrologic connectivity from the headwaters to the downstream of the large stock pond (reservoir).

Figure 30. View of road crossing over the northwestern stream channel with dry ponds (NW Ponds A and B) on the upstream and downstream sides at Site 3.

a)



b)

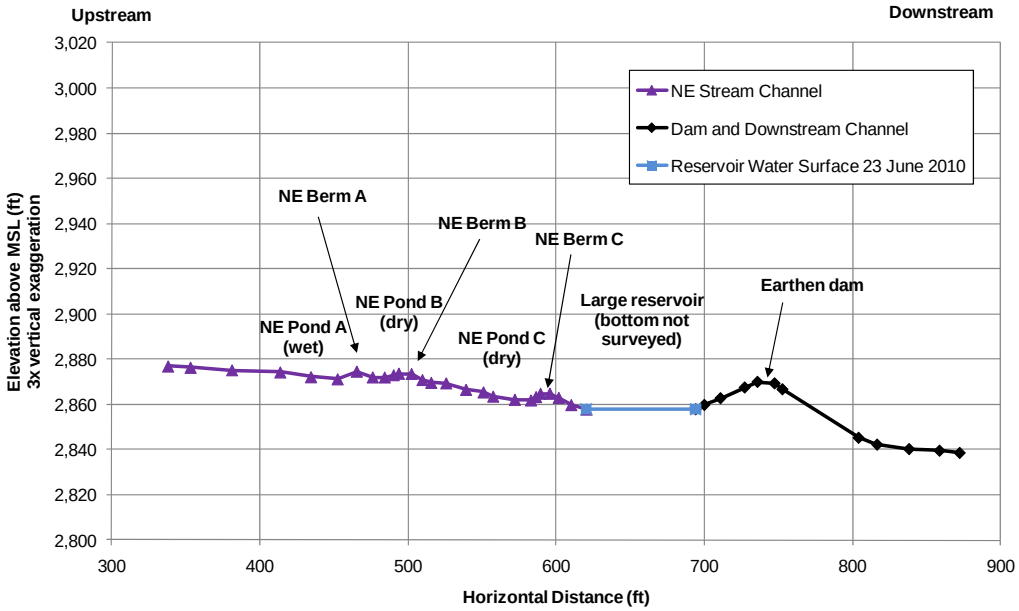
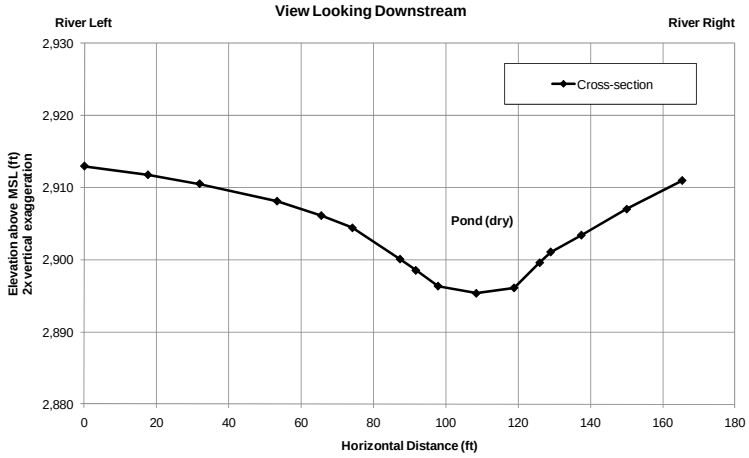


Figure 31. Longitudinal profile along two intermittent stream channels that drain into the large stock pond (reservoir) at Site 3, with flow moving downstream from left to right (a). The longitudinal profile along the northeastern stream channel is shown as reference in (a) and alone in (b).

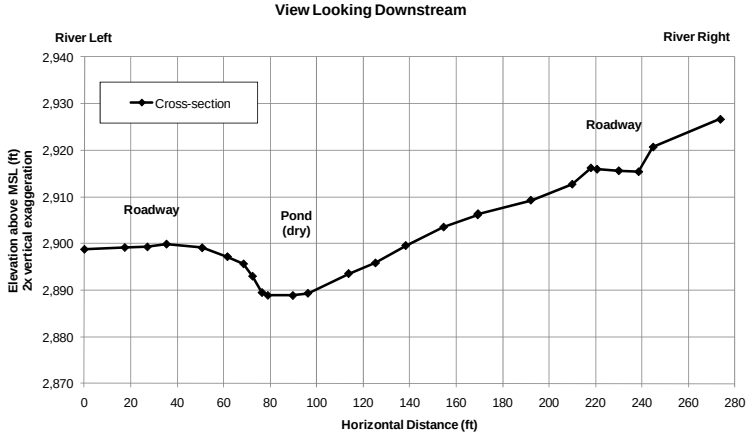
a)


View Looking Downstream
River Left
River Right
Cross-section
Stream channel thalweg
Elevation above MSL (ft) 2x vertical exaggeration
Horizontal Distance (ft)
2,925
2,920
2,915
2,910
2,905
2,900
2,895
2,890
0
20
40
60
80
100
120
140

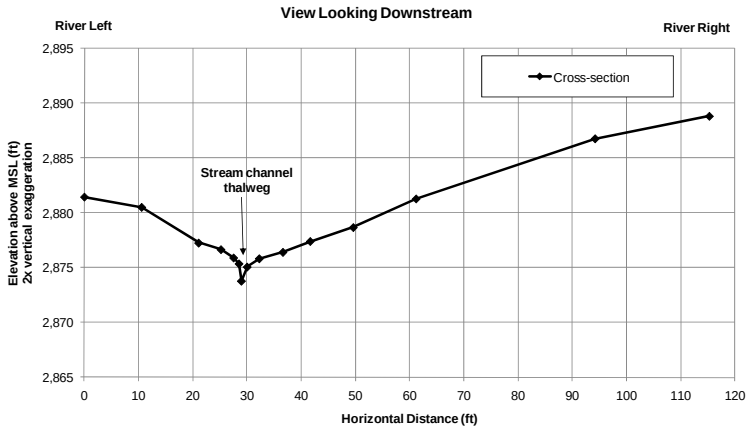
b)


View Looking Downstream
River Left
River Right
Cross-section
Pond (dry)
Elevation above MSL (ft) 2x vertical exaggeration
Horizontal Distance (ft)
2,930
2,920
2,910
2,900
2,890
2,880
0
20
40
60
80
100
120
140
160
180

c)


View Looking Downstream
River Left
River Right
Cross-section
Roadway
Roadway
Pond (dry)
Elevation above MSL (ft) 2x vertical exaggeration
Horizontal Distance (ft)
2,940
2,930
2,920
2,910
2,900
2,890
2,880
2,870
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280

d)



e)

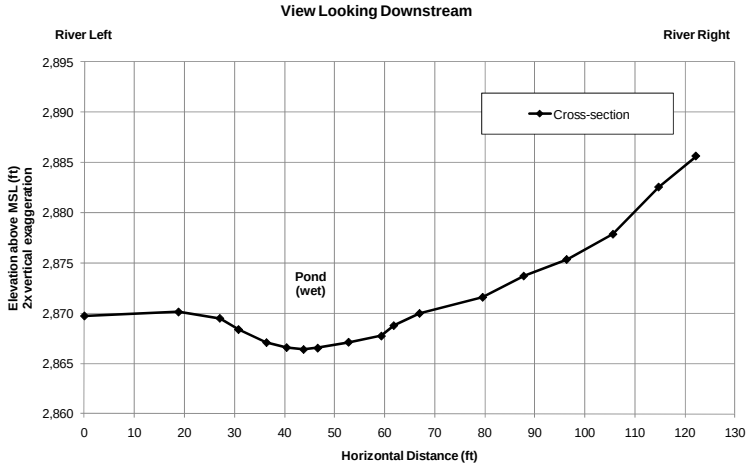
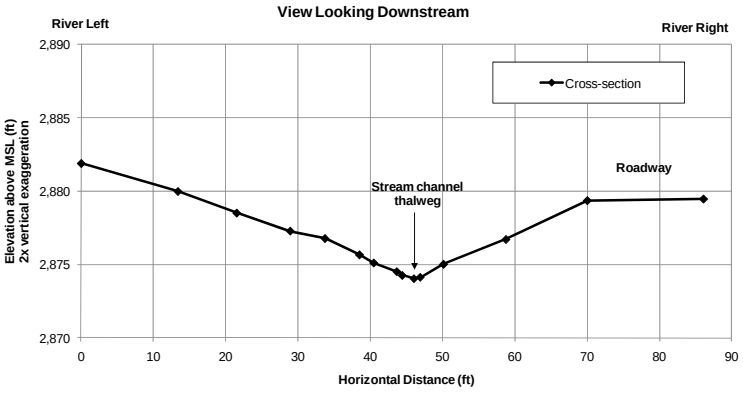
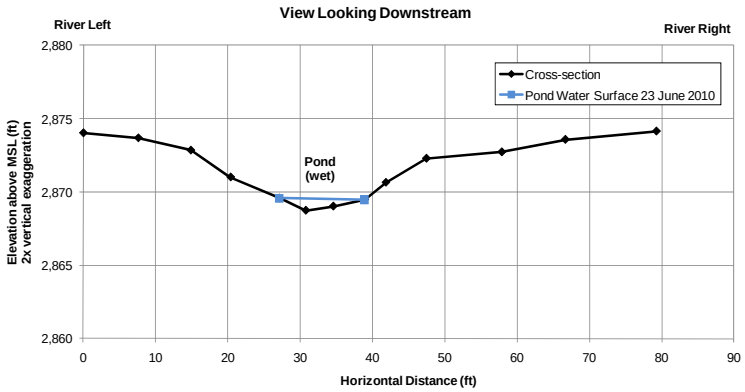


Figure 32. Cross-sections along the northwestern stream channel above the large stock pond (reservoir) at Site 3. The cross-sections span the natural stream channel above NW Pond A (a), the NW Pond A above the road crossing (b), the NW Pond B below the road crossing (c), the stream channel between NW Pond B and NW Pond C (d), and the NW Pond C above the large stock pond (reservoir) (e).

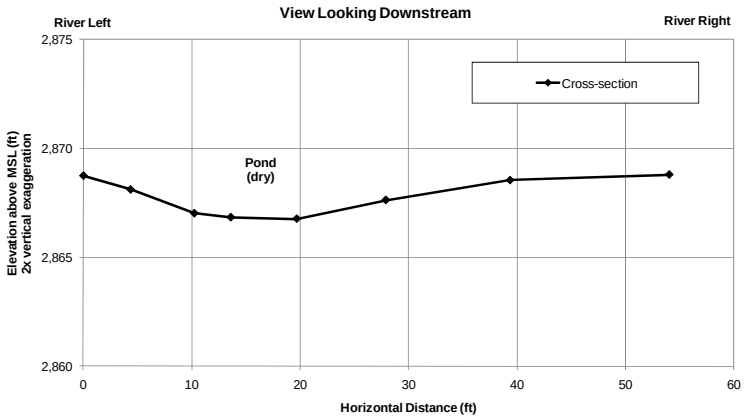
a)



b)



c)



d)

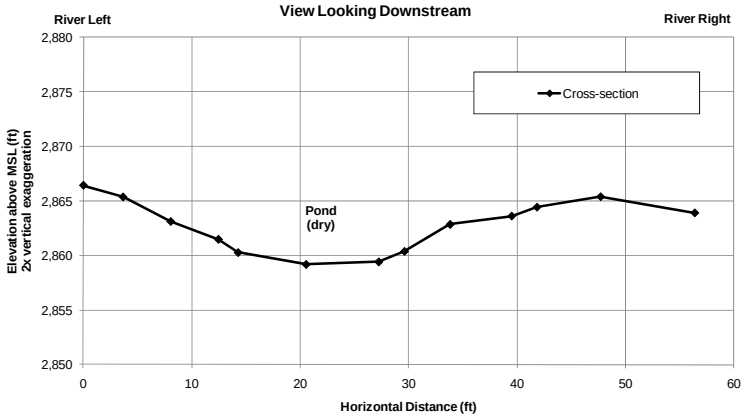


Figure 33. Cross-sections at Site 3 along the northeastern stream channel above the large reservoir. The cross-sections span the natural stream channel above NE Pond A (a), the NE Pond A (b), the NE Pond B (c), and the NE Pond C above the large reservoir (d).

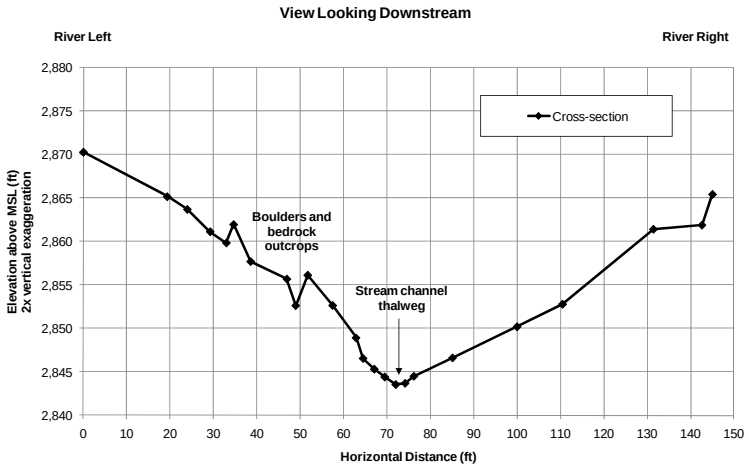


Figure 34. Cross-section of the stream channel downstream of the large reservoir dam at Site 3. Boulders and bedrock outcrops are present on the river-left upland slopes and the dam spillway is present in the notch near the top of the river-right upland slope.

7.1.2.2 Riparian Restoration

Riparian Revegetation for Seasonal Wetland in the Northeast

There is one substantial seasonal wetland in the northeastern the Lightner Mitigation Site (see Figure 6) that will be restored by planting riparian species along the perimeter of the wetland. The seasonal wetland and riparian buffer plant palette to be used for the revegetation of the seasonal wetland and adjacent riparian buffer are listed in Table 18, and detailed construction drawings are presented in Appendix B. Methods to implement vegetation activities are further described in Section 7.2.2.

7.1.3 Enhancement

Enhancement activities which will take place within the Lighter Mitigation Site are described in detail below, and implementation methods are described in Section 7.2. Enhancement activities at this mitigation site will occur within stream channels and surrounding riparian habitat. Activities will include the following:

- Non-native Plant Removal
- Revegetation for Enhancement

7.1.3.1 Non-native, Invasive Plant Removal

Non-native, invasive plant species to be removed include those species listed on the California Invasive Plant Council (Cal-IPC; http://www.cal-ipc.org/ip/inventory/weedlist.php) as having a severe or moderate (A or B) invasive impact, including the annual plant species tocalote and shortpod mustard. The removal of non-native, invasive plant species, or weeds, will be focused on stream channels, wetlands, and ponds at the Lightner Mitigation Site. In general, at this site, the areas adjacent to the stream channels are not adversely impacted by weeds. They do occur at specific locations generally associated with anthropogenic disturbance, such as the largest

dam at the existing stock pond. The downstream side of the existing dam is covered with tocalote, which will be removed. The priority non-native, invasive plant species targeted at the site, as well as the method of control, are listed in Table 13.

Table 13. Priority Non-native, Invasive Plants to be Removed at the Suckle Mitigation Site

Botanical Name	Common Name	Method of Control
Centaurea melitensis	tocalote	Hand and Mechanical Removal
Hirschfeldia incana	shortpod mustard	Hand and Mechanical Removal

This weed removal mitigation activity will result in a combined total of approximately 0.63 acre of stream, wetland and riparian enhancement areas.

7.1.3.2 Revegetation for Enhancement

Existing habitat within and surrounding selected streams will be planted with either a native mixed chaparral or a mixed oak/riparian plant palette. Planting areas are shown in Figure 6 and detailed construction drawings are presented in Appendix B. Methods to implement vegetation activities are described in Section 7.2.2, and the planting palettes used in this area are presented in Tables 16 and 17.

7.1.4 Sequence and Timing

Mitigation activities at Lightner will be concurrent with the construction of the substation. In general, grading will be performed between April 15 and October 15 to avoid working during the rainy season. Seeding will take place between October 1 and November 1 or as directed by the consulting biologist. The first seed application will be performed in conjunction with the application of erosion control measures. Detailed timing requirements are presented in Section 7.2.2, which describes the planting methods that will be utilized. The timing and sequence of the mitigation activities will need to be coordinated with the substation construction activities with regard to access and safety.

7.2 General Mitigation Implementation Methods and BMPs

This section describes general methods for and Best Management Practices (BMPs) for implementation of mitigation activities, including site preparation, weed removal, planting, and erosion control BMPs. In addition, all mitigation activities will avoid impacts to nesting birds and will follow the breeding season dates listed in the SRPL Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) (Aspen Environmental Group 2008). The Hermes copper butterfly is a special status species which has the potential to be at the Lightner Mitigation Site; and precautions will be made to avoid disturbing this species.

7.2.1 Implementation Methods for Control of Non-native, Invasive Plant Species

Non-native, invasive plant species removal will be implemented as part of enhancement activities, during site preparation for restoration activities, and as part of long-term management activities throughout the project alignment (Recon Environmental Inc. 2010). Non-native, invasive plant species removal will target all Cal-IPC (http://www.cal-ipc.org/ip/inventory/weedlist.php) non-native, invasive annual and perennial plant species listed as having a severe or moderate (A or B) invasive impact with the exception of annual grass species which

are abundant within reference locations. Non-native, invasive plant species to be removed are indicated in the invasive plant species control table (Table 13), above. Specifics on the implementation of these methods are described in more detail below.

In general and when feasible, live reproductive plant materials from non-native, invasive plants species, such as seed and rhizomes, will be removed from the site. Some areas of the site are remote and difficult to access, and it may not be feasible to remove plant material from these areas. In addition, some areas have extremely fragile habitats that could be damaged by attempting to remove large quantities of plant material. For these areas, the option of processing and disposing of plant material on-site in an appropriate manner will be determined by the land manager. In all cases, viable plant material will be processed and disposed of outside of the bed and banks of the channel. Plant material processing that may be proposed includes one or more of the methods that are listed below.

- Burning during appropriate time of year to prevent spread of fire
- Cut into manageable size and dispose of on-site to create brush piles for wildlife
- Removal of material from the site
- Burial of material

Weed Removal as Part of Site Preparation

Mowing will be one method used for initial removal of non-native, invasive plants to prepare restoration and enhancement areas, as appropriate, prior to the application of seeding and the installation of container plants. Based on the remoteness and topography of the mitigation sites, mowing will be implemented using weed-eaters (or “weed-whackers”) or similar trimmers with string or metal blades. This method may be used to minimize the extent and height of non-native annual herbs and grasses. Mowing will be used only if it will not have a deleterious effect on native plant species that are interspersed with the weeds.

Removal of Priority Weed Species

The priority weed species at the Lightner Mitigation Site include the annual weeds tocalote and shortpod mustard. The removal of these species will occur using manual methods to the extent possible. Hand removal is the preferred method of removing weed species from the site to minimize ground disturbance and adverse effects to sensitive wildlife species. Hand removal methods include the use of such tools as a hand scythe or pruners. Mechanical methods of removal, such as mowing or the use of weed-eaters, may be acceptable in appropriate areas with the approval of the consulting biologist.

Plant materials that are removed will be disposed of carefully to prevent regeneration or spread. In general, removal will be performed first during the late winter or early spring when soils are moist enough to remove most plants without breaking the roots. A second weed removal effort will take place in late spring or early summer to remove any re-sprouted weeds and ensure that the weed control area is weed-free. Weeds will be removed before they set seed. When this is not feasible, seed heads will be removed from plants prior to removal of the remaining plant. Seed heads of non-native, invasive plant species will be placed in plastic trash bags and removed from the project site for proper disposal.

If manual or mechanical removal methods are tried and found to be ineffective after 2 years of repeated treatment or if the problem is too widespread for hand removal to be practical, then chemical controls may be implemented as described below. All of the methods described in this section will be adapted to each species based on its morphology and phenology.

Herbicides

Herbicides will be used when manual and mechanical removal methods are not effective and may be used in conjunction with manual and mechanical methods for species that are known to be difficult to control. The project will use glyphosate-, triclopyr-, or imazapyr- based herbicides, such as Rodeo®, Habitat®, or other products that are Environmental Protection Agency (EPA)-approved products for use near wetlands and streams. Herbicides will not be used when rain is predicted within 24 hours after application. The owner and applicator must comply with all state and local regulations regarding the application of herbicides.

Herbicides will be applied using a localized spot-treatment method and applied in a manner that will eliminate or reduce drift onto native plants. Herbicides may also be applied to cut stumps for large woody plants or large clumps of herbaceous weeds that cannot be effectively removed.
If the species has the ability to sprout from the cut trunk, then the cut stump will be treated with Garlon® 4 or other approved herbicide in accordance with the manufacturer's specifications to ensure that the cut stump will not sprout. Cut stumps will be subsequently monitored and repeatedly cut and treated with herbicide until the stump is dead. Except as described above, and for the remainder of the ROW, the above ground plant material shall be removed from the site and disposed at a municipal recycling center that is equipped to process and recycle green waste (Recon Environmental Inc. 2010). The removal shall be performed at a time when the plants do not have ripe seed. If this is not feasible, then seeds will be removed, placed in plastic bags and disposed of off-site.

As an alternative to commercially manufactured herbicides, the project may use an organic alternative of horticultural vinegar (20%) spray or common household vinegar (5%) spray. Herbicides may also be applied to cut stumps for large woody plants.

7.2.2 Implementation Methods for Planting

The following planting methods may be used: topsoil with seed bank, direct seed, containerized plants, and pole cuttings. This section describes the implementation methods that will be used at the sites to plant native plant species.

Topsoil with Seed Bank

Within the footprint of the proposed substation at the Lighter Mitigation Site, topsoil containing natural seed bank materials may be salvaged from areas with existing native chaparral vegetation types for use at the stream restoration sites. In these areas, the above ground plant material will be removed and processed into mulch for re-use around newly planted, containerized upland plants. After the plant material has been cleared and grubbed, approximately 4 to 6 inches of topsoil will be removed and stockpiled for reuse. Salvaged topsoil with seed bank will be stored in a control area and monitored to prevent contamination and unauthorized use. Salvaged topsoil with seed bank will be utilized within 12 months of salvaging. Salvaged topsoil with seed bank will be spread on designated enhancement areas to a depth of 2 to 4 inches and stabilized using the erosion control measures that are outlined in this mitigation plan. Topsoil should not be stored in piles greater than 2-feet-tall.

Direct Seeding

Seed for revegetation efforts will be collected from the mitigation site or from similar habitat types that are located within San Diego County. Seed collection will be performed by a seed provider with experience identifying, collecting, and processing seed of native plant species. Seed collection will be performed during the appropriate time of year for each species. If possible, at

least two temporally discrete seed collections will be performed for each species to increase the probability of obtaining ripe seed. Seeding will take place annually between October 1 and November 1 or as specified by the consulting biologist. The first seeding will be performed in conjunction with site preparation and the installation of erosion control measures. Seed will be over-seeded to counter potentially low germination rates. The seed mix to be used throughout the mitigation site is presented in Table 14.

Table 14. Native Seed Mix

Botanical Name	Common Name	Pure Live Seed (Pounds/Acre)
Adenostoma fasciculatum	Chamise	1.0
Artemisia californica	coastal sage brush	0.5
Asclepias fascicularis	narrowleaf milkweed	1.0
Bromus carinatus	California brome	8.0
Calandrinia ciliata	red maids	0.5
Elymus glaucus	blue wildrye	6.0
Eriophyllum confertiflorum	golden yarrow	0.5
Eriogonum fasciculatum	California buckwheat	1.0
Eschscholzia californica	California poppy	3.0
Helianthemum scoparium	peak rush rose	2.0
Lotus scoparius	Deerweed	3.0
Muhlenbergia rigens	Deergrass	0.5
Nassella cernua	nodding needlegrass	3.0
Nemophila menziesii	baby blue eyes	2.0
Salvia apiana	white sage	0.5
Solanum douglasii	white nightshade	2.0
Vulpia microstachys	small fescue	6.0

Planting Containerized Plants

Enhancement and restoration mitigation activities will include planting native plants to enhance or create native plant communities. Revegetation activities will utilize four plant palettes for the revegetation of the mitigation activity areas: Mixed Chaparral, Mixed Oak/Riparian, Live Oak Woodland, and Seasonal Wetland and Riparian Buffer (for location and areas of planting by palette see Figure 6). Each of these planting palettes will be described in the following subsections. Planting palettes are based on typologies observed at reference sites and within the SRPL Revegetation Plan (Chambers Group, Inc. 2010). Biologists observed reference sites during field visits for the existing conditions report, CRAM analysis and delineation of waters. Additional field visits were conducted by WRA staff to confirm the plant species composition, density, and structure at reference sites in July and September 2010.

Containerized plants will be used to re-establish oak species and may be used to re-establish selected wetland species. Tree seed and containerized wetland plants will be collected by a seed provider with experience identifying, collecting, and processing seed of native plant species from a similar habitat type within San Diego County and propagated on-site or off-site at a nursery with experience growing native plant species to produce containerized plants for revegetation activities that are scheduled for the fall/winter of 2011 or later. We recommend that oak acorns be grown in deep containers (greater than 14 inches) to allow for deep root development prior to planting. Containerized plants will be installed between December 1 and January 31.

Supplemental water may be available to support the establishment of containerized plants. In general, species established by direct seed or placement of salvaged topsoil with seed bank will not require irrigation. Supplemental water may be provided for species that are established using containerized plants such as oaks and some of the larger shrub species. Potential sources of on-site water will be investigated (e.g. wells). Alternatively, irrigation water will be provided manually from either a water truck or on-site storage tanks.

Live Oak Woodland Plant Palette

Planting of the Live Oak Woodland plant palette will occur between OHWM and top of bank (TOB) and above TOB. A consulting biologist, hydrologist, or otherwise qualified consultant will determine these indicators to establish planting locations in the field. The plant species included in this palette to be used for the revegetation of streams and adjacent areas are listed in Table 15.

Table 15. Live Oak Plant Palette for Containerized Plants

Botanical Name	Common Name
Quercus agrifolia	coast live oak
Quercus engelmannii	Engelmann oak
Sambucus nigra ssp. *caerula*	blue elderberry

Mixed Chaparral Plant Palette

The primary method of establishing these plants will be topsoil with seed bank, direct seeding, and container plants. The plant species for the mixed chaparral plant palette are listed in Table 16. Contents of seed mix to be used are shown in Table 14. The project may not utilize all of the plants that are listed in the plant palette depending on availability of the seed from the mitigation site and plants at local nurseries.

Table 16. Mixed Chaparral Plant Palette for Containerized Plants

Botanical Name	Common Name
Arctostaphylos glauca	big berry manzanita
Adenostoma fasciculatum	Chamise
Artemisia californica	coastal sage brush
Ceanothus greggii	desert ceanothus
Eriogonum fasciculatum	California buckwheat
Quercus berberdifolia	scrub oak

Mixed Oak/Riparian Revegetation and Plant Palette

Planting of the Mixed Oak/Riparian plant palette will occur between OHWM and TOB, and above the TOB. A consulting biologist, hydrologist, or otherwise qualified consultant will determine these indicators to establish planting areas in the field. The plant species for the revegetation of streams and adjacent areas are listed in Table 17.

Table 17. Mixed Oak Riparian Plant Palette for Containerized Plants

Botanical Name	Common Name
Arctostaphylos glauca	big berry manzanita
Baccharis salicifolia	Mulefat
Ceanothus greggii	desert ceanothus
Ceanothus leucodermis	chaparral whitethorn
Eriogonum fasciculatum	California buckwheat
Quercus agrifolia	coast live oak
Quercus engelmannii	Engelmann oak
Rhus ovata	Sugarbush

Seasonal Wetland and Riparian Buffer

Planting of the seasonal wetland and riparian buffer palette will occur within two distinct zones: intermediate zone (area on the upland edge of the wetland within 3 to 10 feet of the wetland where plants are dependent on the proximity to wetland hydrology), and dry zone (upland area surrounding the wetland, within 40 to 80 feet of the intermediate zone). The intermediate and dry zone plantings will restore a riparian buffer around the wetland. The plant species for the revegetation of seasonal wetlands and adjacent areas are listed in Table 18.

Table 18. Seasonal Wetland and Riparian Buffer Plant Palette for Containerized Plants

Botanical Name	Common Name
Baccharis salicifolia	Mulefat
Ceanothus leucodermis	chaparral whitethorn
Eriogonum fasciculatum	California buckwheat
Muhlenbergia rigens	Deergrass
Quercus agrifolia	coast live oak
Quercus engelmannii	Engelmann oak

7.2.3 Erosion Control Measures

Erosion control measures will be utilized in areas that involve grading and in conjunction with any mitigation activities that result in bare ground. These areas will be covered with rice straw to protect the surface from erosion. In areas where the slope is greater than 3:1 (horizontal to vertical), straw wattles, straw bales, and/or silt fence may be installed to reduce the velocity of runoff and trap sediment. Wattles, bales, and silt fence will either be biodegradable or will be removed as part of the mitigation activities when they are no longer needed.

8.0 MAINTENANCE PLAN

Maintenance activities are summarized in the following sections. The maintenance plan for the first 5 years (start-up period) in the HAP/HMP area is described fully in the HAP/HMP (SDG&E 2010) and summarized below.

8.1 Maintenance Activities within Mitigation Areas

Ongoing removal of non-native, invasive plant species will occur in the mitigation areas twice annually as stated in 7.2.1. Methods for control of invasive species will be selected based on the best available techniques as informed by practices of adaptive management through annual monitoring during the initial five year monitoring period.

Any detrimental erosion in areas of stream restoration described above in Section 7.1 will be managed as needed to facilitate the establishment of natural stream channels. Areas surrounding stream restoration sites will be planted following implementation, and those plantings will be maintained as needed based on monitoring data and using the concepts of adaptive management.

Riparian plantings will be maintained to ensure establishment through the five year monitoring period as required by applicable permits. Maintenance needs for planted riparian areas will be identified through annual monitoring as described in Section 9.0 below.

8.2 Maintenance Activities within HAP/HMP Area

As stated in the HAP/HMP (SDG&E 2010), the following maintenance activities will take place within the Lightner Mitigation Site:

- Access control and maintenance of signage
- Control of invasive plant species
- Erosion control along maintained roads and decommissioned roads
- Fire management in coordination with local fire agencies
- Monitoring and maintenance of illegal dumping and general trash removal

In addition, the HAP/HMP (SDG&E 2010) includes ongoing tasks for general monitoring of environmental conditions, species community mapping, species surveys, and wildlife assessments. These activities will inform maintenance activities through preparation of monitoring reports.

9.0 MONITORING REQUIREMENTS AND PERFORMANCE CRITERIA

9.1 As-built Conditions Reporting

As-built conditions reporting will take place at the end of the 120-day establishment period which will serve to notify the agencies of the completion of construction. In addition, this will be reported as part of the first annual monitoring report for the Lightner mitigation site. As-built conditions reporting will include descriptions of grading and enhancement activities undertaken during mitigation implementation. If grading and enhancement activities take place during consecutive years, the reporting will occur as part of the annual reporting the first year following implementation at the mitigation site.

9.2 Initial Mitigation Monitoring Activities and Performance Criteria

The purpose of the project's mitigation monitoring program is to assess the effects of enhancement and restoration activities, as well as to provide guidance for habitat management in the event of negative environmental stressors that may affect ecosystem function. The project will use CRAM to provide quantitative evaluation of mitigation site waters during the initial monitoring period, as well as qualitative monitoring that will include monitoring and mapping of non-native invasive species, excessive erosion, and other negative environmental stressors.

Monitoring at the mitigation site will occur for a minimum 5-year period, with Year 1 beginning following the completion of mitigation action at the site and the completion of preservation agreements between SDG&E and the long-term land manager. Year 1 begins following completion of the mitigation action (e.g., non-native, invasive species removal and replanting for enhancement activities or grading and replanting for restoration activities). Monitoring would continue on an annual basis until the site has met all performance criteria *and* all regulatory agencies have agreed in writing that the site has met performance criteria and is ready for transfer to the long-term manager. Monitoring methods are described below.

9.2.1 Hydrological and Erosion Monitoring for Stream Enhancement

Purpose: To evaluate success of stream enhancement activities implemented during the implementation phase and monitor potential erosion and sedimentation from the construction of the substation and associated sedimentation basin.

Methods: Enhanced and restored stream reaches will be monitored by a qualified hydrologist to evaluate the success of stream enhancement and restoration activities. For activities requiring grading and bank stabilization, a minimum of one upstream and downstream hydrological cross section will be taken to monitor stream channel evolution. Erosion and sedimentation downstream of the sedimentation basin will be monitored in a similar fashion through establishment of at least two cross sections downstream to monitor stream conditions in that area. All enhanced stream reaches and the stream reach below the sedimentation basin will be monitored for erosion, including nick points, headcuts, gullies, and washouts. The source of each erosion point will be evaluated to determine if the erosion is a natural part of stream evolution, or if the observed erosion is occurring as a result of human activities, including restoration activities.

Performance Criteria: Areas of erosion that are determined to be detrimental to the goals of the restoration will be addressed each year based on management recommendations in each annual monitoring report. If stream cross sections show that the enhanced stream reaches are not progressing as expected, management actions will be taken to address those issues.

9.2.2 Monitoring of Planted Vegetation

Purpose: To evaluate establishment of planted vegetation in enhanced and restored stream reaches.

Methods: Plants will be monitored each year for survival and total percent cover of vegetation. Each species present will be identified to the species level and counted. Irrigation systems will also be monitored to determine if repairs are needed to aid in initial establishment of planted species. In addition, a representative reference site will be evaluated for total percent cover of herbaceous plant species and woody vegetation.

Performance Criteria: As required in the LSAA, all mitigation plantings shall have a minimum of 75% survival the first year and 80% survival thereafter. Perennial woody vegetation shall meet these survivorship criteria over the five-year monitoring period *and/or* have aerial coverage of 70% of an adjacent reference site after 3 years and 90% of an adjacent reference site after 5 years. Adaptive management shall be used in determining the species of the replacement mitigation plantings. Species with relatively high survival rates shall be used in place of species with low survival rates for replacement plantings. At the completion of the monitoring period, the mitigation site shall have received no supplemental irrigation for a period of two consecutive years. Non-native, invasive perennial plant species populations designated as having a severe or moderate (A or B) invasive impact by Cal-IPC will be managed so they do not exceed more than 0% cover within waters, and non-native, invasive, annual plant species designated as having a severe or moderate (A or B) invasive impact by Cal-IPC do not exceed 5% cover within waters. Non-native, annual grass species will be controlled within waters for the duration of the monitoring period, but are expected to be present due to their prolific nature within reference locations. Similarly, non-native annual grasses are expected to be present in the buffer areas surrounding streams and wetlands; however, these species are expected to match reference locations in terms of percent cover.

9.2.3 Quantitative CRAM Evaluation

Purpose: Provide quantitative evaluation of preserved streams to inform adaptive management through comparison of CRAM scores from year to year.

Methods: CRAM methodology developed by the Southern California Coastal Water Research Project (SCCWRP) for riverine habitats in the project reach will be applied annually to enhanced stream reaches. CRAM AAs will remain the same from year to year to enable consistent comparison of performance. Evaluation of riverine wetlands using CRAM will be led by certified CRAM practitioners trained in the riverine CRAM module or a more specific module for these areas, if developed in the future. The results of riverine wetland evaluations using CRAM will be presented as part of the annual monitoring reports.

Performance Criteria: CRAM scores will be compared to baseline CRAM scores for enhanced stream reaches. CRAM scores are anticipated to increase compared to baseline conditions following enhancement and restoration. The rate and of increase will vary based on the baseline scores for each reach, and intensity of enhancement and restoration actions. Some CRAM scores may decrease compared to baseline conditions during Year 1 of monitoring as a result of grading or other construction activities that occur upstream of preserved waters. However, these scores are anticipated to meet or exceed baseline conditions after Year 5. This applies only to restoration sites within the restored stream channel and does not apply to other areas such as fill/cut or road removal sites. If CRAM scores decrease, reasons for the decrease will be reported as part of the annual monitoring report and management actions will be implemented.

9.2.4 Qualitative Monitoring for Non-native, Invasive Species

Purpose: To monitor conditions for non-native, invasive species that may affect the ability of the mitigation site to continue to provide adequate habitat functions and to identify and retreat any re-growth or new colonies prior to spreading.

Methods: The mitigation site will be surveyed during each annual monitoring visit to map and describe the occurrence of negative environmental stressors. For invasive species, the site will be surveyed for the locations of non-native, invasive species populations designated as having a severe or moderate (A or B) invasive impact by Cal-IPC (with the exception of annual grass species). Non-native, annual grass species will be controlled within waters for the duration of the

monitoring period, but are expected to be present due to their prolific nature within reference locations. For any observed non-native invasive plant species, locations and extents of each population will be mapped, and estimates of population size (number of individuals) will be made. Other stressors to be evaluated include OHV use and anthropogenic sources of erosion and sedimentation. If environmental stressors are identified, the source of the stressor (for example, a cut fence resulting in OHV use, or off-site source population of invasive species) will be identified and described for management action. Weeds in other locations will follow the Weed Control Plan for the entire ROW (Recon Environmental Inc. 2010).

Performance Criteria: Non-native, invasive plant species listed as having a severe or moderate (A or B) invasive impact by the Cal-IPC (with the exception of annual grass species prevalent in the area) will be managed so they do not exceed more than 5 percent cover of annual species and 0% cover of perennial species within waters. Non-native, annual grass species will be controlled within waters for the duration of the monitoring period, but are expected to be present due to their prolific nature within reference locations Monitoring reports in years 2 through 5 will contain a description of management activities performed each year based on previous year's management recommendations. The success of management recommendations will also be evaluated as part of the adaptive management strategy for the site (see Section 6.4 below).

9.2.5 Semiannual Wildlife Surveys

A qualified biologist will conduct semiannual surveys of mitigation areas to document the bird, wildlife, and fish use of the enhanced and restored habitats within the mitigation site. Wildlife surveys will be conducted in the spring and fall of each year; the exact timing will be determined by the consulting biologist. The surveys will be initiated after revegetation has occurred and will continue through the initial 5-year monitoring period. No performance criteria have been established for this task.

9.3 Monitoring Schedule and Reporting Requirements

With the exception of wildlife surveys, monitoring of the mitigation site will occur on a quarterly basis for the first year, bi-annually for the second year, and annually until performance criteria are met. Qualitative monitoring would be completed at the end of every year with quantitative monitoring (e.g. CRAM, vegetation transects or other data collection methods) would occur bi-annually (e.g. Year 1, 3, and 5). Wildlife surveys will be conducted twice annually throughout the 5-year monitoring period. Reporting will occur annually; reports for qualitative years (Year 2 and 4) will consist of a memorandum discussing the general condition of the site and management actions implemented in that year and/or recommended for the following year. Quantitative monitoring years (Years 1, 3, and 5) will be a full report with analysis. Each monitoring report will include a summary of the two wildlife surveys conducted in that year.

Monitoring at this mitigation site will be completed during the late spring or early summer of each monitoring year. A mitigation monitoring report will be prepared for the mitigation site to enable clear communication to the land manager at this location. The report will be submitted to the Corps, CDFG, and SWRCB by December 31 of each monitoring year.

10.0 LONG-TERM MANAGEMENT PLAN

Long-term management for the Lightner Mitigation Site is described in the HAP/HMP (SDG&E 2010) for the SRPL Project, and is to be funded by a long term endowment based on a Property Analysis Record (PAR). The timing for development of the long-term management plan is detailed in Conservation Measure G-CM-17 of the Biological Opinion (USFWS 2010):

> *(b) SDG&E will fully fund an endowment for in-perpetuity management of all parcels acquired in (c) within 3 months of the Wildlife Agencies' approval of the final endowment amounts.*
>
> *(c) Unless otherwise authorized by the Wildlife Agencies, no later than 18 months from the date of the revised 2010 biological and conference opinion, SDG&E will acquire and permanently preserve the nine (9) parcels identified in the September 2010 HAP (referenced by name as Nabi, Lakeside Ranch, Hamlet, El Capitan, Chocolate Canyon, Lightner, Long Potrero, Suckle, and Desert Cahuilla) in a manner consistent with the HAP and the following provisions:*
>
> - *The land-owner, land management entity, conservation easement grantee, and endowment fund manager for each property will be approved by the Wildlife Agencies. SDG&E will coordinate efforts with the Wildlife Agencies to identify potential candidates and review their qualifications to hold and manage lands and/or endowment funds. This task will be completed within 6 months of issuance of the 2010 revised biological and conference opinion.*
>
> - *SDG&E will conduct a revised Property Analysis Record (PAR) or PAR-like analysis for each property once the land management entity for individual properties has been identified and approved by the Wildlife Agencies. This revised PAR will be used to determine the final endowment amount SDG&E will provide for in-perpetuity habitat management of each property.*
>
> - *Conservation easement language, or its equivalent where an easement is not allowed by the land manager (State Parks), for all properties will be approved by the Wildlife Agencies prior to easement recordation; and*
>
> - *SDG&E will complete the required acquisition, protection, and transfer of all properties and record the required conservation easements in favor of DFG, or other entity approved by the Wildlife Agencies, no later than 18 months after the start of the ground- or vegetation-disturbing activities.*

The PAR results for all land management activities including those necessary to maintain the wetlands and streams within the mitigation site are included in the HAP/HMP. The PAR provides the basis for long-term funding determinations. A preliminary summary of the conveyance, land use restrictions, and funding is provided in Table 19. A summary of the preliminary long-term endowment costs for the Lightner Mitigation Site is provided in Table 20.

10.1 Parties Responsible for Long-Term Management

The Lightner Mitigation Site is likely to be conveyed to a non-profit conservancy or the County of San Diego; however, a final decision will not be made until the resource agencies consider and approve a long-term management entity. The entity responsible for long-term management will be identified according to the schedule provided above.

10.2 Incorporation with Habitat Mitigation Plan for the Lightner Mitigation Site

Long term management of wetlands and waters in the Lightner Mitigation Site is fully incorporated with the long term maintenance and monitoring described in the HAP/HMP.

10.3 Activities Included in Long-Term Management

Long term management activities are similar to maintenance activities described in the HAP/HMP and summarized above in Section 8.2. These activities include::

- Access control and maintenance of signage
- Control of invasive plant species
- Erosion control along maintained roads and decommissioned roads
- Fire management in coordination with local fire agencies
- Monitoring and maintenance of illegal dumping and general trash removal
- General conditions monitoring and wildlife assessment
- Vegetation mapping
- Special status species surveys
- Maintenance of a Geographic Information System (GIS) database
- Preparation of annual reports detailing management activities that occurred during the reporting year

Complete descriptions of these activities are included in the HAP/HMP (SDG&E 2010).

Table 19. Summary of elements of Long-Term Management for the Lightner Mitigation Site[3]. Details provided in HAP/HMP and BO.

Land Use Restrictions	Par Analysis	Funding for Long-term Maintenance
Entire mitigation site would be managed for conservation purposes, with emphasis on the wetland resources, native trees, and other sensitive biological resources (including Hermes copper butterfly). Restricted access.	PAR Analysis provided in Sept. 2010 HAP/HMP Funding for Endowment provided 3 months after revised PAR and land management entity selected by Wildlife Agencies, SWRCB, and Corps Final easements and property ownership conveyed to management entity no later than 18 months after ground disturbance activities	SDG&E will provide funding for perpetual management of the mitigation site; long-term costs estimated based on a PAR analysis of mitigation site maintenance and management of biological resources approved by Wildlife Agencies. Long-term management would include control of non-native species, habitat and species monitoring, access control, and related measures. SDG&E will provide copies of the management plans that identify how access will be controlled.

Table 20. Long-term Endowment Costs for the Lightner Mitigation Site.

Endowment Total	Yearly Average Cost: First 5 years
$1,844,094	$72,889

[3] Long term management agency subject to Corps approval.

11.0 ADAPTIVE MANAGEMENT PLAN

SDG&E will be the responsible party for implementation of management activities during the initial monitoring period. Specific maintenance and management activities will be identified based on the results of each annual monitoring visit. As part of each annual monitoring report, maintenance and management activities implemented during the previous year will be described and the results will be evaluated under the framework of adaptive management. If management and maintenance methods are not successful in addressing negative environmental stressors identified as part of annual monitoring reports, the methods will be examined and altered to increase the potential for success based on best professional judgment and management methods that are shown to be successful based on scientific research. In some cases, success of management and maintenance activities may not be evident over the course of only one year. This will be accounted for in annual monitoring reports through evaluation of whether or not management actions are contributing to progress towards the ultimate goal. In these cases, it may be necessary to wait for two years or more before altering methods as part of an adaptive management strategy. Each annual monitoring report will contain a section dedicated to evaluation of management and maintenance actions as part of the adaptive management strategy.

11.1 Incorporation within Habitat Mitigation Plan for the Lightner Mitigation Site

The principles of adaptive management are fully incorporated into the implementation, monitoring, maintenance, and long term management of the Lightner Mitigation Site described in this HMMP.

11.2 Natural Occurrences

Contingencies have been included in the financial assurances (Section 12.0) to provide a cushion for any unforeseen costs of management activities to be carried out in the event that a fire, flood, or other natural disaster should have a negative impact on preserved, enhanced, and/or restored habitat during the initial monitoring period. The 5-year habitat management work programs (described fully in the HAP/HMP) includes a fire management component developed in cooperation with the responsible fire agencies and in compliance with applicable State and local policies and regulations. In addition, the fire management component of the long-term management plan will be updated every 3 years. Remedial actions will be carried out during the initial monitoring period if habitat quality is reduced due to the occurrence of fire and/or other natural disasters. Remedial actions will also be carried out during long-term management if habitat quality is reduced due to management activities. These actions are described in the HAP/HMP (SDG&E 2010) and summarized in the following section.

11.3 Potential Remedial Actions

Habitat remediation consists of minor restoration of habitat from the effects of erosion, unauthorized access or removal of exotics; it is not considered ecological habitat restoration or creation. This task may include seeding with native seeds, raking, or weed removal. Remedial restoration may also include the restoration of closed trails or roads. Due to the high level of disturbance and compaction, a closed road or trail can take a substantially greater amount of time to revert back to the surrounding native vegetation community without active seeding,

weeding, and soil preparation. Therefore, remedial restoration for decommissioned roads and trails will be somewhat active (e.g., may include soil de-compaction, seeding with the imprinting method, more active exotic species control etc.). Habitat remediation is included during the initial monitoring (start-up) period for this mitigation site and is also an integral part of the habitat management in perpetuity.

12.0 FINANCIAL ASSURANCES

12.1 Estimated Costs for Mitigation Measures

12.1.1 Land acquisition

The Lightner Mitigation Site is already owned by SDG&E. Therefore, there are no additional land acquisition costs associated with this mitigation site.

12.1.2 Plan Implementation

Implementation costs for the HMMP are estimated to be $756,724, as shown in Table 21 below. Implementation tasks include mobilization, road crossing removal in specific locations, removal and alteration of dams, removal of non-native invasive species, and enhancement of riparian and wetland vegetation.

12.1.3 Monitoring and Maintenance for Performance Period

Monitoring costs for the HMMP are estimated to be $322,922, as shown in Table 21 below. These costs represent the first five years of monitoring. In addition, maintenance costs from the HMP are estimated to be $398,000 for the first 5 years.

12.1.4 Long-Term Maintenance

Long-term endowment costs are estimated at just under $1.5 million, as shown in Table 21 below. This endowment estimate is based on the amount of money needed to generate, on an annual basis, the annual maintenance costs (assuming a 5% return on the money and 3% inflation).

12.1.5 Remediation

Remediation costs are combined with maintenance costs in Table 21 below. Remediation efforts could include replanting, weed removal, and erosion control.

Table 21. Lightner Mitigation Costs

	Cost
First Five Years	
Implementation Costs for HMMP	$756,724
5-year Monitoring Costs for HMMP	$322,922
Maintenance/Remediation	$389,000
In Perpetuity	
Long-term Endowment Costs	$1,479,648

12.2 Form of the Letter of Credit

Financial assurance during the initial monitoring period will be guaranteed by SDG&E through issuance of a Letter of Credit. The dollar amount of the Letter of Credit will be based on the estimated cost of mitigation implementation to be determined upon acceptance of the mitigation plan by resource agencies and is subject to final approval by the Corps. The final dollar amount will be provided by SDG&E under separate cover upon issuance of project permits. Cost estimates for both the mitigation activities and initial management of the mitigation site described in this document are in Appendix C.

13.0 REFERENCES

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Appendix A. All CRAM Scores Collected for the Sunrise Powerlink Project

Appendix A. All CRAM Scores Collected for the Sunrise Powerlink Project.*

				Buffer and Landscape Context										Hydrology							
CRAM ID	Category	OVERALL CRAM SCORE		Landscape Connec-tivity		% of AA with Buffer		Average Buffer Width		Buffer Condition		Attribute Score (Final %)		Water Source		Hydro-period/ Channel Stability		Hydrologic Connec-tivity		Attribute Score (Final %)	
Existing/Projected		E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
5-DW-7	DDW	62.2%	58.4%	12	12	12	12	12	12	12	9	100.0%	93.3%	12	12	12	9	3	3	75.0%	66.7%
5-DW-8	DDW	71.5%	67.8%	12	12	12	12	12	12	12	9	100.0%	93.3%	12	12	12	9	9	9	91.7%	83.3%
7-DW-10	DDW	64.0%	62.0%	12	12	12	12	12	12	9	6	93.3%	85.4%	12	12	9	9	12	12	91.7%	91.7%
8-DW-2	DDW	65.3%	65.3%	12	12	12	12	12	12	9	9	93.3%	93.3%	12	12	9	9	12	12	91.7%	91.7%
9-DW-9	DDW	71.2%	69.2%	12	12	12	12	12	12	9	9	93.3%	93.3%	12	12	12	9	12	12	100.0%	91.7%
10-DW-1	DDW	72.7%	72.7%	12	12	12	12	12	12	6	6	85.4%	85.4%	12	12	9	9	12	12	91.7%	91.7%
11-DW-1	DDW	62.0%	62.0%	12	12	12	12	12	12	6	6	85.4%	85.4%	12	12	9	9	12	12	91.7%	91.7%
13-DW-15	DDW	65.3%	63.3%	12	12	12	12	12	12	9	9	93.3%	93.3%	12	12	12	9	6	6	83.3%	75.0%
14-DW-12	DDW	69.1%	65.3%	12	12	12	12	12	12	12	9	100.0%	93.3%	12	12	12	9	12	12	100.0%	91.7%
15-DW-1	DDW	68.8%	68.8%	12	12	12	12	12	12	12	12	100.0%	100.0%	12	12	9	9	9	9	83.3%	83.3%
15-DW-8	DDW	71.2%	67.4%	12	12	12	12	12	12	12	9	100.0%	93.3%	12	12	12	9	12	12	100.0%	91.7%
16-DW-11	DDW	68.6%	68.6%	12	12	12	12	12	12	6	6	85.4%	85.4%	12	12	9	9	12	12	91.7%	91.7%
17-DW-2	DDW	71.2%	71.2%	12	12	12	12	12	12	9	9	93.3%	93.3%	12	12	9	9	12	12	91.7%	91.7%
17-DW-7	DDW	63.3%	61.2%	12	12	12	12	12	12	9	9	93.3%	93.3%	12	12	12	9	6	6	83.3%	75.0%
35-S-2	ME	67.4%	67.4%	12	12	12	12	12	12	9	9	93.3%	93.3%	12	12	9	9	6	6	75.0%	75.0%
35-S-4	ME	70.5%	70.5%	12	12	12	12	12	12	9	9	93.3%	93.3%	12	12	9	9	12	12	91.7%	91.7%
53-S-8	ME	78.5%	74.7%	12	12	12	12	12	12	12	9	100.0%	93.3%	12	12	12	9	12	12	100.0%	91.7%
54-S-10	ME	63.6%	63.6%	12	12	12	12	12	12	9	9	93.3%	93.3%	12	12	6	6	3	3	58.3%	58.3%
62-S-12	ME	80.2%	80.2%	12	12	12	12	12	12	12	12	100.0%	100.0%	12	12	9	9	9	9	83.3%	83.3%
79-S-1	ME	83.4%	81.3%	12	12	12	12	12	12	9	9	93.3%	93.3%	12	12	12	9	12	12	100.0%	91.7%
82-S-1	I	83.3%	79.6%	12	12	12	12	12	12	12	9	100.0%	93.3%	12	12	12	9	12	12	100.0%	91.7%
92-S-4	ME	72.6%	70.9%	12	12	12	12	12	12	12	9	100.0%	93.3%	12	12	9	9	9	9	83.3%	83.3%
92-S-6	ME	82.6%	78.9%	12	12	12	12	12	12	12	9	100.0%	93.3%	12	12	12	9	12	12	100.0%	91.7%
107-S-2	ME	72.3%	68.2%	12	12	12	12	12	12	9	6	93.3%	85.4%	12	12	12	9	12	12	100.0%	91.7%
107-S-3	ME	67.8%	65.8%	12	12	12	12	12	12	9	6	93.3%	85.4%	12	12	9	9	3	3	66.7%	66.7%
109-S-1	I	87.8%	49.1%	12	3	12	6	12	9	12	9	100.0%	46.4%	12	6	9	3	12	6	91.7%	41.7%
111-S-9	I, W	82.0%	79.9%	12	12	12	12	12	12	9	9	93.3%	93.3%	12	12	12	9	3	3	75.0%	66.7%
112-S-2	I, W	80.4%	78.4%	12	12	12	12	9	9	6	6	82.9%	82.9%	12	12	12	9	12	12	100.0%	91.7%
117-S-1	P	81.0%	81.0%	3	3	12	12	12	12	9	9	55.8%	55.8%	9	9	9	9	12	12	83.3%	83.3%
130-S-1	ME	69.2%	67.1%	12	12	12	12	12	12	9	9	93.3%	93.3%	12	12	12	9	6	6	83.3%	75.0%
L-S-10	I	88.3%	95.8%	12	12	12	12	12	12	9	12	93.3%	100.0%	6	9	12	12	12	12	83.3%	91.7%
L-S-1	I	78.5%	80.2%	12	12	12	12	12	12	9	12	93.3%	100.0%	12	12	12	12	12	12	100.0%	100.0%
L-W-2	W	65.0%	69.2%	3	3	12	12	12	12	9	9	55.8%	55.8%	12	12	12	12	12	12	100.0%	100.0%
LP-S-12	I	70.5%	71.2%	12	12	12	12	12	12	9	9	93.3%	93.3%	12	12	9	9	12	12	91.7%	91.7%
LP-W-4**	W	59.4%	61.8%	3	3	12	12	12	12	9	12	55.8%	62.5%	12	12	10.5	10.5	12	12	95.8%	95.8%
S-DW-1	DDW	68.1%	71.2%	12	12	12	12	12	12	9	12	93.3%	100.0%	12	12	9	9	12	12	91.7%	91.7%
117-S-1	P	81.0%	81.7%	3	3	12	12	12	12	9	9	55.8%	55.8%	9	9	9	9	12	12	83.3%	83.3%

Impact AA

Mitigation AA

Key to Categories

DDW = Desert Dry Wash; ME = Mountain Ephemeral Stream; I = Intermittent Stream; P = Perennial Stream; W = Corps Wetland.

* Note: The data table in Appendix A was originally included in Appendix B of the Conceptual HMMP (WRA 2010b), titled "Table B-1."

** The CRAM score reported for depressional wetland (proposed mitigation site) LP-W-4 is the average of two CRAM assessments done on the same feature. This approach was requested by staff from the US Army Corps of Engineers.

Appendix A. All CRAM Scores Collected for the Sunrise Powerlink Project.*

				Physical Structure						Biotic Structure											
CRAM ID	Category	OVERALL CRAM SCORE		Structural Patch Richness		Topo-graphic Complexity		Attribute Score (Final %)		Number of Plant Layers		Number of Co-dominant Species		Percent Invasion		Horizontal Inter-spersion/ Zonation		Vertical Biotic Structure		Attribute Score (Final %)	
Existing/Projected		E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
5-DW-7	DDW	62.2%	58.4%	3	3	6	6	37.5%	37.5%	6	6	3	3	12	12	3	3	3	3	36.1%	36.1%
5-DW-8	DDW	71.5%	67.8%	6	6	6	6	50.0%	50.0%	6	6	3	3	12	12	6	6	3	3	44.4%	44.4%
7-DW-10	DDW	64.0%	62.0%	3	3	6	6	37.5%	37.5%	6	6	3	3	9	9	3	3	3	3	33.3%	33.3%
8-DW-2	DDW	65.3%	65.3%	3	3	6	6	37.5%	37.5%	6	6	3	3	6	6	6	6	3	3	38.9%	38.9%
9-DW-9	DDW	71.2%	69.2%	6	6	6	6	50.0%	50.0%	6	6	6	6	6	6	6	6	3	3	41.7%	41.7%
10-DW-1	DDW	72.7%	72.7%	6	6	6	6	50.0%	50.0%	6	6	9	9	9	9	9	9	6	6	63.9%	63.9%
11-DW-1	DDW	62.0%	62.0%	3	3	6	6	37.5%	37.5%	6	6	3	3	9	9	3	3	3	3	33.3%	33.3%
13-DW-15	DDW	65.3%	63.3%	3	3	6	6	37.5%	37.5%	6	6	6	6	12	12	6	6	3	3	47.2%	47.2%
14-DW-12	DDW	69.1%	65.3%	3	3	6	6	37.5%	37.5%	6	6	6	6	12	12	3	3	3	3	38.9%	38.9%
15-DW-1	DDW	68.8%	68.8%	6	6	6	6	50.0%	50.0%	6	6	9	9	12	12	3	3	3	3	41.7%	41.7%
15-DW-8	DDW	71.2%	67.4%	3	3	6	6	37.5%	37.5%	6	6	6	6	12	12	6	6	3	3	47.2%	47.2%
16-DW-11	DDW	68.6%	68.6%	6	6	6	6	50.0%	50.0%	6	6	6	6	12	12	6	6	3	3	47.2%	47.2%
17-DW-2	DDW	71.2%	71.2%	6	6	6	6	50.0%	50.0%	9	9	6	6	12	12	6	6	3	3	50.0%	50.0%
17-DW-7	DDW	63.3%	61.2%	3	3	6	6	37.5%	37.5%	6	6	6	6	12	12	3	3	3	3	38.9%	38.9%
35-S-2	ME	67.4%	67.4%	3	3	6	6	37.5%	37.5%	9	9	6	6	9	9	9	9	6	6	63.9%	63.9%
35-S-4	ME	70.5%	70.5%	6	6	6	6	50.0%	50.0%	6	6	3	3	6	6	6	6	6	6	47.2%	47.2%
53-S-8	ME	78.5%	74.7%	6	6	6	6	50.0%	50.0%	9	9	6	6	9	9	9	9	6	6	63.9%	63.9%
54-S-10	ME	63.6%	63.6%	3	3	3	3	25.0%	25.0%	9	9	9	9	12	12	9	9	9	9	77.8%	77.8%
62-S-12	ME	80.2%	80.2%	9	9	6	6	62.5%	62.5%	9	9	6	6	12	12	9	9	9	9	75.0%	75.0%
79-S-1	ME	83.4%	81.3%	6	6	9	9	62.5%	62.5%	12	12	9	9	9	9	9	9	9	9	77.8%	77.8%
82-S-1	I	83.3%	79.6%	6	6	6	6	50.0%	50.0%	12	12	12	12	12	12	9	9	9	9	83.3%	83.3%
92-S-4	ME	72.6%	70.9%	3	3	6	6	37.5%	37.5%	9	9	9	9	12	12	9	9	6	6	69.4%	69.4%
92-S-6	ME	82.6%	78.9%	6	6	6	6	50.0%	50.0%	9	9	12	12	12	12	9	9	9	9	80.6%	80.6%
107-S-2	ME	72.3%	68.2%	3	3	6	6	37.5%	37.5%	12	12	9	9	6	6	6	6	6	6	58.3%	58.3%
107-S-3	ME	67.8%	65.8%	6	6	6	6	50.0%	50.0%	12	12	9	9	9	9	6	6	6	6	61.1%	61.1%
109-S-1	I	87.8%	49.1%	9	3	6	3	62.5%	25.0%	12	9	12	9	9	9	12	9	12	12	97.2%	83.3%
111-S-9	I, W	82.0%	79.9%	9	9	6	6	62.5%	62.5%	12	12	12	12	9	9	12	12	12	12	97.2%	97.2%
112-S-2	I, W	80.4%	78.4%	6	6	6	6	50.0%	50.0%	12	12	6	6	6	6	12	12	12	12	88.9%	88.9%
117-S-1	P	81.0%	81.0%	12	12	9	9	87.5%	87.5%	12	12	12	12	9	9	12	12	12	12	97.2%	97.2%
130-S-1	ME	69.2%	67.1%	3	3	9	9	50.0%	50.0%	6	6	6	6	6	6	6	6	6	6	50.0%	50.0%
L-S-10	I	81.3%	85.1%	9	9	6	6	62.5%	62.5%	12	12	9	9	9	9	9	9	12	12	86.1%	86.1%
L-S-1	I	78.5%	80.2%	3	3	6	6	37.5%	37.5%	12	12	6	6	9	9	9	9	12	12	83.3%	83.3%
L-W-2	W	65.0%	69.2%	6	6	3	3	37.5%	37.5%	6	9	3	6	9	12	6	9	12	12	66.7%	83.3%
LP-S-12	I	70.5%	71.2%	6	6	6	6	50.0%	50.0%	9	9	6	6	9	12	6	6	3	3	47.2%	50.0%
LP-W-4**	W	59.4%	61.8%	3	3	6	6	37.5%	37.5%	7.5	7.5	3	3	6	9	6	6	6	6	48.6%	51.4%
S-DW-1	DDW	68.1%	71.2%	3	3	6	6	37.5%	37.5%	9	9	6	6	3	9	6	6	6	6	50.0%	55.6%
117-S-1	P	81.0%	81.7%	12	12	9	9	87.5%	87.5%	12	12	12	12	9	12	12	12	12	12	97.2%	100.0%

Impact AA

Mitigation AA

Key to Categories

DDW = Desert Dry Wash; ME = Mountain Ephemeral Stream; I = Intermittent Stream; P = Perennial Stream; W = Corps Wetland.

* Note: The data table in Appendix A was originally included in Appendix B of the Conceptual HMMP (WRA 2010b), titled "Table B-1."

** The CRAM score reported for depressional wetland (proposed mitigation site) LP-W-4 is the average of two CRAM assessments done on the same feature. This approach was requested by staff from the US Army Corps of Engineers.

Appendix B. Grading and Landscape Plans for the Lightner Mitigation Site

wra
ENVIRONMENTAL CONSULTANTS
LANDSCAPE ARCHITECTS AND PLANNERS
2169-G East Francisco Blvd.
San Rafael, CA 94901
(415) 454-8868 Phone
(415) 454-0129 Fax

SHEET INDEX

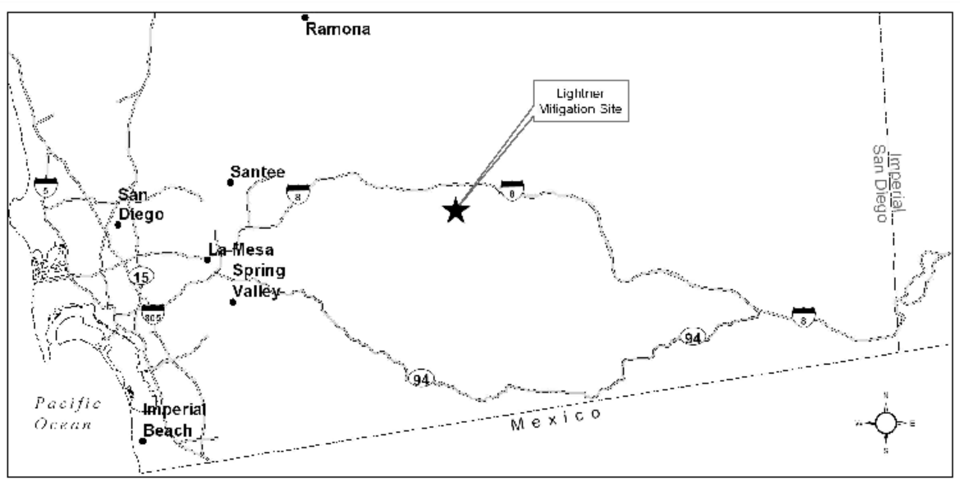
L-1	--- COVER SHEET
C-1	--- CONTEXT MAP AND GENERAL NOTES
C-2	--- SITES 1 AND 8
C-3	--- SITES 1 AND 8
C-4	--- SITE 2-A
C-5	--- SITE 2-A
C-6	--- SITE 2-B
C-7	--- SITE 3
C-8	--- SITE 3
C-9	--- SITE 11
L-2	--- WEED REMOVAL PLAN
L-3	--- EROSION CONTROL AND SEEDING PLAN
L-4A	--- LIVE OAK PLANTING PLAN, KEY MAP & IRRIGATION NOTES
L-4B	--- MIXED CHAPARRAL PLANTING PLAN
L-4C	--- MIXED OAK RIPARIAN PLANTING PLAN
L-4D	--- RIPARIAN BUFFER PLANTING PLAN

SUNRISE POWERLINK

LIGHTNER PROPERTY
WATERS MITIGATION PLAN
SAN DIEGO COUNTY, CALIFORNIA
CORPS FILE NUMBER: 2007-00704-SAS

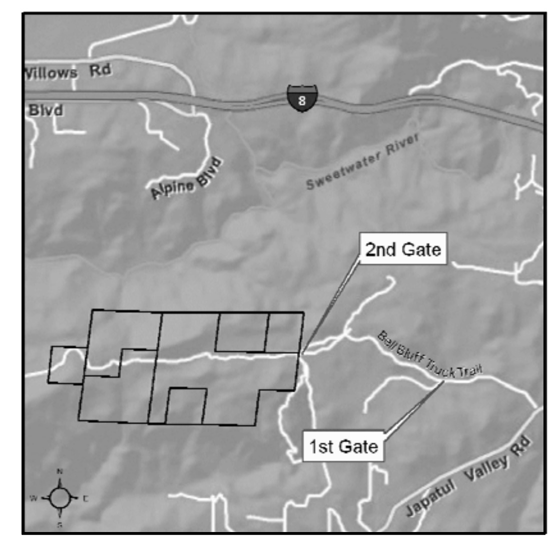
NOT FOR CONSTRUCTION

LOCATION MAP



NOTES:
1. LIGHTNER PROPERTY MITIGATION SITE MAY BE ACCESSED VIA INTERSTATE 8.
2. CONTRACTOR SHALL NOT ACCESS SITE WITHOUT PRIOR PERMISSION FROM LAND MANAGER.

SITE MAP



DIRECTIONS TO LIGHTNER PROPERTY MITIGATION SITE:
FROM INTERSTATE 5, TAKE INTERSTATE 8 EAST AND EXIT AT JAPATUL VALLEY ROAD. CONTINUE APPROXIMATELY 2 MILES TO BELL BLUFF TRUCK TRAIL. TURN RIGHT ONTO BELL BLUFF TRUCK TRAIL AND CONTINUE NORTHWEST 0.7 MILES TO FIRST GATE (KEYS REQUIRED). ENTER SITE AT SECOND GATE (KEYS REQUIRED).

LICENSED LANDSCAPE ARCHITECT
GEORGE J. SALVAGGIO
STATE OF CALIFORNIA

Date	Issues And Revisions	No.
11/12/10	PERMIT SET	

PROJECT #17128-3
DRAWN BY: ICM, KET
CHECKED BY: GJS
ORIGINAL DRAWING SIZE: 24 X 36

N

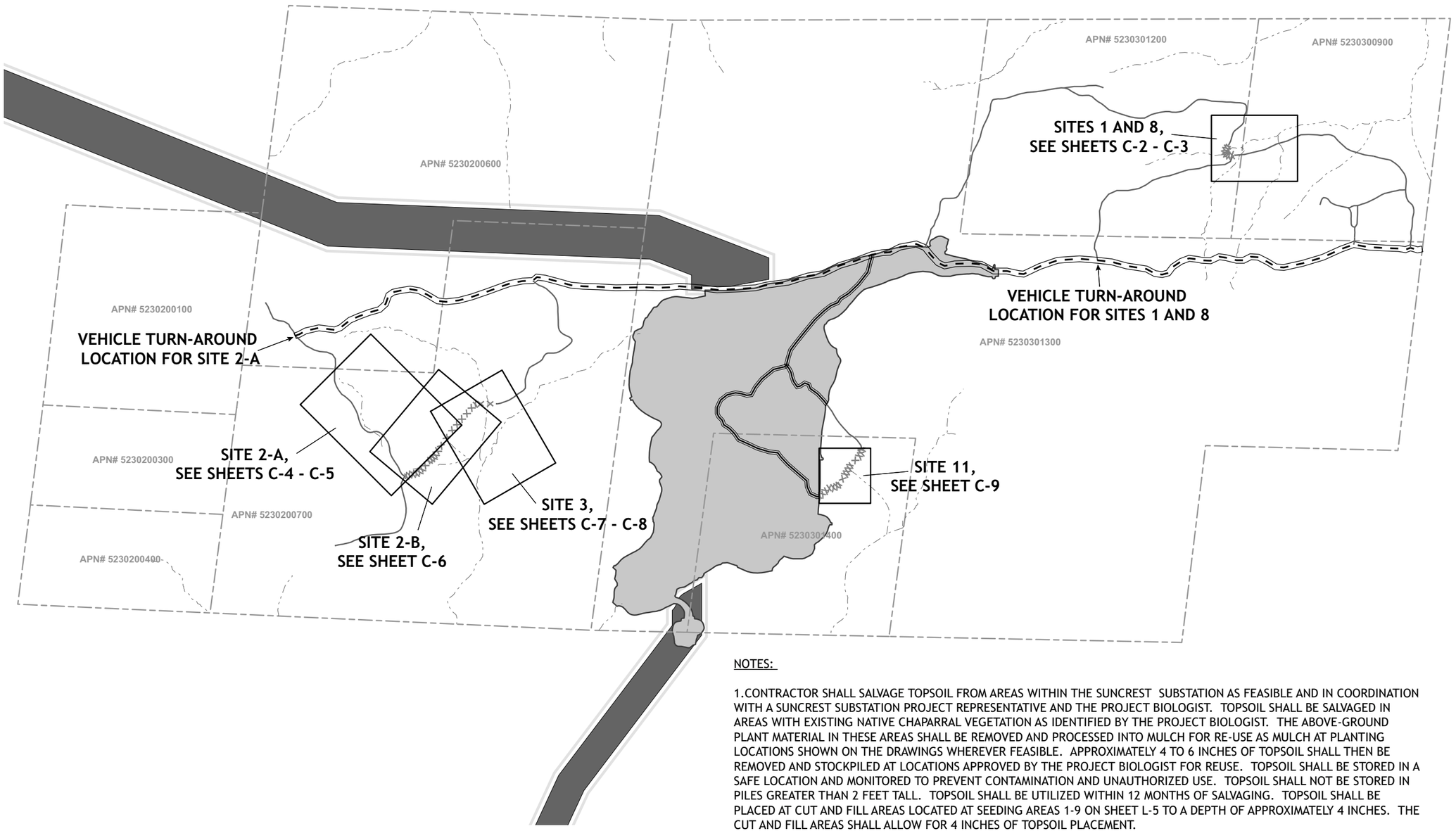
COVER SHEET

Sheet

L-1

Legend

- Road Surface - To be improved by others during substation construction
- Road Surface - Abandon in place
- Road Surface - Remove for stream restoration
- Road Surface - Remove with substation construction by others
- Watercourse
- Assessor's Parcel Number (APN) boundary
- Suncrest Substation - To be constructed by others
- Sunrise Powerlink Right of Way - To be constructed by others



NOTES:

1.CONTRACTOR SHALL SALVAGE TOPSOIL FROM AREAS WITHIN THE SUNCREST SUBSTATION AS FEASIBLE AND IN COORDINATION WITH A SUNCREST SUBSTATION PROJECT REPRESENTATIVE AND THE PROJECT BIOLOGIST. TOPSOIL SHALL BE SALVAGED IN AREAS WITH EXISTING NATIVE CHAPARRAL VEGETATION AS IDENTIFIED BY THE PROJECT BIOLOGIST. THE ABOVE-GROUND PLANT MATERIAL IN THESE AREAS SHALL BE REMOVED AND PROCESSED INTO MULCH FOR RE-USE AS MULCH AT PLANTING LOCATIONS SHOWN ON THE DRAWINGS WHEREVER FEASIBLE. APPROXIMATELY 4 TO 6 INCHES OF TOPSOIL SHALL THEN BE REMOVED AND STOCKPILED AT LOCATIONS APPROVED BY THE PROJECT BIOLOGIST FOR REUSE. TOPSOIL SHALL BE STORED IN A SAFE LOCATION AND MONITORED TO PREVENT CONTAMINATION AND UNAUTHORIZED USE. TOPSOIL SHALL NOT BE STORED IN PILES GREATER THAN 2 FEET TALL. TOPSOIL SHALL BE UTILIZED WITHIN 12 MONTHS OF SALVAGING. TOPSOIL SHALL BE PLACED AT CUT AND FILL AREAS LOCATED AT SEEDING AREAS 1-9 ON SHEET L-5 TO A DEPTH OF APPROXIMATELY 4 INCHES. THE CUT AND FILL AREAS SHALL ALLOW FOR 4 INCHES OF TOPSOIL PLACEMENT.

2. CUT AND FILL AREAS SHALL TIE INTO EXISTING GRADE OF ADJACENT SURFACES. AT STREAM CROSSING RESTORATION LOCATIONS, CUT AREAS SHALL BE SIZED AND SLOPED SIMILAR TO THE ADJACENT, NATURAL CHANNEL GEOMETRY AND GRADIENT.

wra
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SUNRISE POWERLINK

LIGHTNER PROPERTY
WATERS MITIGATION PLAN
SAN DIEGO COUNTY, CALIFORNIA
CORPS FILE NUMBER: 2007-00704-SAS

NOT FOR CONSTRUCTION

Michael N. Josselyn, PhD
Professional Wetland Scientist, #000121

Date	Issues And Revisions	No.
11/12/10	PERMIT SET	

PROJECT #17128-3
DRAWN BY: ISP, EKT
CHECKED BY: GTL, DBB
ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 333'

0 333
SCALE: 1" = 333'

N

CONTEXT MAP AND GENERAL NOTES

Sheet

C-1

Legend

Cross section

Fill area

Cut area

Direction of flow

10-ft elevation contour

2-ft elevation contour

Road surface - Abandon in place

Road surface - Remove for stream restoration

NOTES:

1. REFER TO SHEET C-3 FOR ALL CROSS SECTIONS SHOWN ON SHEET C-2

INSTALL BOULDER BARRICADE WITH 1.2 TON, 2-3' HEIGHT AND WIDTH BOULDERS, MINIMUM 10' SETBACK FROM CUT AREA DISTURBANCE. EXACT LOCATION OF BOULDERS SHALL BE DETERMINED BY PROJECT BIOLOGIST.

INSTALL BOULDER BARRICADE WITH 1.2 TON, 2-3' HEIGHT AND WIDTH BOULDERS, MINIMUM 10' SETBACK FROM CUT AREA DISTURBANCE. EXACT LOCATION OF BOULDERS SHALL BE DETERMINED BY PROJECT BIOLOGIST.

SITE 1 / SITE 8

REMOVE CULVERT

REMOVE ROAD CROSSINGS SEE CROSS SECTIONS E AND F, SHEET C-3

3,090 3,080 3,070 3,060 3,050 3,040

XS-3 XS-02 XS-01 LP-01 LP-02

1 SITES 1 AND 8

CI = 2 FT

wra
ENVIRONMENTAL CONSULTANTS
LANDSCAPE ARCHITECTS AND PLANNERS
2169-G East Francisco Blvd.
San Rafael, CA 94901
(415) 454-8868 Phone
(415) 454-0129 Fax

Stillwater Sciences
2855 Telegraph Avenue, Suite 400
Berkeley, CA 94705
(510) 848-8098 Phone

SUNRISE POWERLINK

LIGHTNER PROPERTY
WATERS MITIGATION PLAN
SAN DIEGO COUNTY, CALIFORNIA
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PROJECT #17128-3
DRAWN BY: ISP, EKT
CHECKED BY: GTL, DBB
ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 20'

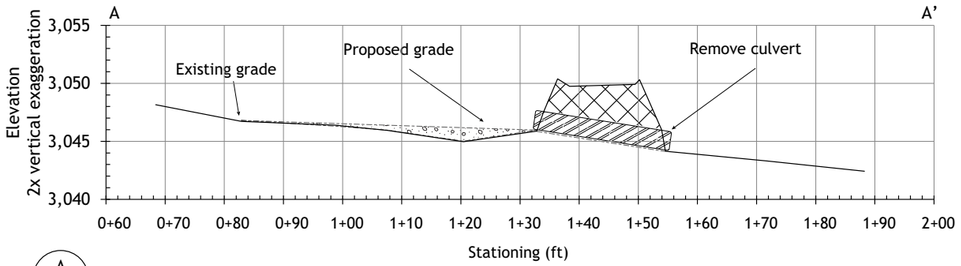
0 20
SCALE: 1 " = 20'

N

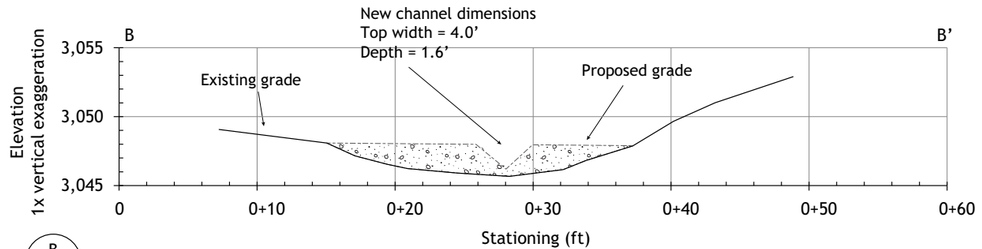
SITES 1 AND 8

Sheet

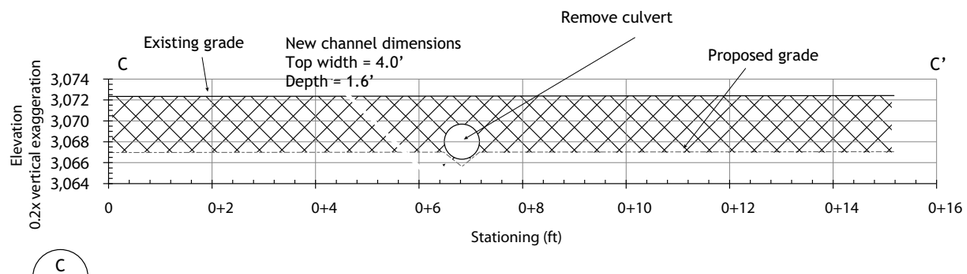
C-2



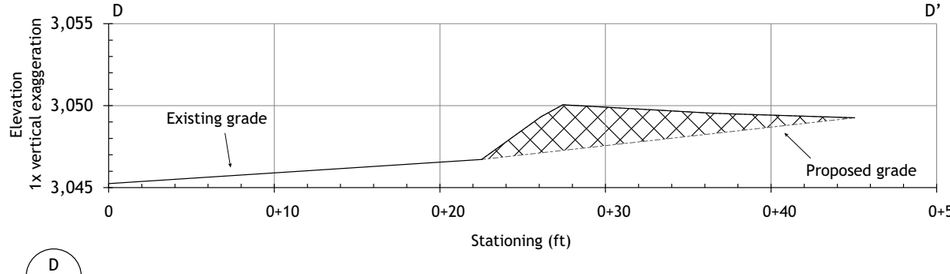
A
C-2 CROSS SECTION OF POND AND ROAD REMOVAL



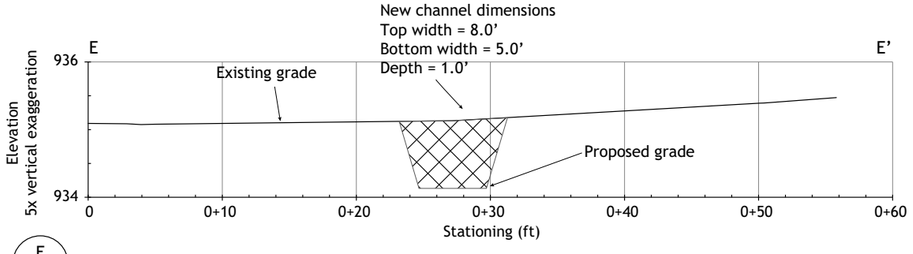
B
C-2 CROSS SECTION OF POND REMOVAL



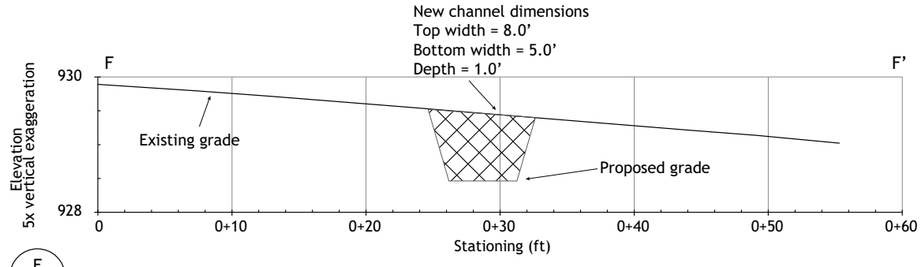
C
C-2 CROSS SECTION OF ROAD FILL REMOVAL



D
C-2 CROSS SECTION OF ROAD FILL REMOVAL



E
C-2 CROSS SECTION OF WESTERN ROAD CROSSING REMOVAL



F
C-2 CROSS SECTION OF EASTERN ROAD CROSSING REMOVAL

Legend

Fill area

Cut area

wra
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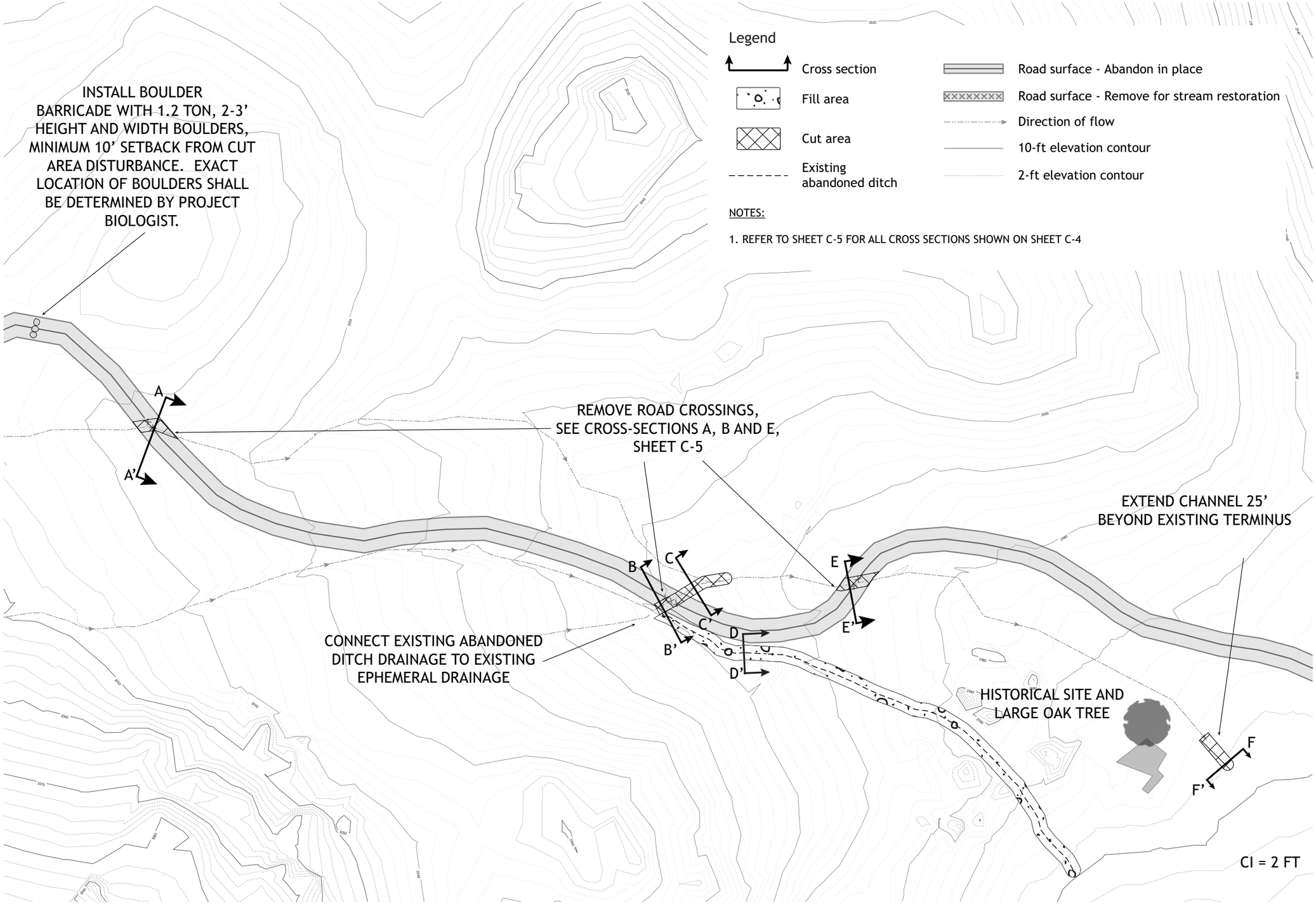
ORIGINAL DRAWING SIZE: 24 X 36

SITES 1 AND 8

Sheet

C-3



1 SITE 2-A

wra
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PROJECT #17128-3
DRAWN BY: ISP, EKT
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ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 30'

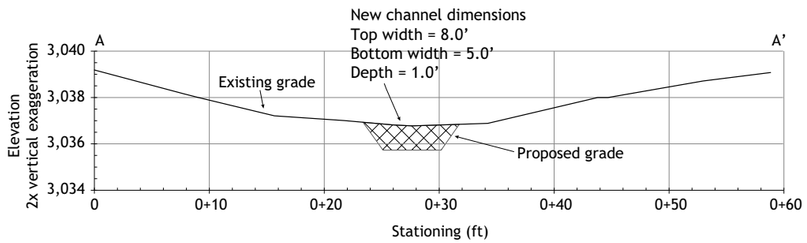
0 30
SCALE: 1 " = 30'

N

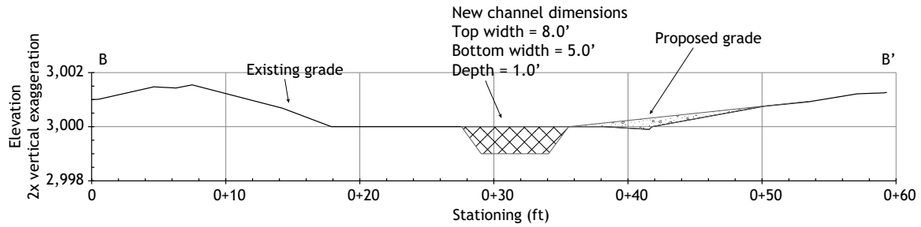
SITE 2-A

Sheet

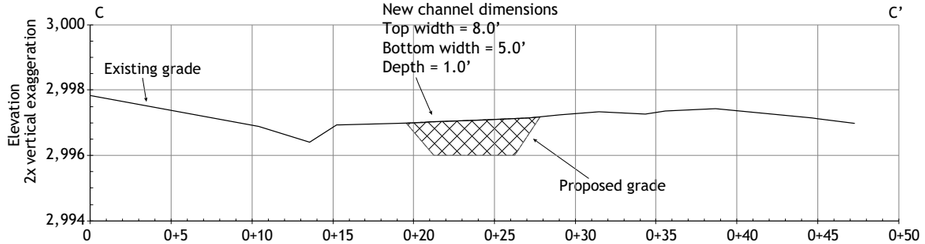
C-4



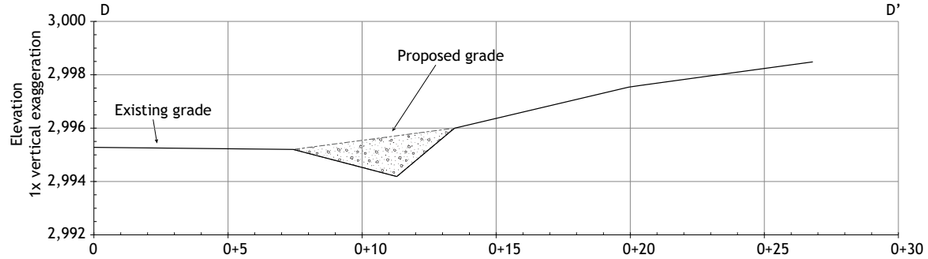
A / C-4 CROSS SECTION OF UPPER ROAD CROSSING REMOVAL



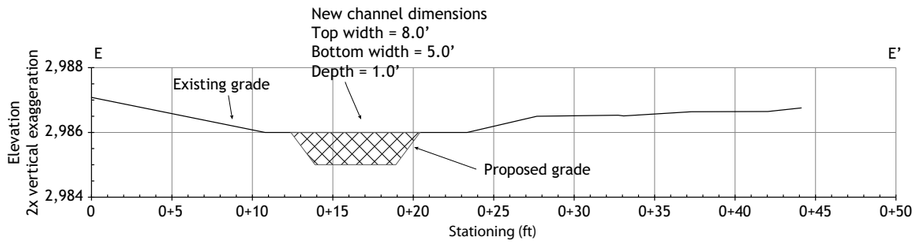
B / C-4 CROSS SECTION OF MIDDLE ROAD CROSSING



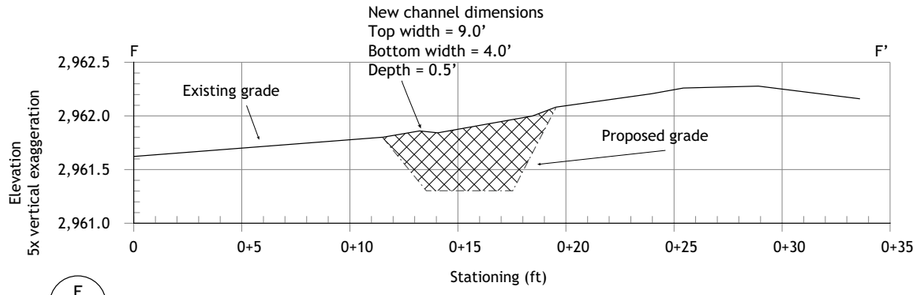
C / C-4 CROSS SECTION OF CHANNEL CONNECTION



D / C-4 CROSS SECTION OF DITCH FILLING



E / C-4 CROSS SECTION OF LOWER ROAD CROSSING



F / C-4 CROSS SECTION OF CHANNEL EXTENSION

Legend

Fill area

Cut area

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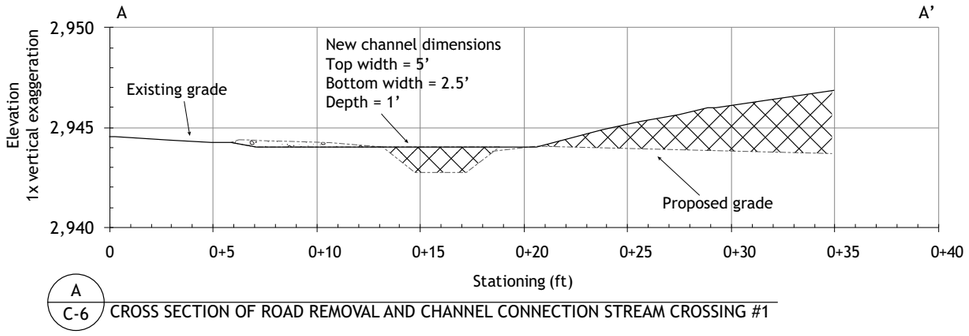
ORIGINAL DRAWING SIZE: 24 X 36

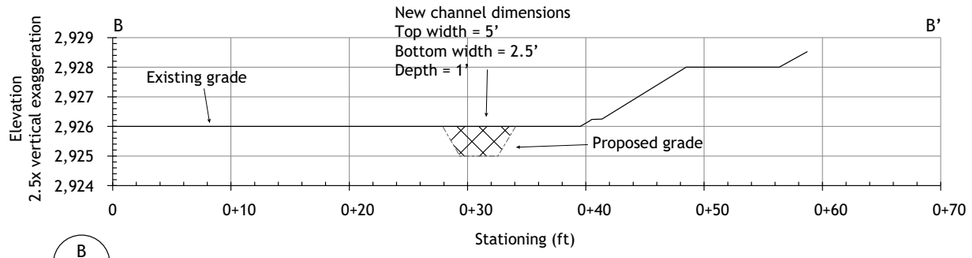
SITE 2-A

Sheet

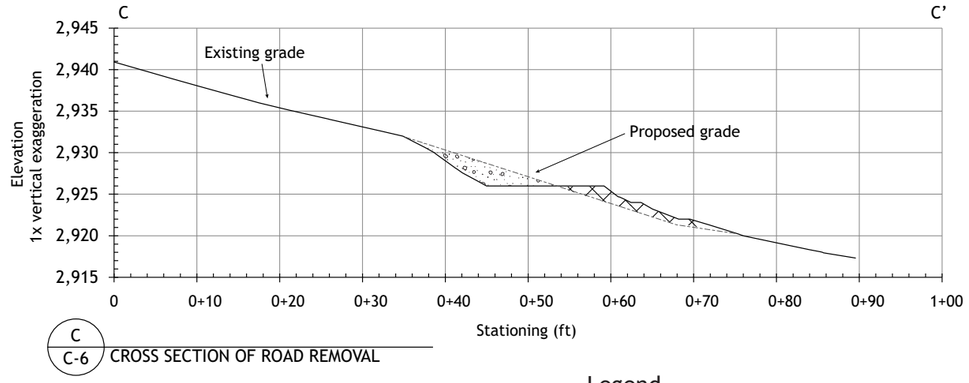
C-5



A / C-6 CROSS SECTION OF ROAD REMOVAL AND CHANNEL CONNECTION STREAM CROSSING #1



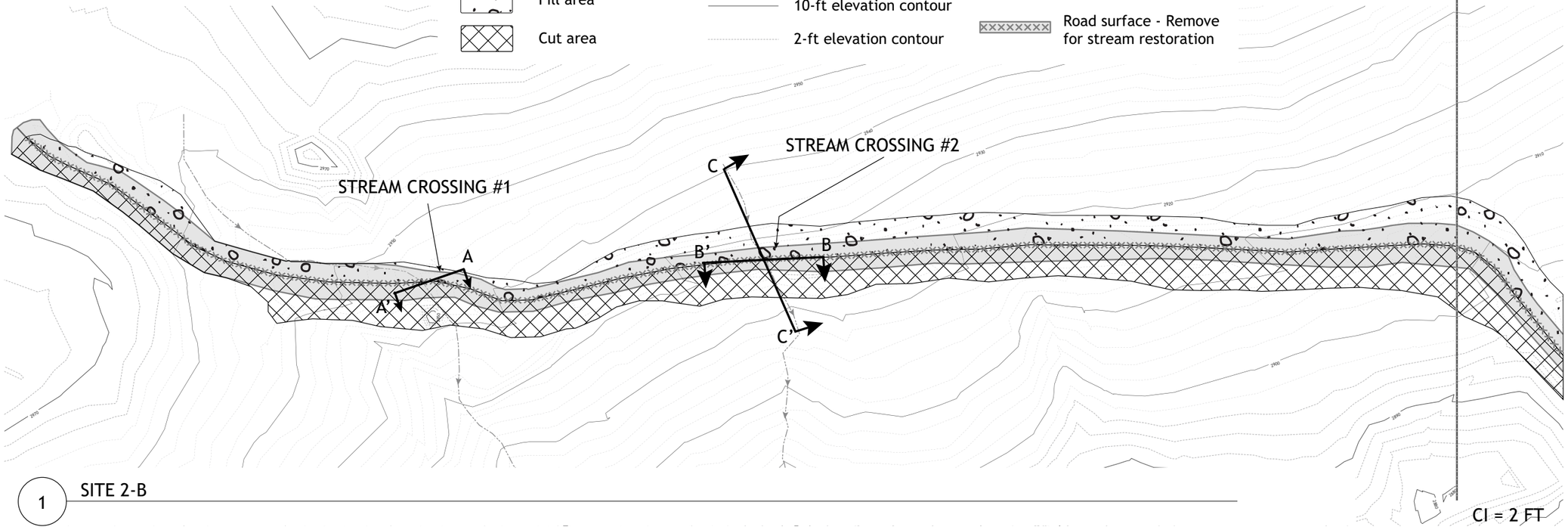
B / C-6 CROSS SECTION OF STREAM CROSSING #2



C / C-6 CROSS SECTION OF ROAD REMOVAL

Legend

- Cross section
- Fill area
- Cut area
- Direction of flow
- 10-ft elevation contour
- 2-ft elevation contour
- Road surface - Abandon in placece
- Road surface - Remove for stream restoration



1 SITE 2-B

wra
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PROJECT #17128-3
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CHECKED BY: GTL, DBB
ORIGINAL DRAWING SIZE: 24 X 36

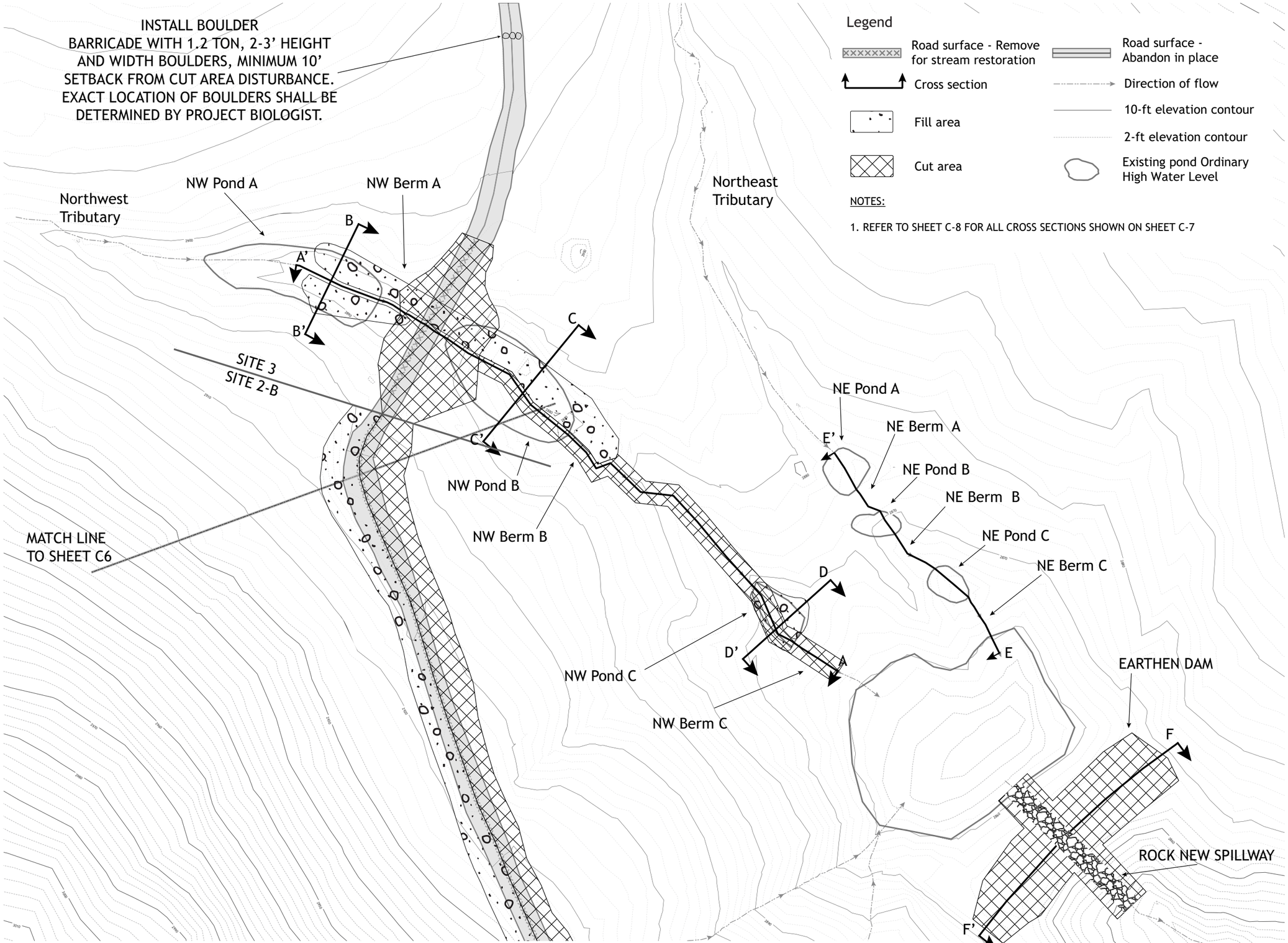
SCALE: 1" = 25'

0 25
SCALE: 1 " = 25'

SITE 2-B

Sheet

C-6



Legend

- Road surface - Remove for stream restoration
- Road surface - Abandon in place
- Cross section
- Direction of flow
- Fill area
- 10-ft elevation contour
- Cut area
- 2-ft elevation contour
- Existing pond Ordinary High Water Level

NOTES:

1. REFER TO SHEET C-8 FOR ALL CROSS SECTIONS SHOWN ON SHEET C-7

1 SITE 3

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CHECKED BY: GTL, DBB
ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 25'

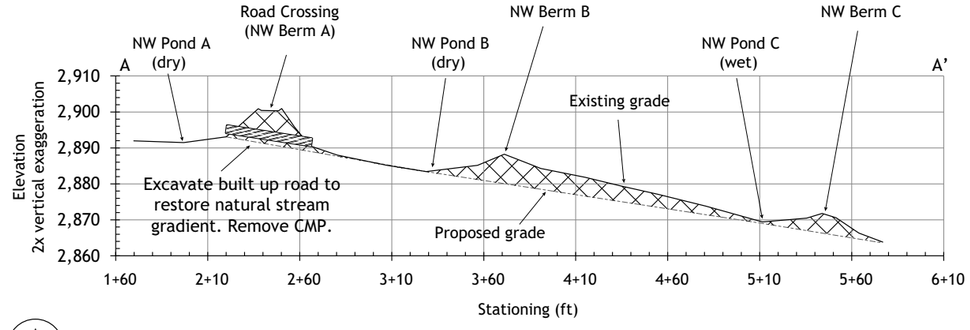
0 25
SCALE: 1 " = 25'

N

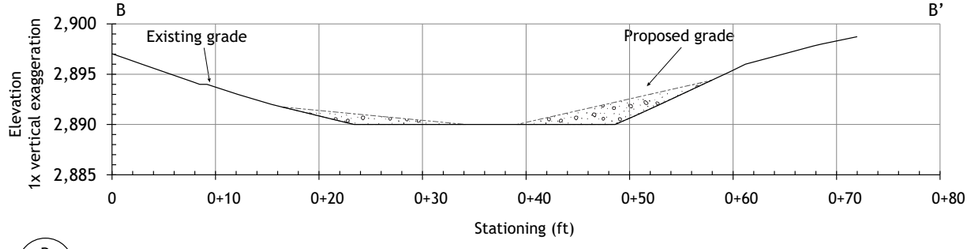
SITE 3

Sheet

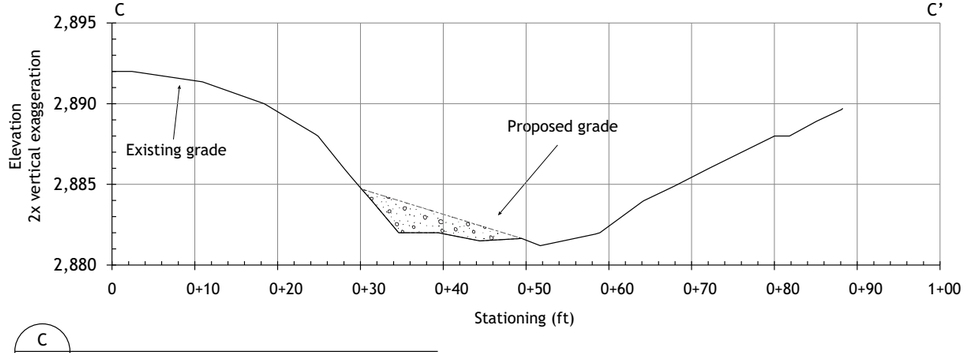
C-7



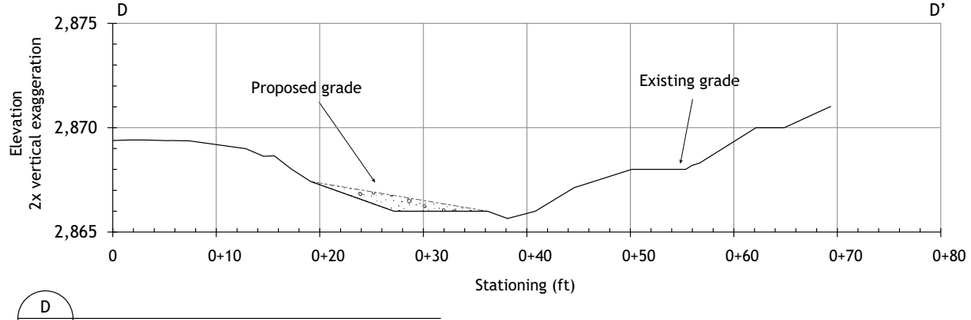
A
C-7 CROSS SECTION OF POND AND ROAD REMOVAL



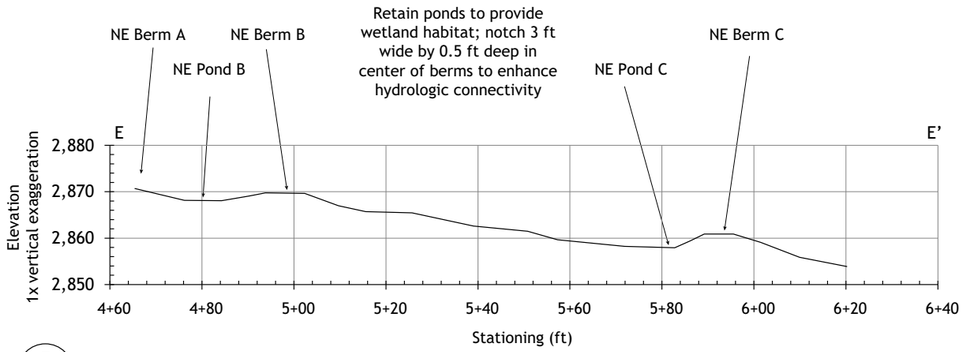
B
C-7 CROSS SECTION OF NW POND A REMOVAL



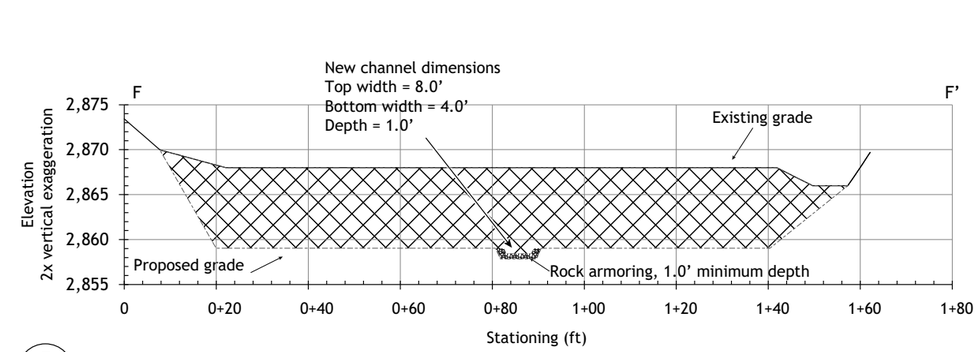
C
C-7 CROSS SECTION OF NW POND B REMOVAL



D
C-7 CROSS SECTION OF NW POND C REMOVAL



E
C-7 CROSS SECTION OF POND BERM MODIFICATION



F
C-7 CROSS SECTION OF EARTHEN DAM AND ROCKED SPILLWAY

Legend

- Rock armoring
- Fill area
- Cut area

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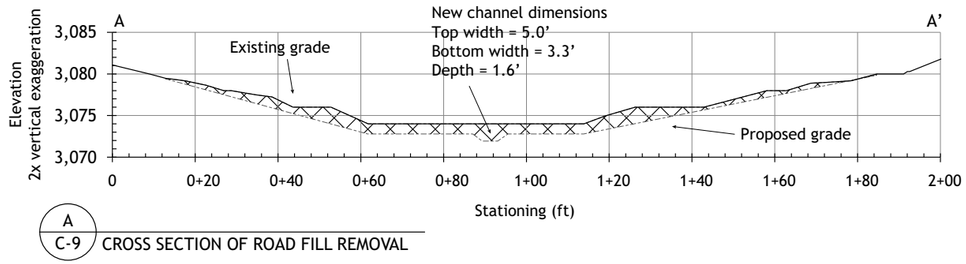
ORIGINAL DRAWING SIZE: 24 X 36

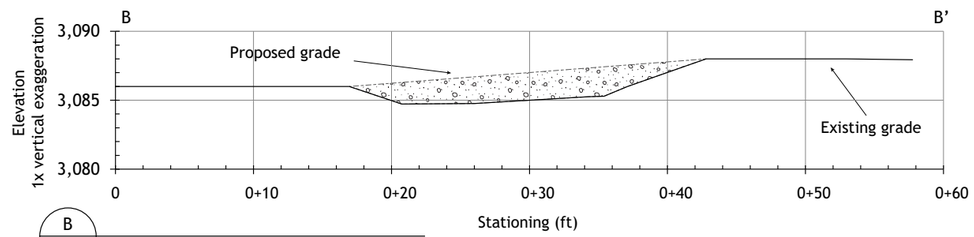
SITE 3

Sheet

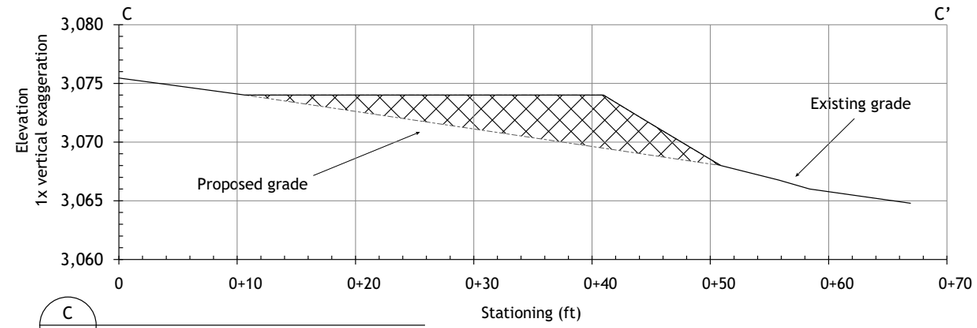
C-8



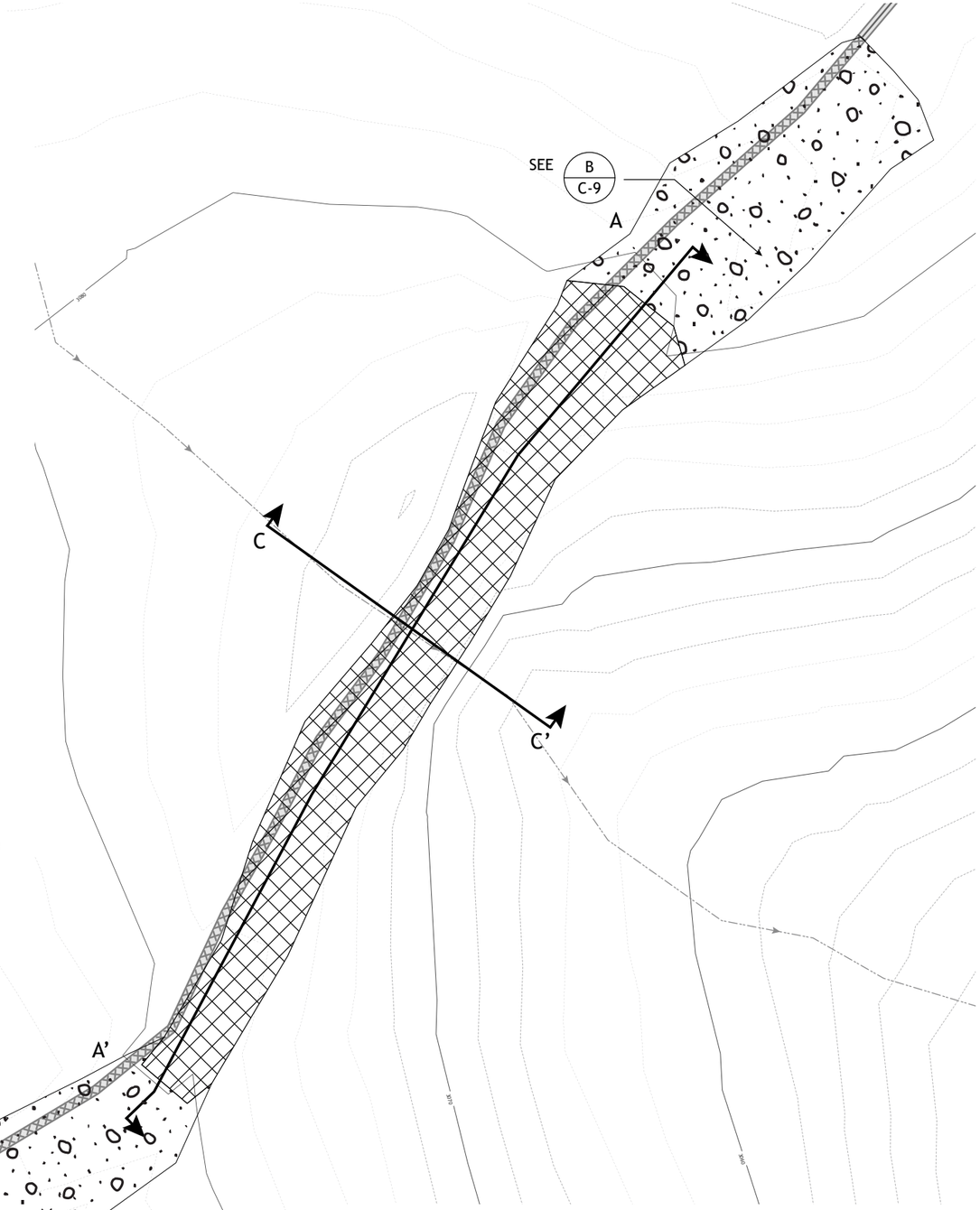
A / C-9 CROSS SECTION OF ROAD FILL REMOVAL



B / C-9 CROSS SECTION OF ROAD CUT REMOVAL



C / C-9 CROSS SECTION CHANNEL CONNECTION



1 SITE 11

Legend

- Road surface - Remove for stream restoration
- Road surface - Abandon in place
- Cross section
- Direction of flow
- Fill area
- 10-ft elevation contour
- Cut area
- 2-ft elevation contour

CI = 2 FT

wra
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ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 12'

0 12
SCALE: 1" = 12'

N

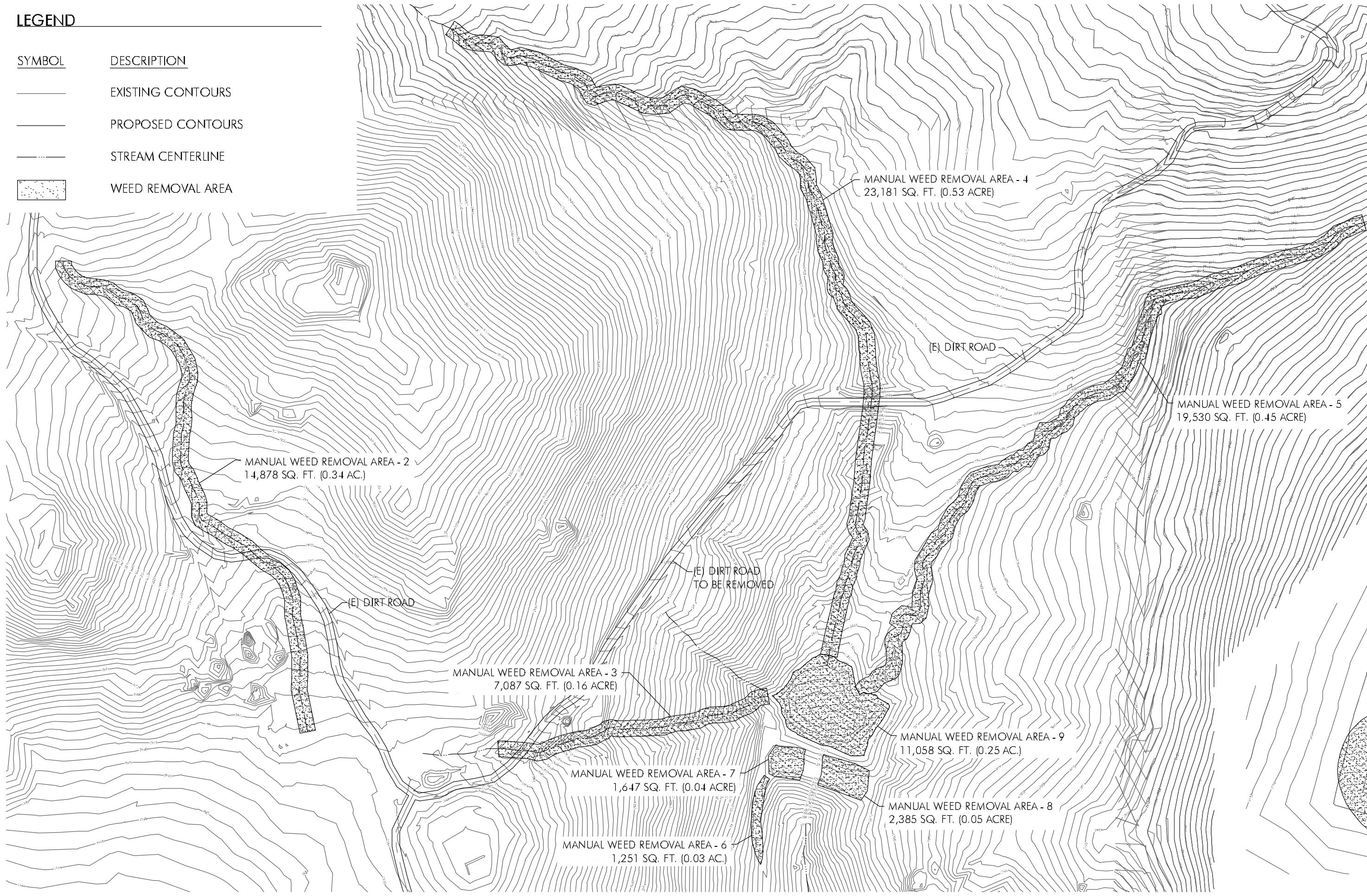
SITE 11

Sheet

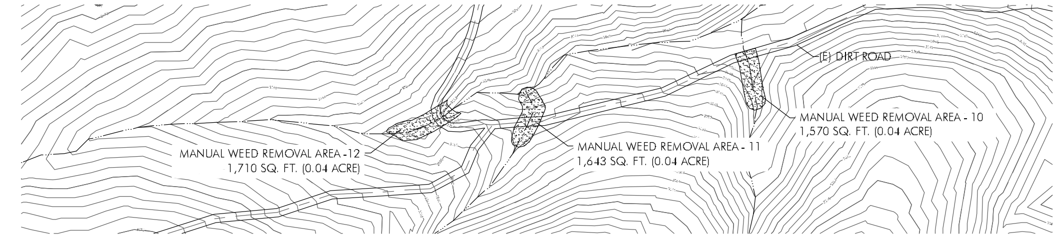
C-9

LEGEND

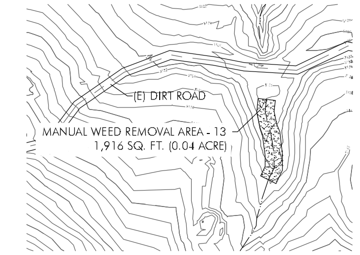
SYMBOL	DESCRIPTION
(line)	EXISTING CONTOURS
(line)	PROPOSED CONTOURS
(line)	STREAM CENTERLINE
(hatch)	WEED REMOVAL AREA



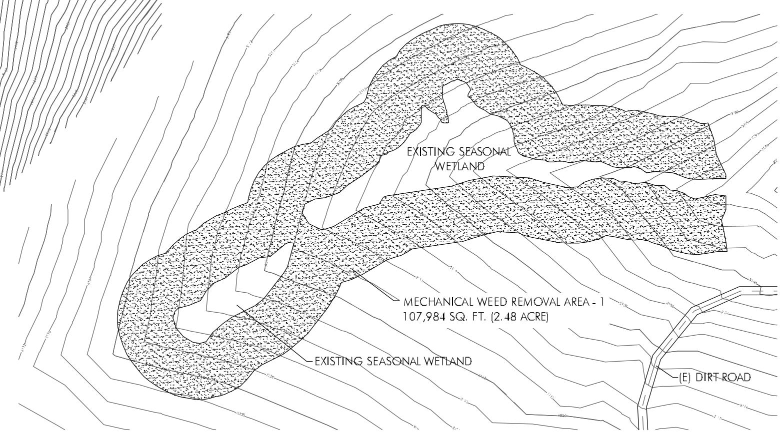
1 WEED REMOVAL AREA 1
1" = 100'



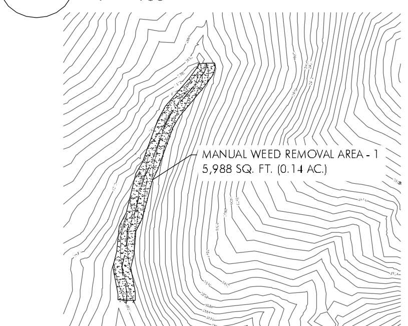
2 WEED REMOVAL AREA 2
1" = 100'



3 WEED REMOVAL AREA 3
1" = 100'



4 WEED REMOVAL AREA 4
1" = 100'



5 WEED REMOVAL AREA 5
1" = 100'

GENERAL SITE DESCRIPTION

1. ACCESS ROADS LEAD TO ALL MITIGATION AREAS.
2. THE MAJORITY OF THE VEGETATION AT THE LIGHTNER PROPERTY IS NATIVE AND CLASSIFIED AS CHAPARRAL AND OAK WOODLAND, EXCEPT IN AREAS WHERE SENSITIVE RIPARIAN AND EMERGENT WETLAND HABITATS ARE PRESENT.
3. THE LOCAL CLIMATE CAN VARY FROM MILD TO HOT. CONDITIONS MAY BE PHYSICALLY CHALLENGING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE HEALTH AND SAFETY OF WORKERS AT THE SITE.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING POTABLE WATER AND PORTABLE RESTROOM FACILITIES AT THE SITE. THE CONTRACTOR SHALL BE PROHIBITED FROM DISPOSING OF ANY HUMAN EXCREMENT AT THE SITE.

PROTECTION OF WILDLIFE, PLANT SPECIES AND NATURAL RESOURCES

1. HABITAT ON THE SITE HAS THE POTENTIAL TO SUPPORT THE HERMES COPPER BUTTERFLY (*LYCAENA HERMES*). CONTRACTORS SHALL AVOID CONTACT WITH WILDLIFE AND NOTIFY THE PROJECT BIOLOGIST OF ANY OBSERVATIONS OF SPECIAL STATUS WILDLIFE SPECIES.
2. NO PROTECTED PLANT SPECIES ARE KNOWN TO OCCUR WITHIN THE SITE. THE MAJORITY OF PLANTS NOT TARGETED FOR WEED REMOVAL ARE NATIVE AND SHALL NOT TO BE DISTURBED DURING WEED REMOVAL ACTIVITIES. THE CONTRACTOR SHALL OBTAIN A LIST OF SENSITIVE SPECIES FROM THE PROJECT BIOLOGIST.
3. WEED REMOVAL ACTIVITIES ARE TO OCCUR WITHIN SPECIFIC BOUNDARIES WITHIN THE MITIGATION AREAS. DISTURBANCE TO SENSITIVE HABITAT OUTSIDE MITIGATION AREAS SHALL BE PROHIBITED. THE PROJECT BIOLOGIST WILL DETERMINE BOUNDARIES.
4. WEED REMOVAL ACTIVITIES SHALL MINIMIZE DAMAGE TO THE NATIVE VEGETATION.
5. DESIGNATED ACCESS ROADS SHALL BE CONFIRMED BY THE PROJECT BIOLOGIST. USE OF OTHER ROADS SHALL BE PROHIBITED.
6. THE CONTRACTOR SHALL PROPOSE SUITABLE STAGING AREAS, WHICH SHALL BE APPROVED BY THE PROJECT BIOLOGIST.
7. HERBICIDES SHALL BE APPROVED FOR SENSITIVE SPECIES BY THE PROJECT BIOLOGIST.
8. ALL WORK SHALL COMPLY WITH PROVISIONS LISTED IN THE PROJECT FINAL ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT (FEIR/EIS), BIOLOGICAL ASSESSMENT, AND FINAL REGULATORY PERMITS.

DISTRIBUTION OF WEEDS

1. WEED REMOVAL WILL FOCUS ON THE TREATMENT OF THE ANNUAL WEEDS TOCALOTE (*CENTAUREA MELITENSIS*) AND SHORTPOD MUSTARD (*HIRSCHFELDIA INCANA*). THE SPECIES OCCUR AT VARYING DENSITIES THROUGHOUT THE MITIGATION SITE.
2. WEED REMOVAL ACTIVITIES WILL FOCUS ON THE REMOVAL OF WEEDS FROM WITHIN BANKS OF STREAM CHANNELS, WETLANDS, AND PONDS, UNLESS OTHERWISE INDICATED.

BEST MANAGEMENT PRACTICES FOR WEED REMOVAL

1. AVOID IMPACTS TO NATIVE TREES AND SHRUBS AND ALL SENSITIVE SPECIES ON THE SITE.
2. AVOID DISTURBANCE AND DO NOT STAGE CONSTRUCTION ACTIVITIES IN WEED INFESTED AREAS.
3. AVOID AND MINIMIZE GROUND DISTURBANCE. SELECT WEED REMOVAL EQUIPMENT WHICH WILL MINIMIZE DISTURBANCE TO THE SOIL AND NATIVE VEGETATION WHENEVER POSSIBLE.
4. CLEAN VEHICLES BEFORE ENTERING OR LEAVING A WEED-INFESTED SITE OR CONSTRUCTION SITE TO PREVENT THE TRANSPORT OF SOIL AND PLANT MATERIAL.
5. REMOVE SEEDS FROM CLOTHING, FOOTWEAR, VEHICLES, AND EQUIPMENT BEFORE ENTERING AREAS WITH NO WEED INFESTATION.
6. COVER MATERIAL, INCLUDING DEAD WEED BIOMASS OR SOIL, SECURELY DURING TRANSPORT.

MANUAL WEED REMOVAL AREAS

YEAR 1

1. WEEDS WITHIN THE MANUAL WEED REMOVAL AREAS SHALL BE REMOVED AS DESCRIBED IN THE DRAWINGS.
2. WEED SPECIES DESIGNATED FOR MANUAL REMOVAL INCLUDE NON-NATIVE, INVASIVE PLANT SPECIES LISTED BY THE CALIFORNIA INVASIVE PLANT COUNCIL (CAL-IPC) AS HAVING A SEVERE OR MODERATE (A OR B) INVASIVE IMPACT. THESE WEED SPECIES SHALL BE DESCRIBED AND IDENTIFIED TO THE CONTRACTOR BY THE PROJECT BIOLOGIST. CONTRACTOR SHALL PROVIDE A WEED REMOVAL PLAN WHICH ADDRESSES EACH WEED SPECIES AND WEED REMOVAL LOCATION FOR APPROVAL BY THE PROJECT BIOLOGIST PRIOR TO ANY REMOVAL ACTIVITIES.
3. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT BIOLOGIST TO DETERMINE THE EXACT TIMING OF WEED REMOVAL ACTIVITIES. CONTRACTOR SHALL REMOVE SEED HEADS FROM PLANTS PRIOR TO REMOVING THE STEMS AND ROOTS, IF THE PLANTS HAVE SET SEED.
   A. PERENNIAL WEEDS SHALL BE REMOVED ONCE A MONTH DURING THE GROWING SEASON, OCCURRING BETWEEN APPROXIMATELY FEBRUARY 1 TO AUGUST 31. COMMON PERENNIAL WEEDS AT THE SITE INCLUDE CASTOR BEAN (*RICINUS COMMUNIS*) AND CURLY DOCK (*RUMEX CRISPUS*).
   B. ANNUAL WEEDS SHALL BE REMOVED TWO TIMES DURING THE SPRING, ONCE BETWEEN APPROXIMATELY FEBRUARY 1 AND APRIL 15 AND ONCE BETWEEN APRIL 16 AND JUNE 30. COMMON ANNUAL WEEDS AT THE SITE INCLUDE SAHARAN MUSTARD (*BRASSICA TOURNEFORTII*), TOCALOTE (*CENTAUREA MELITENSIS*), AND SHORTPOD MUSTARD (*HIRSCHFELDIA INCANA*).
4. WEEDS SHALL BE REMOVED WITH MANUAL TOOLS WHICH CAUSE MINIMAL GROUND DISTURBANCE. NATIVE SHRUBS OR TREES ADJACENT TO WEED REMOVAL AREAS SHALL NOT BE DISTURBED.
5. THE CONTRACTOR SHALL DISPOSE OF SEEDS, WEED CLIPPINGS AND DEAD PLANT BIOMASS WITH APPROVAL FROM THE PROJECT BIOLOGIST. THE CONTRACTOR SHALL CONTAIN SEEDS, WEED CLIPPINGS, AND DEAD PLANT BIOMASS IN BAGS. THE CONTRACTOR SHALL DISPOSE OF WEED CLIPPINGS IN DESIGNATED AREAS WITHIN THE SITE, AS FEASIBLE. THE METHOD OF ONSITE AND OFFSITE TRANSPORTATION OF REMOVING SEEDS, WEED CLIPPINGS, AND DEAD PLANT BIOMASS SHALL BE DETERMINED BASED ON THE SITE TOPOGRAPHY AND REMOTENESS.

YEARS 2-5

1. YEAR 2: ANNUAL WEEDS SHALL BE REMOVED TWO TIMES DURING THE SPRING, ONCE BETWEEN FEBRUARY 1 AND APRIL 15 AND ONCE BETWEEN APRIL 16 AND JUNE 30. PERENNIAL WEEDS SHALL BE REMOVED FOUR TIMES DURING THE GROWING SEASON, BETWEEN FEBRUARY 1 AND AUGUST 31. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT BIOLOGIST TO DETERMINE THE EXACT TIMING OF WEED REMOVAL ACTIVITIES.
2. YEARS 3-5: WEEDS SHALL BE REMOVED TWICE ANNUALLY AT A MINIMUM. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT BIOLOGIST TO DETERMINE THE EXACT TIMING OF WEED REMOVAL ACTIVITIES.
3. WEED REMOVAL METHODS SHALL BE ADAPTED AS NECESSARY BASED ON ANNUAL MONITORING RESULTS. THE PROJECT BIOLOGIST SHALL SPECIFY CHANGES TO WEED REMOVAL METHODS BY SEPTEMBER 15 OF EACH MONITORING YEAR.

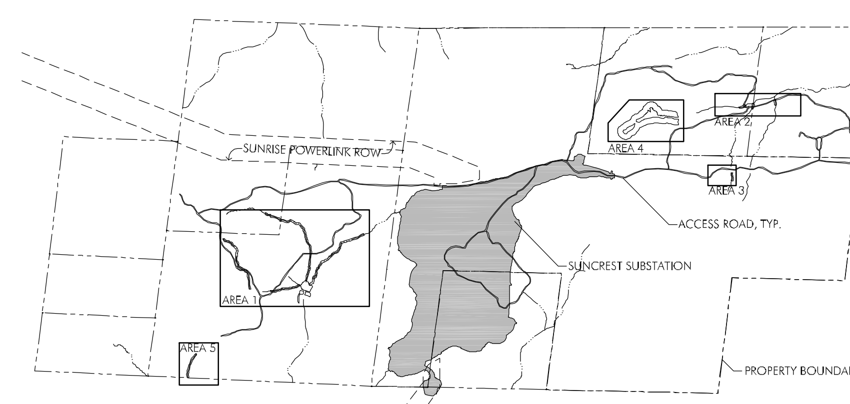
MECHANICAL WEED REMOVAL AREAS

YEAR 1

1. WEEDS WITHIN THE MECHANICAL WEED REMOVAL AREAS SHALL BE REMOVED AS DESCRIBED IN THE DRAWINGS.
2. WEED SPECIES DESIGNATED FOR MECHANICAL REMOVAL INCLUDE NON-NATIVE, INVASIVE PLANT SPECIES LISTED BY THE CAL-IPC AS HAVING A SEVERE OR MODERATE (A OR B) INVASIVE IMPACT. THESE WEED SPECIES SHALL BE DESCRIBED AND IDENTIFIED TO THE CONTRACTOR BY THE PROJECT BIOLOGIST. CONTRACTOR SHALL PROVIDE A WEED REMOVAL PLAN THAT ADDRESSES EACH WEED SPECIES AND WEED REMOVAL LOCATION FOR APPROVAL BY THE PROJECT BIOLOGIST PRIOR TO ANY REMOVAL ACTIVITIES.
3. WEED REMOVAL SHALL OCCUR TWO TIMES DURING THE SPRING, ONCE BETWEEN APPROXIMATELY FEBRUARY 1 AND APRIL 15 AND ONCE BETWEEN APRIL 16 AND JUNE 30. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT BIOLOGIST TO DETERMINE THE EXACT TIMING OF THE WEED REMOVAL ACTIVITIES.
4. WEEDS SHALL BE REMOVED WITH A TRACTOR MOWER, WEED-EATER OR OTHER EQUIVALENT TOOL OR METHOD AS APPROVED BY THE PROJECT BIOLOGIST.
5. CONTRACTOR SHALL REMOVE SEED HEADS FROM PLANTS PRIOR TO REMOVING THE STEMS AND ROOTS IF THE PLANTS HAVE SET SEED.
6. THE CONTRACTOR SHALL DISPOSE OF SEEDS, WEED CLIPPINGS AND DEAD PLANT BIOMASS WITH APPROVAL FROM THE PROJECT BIOLOGIST. THE CONTRACTOR SHALL CONTAIN SEEDS, WEED CLIPPINGS, AND DEAD PLANT BIOMASS IN BAGS. THE CONTRACTOR SHALL DISPOSE OF WEED CLIPPINGS IN DESIGNATED AREAS WITHIN THE SITE, AS FEASIBLE. THE METHOD OF ONSITE AND OFFSITE TRANSPORTATION OF REMOVING SEEDS, WEED CLIPPINGS, AND DEAD PLANT BIOMASS SHALL BE DETERMINED BASED ON THE SITE TOPOGRAPHY AND REMOTENESS.
7. CONTRACTOR SHALL AVOID DISTURBING THE EXISTING SEASONAL WETLANDS AND MITIGATION PLANTINGS.

YEARS 2-5

1. WEEDS SHALL BE REMOVED TWICE ANNUALLY AT A MINIMUM DURING THE MONITORING YEARS 2-5. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT BIOLOGIST TO DETERMINE THE TIMING OF WEED REMOVAL ACTIVITIES.
2. WEED REMOVAL METHODS SHALL BE ADAPTED AS NECESSARY BASED ON ANNUAL MONITORING RESULTS. THE PROJECT BIOLOGIST SHALL SPECIFY CHANGES TO WEED REMOVAL METHODS BY SEPTEMBER 15 OF EACH MONITORING YEAR.



WEED REMOVAL AREA KEY MAP
1" = 1000'

wra
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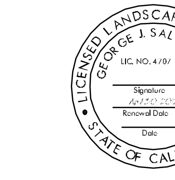
SUNRISE POWERLINK

LIGHTNER PROPERTY
WATERS MITIGATION PLAN
SAN DIEGO COUNTY, CALIFORNIA
CORPS FILE NUMBER: 2007-00704-SAS

NOT FOR CONSTRUCTION



Date	Issues And Revisions	No.
11/12/10	PERMIT SET	

PROJECT #17128-3
DRAWN BY: ICM, KET
CHECKED BY: GJS
ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 100'

LIGHTNER PROPERTY
WEED REMOVAL PLAN

Sheet

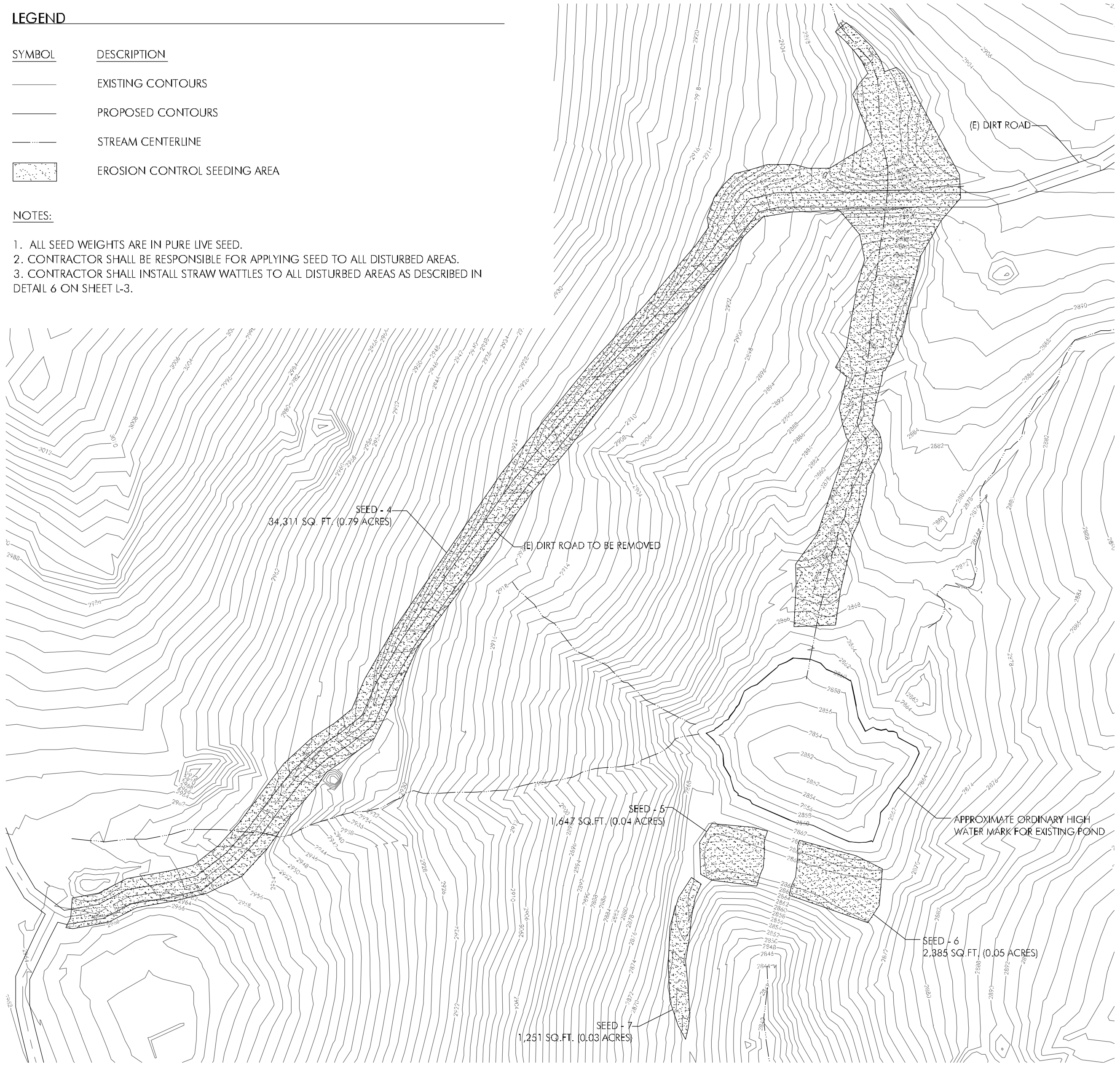
L-2

LEGEND

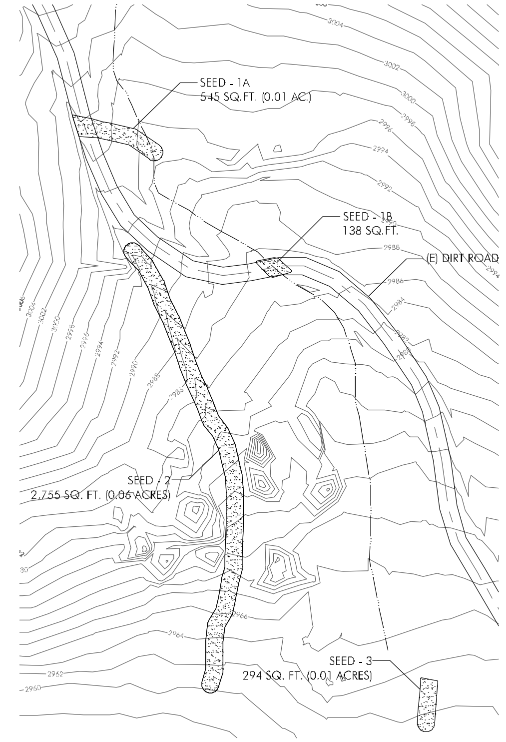
SYMBOL	DESCRIPTION
	EXISTING CONTOURS
	PROPOSED CONTOURS
	STREAM CENTERLINE
	EROSION CONTROL SEEDING AREA

NOTES:

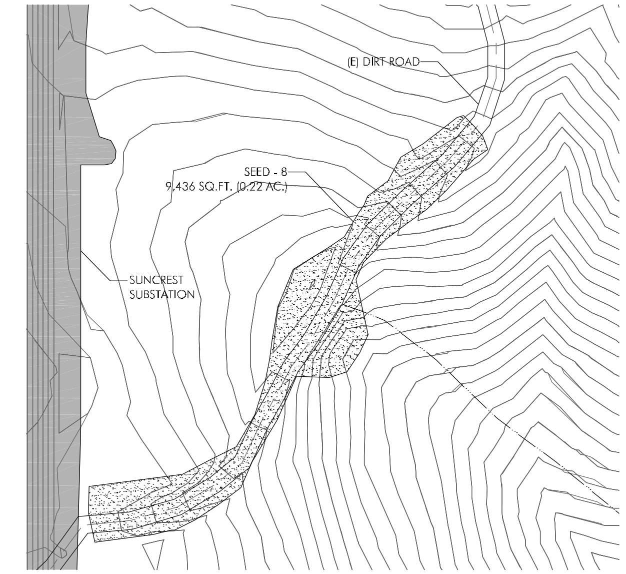
1. ALL SEED WEIGHTS ARE IN PURE LIVE SEED.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR APPLYING SEED TO ALL DISTURBED AREAS.
3. CONTRACTOR SHALL INSTALL STRAW WATTLES TO ALL DISTURBED AREAS AS DESCRIBED IN DETAIL 6 ON SHEET L-3.



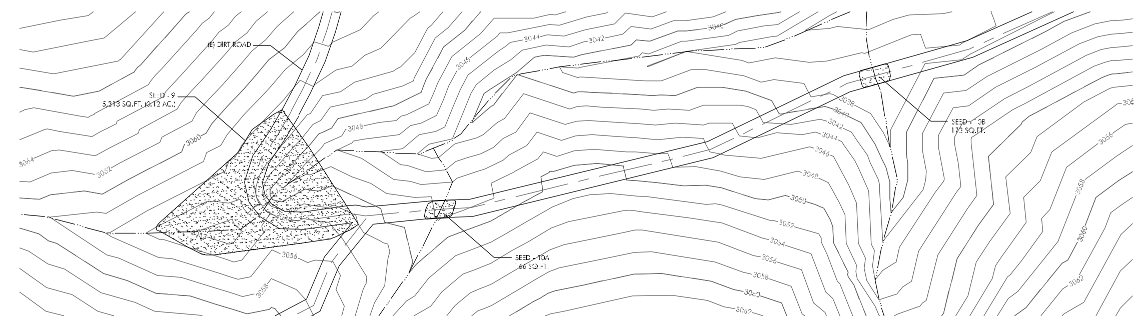
1 AREA - 1
1" = 50'



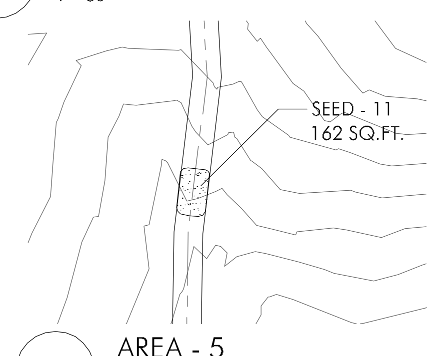
2 AREA - 2
1" = 50'



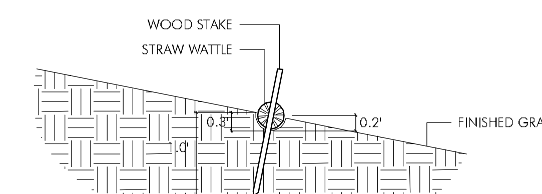
3 AREA - 3
1"=50'



4 AREA - 4
1"=50'



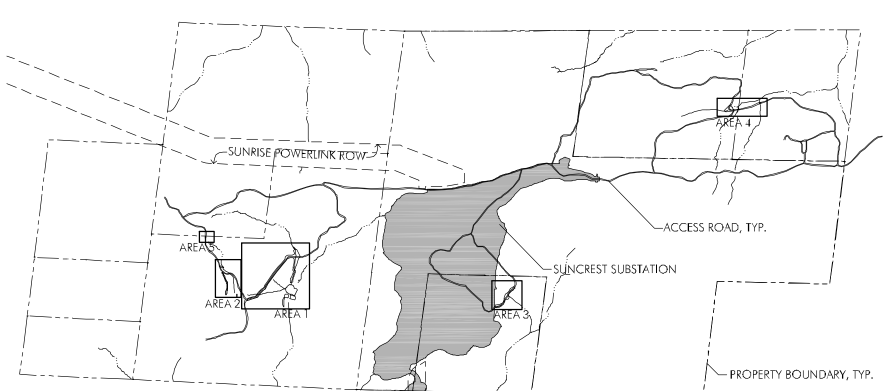
5 AREA - 5
NOT TO SCALE



NOTES:

1. STRAW WATTLES SHALL BE PLACED ALONG SLOPE CONTOURS WHERE THE SLOPE IS STEEPER THAN OR EQUAL TO 3:1 AND THE VERTICAL DISTANCE OF THE SLOPE IS GREATER THAN 15 FEET. STRAW WATTLES SHALL BE PLACED AT A MAXIMUM DISTANCE OF 15 VERTICAL FEET.
2. EXCEPT WHERE OVERLAPPING, STRAW WATTLE ENDS SHALL BE STAKED 0.75' UPSLOPE.

6 STRAW WATTLE
NOT TO SCALE



KEY MAP
1" = 1000'

PLANT LEGEND FOR EROSION CONTROL SEED MIX

SYMBOL	BOTANICAL NAME	COMMON NAME	PLS/ACRE
ADE FAS	*ADENOSTOMA FASCICULATUM*	CHAMISE	1.00
ART CAL	*ARTEMISIA CALIFORNICA*	COASTAL SAGE BRUSH	0.50
ASC FAS	*ASCLEPIAS FASCICULARIS*	NARROWLEAF MILKWEED	1.00
BRO CAR	*BROMUS CARINATUS*	CALIFORNIA BROME	8.00
CAL CIL	*CALANDRINIA CILIATA*	RED MAIDS	0.50
ELY GLA	*ELYMUS GLAUCUS*	BLUE WILDRYE	6.00
ERI CON	*ERIOPHYLLUM CONFERTIFLORUM*	GOLDEN YARROW	0.50
ERI FAS	*ERIOGONUM FASCICULATUM*	CALIFORNIA BUCKWHEAT	1.00
ESC CAL	*ESCHSCHOLZIA CALIFORNICA*	CALIFORNIA POPPY	3.00
HEL SCO	*HELIANTHEMUM SCOPARIUM*	PEAK RUSH ROSE	2.00
LOT SCO	*LOTUS SCOPARIUS*	DEERWEED	3.00
MUH RIG	*MUHLENBERGIA RIGENS*	DEERGRASS	0.50
NAS CER	*NASSELLA CERNUA*	NODDING NEEDLEGRASS	3.00
NEM MEN	*NEMOPHILIA MENZIESII*	BABY BLUE EYES	2.00
SAL API	*SALVIA APIANA*	WHITE SAGE	0.50
SOL DOU	*SOLANUM DOUGLASII*	WHITE NIGHTSHADE	2.00
VUL MIC	*VULPIA MICROSTACHYS*	SMALL FESCUE	6.00

QUANTITY ESTIMATES FOR EROSION CONTROL SEED MIX

SYMBOL	SIZE SQ. FT.	SIZE AC.	*ADE FAS* LBS	*ART CAL* LBS	*ASC FAS* LBS	*BRO CAR* LBS	*CAL CIL* LBS	*ELY GLA* LBS	*ERI CON* LBS	*ERI FAS* LBS	*ESC CAL* LBS	*HEL SCO* LBS	*LOT SCO* LBS	*MUH RIG* LBS	*NAS CER* LBS	*NEM MEN* LBS	*SAL API* LBS	*SOL DOU* LBS	*VUL MIC* LBS	TOTAL LBS
SEED - 1A	545	0.01	0.01	0.01	0.01	0.10	0.01	0.08	0.01	0.01	0.04	0.03	0.04	0.01	0.04	0.03	0.01	0.03	0.08	**0.51**
SEED - 1B	138	0.00	0.00	0.00	0.00	0.03	0.00	0.02	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.02	**0.13**
SEED - 2	2,755	0.06	0.06	0.03	0.06	0.51	0.03	0.38	0.03	0.06	0.19	0.13	0.19	0.03	0.19	0.13	0.03	0.13	0.38	**2.56**
SEED - 3	294	0.01	0.01	0.00	0.01	0.05	0.00	0.04	0.00	0.01	0.02	0.01	0.02	0.00	0.02	0.01	0.00	0.01	0.04	**0.27**
SEED - 4	34,311	0.79	0.79	0.39	0.79	6.30	0.39	4.73	0.39	0.79	2.36	1.58	2.36	0.39	2.36	1.58	0.39	1.58	4.73	**31.90**
SEED - 5	1,647	0.04	0.04	0.02	0.04	0.30	0.02	0.23	0.02	0.04	0.11	0.08	0.11	0.02	0.11	0.08	0.02	0.08	0.23	**1.53**
SEED - 6	2,385	0.05	0.05	0.03	0.05	0.44	0.03	0.33	0.03	0.05	0.16	0.11	0.16	0.03	0.16	0.11	0.03	0.11	0.33	**2.22**
SEED - 7	1,251	0.03	0.03	0.01	0.03	0.23	0.01	0.17	0.01	0.03	0.09	0.06	0.09	0.01	0.09	0.06	0.01	0.06	0.17	**1.16**
SEED - 8	9,436	0.22	0.22	0.11	0.22	1.73	0.11	1.30	0.11	0.22	0.65	0.43	0.65	0.11	0.65	0.43	0.11	0.43	1.30	**8.77**
SEED - 9	5,313	0.12	0.12	0.06	0.12	0.98	0.06	0.73	0.06	0.12	0.37	0.24	0.37	0.06	0.37	0.24	0.06	0.24	0.73	**4.94**
SEED - 10A	166	0.00	0.00	0.00	0.00	0.03	0.00	0.02	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.02	**0.15**
SEED - 10B	173	0.00	0.00	0.00	0.00	0.03	0.00	0.02	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.02	**0.16**
SEED - 11	162	0.00	0.00	0.00	0.00	0.03	0.00	0.02	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.02	**0.15**
TOTAL	**58,575**	**1.34**	**1.34**	**0.67**	**1.34**	**10.76**	**0.67**	**8.07**	**0.67**	**1.34**	**4.03**	**2.69**	**4.03**	**0.67**	**4.03**	**2.69**	**0.67**	**2.69**	**8.07**	**54.46**

wra
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SUNRISE POWERLINK

LIGHTNER PROPERTY
WATERS MITIGATION PLAN
SAN DIEGO COUNTY, CALIFORNIA
CORPS FILE NUMBER: 2007-00704-SAS

NOT FOR CONSTRUCTION

LICENSED LANDSCAPE ARCHITECT
GEORGE J. SALVAGGIO
STATE OF CALIFORNIA

Date	Issues And Revisions	No.
11/12/10	PERMIT SET	

PROJECT #17128-3
DRAWN BY: ICM, KET
CHECKED BY: GJS
ORIGINAL DRAWING SIZE: 24 X 36

SEE PLANS
SCALE: 1" = 50'

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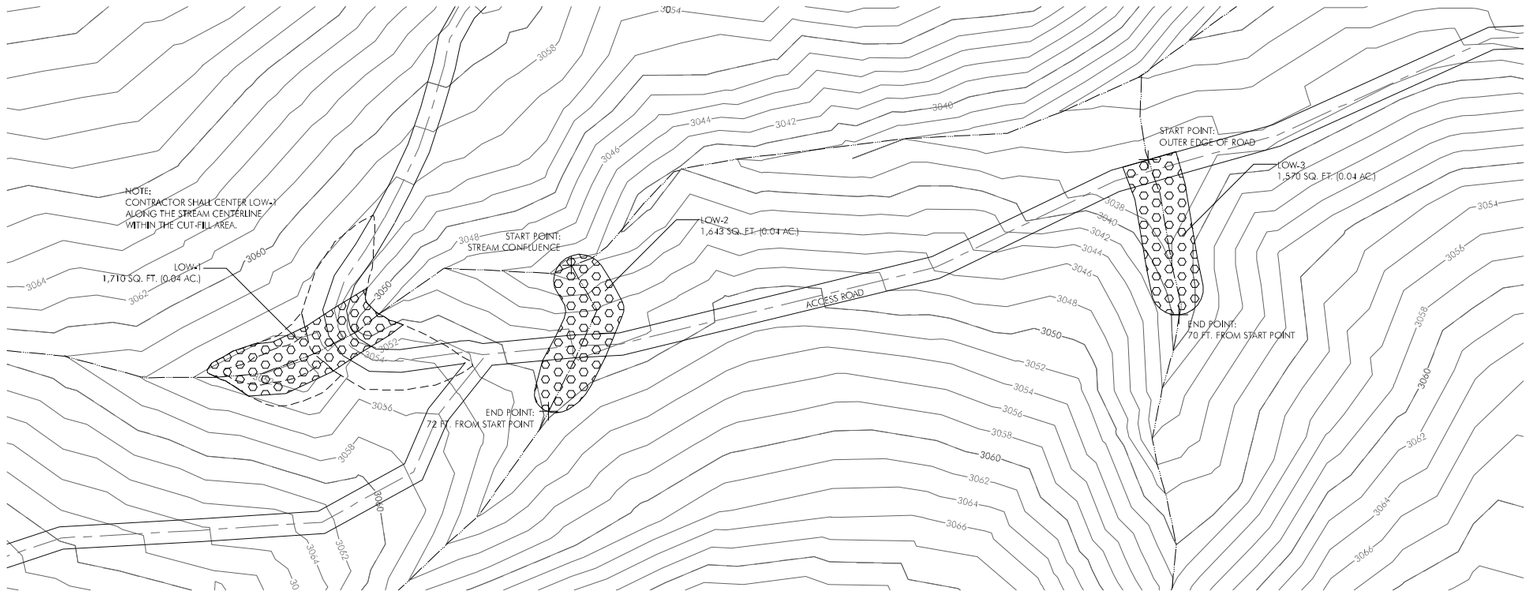
EROSION CONTROL AND SEEDING PLAN

Sheet

L-3



1 LIVE OAK PLANTING PLAN

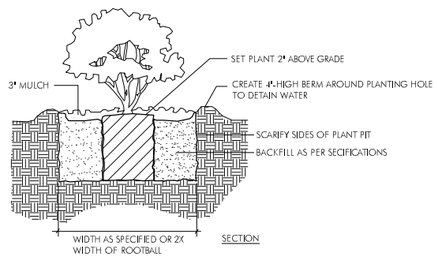
1" = 30'

PLANT LEGEND - LIVE OAK WOODLAND

SYMBOL	NAME	NAME	SIZE	SPACING (OC FEET)	ACCESSORIES
QUE AGR	*QUERCUS AGRIFOLIA*	COAST LIVE OAK	1 GAL	12	TREE SHELTER
QUE ENG	*QUERCUS ENGELMANNII*	ENGELMANN OAK	1 GAL	12	TREE SHELTER
SAM NIG	*SAMBUCUS NIGRA SSP. CAERULEA*	BLUE ELDERBERRY	1 GAL	10	NONE

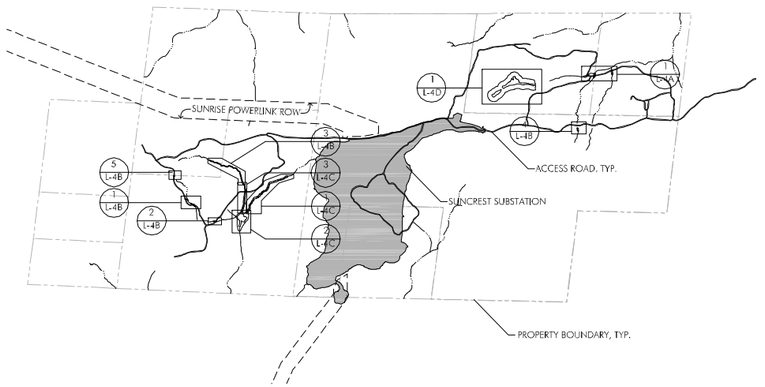
QUANTITY ESTIMATES - LIVE OAK WOODLAND

SYMBOL	AREA SF	AREA AC	QUE AGR 1 GAL	QUE ENG 1 GAL	SAM NIG 1 GAL	SUBTOTAL
LOW-1	1,710	0.039	4	4	5	**13**
LOW-2	1,643	0.038	3	3	4	**10**
LOW-3	1,570	0.036	3	3	4	**10**
TOTAL	**4,923**	**0.11**	**10**	**10**	**13**	**33**



2 TREE AND SHRUB PLANTING DETAIL

NOT-TO-SCALE



3 KEY MAP

1" = 1000'

LEGEND

- EXISTING CONTOUR
- STEAM CENTERLINE
- ROAD CENTERLINE
- LIMIT OF CUT/FILL
- LIVE OAK WOODLAND PLANTING AREA
- START OR END POINT OF PLANTING AREA

PLANTING NOTES :

1. CONTRACTOR SHALL INSTALL WOODEN STAKES AT THE START AND END POINTS OF EACH PLANTING AREA AS SHOWN ON THE DRAWINGS.
2. CONTRACTOR SHALL COORDINATE WITH THE PROJECT BIOLOGIST TO COMPLETE PLANT LOCATION STAKING.

IRRIGATION SYSTEM

1. THE CONTRACTOR SHALL DESIGN AND INSTALL AN IRRIGATION SYSTEM TO PROVIDE TEMPORARY WATER TO THE MITIGATION SITES AT LOCATIONS WHERE CONTAINERIZED PLANTS WILL BE UTILIZED.
2. THE CONTRACTOR SHALL PREPARE SHOP DRAWINGS AND SUBMIT THEM TO THE PROJECT BIOLOGIST FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION. SHOP DRAWINGS SHALL AT A MINIMUM INDICATE THE LOCATION AND CONFIGURATION OF ALL OF THE MAJOR SYSTEM COMPONENTS.
3. IRRIGATION SCHEDULE - TO BE DETERMINED IN BID DOCUMENTS.
4. SOURCES OF WATER - THE CONTRACTOR SHALL UTILIZE ONE OR ALL OF THE FOLLOWING SOURCES OF WATER FOR THE DESIGN OF THE IRRIGATION SYSTEM. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE GENERAL CONTRACTOR AND OPERATOR OF THE SUBSTATION TO UTILIZE WATER SOURCES ASSOCIATED WITH THE CONSTRUCTION AND OPERATION OF THE SUBSTATION.
   A. THE CONTRACTOR MAY TRANSPORT AND DISTRIBUTE IRRIGATION WATER VIA WATER TRUCKS. IF THE CONTRACTOR UTILIZES THIS SOURCE OF WATER THEN THE CONTRACTOR IS RESPONSIBLE FOR DEALING WITH POTENTIAL SITE LIMITATIONS SUCH AS THE GENERAL AND SEASONAL CONDITIONS OF THE VARIOUS EXISTING ACCESS ROADS AT THE SITE.
   B. THE CONTRACTOR MAY UTILIZE WATER FROM THE PROPOSED 300,000-GALLON WATER TANK THAT WILL BE INSTALLED IN CONJUNCTION WITH THE CONSTRUCTION AND OPERATION OF THE SUBSTATION. IF THE CONTRACTOR UTILIZES THIS SOURCE OF WATER THEN THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE GENERAL CONTRACTOR AND OPERATOR OF THE SUBSTATION REGARDING ACCESS AND LIMITATIONS TO THIS WATER. THE CONTRACTOR MAY CONNECT IRRIGATION MAIN LINES DIRECTLY TO THIS TANK FOR CONVEYANCE OF WATER TO THE MITIGATION SITES.
   C. THE CONTRACTOR MAY INSTALL WATER TANKS TO STORE WATER IN THE VICINITY OF EACH MITIGATION AREA AS NEEDED. THE CONTRACTOR MAY FILL THESE TANKS EITHER AUTOMATICALLY BY CONNECTING THEM DIRECTLY TO THE 300,000-GALLON TANK OR FILL THESE VIA A WATER TRUCK.
5. THE CONTRACTOR SHALL DESIGN AND INSTALL AN AUTOMATIC IRRIGATION SYSTEM OR HAND WATER THE MITIGATION AREAS.
6. HAND WATERING - IF THE CONTRACTOR SELECTS TO HAND WATER THE MITIGATION AREA THEN THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING IRRIGATION IN ACCORDANCE WITH THE IRRIGATION SCHEDULE AND IS RESPONSIBLE FOR REPLACING ALL PLANTS THAT DIE AS A RESULT OF HE/SHE MISSING WATER APPLICATIONS.
7. AUTOMATIC IRRIGATION SYSTEM - IF THE CONTRACTOR SELECTS TO INSTALL AN AUTOMATIC IRRIGATION SYSTEM, THEN THE CONTRACTOR SHALL UTILIZE A SPRAY SYSTEM TO PROVIDE WATER IN THE VICINITY OF THE CONTAINERIZED PLANTS. FOR PLANTS LOCATED ADJACENT TO AND ALONG STREAM CHANNELS, THE CONTRACTOR SHALL PROVIDE A ROW OF APPROPRIATELY SPACED SPRAY HEADS ON EITHER SIDE OF THE CHANNEL. AUTOMATED SYSTEMS CAN BE CONNECTED TO THE 300,000-GALLON WATER TANK, DISTRIBUTED SMALLER WATER TANKS, OR DIRECTLY TO A PORTABLE WATER TRUCK. IF UTILIZED, MAINLINES MUST BE BURIED A MINIMUM OF 18 INCHES IN ACCORDANCE WITH STANDARD IRRIGATION PRACTICES. IF UTILIZED, THE CONTRACTOR SHALL INSTALL BATTERY OPERATED REMOTE CONTROL VALVES. LOW PRESSURE WATER SHALL BE DISTRIBUTED IN UV-PROTECTED PVC PILE, INSTALLED AT GRADE.
8. GUARANTEE - THE CONTRACTOR SHALL GUARANTEE AND MAINTAIN THE SYSTEM FOR A PERIOD OF 1 YEAR FROM THE TIME THE SYSTEM HAS BEEN ACCEPTED. DURING THIS TIME THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE FUNCTION OF THE SYSTEM SUCH THAT THE APPLICATION OF IRRIGATION WATER IS NOT INTERRUPTED FOR MORE THAN 2 CONSECUTIVE WEEKS. DURING THIS TIME THE CONTRACTOR SHALL MONITOR AND REPAIR THE IRRIGATION SYSTEM AT NO ADDITIONAL EXPENSE TO THE OWNER. DURING THIS TIME THE CONTRACTOR SHALL REPLACE ANY AND ALL PLANTS THAT DIE AS A RESULT OF INADEQUATE WATER AT NO ADDITIONAL EXPENSE TO THE OWNER.

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SUNRISE POWERLINK

LIGHTNER PROPERTY
WATERS MITIGATION PLAN
SAN DIEGO COUNTY, CALIFORNIA
CORPS FILE NUMBER: 2007-00704-SAS

NOT FOR CONSTRUCTION

LICENSED LANDSCAPE ARCHITECT
GEORGE J. SALVAGGIO
LIC. NO. 4707
Signature
Renewal Date
Date
STATE OF CALIFORNIA

Date	Issues And Revisions	No.
11/12/10	PERMIT SET	

PROJECT #17128-3
DRAWN BY: ICM, KET
CHECKED BY: GJS
ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 30'

0 30
SCALE: 1" = 30'

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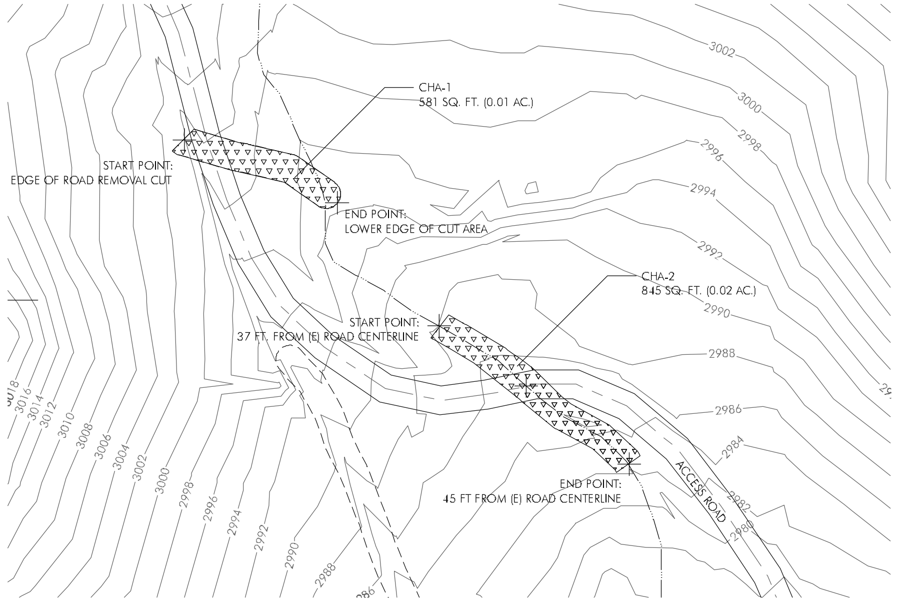
LIVE OAK PLANTING PLAN,
KEY MAP & IRRIGATION NOTES

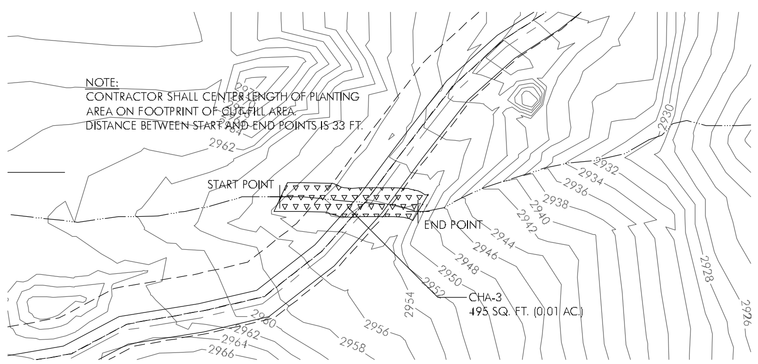
Sheet

L-4A



1 MIXED CHAPARRAL PLANTING PLAN

1" = 30'



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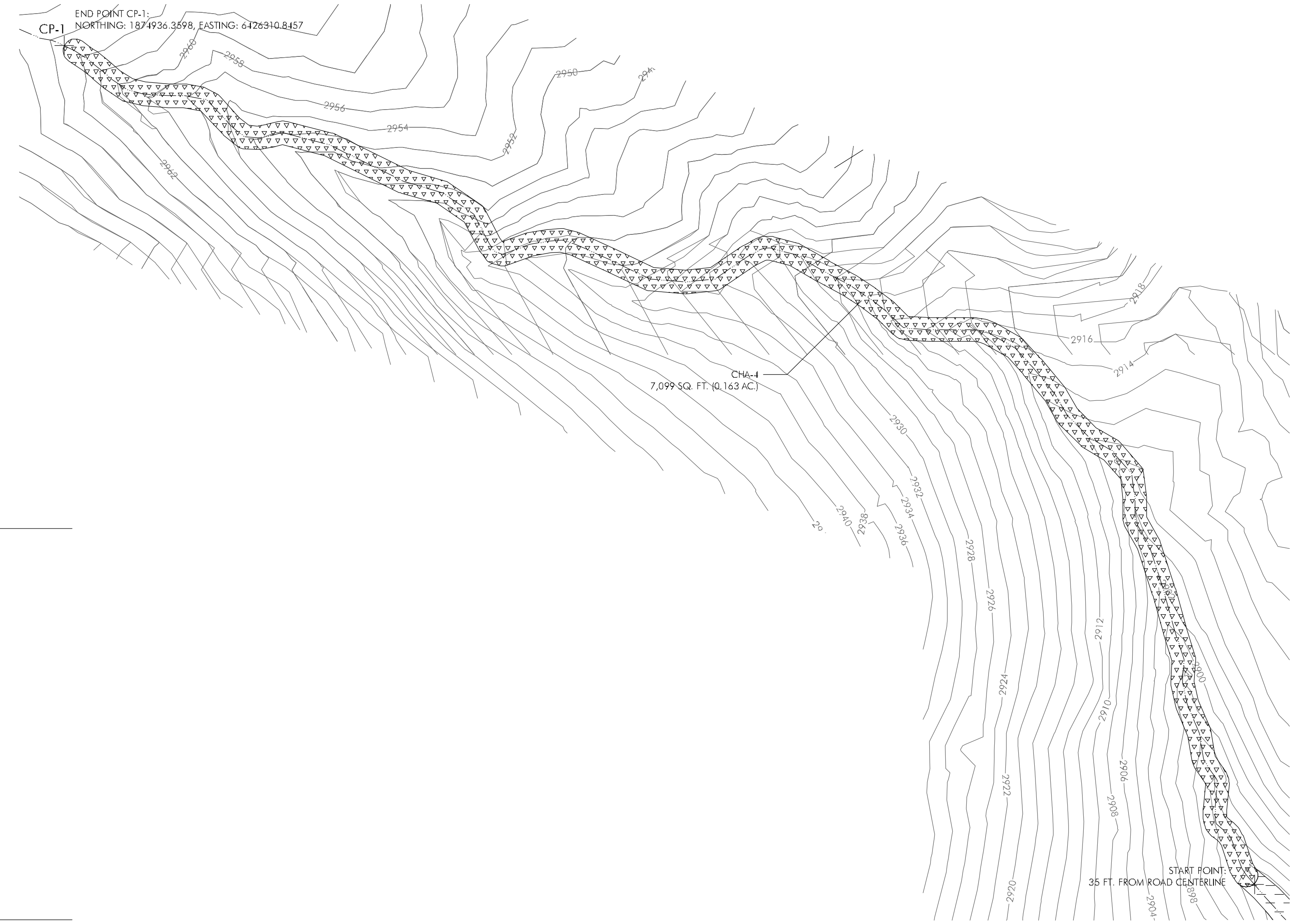

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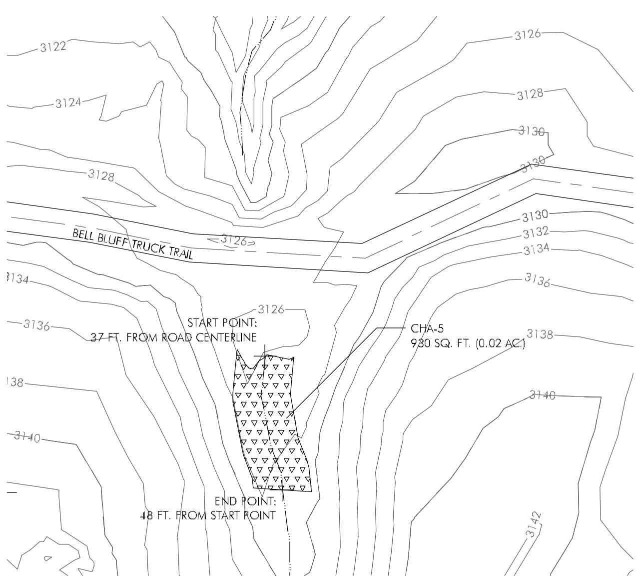
1" = 30'



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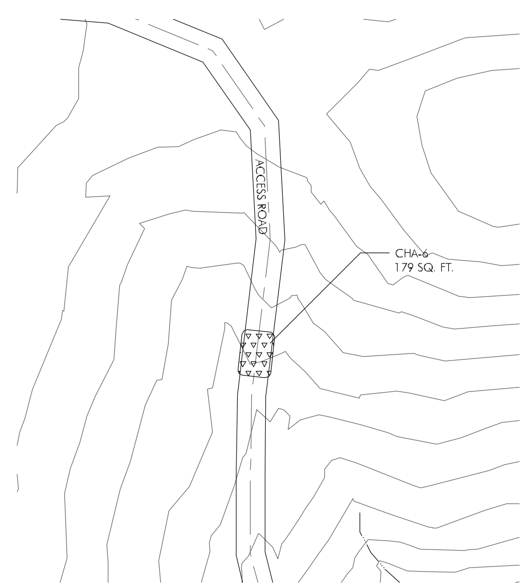
1" = 30'



5 MIXED CHAPARRAL PLANTING PLAN

1" = 30'

LEGEND

- EXISTING CONTOUR
- STREAM CENTERLINE
- ROAD CENTERLINE
- LIMIT OF CUT/FILL AREA
- MIXED CHAPARRAL PLANTING AREA
- START OR END POINT OF PLANTING AREA

PLANTING NOTES:

1. CONTRACTOR SHALL INSTALL WOODEN STAKES AT THE START AND END POINTS OF EACH PLANTING AREA AS SHOWN ON THE DRAWINGS. DISTANCE BETWEEN START AND END POINTS SHALL BE MEASURED ALONG STREAM CENTERLINE.

2. CONTRACTOR SHALL INSTALL WOODEN STAKES AT 50-FOOT INTERVALS ALONG THE STREAM CHANNEL WITHIN PLANTING AREA CHA-5.

3. CONTRACTOR SHALL COORDINATE WITH THE PROJECT BIOLOGIST TO COMPLETE PLANT LOCATION STAKING.

PLANT LEGEND - MIXED CHAPARRAL

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING (OC FEET)	ACCESSORIES
ARC GLA	*ARCTOSTAPHYLOS GLAUCA*	BIG BERRY MANZANITA	1 GAL	8	NONE
ADE FAS	*ADENOSTOMA FASCICULATUM*	CHAMISE	1 GAL	6	NONE
ART CAL	*ARTEMISIA CALIFORNICA*	COASTAL SAGE BRUSH	1 GAL	6	NONE
CEA GRE	*CEANOTHUS GREGGII*	DESERT CEANOTHUS	1 GAL	8	NONE
ERI FAS	*ERIOGONUM FASCICULATUM*	CALIFORNIA BUCKWHEAT	1 GAL	6	NONE
QUE BER	*QUERCUS BERBERDIFOLIA*	SCRUB OAK	1 GAL	12	TREE SHELTER

QUANTITY ESTIMATES - MIXED CHAPARRAL

SYMBOL	AREA SF	AREA AC	ARC GLA 1 GAL	ADE FAS 1 GAL	ART CAL 1 GAL	CEA GRE 1 GAL	ERI FAS 1 GAL	QUE BER 1 GAL	SUBTOTAL
CHA-1	581	0.01	1	4	1	1	2	1	10
CHA-2	845	0.02	1	8	1	1	4	1	16
CHA-3	495	0.01	1	4	1	1	2	1	10
CHA-4	7,099	0.16	3	24	3	3	12	2	47
CHA-5	930	0.02	1	3	1	0	2	1	8
CHA-6	179	4.00	0	2	0	1	1	0	4
TOTAL	**9,950**	**0.22**	**7**	**45**	**7**	**7**	**23**	**6**	**95**

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GEORGE J. SALVAGGIO
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PROJECT #17128-3
DRAWN BY: ICM, KET
CHECKED BY: GJS
ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 30'

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MIXED CHAPARRAL
PLANTING PLAN

Sheet

L-4B

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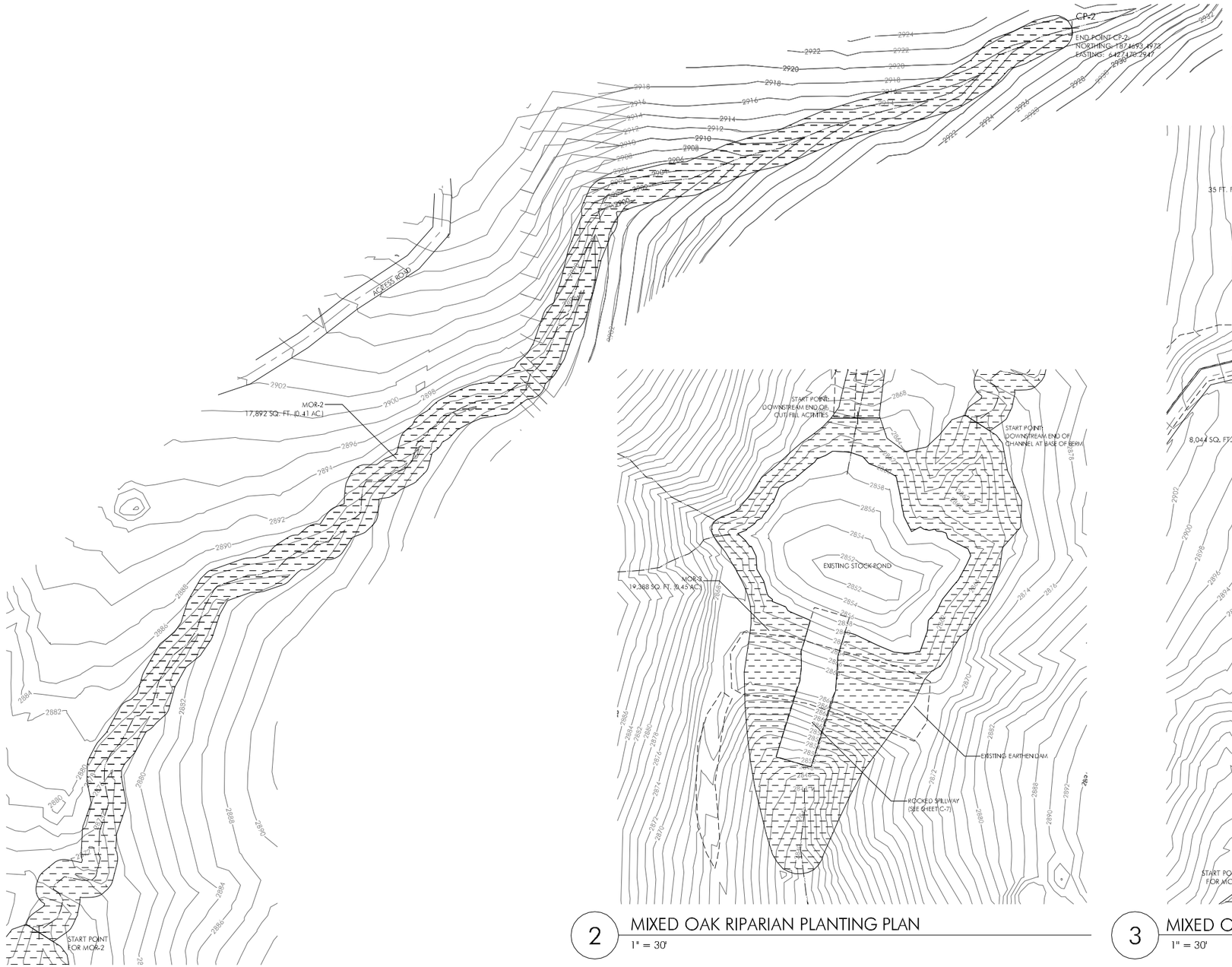
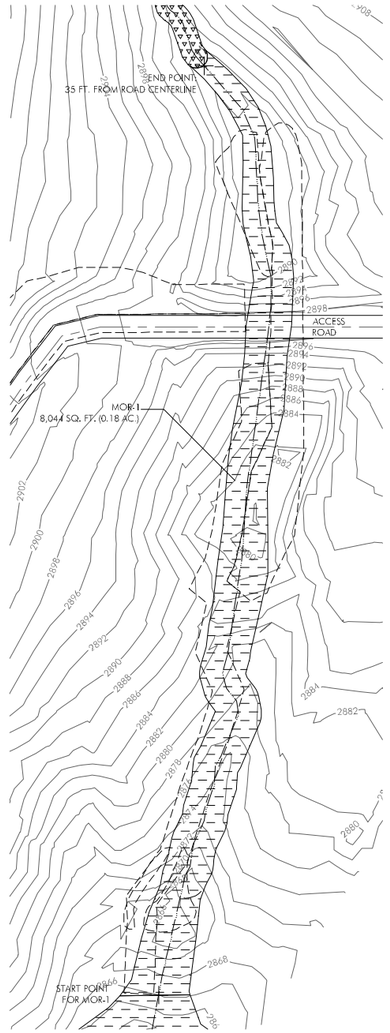


1 MIXED OAK RIPARIAN PLANTING PLAN
1" = 30'

2 MIXED OAK RIPARIAN PLANTING PLAN
1" = 30'



3 MIXED OAK RIPARIAN PLANTING PLAN
1" = 30'

PLANT LEGEND - MIXED OAK RIPARIAN

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING (OC FEET)	ACCESSORIES
ARC GLAU	*ARCTOSTAPHYLOS GLAUCA*	BIG BERRY MANZANITA	1 GAL	8	
BAC SAL	*BACCHARIS SALICIFOLIA*	MULEFAT	1 GAL	10	
CEA GRE	*CEANOTHUS GREGGII*	DESERT CEANOTHUS	1 GAL	8	
CEA LEU	*CEANOTHUS LEUCODERMIS*	CHAPARRAL WHITETHORN	1 GAL	8	
ERI FAS	*ERIOGONUM FASCICULATUM*	CALIFORNIA BUCKWHEAT	1 GAL	6	
QUE AGR	*QUERCUS AGRIFOLIA*	COAST LIVE OAK	1 GAL	12	TREE SHELTER
QUE ENG	*QUERCUS ENGELMANNII*	ENGELMANN OAK	1 GAL	12	TREE SHELTER
RHU OVA	*RHUS OVATA*	SUGARBUSH	1 GAL	8	

QUANTITY ESTIMATES - MIXED OAK RIPARIAN

SYMBOL	AREA SF	AREA AC	ARC GLA 1 GAL	BAC SAL 1 GAL	CEA GRE 1 GAL	CEA LEU 1 GAL	ERI FAS 1 GAL	QUE AGR 1 GAL	QUE ENG 1 GAL	RHU OVA 1 GAL	SUBTOTAL
MOR-1	8,044	0.18	19	0	15	15	27	7	7	10	**100**
MOR-2	17,892	0.41	13	0	13	13	22	6	6	8	**81**
MOR-3	19,388	0.45	23	29	23	23	40	10	10	15	**173**
TOTAL	**45,324**	**1.04**	**55**	**29**	**51**	**51**	**89**	**23**	**23**	**33**	**354**

LEGEND
- EXISTING CONTOUR
- STREAM CENTERLINE
- ROAD CENTERLINE
- LIMIT OF CUT/FILL
- MIXED OAK RIPARIAN PLANTING AREA
- START OR END POINT OF PLANTING AREA

PLANTING NOTES -

1. CONTRACTOR SHALL INSTALL WOODEN STAKES AT THE START AND END POINTS OF EACH PLANTING AREA AS SHOWN ON THE DRAWINGS.
2. CONTRACTOR SHALL INSTALL WOODEN STAKES AT 25-FOOT INTERVALS AT THE ORDINARY HIGH WATER ELEVATION AROUND THE EXISTING STOCK POND.
3. CONTRACTOR SHALL COORDINATE WITH THE PROJECT BIOLOGIST TO COMPLETE PLANT LOCATION STAKING.

LICENSED LANDSCAPE ARCHITECT
GEORGE J. SALVAGGIO
LIC. NO. 4707
Signature
Rev/Ltd. Date
Date
STATE OF CALIFORNIA

11/12/10 PERMIT SET
Date Issues And Revisions No.

PROJECT #17128-3
DRAWN BY: ICM, KET
CHECKED BY: GJS
ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 30'
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SCALE: 1" = 30'
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MIXED OAK RIPARIAN PLANTING PLAN

Sheet

L-4C

1 RIPARIAN BUFFER FOR SEASONAL WETLANDS PLANTING PLAN

1" = 30'

PLANT LEGEND - RIPARIAN BUFFER FOR SEASONAL WETLANDS

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING (OC FEET)	ACCESSORIES
BAC SAL	*BACCHARIS SALICIFOLIA*	MULEFAT	1 GAL	10	
CEA LEU	*CEANOTHUS LEUCODERMIS*	CHAPARRAL WHITETHORN	1 GAL	8	
ERI FAS	*ERIOGONUM FASCICULATUM*	CALIFORNIA BUCKWHEAT	1 GAL	8	
MUH RIG	*MUHLENBERGIA RIGENS*	DEERGRASS	1 GAL	8	
QUE AGR	*QUERCUS AGRIFOLIA*	COAST LIVE OAK	1 GAL	12	TREE SHELTER
QUE ENG	*QUERCUS ENGELMANNII*	ENGELMANN OAK	1 GAL	12	TREE SHELTER

QUANTITY ESTIMATES - RIPARIAN BUFFER FOR SEASONAL WETLANDS

SYMBOL	AREA SF	AREA AC	BAC SAL 1 GAL	CEA LEU 1 GAL	ERI FAS 1 GAL	MUH RIG 1 GAL	QUE AGR 1 GAL	QUE ENG 1 GAL	SUBTOTAL
BUF-1	107,984	2.48	32	100	100	68	60	60	420
TOTAL	**107,984**	**2.48**	**32**	**100**	**100**	**68**	**60**	**60**	**420**

LEGEND

- EXISTING CONTOUR
- STREAM CENTERLINE
- ROAD CENTERLINE
- RIPARIAN BUFFER AT SEASONAL WETLANDS PLANTING AREA

PLANTING NOTES :

1. CONTRACTOR SHALL COORDINATE WITH THE PROJECT BIOLOGIST TO DETERMINE THE EXTENT OF THE EXISTING SEASONAL WETLANDS. CONTRACTOR SHALL STAKE THE BOUNDARY OF THE SEASONAL WETLANDS AND AN APPROXIMATELY 65-FOOT BUFFER AROUND THE WETLANDS. PLANTING SHALL OCCUR WITHIN THIS BUFFER.

2. CONTRACTOR SHALL COORDINATE WITH THE PROJECT BIOLOGIST TO COMPLETE THE PLANT LOCATION STAKING.

3. CONTRACTOR SHALL AVOID DISTURBANCE TO THE EXISTING SEASONAL WETLANDS.

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PROJECT #17128-3
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CHECKED BY: GJS
ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 30'

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RIPARIAN BUFFER
PLANTING PLAN

Sheet

L-4D

Appendix C. Detailed Mitigation Implementation Cost Estimate to Support Financial Assurances

Appendix C. Mitigation Activities and Initial Management Cost Estimate at the Lightner Mitigation Site

1.0 Mobilization						
Item						
Number	Description		Quantity	Unit	Unit Cost	Cost
1.1	Mobilization		$613,740	% of base cost	5%	$30,687
1.2	Topsoil Salvage - Substation		680	CU. YD.	$20	$13,600
					Subtotal	**$44,287**
2.0 Road Crossing Removal and Stream Restoration in Northeast						
Item						
Number	Description		Quantity	Unit	Unit Cost	Cost
2.1	Road Crossing Removal - ephemeral		2	allocation	$3,500	$7,000
2.2	Total Cut Volume		290	CU. YD.	$20	$5,802
2.3	Total Fill Volume		27	CU. YD.	$20	$540
2.4	Net Material		263	CU. YD.	$15	$3,947
2.5	Topsoil w/Seed Bank		65	CU. YD.	$20	$1,299
2.6	Seeding		0.12	AC	$3,500	$427
2.7	Erosion Control Measures		0.12	AC	$5,000	$610
					Subtotal	**$19,625**
3.0 Road Crossing Removal and Restoration of the Stream Channel above the Southwest Grassland						
Item						
Number	Description		Quantity	Unit	Unit Cost	Cost
3.1	Total Cut Volume		16	CU. YD.	$20	$322
3.2	Total Fill Volume		54	CU. YD.	$20	$1,073
3.3	Net Material		38	CU. YD.	$15	$563
3.4	Topsoil w/Seed Bank		44	CU. YD.	$20	$887
3.5	Seeding		0.08	AC	$3,500	$292
3.6	Erosion Control Measures		0.08	AC	$5,000	$417
					Subtotal	**$3,554**
4.0 Road Crossing Removal and Restoration of the Stream Channel West of the Stock Pond						
Item						
Number	Description		Quantity	Unit	Unit Cost	Cost
4.1	Total Cut Volume		494	CU. YD.	$20	$9,873
4.2	Total Fill Volume		2,439	CU. YD.	$20	$48,782
4.3	Net Material		1,945	CU. YD.	$15	$29,182
4.4	Topsoil w/Seed Bank		87	CU. YD.	$20	$1,735

4.5	Seeding		0.16	AC	$3,500	$570
4.6	Erosion Control Measures		0.16	AC	$5,000	$815
					Subtotal	**$90,957**
5.0 Removal of Abandoned Roads and Road Stream Crossing - East of the Substation						
Item						
Number	Description		Quantity	Unit	Unit Cost	Cost
5.1	Total Cut Volume		324	CU. YD.	$20	$6,481
5.2	Total Fill Volume		287	CU. YD.	$20	$5,741
5.3	Net Material		37	CU. YD.	$15	$556
5.4	Topsoil w/Seed Bank		419	CU. YD.	$20	$8,387
5.5	Seeding		0.79	AC	$3,500	$2,757
5.6	Erosion Control Measures		0.79	AC	$5,000	$3,938
					Subtotal	**$27,860**
6.0 Removal and Alteration of Dams to Restore/Enhance Streams						
Item						
Number	Description		Quantity	Unit	Unit Cost	Cost
6.0	Total Cut Volume		1,851	CU. YD.	$20	$37,017
6.1	Total Fill Volume		237	CU. YD.	$20	$4,748
6.2	Net Material		1,613	CU. YD.	$15	$24,202
6.3	Topsoil w/Seed Bank		65	CU. YD.	$20	$1,291
6.4	Seeding		0.12	AC	$3,500	$424
6.5	Erosion Control Measures		0.12	AC	$5,000	$606
					Subtotal	**$68,288**
7.0 Removal of Non-native and Invasive Plant Species						
Item						
Number	Description		Quantity	Unit	Unit Cost	Cost
7.1	Removal of Non-Native Invasive Plants within Enhanced Stream Channels		2.42	AC	$7,500	$18,150
7.2	Removal of Non-Native Invasive Plants within Specific Locations		0.03	AC	$10,000	$300
					Subtotal	**$18,450**

8.0 Enhancement of Wetland and Riparian Vegetation						
Item						
Number	Description		Quantity	Unit	Unit Cost	Cost
8.1	Live Oak Woodland Plantings		0.11	AC	$50,000	$5,500
8.2	Mixed Chaparral Plantings		0.22	AC	$50,000	$11,000
8.3	Mixed Oak/Riparian Plantings		1.04	AC	$50,000	$52,000
8.4	Seasonal Wetland and Riparian Buffer Plantings		2.48	AC	$50,000	$124,000
8.5	Irrigation		3.85	AC	$50,000	$192,500
					Subtotal	**$385,000**
9.0 Interim Maintenance and Monitoring (1-5 Years)						
Item						
Number	Description		Quantity	Unit	Unit Cost	Cost
9.1	Adaptive management - Weed Removal		5	Annual	$17,500	$87,500
9.2	Adaptive management - Replacement Plantings		5	Annual	$50,000	$250,000
9.3	Trash Removal		5	Annual	$140	$700
9.4	Monitoring		5	Annual	$64,584	$322,922
					Subtotal	**$661,122**
					SUBTOTAL	**$1,319,143**
					15% Contingency	**$149,504**
					TOTAL	**$1,468,647**