FINAL HABITAT MITIGATION AND MONITORING PLAN

LIGHTNER MITIGATION SITE

SUNRISE POWERLINK

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

SUBMITTED BY:

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List of Acronyms

AA(s)	Assessment Area(s)
APN	Assessor Parcel Number
BMPs	Best Management Practices
BO	Biological Opinion
Cal-IPC	California Invasive Plant Council
CDFG	California Department of Fish and Game
CNF	Cleveland National Forest
Corps	U.S. Army Corps of Engineers
CPUC	California Public Utilities Commission
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/Habitat Management Plan
HMMP	Habitat Mitigation and Monitoring Plan
HSA	Hydrologic Subarea
kV	kilovolt
LSAA	Lake and Streambed Alteration Agreement
MMCRP	Mitigation Monitoring, Compliance, and Reporting Program
MSCP	Multiple Species Conservation Program
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 & Electric Company
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
TOB	Top of Bank
USDA	United States Department of Agriculture
USFS	United States [Department of Agriculture] 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 & Electric Company (SDG&E) is constructing a new 500/230 kilovolt (kV) electric transmission line (Sunrise Powerlink, the Project) that will extend approximately 117 miles from the El Centro area of Imperial County to southwestern San Diego County in southern California (Figure 1). Construction of the transmission line structures, access roads, and ancillary facilities will result in permanent and temporary impacts to "waters of the United States" (WOUS) and "waters of the State" (WOS). In compliance with federal and state regulations, SDG&E has applied for and received authorization for the impacts from the U.S. Army Corps of Engineers (Corps), the State Water Resources Control Board (SWRCB), and the California Department of Fish and Game (CDFG).

- The Corps has determined that the Project complies with its Nationwide Permit (NWP) No. 12 and No. 3 under section 404 of the Clean Water Act (CWA), as specified in the notification dated January 7, 2011 (File No. 2007-00704-SAS);

- SWRCB has issued a certification that the Project is in compliance with section 401 of the CWA, as specified in the notification dated November 10, 2010 (File No. SB090151N); and

- CDFG has approved a Lake and Streambed Alteration Agreement (LSAA) for the Project in accordance with sections 1602 and 1603 of the California Fish and Game Code, as specified in agreement no. 1600-2009-0365-R5 dated November 29, 2010.

The authorizations are conditioned on implementation of the impact avoidance, minimization, monitoring, and mitigation measures identified in the Corps NWP notification letter, SWRCB 401 certification, and CDFG LSAA. For permanent impacts to WOUS and WOS, the required mitigation includes the preservation, restoration, enhancement, and management of wetlands and waters at five mitigation sites (Chocolate Canyon, Desert Cahuilla, Lightner, Long Potrero, and Suckle) at the locations shown on Figure 2. This Final Habitat Management and Monitoring Plan (Final HMMP) identifies the mitigation for permanent impacts that will be implemented at the Lightner Mitigation Site in San Diego County, California. This Final HMMP describes the specific mitigation activities and plans, performance criteria to measure success, initial monitoring and management actions, long-term management activities, and estimated costs for the implementation of HMMP mitigation. It supplements the Conceptual HMMP (WRA 2010b) that was conditionally approved when the Corps, SWRCB, and CDFG issued their authorizations. A Final HMMP also has been prepared for each of the other mitigation sites.

1.1 Responsible Parties

SDG&E is responsible for implementing mitigation for the Project, including the measures identified in this Final HMMP. SDG&E also is the current owner of the Lightner Mitigation Site.

WRA, Inc. (WRA) is SDG&E's authorized agent; prepared SDG&E's applications to the Corps, SWRCB, and CDFG; and prepared this and the other four Final HMMPs. WRA is also the prime contractor for implementation of the restoration, enhancement, maintenance, and monitoring measures identified in the Final HMMPs, excluding the long-term (in perpetuity) management of the mitigation sites.

Figure 1. Project Area Location Map

N
W E
S

0 5 10 20 Miles

Sunrise Powerlink
San Diego/Imperial County, California

wra
ENVIRONMENTAL CONSULTANTS

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

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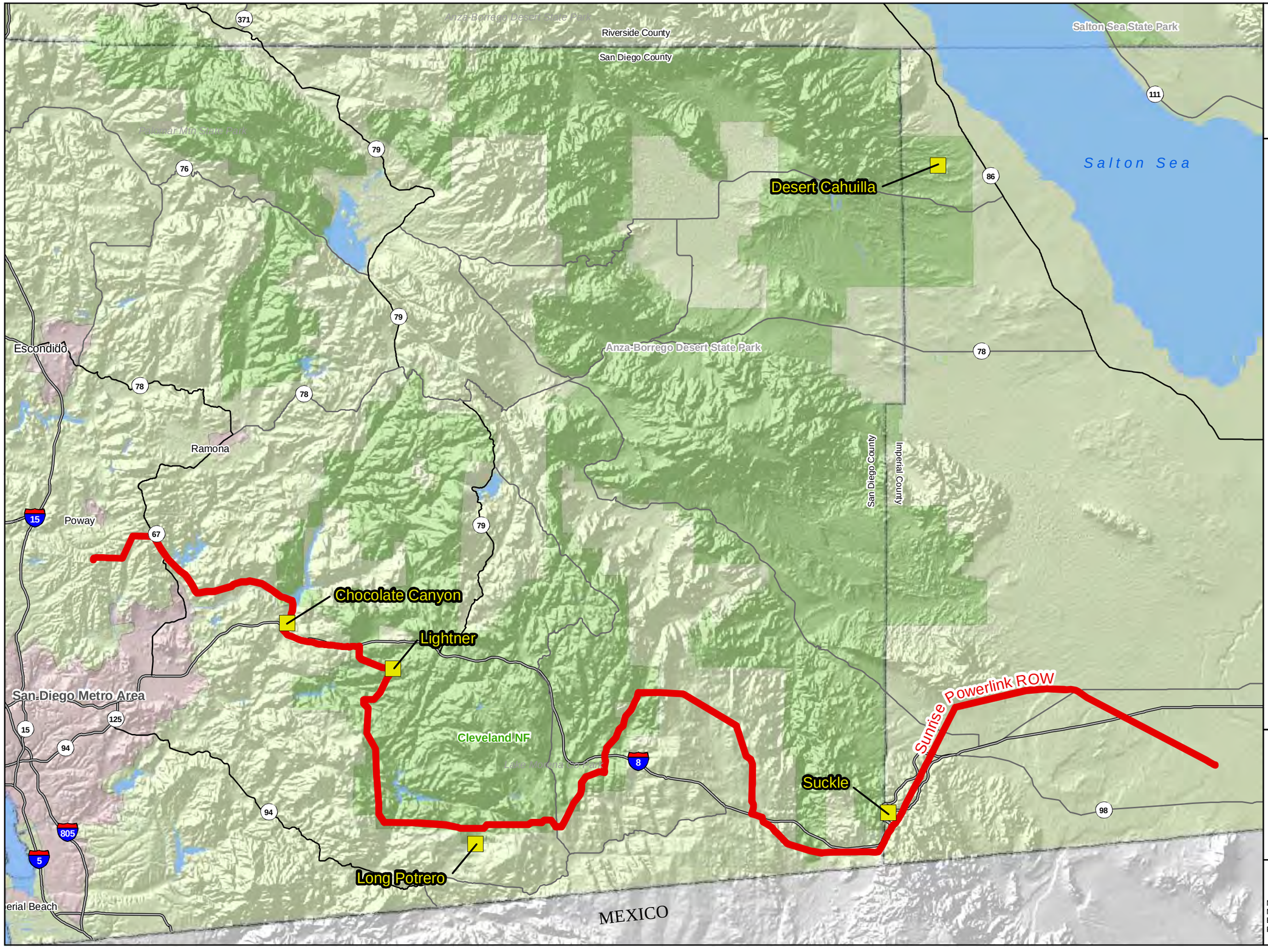
Sunrise Powerlink

San Diego/Imperial County, California

Figure 2.

Overview of Mitigation Area Locations



Legend

- Mitigation Area

N
W E
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0 5 10
Miles

Map Date: June 2010
Map By: Derek Chan
Base Source: ESRI
Filepath: L:\Acad 2000 Files\17000\17128-3\GIS\ArcMap\Mitigation\Fig2_MitigationSites_20100629.mxd

Long-term (in perpetuity) management of Lightner Mitigation Site will be conducted either by the U.S. Department of Agriculture Forest Service (USFS) or a qualified land conservancy (see Section 4.0). Ownership of the land will be conveyed to the designated land manager, who will protect and maintain the site as natural open space. The authorizations for impacts to WOUS and WOS require that the land manager, the provisions for permanent site protection, the long-term management plan for the site, and the financial commitments for management be approved by the Corps, SWRCB, and CDFG (see Sections 4, 11, and 13).

Primary contact information for these parties is below:

Permittee: 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

Land Manager Contact information will be provided when the entity has been approved by the agencies.

1.2 Purpose and Organization

The purpose of this Final HMMP is to identify the compensatory mitigation measures that will be implemented on the Lightner Mitigation Site for the Project's permanent impacts to WOUS and WOS, The impacts to be mitigated include those from Project activities along a 38-mile segment of the transmission line, beginning at tower EP140 (part of the 500 kV line) and extending through the Suncrest Substation site to where the 230 kV line goes underground at towers CP96-1 and CP95-1.

The document generally is organized to follow the regulations set forth in the 2008 Clean Water Act (CWA) Section 404 Final Compensatory Mitigation Rule (33 CFR Parts 325 and 332), as well as 401 certification and LSAA requirements. Because regulations from multiple agencies are addressed, the terminology and order of requirements sometimes differs from that in the 2004 Los Angeles District Final Mitigation Guidelines and Monitoring Requirements. However, all Corps requirements are addressed. In addition, as requested by the Los Angeles District Corps office and the SWRCB, the HMMP includes a function-based assessment of the impact areas and mitigation sites that was prepared using the California Rapid Assessment Method (CRAM).

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. The required content of the HMMP is listed below, with the location of the information within this document indicated in parentheses.

- Mitigation Goals and Objectives, including resource type, amounts, and methods of compensation and justification for inclusion of preservation as part of the compensatory mitigation (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 the ecological characteristics of impact areas and mitigation sites and CRAM evaluation (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)
- Ecologically-based Performance Standards (see Section 8.0)
- Monitoring Requirements and Methods (see Section 8.0)
- Maintenance Plan, including maintenance activities to ensure continued viability of the mitigation site (see Sections 9.0 and 10.0)
- Long-term Management Plan, (see Section 11.0)
- Adaptive Management Plan (see Section 12.0)
- Financial Assurances to ensure project mitigation will be effectively implemented and maintained (see Section 13.0)

Supplemental information is provided in five appendices:

Appendix A. All CRAM Scores Collected for the Sunrise Powerlink Project
Appendix B. Grading and Landscape Plans for the Lightner Mitigation Site
Appendix C. PAR Analysis for the Lightner Mitigation Site from the September 2010 HAP/HMP
Appendix D. Detailed Mitigation Implementation Cost Estimate to Support Financial Assurances
Appendix E. Title Report, County Assessor's Parcel Map, Phase One Environmental Assessment Report, Plat Map, and Williams Act/Farmland Security Zone Contracts (distributed as a separate document)

Project impacts were described in the Pre-Construction Notification (PCN) prepared for the Corps, as part of the 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. Mitigation for temporary impacts to streams, wetlands, and desert dry washes will occur through restoration within the temporary impact areas, as described in the Conceptual HMMP (WRA 2010b), and is not addressed in this document.

1.3 Relationship to the Project's Habitat Acquisition Plan/Habitat Management Plan (HAP/HMP)

The measures in this Final HMMP for the acquisition, permanent protection, and long-term management of the entire mitigation site – including the areas where HMMP preservation, enhancement, and restoration measures will be implemented – are from the Project's Habitat Acquisition Plan/Habitat Management Plan (HAP/HMP). The HAP/HMP is required under the

Project's Mitigation Monitoring, Compliance, and Reporting Program (MMCRP, Aspen 2010) and the 2010 Biological Opinion (BO, USFWS 2010) issued by the U.S. Fish and Wildlife Service (USFWS) to mitigate the Project's impacts on sensitive vegetation communities and special status species. It is an appropriate vehicle for implementation of parts of the HMMP because:

1. The HAP/HMP includes the Chocolate Canyon, Desert Cahuilla, Lightner, Long Potrero, and Suckle Mitigation Sites, the same properties covered in the Final HMMPs;

2. The requirements specified in the MMCRP and BO regarding mitigation land acquisition, management, site protection assurances, and funding guarantees are fundamentally the same as those specified by the Corps, SWRCB, and CDFG in the NWP conditions, 401 certification, and LSAA; and

3. The HAP/HMP includes provisions for coordinating initial and long-term management of the entire mitigation property with implementation of HMMP measures on the site.

The HAP/HMP measures in this HMMP are from the HAP/HMP dated September 22, 2010 (SDG&E 2010a), which was developed by qualified biologists and conservation planners working in close coordination with USFWS and CDFG. The September 2010 HAP/HMP includes a management plan and Property Analysis Record (PAR) or PAR equivalent for each of the mitigation sites. The management plan:

- Identifies the mitigation function of the property,
- Identifies potential land managers and holder of the fee title or conservation easement,
- Describes the property and its biological resources,
- Identifies the biological resource and land stewardship tasks necessary to conserve and maintain the property's mitigation values,
- Summarizes the results of the PAR for each property in terms of funding required for the first five years of management and for a non-wasting endowment for ongoing management, and
- Indicates whether the property has been acquired.

The HAP/HMP also includes a description of the PAR assumptions, the PAR spreadsheets for each property, and legal descriptions of the properties.

As required by the MMCRP and BO, the HAP/HMP was submitted for approval to the CPUC, BLM, USFWS, and CDFG as the mitigation plan for vegetation and species' impacts outside CNF. A separate HAP/HMP was prepared for and has been approved by USFS to mitigate vegetation and species impacts within CNF unrelated to wetlands and waters. Consistent with their regulatory role, USFWS and CDFG took the lead in reviewing the September 2010 HAP/HMP. They issued a joint letter on December 2, 2010 (USFWS and CDFG 2010) indicating their approval for MMCRP purposes of several Project mitigation plans, including conditional approval of the HAP/HMP. Subsequently, the CPUC and BLM also approved the HAP/HMP for MMCRP purposes.

The conditional approval by the USFWS and CDFG requires that a final management plan and a final PAR be prepared for each mitigation site. As stated in the December 2, 2010, letter:

> *…the HMP will require further revisions once the mitigation lands have been acquired and land managers have been identified and approved by the Wildlife Agencies. Once the land managers are approved, San Diego Gas & Electric (SDG&E) will be required to provide a revised final HMP that will include revised Property Analysis Records, approved by the identified land managers, for Wildlife Agency review and approval. The final HMP must be implemented no later than 18 months from the initiation of construction activities.*

To facilitate the final identification and approval of the land managers and the subsequent preparation of final management plans and PARs, USFWS and CDFG has initiated discussions with entities identified as potential land managers in the HAP/HMP. They also are preparing their recommended revisions to the individual management plans and PAR assumptions. For the five HMMP mitigation sites, the discussions with land managers and HMP/PAR revisions will be coordinated with and will include the Corps, SWRCB, and CDFG LSAA staff. SDG&E will be responsible for completing the revised final documents and submitting them back to the agencies for final review and approval. For MMCRP purposes, the CPUC and BLM also must approve the final plan and PAR.

When the revised final HMP/PAR is approved for the Lightner Mitigation Site, it will supersede the HAP/HMP tasks and estimates in Sections 10 and 11 of this Final HMMP.

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
- Compensate for Project impacts to WOS beneficial uses
- 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 approaches at the Lightner Mitigation Site are defined in accordance with the Corps 2008 Mitigation Rule (Corps 2008b) as follows:

- **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. In this Final HMMP, 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, Types, and Amounts

The Lightner Mitigation Site supports a mixture of ephemeral and intermittent streams along with riparian and wetland habitat (Figure 3). Preservation of the site will protect streams (including headwaters), riparian and wetland habitats, and adjacent upland areas by removing the threat of development on the property and also eliminating the potential re-introduction of cattle grazing to recur (see Section 3.0 for additional details). Past uses of the site, primarily cattle grazing, have disturbed and/or removed stream and habitat resources and have introduced berms and ponds that have adversely affected streamflow within and downstream of the site. These disturbances present opportunities for restoration and enhancement activities that will benefit resources on and off the Lightner site.

As described in more detail in Section 7.0, the mitigation activities at Lightner will:

- Preserve 0.55 acre, enhance 0.09 acre, and restore 0.04 acre of intermittent and ephemeral streams;

- Preserve 0.20 acre and enhance 0.63 acre of wetlands; and

- Preserve 15.83 acres, enhance 0.63 acre, and restore 3.43 acres of riparian habitat.

These preserved, enhanced, and restored resources occur on and will be managed in perpetuity as part of the Lightner Mitigation Site. As identified in the September 2010 HAP/HMP, the Lightner Mitigation Site includes a total of approximately 706 acres. In addition to the stream, wetland, and riparian resources identified in this HMMP, the 706 acres include approximately 75 acres oak woodland, approximately 600 acres of chaparral with extensive stands of native oaks, and approximately 20 acres of grassland; the remainder includes less than 10 acres of roads and disturbed lands. As indicated on Figure 3, the Project right-of-way (ROW), Project access roads, and the Suncrest Substation also are located on the Lightner property. These Project areas total approximately 91 acres, are excluded from the mitigation site, and are not counted as part of the 706 acres.

Prior to purchase for conservation, the Lightner Mitigation Site was proposed for development by the previous owner. The site is zoned for development and rural residences (parcels are zoned at an 8-acre minimum resulting in approximately 80 8-acre ranchettes) (San Diego County 2010). The acquisition of this site ensures that the headwaters on the site (except for

approximately 1,782 linear feet of the uppermost portion of intermittent stream 109-S-1 that will be culverted) are preserved for continued natural resource functions and services.

2.2 Basis for Request to Include Preservation as Part of Compensatory Mitigation

As also discussed in the Conceptual HMMP, preservation of resources on the Lightner Mitigation Site is appropriate as part of the compensatory mitigation for the Project's impacts because the preservation meets the requirements from the Corps 2008 Mitigation Rule in 33 CFR 332.3(h): (Corps 2008b). 33 CFR 332.3h states that:

> *(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.*

The justification for including preservation at the Lightner Mitigation Site as part of the compensatory mitigation for the Project is as follows:

- *Important watershed functions are preserved*. Headwaters of the watershed (except for approximately 1,782 linear feet of one intermittent stream) and extensive areas of upland vegetation surrounding the headwaters will be preserved, thereby protecting and providing the basis for enhancing hydrologic functions within the watershed.

- *Significantly contributes to ecological sustainability*. In addition to the contribution to sustainability stemming from the preservation of headwaters on the site, preservation of the oak woodland (approximately 75 acres) and chaparral (approximately 600 acres) will contribute to protecting soils from erosion and landslide, regulating water flow, maintaining water quality, and supporting groundwater recharge in the watershed. The CRAM analysis in Section 5.0 provides additional detail regarding the ecological function and importance of the mitigation site. In addition, the analysis conducted by the County of San Diego as part of the County's Multiple Species Conservation Program (MSCP) includes the Lightner property in the draft Focused Conservation Areas for the future East County MSCP. The County's analysis took into consideration known biological values (including wetland and riparian resources), ecological functions, and connectivity to existing or proposed conserved habitat. The draft map of the Focused Conservation Area and other information about the East County MSCP are on the County's website at http://www.sdcounty.ca.gov/dplu/mscp.

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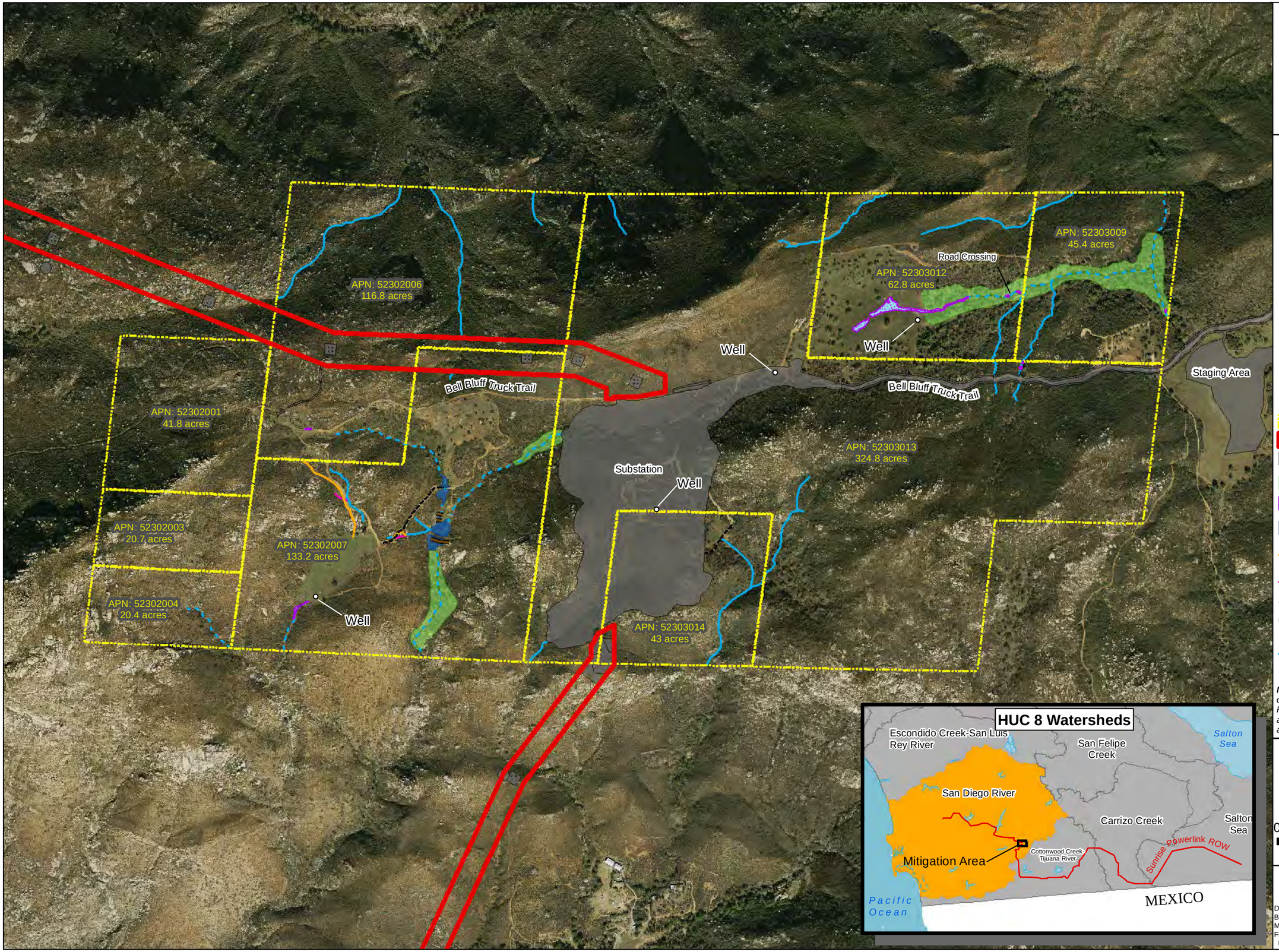
Sunrise Powerlink

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.*

N
W E
S

0 400 800
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_Existing_20101119.mxd

- *Preservation is appropriate and practicable.* Preservation at the Lightner site is appropriate because the preserved resources are the same type, are in the same watershed, and – in the case of the Project ROW, access roads, and substation shown on Figure 3 – on the same property as the impacts to be mitigated. Preservation of the resources at Lightner is practicable because the resources occur on one property that is one ownership and that will be managed in its entirety for its biological as well as its waters values. This circumstance increases the likelihood of maintaining and potentially improving the condition of the preserved WOUS and WOS resources over time.

- *Resources are under threat of destruction or adverse modification.* The entire property is designated under the County's existing General Plan for rural residential uses. Parcels are zoned at an 8-acre minimum, which would allow for approximately 80 8-acre ranchettes (San Diego County 2010). The County's proposed General Plan Update would reduce but not eliminate the development potential of the property but has not yet been adopted by the County Board of Supervisors. (The next public hearing on the proposed General Plan update will occur in August 2011.) The property also has several characteristics that have enhanced its development potential over the years. It is easily accessed off Interstate 8 and local roads, is surrounded on three sides by permanent open space in the Cleveland National Forest (CNF), does not have federally or state listed species that trigger restrictions on land development, and the two primary vegetation communities on the site (chaparral and oak woodland) generally are not subject to special protection under federal or state regulations. These same factors also led to the siting of the Suncrest Substation on the property, which in turn led to the acquisition of the property in 2010. At that time, the owner was actively pursuing development of the site. Acquisition by SDG&E eliminated the immediate plans for development of the property and made preservation of most resources on the site possible. Preservation under the HMMP and HAP/HMP will permanently remove the threat of residential and other forms of rural development. In addition, the minimization, monitoring, and mitigation measures that apply to the Project ROW, Project access roads, and substation are designed to avoid destruction or adverse modification of the adjacent preserved resources.

- *Resources will be permanently protected.* If USFS becomes the land manager/owner of the mitigation site, the resources will be protected and managed as part of the CNF. An agreement with USFS will specify that the lands include mitigation for impacts to WOUS and WOS and will be permanently preserved. The language of the agreement will be subject to approval by the Corps, SWRCB, and CDFG. If a land conservancy becomes the land manager/owner, a conservation easement over the site will be conveyed to CDFG. The conservation easement will be subject to review and approval by the Corps and SWRCB as well as CDFG. Permanent protection will include implementation of the long-term management plan for the site. As discussed in Section 1.3, both the plan and the funding provided for perpetual management of the mitigation site are subject to approval by the Corps, SWRCB, and CDFG.

- *Preservation is coordinated with restoration, establishment, and/or enhancement.* As described in detail in Section 7.0, restoration and enhancement actions are proposed for the mitigation site in addition to preservation of existing waters and riparian/wetland habitat. The other measures include restoration of impeded streamflow through removal of ponds, berms, and a dam installed by prior landowners in the 1950s or earlier; removal of internal roads; implementation of weed control measures along preserved and restored streams; and restoration of native vegetation and riparian areas along streams. These measures will be implemented as part of the HMMP for the Lightner. Preservation of the WOUS and WOS resources also will be coordinated with the management of the upland habitats under the HAP/HMP.

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 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, chamise chaparral, northern and southern mixed chaparral, pristine Engelmann oak woodland habitat (a sensitive community in San Diego County), habitat for the Hermes copper butterfly (*Lycaena hermes*), and populations of delicate clarkia (*Clarkia delicata*) and felt-leaved monardella (*Monardella hypoleuca* ssp*. lanata*). The property also is part of the area mapped as the "Focused Conservation Area" for the future East County MSCP.

As stated in Section 2.1, the entire Lightner mitigation site is zoned for development (San Diego County 2010) and was slated for development by the previous land owner. In addition, the mitigation site has historically been used for 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 (on the property but excluded from mitigation acreage) offers the opportunity to manage long-term preservation of habitat functions and services in the area directly surrounding one of the Project's largest impact areas. Lands will be permanently protected and managed in perpetuity as described in Section 4.0. The site also 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 is 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 2010a). 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 Table 1.

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	Upper Sweetwater Watershed within the San Diego River Watershed, Loveland HSA (909.31)
Mitigation Site City and County	Unincorporated area, 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, located in the San Diego River watershed, the San Diego RWQCB has designated the following beneficial uses (Table 2): Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Service Supply (IND), Industrial Process Supply (PROC), Freshwater Replenishment (FRSH), Hydropower Generation (POW), , Water Contact Recreation (REC1), Noncontact Water Recreation (REC2), Preservation of Biological Habitats of Special Significance (BIOL), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), and Spawning, Reproduction, and/or Early Development (SPWN). The Lightner Mitigation Site primarily contains headwaters of larger water bodies within the watershed, and the watershed as a whole provides the nine above-mentioned beneficial uses. Table 2 contains definitions of beneficial uses for waters in the State of California. Not all of these beneficial uses have been designated for the mitigation site or for impacted sites.

One goal of the Final HMMP for the Lightner site is to compensate for Project-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 Project activities. The restoration, enhancement, and preservation of wetlands, waters, and riparian habitat at the Lightner Mitigation Site will contribute to beneficial uses within the Loveland HAS and San Diego River watershed. Mitigation activities on the other four mitigation sites are intended to compensate for any remaining beneficial uses not provided by the Lightner Mitigation Site (i.e., there will be no net loss of beneficial use from any project activity).

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.
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).

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

State Recognized Beneficial Uses	Description
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.

The Project is expected to impact a total of 0.35 acre of ephemeral, intermittent, and perennial stream habitat, 2.36 acres of riparian vegetation, and 0.08 acre of wetland. Though the impact sites do not directly support many of the beneficial uses listed for the San Diego River watershed due to their small size, some beneficial uses are expected to be impacted based on the contributions of impact sites to beneficial uses within the San Diego River watershed. These beneficial uses include: MUN, AGR, PROC, FRSH, POW, REC1, REC2, BIOL, WARM, COLD, WILD, and SPWN. The Lightner Mitigation Site will provide 0.68 acres of stream mitigation habitat, 19.89 acres of stream with riparian vegetation mitigation habitat, and 0.65 acres of wetland mitigation habitat as compensation for impacts to beneficial uses. Preservation, enhancement, and restoration activities of these habitats will adequately compensate for the impacted beneficial uses described above by contributing to the improvement and preservation of beneficial uses within the San Diego River watershed. The Lightner Mitigation site provides a 10:1 mitigation to impact ratio for wetlands, 1.9:1 mitigation to impact ratio for streams, and 8.5:1 mitigation to impact for riparian vegetation. In addition, all temporary impacts will be restored to pre-impact condition therefore resulting in no net loss of beneficial uses.

All designated beneficial uses of WOS potentially impacted by Project activities are summarized in Table 3; however, not all uses listed in Table 3 are necessarily affected by the 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 Sunrise Powerlink 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

This section summarizes the requirements for long-term protection of the mitigation site as per the 404 NWP terms and conditions, 401 certification, LSAA, BO, and MMCRP and indicates the status of establishing the protection measures for the Lightner site as of May 2011.

4.1 Long-Term Protection Requirements

The 404 NWP, 401 certification, LSAA, MMCRP, and BO specify the type and timing of the measures required to assure the long-term protection of the mitigation sites. Generally the requirements are the same in these documents, but there are differences in terminology used and/or the timeline for actions. Key requirements stated in all of the documents are summarized below, followed by the specific provisions in separate documents.

4.1.1 Summary of Site Protection Requirements

Long-term protection of each mitigation site will occur through a combination of site documentation, management decisions, and legal agreements/actions involving the Corps, SWRCB, CDFG, USFWS, the entities selected to manage the sites, and SDG&E.

Site Documentation

The site documentation relevant to long-term protection includes a title report, County Assessor's parcel map, Phase One Environmental Assessment Report, plat map, and any Williams Act/Farmland Security Zone contracts for the site. These materials are compiled during the acquisition process and identify any existing easements, ROWs, agricultural contracts, mineral rights, and other conditions/constraints that come with the property. The information is directly or indirectly required by all of the agencies that must approve the long-term protection measures for the site. SDG&E also requires the information for company authorization to proceed with an acquisition.

Management Decisions

There are three key management decisions required for long-term site protection:

- Selection of a land manager qualified to own the property and manage it in accordance with the goals, objectives, and measures identified in the Final HMMP and in the final revised HMP with funding provided by SDG&E;

- Approval of the Final HMMP, revised final HMP, and revised final PAR for the site; and

- Approval of the funding arrangements for long-term management.

These decisions will be made by and/or with the approval of the Corps, SWRCB, CDFG, and USFWS for the HMMP mitigation sites. For MMCRP purposes, the CPUC and BLM also must approve the land manager, final HMP/PAR, and funding arrangement. The agencies also directly or indirectly require that the final PAR be approved by the selected land manager.

All of the agencies require that these decisions be made within a specific timeframe.

Legal Agreements/Actions

There are three legal agreements/actions relevant to the long-term protection of the mitigation sites:

1. Acquisition of the mitigation site;

2. Execution of a conservation easement agreement or its equivalent for the mitigation site. The agreement must be approved in advance by the agencies and also must be accepted by the land manager.

3. Conveyance of fee title and/or the conservation easement or its equivalent to one of the agencies or an entity approved by them (such as the land manager).

All of the agencies require that this step be completed prior to the line being energized. The agencies also acknowledge that federal and state agencies cannot accept fee title for lands subject to conservation easements.

4.1.2 Site Protection Requirements by Source Document

404 NWP

1. SDG&E will assure the five mitigation sites are protected as natural open space in perpetuity. SDG&E shall submit draft site-protection mechanisms to the Corps for approval in advance of or concurrent with impacts within waters of the U.S (Condition #10)

2. Permittee shall also submit a detailed timeframe and action plan addressing the progress for achieving site protection (e.g., steps in the land acquisition/transfer process, identification of land managers and site protection mechanisms, agency planning documentation) for each mitigation site within 30 days of the date of issuance of this permit verification letter (Condition #10)

3. The Permittee shall receive written notification from the Corps of the draft site-protection mechanism prior to them being executed and recorded (Condition #10)

4. The Corps shall require a Conservation Easement (CE) as site protection instrument for each mitigation site. Draft CE must include a 3rd party easement holder. The CE must provide that the 3rd party easement holder may enter upon and do any and all work to comply with special condition #1 in the event the permittee has failed to do so (Condition #10)

5. Corps must approve the use of alternative site-protection mechanism if a CE is not available or feasible (Condition #10)

6. Monthly progress reports for each mitigation site will be submitted to the Corps until the Corps approves the draft site-protection mechanism (Condition #10)

7. For any mitigation site where the Corps-approved third party land manager is a state or Federal agency, a qualified land specialist shall be retained by SDG&E to shepherd the transfer of the mitigation property to the designated agency. SDG&E shall include in the monthly progress reports required per Special Condition #10 the progress of the land transfer and document compliance. (Condition #11)

8. SDG&E must provide monies in the form of a non-wasting endowment (endowment amount to be determined by a revised PAR) to fulfill the land manager's long-term responsibilities, including maintenance activities, etc. (Condition #13)

9. The revised PAR must be submitted by Oct 31st of Year 2 of the mitigation and monitoring period for each mitigation site (Condition #13).

10. SDG&E will provide the endowment within 30 days of the Corps' approval of the revised PAR of the five mitigation sites (Condition #13).

401 Certification

1. Conduct, document, and report compensatory mitigation in compliance with the Final HMMPs. (Condition #7)

2. Full title and ownership or land transfer agreements for all compensatory mitigation properties shall be finalized before energization of the transmission line. (Condition #8)

LSAA

1. DFG has tentatively agreed to the mitigation activities described in the HMMP. Final approval of these sites will occur following DFG's receipt and review of the following, for each site: (1) current Preliminary Title Report, (2) County Assessor's Parcel Map, (3) Phase One Environmental Site Assessment Report, (4) Plat map showing pre-existing easements encumbering the mitigation areas, (5) copies of any Williamson Act contracts and Farmland Security Zone contracts that exist on the mitigation areas, and (6) identification of the long-term property owners and their written commitment to manage consistent with the conservation purposes of the mitigation sites. (Condition #3.7)

2. Within 120 days of signing this SAA agreement (i.e. March 29, 2011), provide to DFG the following for the proposed mitigation sites: (1) Preliminary Title Report, (2) Phase One Environmental Site Assessment Report, (3) Final Mitigation Plan, and (4) any required technical reports (e.g., hydrology studies) (Condition #3.8).

3. Prepare a Habitat Management Plan (HMP) for each mitigation property that follows the criteria in Biological Opinion Measure G-CM-17. (Condition #3.21)

4. Prepare a wildlife conservation easement or its equivalent on each mitigation site to protect existing fish and wildlife resources in perpetuity. Complete the easement or its equivalent prior to energizing the transmission line (Condition #3.22)

5. If a conservation easement is not possible due to a transfer of the property to federal, state, or local jurisdiction, notify DFG of the entity the property is being transferred to and the manner under which it will be held by that entity. Receive written approval from DFG (Condition #3.23).

6. SDG&E shall cause the conservation easement or its equivalent to be conveyed such that the easement's position in title shall not be inferior to any existing monetary liens on the land (e.g., deeds of trust are to be subordinate to the conservation easement). A plat drawn to scale that depicts the conservation easement and delineates the metes and bounds easement description shall be prepared by a professional certified land surveyor or civil engineer and the plat shall be attached as an exhibit. (Condition #3.24)

7. SDG&E shall include with the submission of the conservation easement for its equivalent: (1) a completed Proposed Land for Acquisition Form, (2) a County Assessor's Parcel Map for the subject property, (3) a site location map, (4) a Phase One Environmental Site Assessment Report (no more than 6 months old), (5) a current (no more than 6 months old) Preliminary Title Report, together with (5a) copies of documents supporting the title exceptions, (5b) copies of documents regarding title encumbrances and/or analysis of those encumbrances, and (5c) include a plat showing pre-existing easements encumbering the conservation easement area, (6) copies of any Williamson Act contracts and Farmland Security Zone contracts that exist on the parcels and a copy of all Notification of Public Acquisition of Williamson Act Land memos, if applicable, (7) digital spatial data compatible with ESRI software or geo-referenced CAD files depicting the boundaries of the conservation easement area, and (8) the SAA permit number 1600-2009-0365-R5. (Condition #3.25)

8. DFG has the right to deny the proposed mitigation site/conservation easement if DFG determines the site does not have suitable conservation value. (Condition #3.26)

9. SDG&E is responsible for all land/easement acquisition costs, including title document cost, escrow fees, recording fees, title insurance premiums, Phase One Environmental Site Assessment Report, and any other escrow-related fees. If DFG becomes the grantee then DFG staff time will be charged to SDG&E. (Condition #3.27)

BO

General Conservation Measure (G-CM) #17 in the 2010 BO includes the long-term protection requirements specified by both USFWS and CDFG for the HAP/HMP. G-CM-17 also is the measure cited in the LSAA. It reads in its entirety 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.*

MMCRP

The MMCRP requirements regarding site protection are as follows:

1. A HAP/HMP must be prepared for offsite mitigation parcels (for impacts to sensitive vegetation and special status species), must be approved by the CPUC, BLM, USFWS, CDFG, and – for mitigation parcel for impacts to CNF – by USFS; and must include (among other items):
    a. Legal descriptions of the parcels
    b. Designation of a land management entity approved by the CPUC, BLM, USFWS, CDFG, and – for mitigation for impacts to CNF – USFS.
    c. A PAR prepared by the designated land management entity that explains the amount of funding required to implement the HMP;
    d. Designation of responsible parties and their roles (*e.g.,* provision of endowment by the Applicant to fund the Habitat Management Plan and implementation of the Habitat Management Plan by the designated land management entity)
    e. Management specifications including, but not limited to, regular biological surveys; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reports (measures B-1a and elsewhere)

2. The HAP/HMP must be approved by CPUC, BLM, USFWS, CDFG, and – for mitigation parcel for impacts to CNF – by USFS prior to vegetation clearing activities

3. All offsite mitigation parcels shall be approved by the CPUC, BLM, USFWS, CDFG, and – for mitigation parcel for impacts to CNF – by USFS and must be acquired or their acquisition assured prior to the line being energized (measure B-1a and elsewhere)

The MMCRP also includes an earlier version of BO G-CM-17 on a table that summarizes USFWS measures. The G-CM-17 measure in the 2010 BO supersedes that in the April 2010 MMCRP.

4.2 Status of Site Protection Measures for the Lightner Mitigation Site

As of May 2011, the status of site protection measures for the Lightner Mitigation Site is as follows:

- *Acquisition*. The mitigation site has been acquired by SDG&E.

- *Site Documentation*. The title report, County Assessor's parcel map, Phase One Environmental Assessment Report, plat map, and any Williams Act/Farmland Security Zone contracts have been completed and are included as Appendix E to this Final HMMP;

- *HMP/PAR*. A management plan and PAR were prepared for the site as part of the September 2010 HAP/HMP, were conditionally approved by USFWS, CDFG, BLM, and the CPUC for MMCRP purposes, and are being revised in coordination with the Corps, SWRCB, CDFG, and USFWS. The September 2010 HAP/HMP management measures and PAR are included in Sections 10 and 11 of this Final HMMP and will be superseded by the revised final HMP/PAR approved by the agencies. The revised final HMP/PAR will be completed by May 2012 (18 months after the date of the BO).

- *Selection of Land Manager.* Land managers under consideration are USFS and local land conservancies (e.g., Back County Land Trust or Center for Natural Lands Management). At the time of the September 2010 HAP/HMP, USFS had indicated it was not interested in receiving and managing the site. Subsequently, USFS has reconsidered its initial response, has conducted site visits at Lightner, and has expressed an interest in becoming the land manager/owner. However, it is not clear if USFS could agree to the site protections required under the HMMP for the preserved, enhanced, and restored WOUS and WOS. The option of having a conservancy as land manager is still being considered. Approval of the land manager must occur prior to or concurrent with approval of the final HMP/PAR. SDG&E has requested that the agencies make their recommendation regarding the land manager by the end of May 2011 to allow adequate time to involve the manager in the revisions to the HMP and PAR and the planning for other long-term site protection measures.

- *Conservation Easement or Equivalent Agreement.* Preparation of a draft conservation easement or equivalent agreement will depend on who is selected as the land manager. If the manager is USFS, the "equivalent" option will be necessary. If a land conservancy is selected, a conservation easement agreement will be prepared. Pending the selection of the manager, SDG&E is preparing draft templates for both types of agreements.

- *Funding Arrangements*. If USFS is selected as the land manager, SDG&E would provide funding for long-term management via a collection agreement (USFS cannot be the beneficiary of third-party endowment). The funds would be placed is a designated account for management of the property as part of CNF. If a conservancy is selected as the land manager, a non-wasting endowment would be established. USFWS and CDFG have indicated their interest in having the endowment managed by a third-party (versus having the land manager set up and manage the endowment). SDG&E has met with the San Diego Foundation and the California Wildlife Foundation to discuss their potential role as third-party managers of endowments. No decisions have been made on the endowment arrangements. The amount of the funding for long-term management will be determined in the final PAR based on the measures in the final HMP.

- *Other*. As required by the Corps, SDG&E has prepared and is implementing an action plan and schedule for ensuring progress on the long-term site protection requirements. The Corps, SWRCB, CDFG, and USFWS have conducted site visits at Lightner.

5.0 BASELINE INFORMATION

5.1 Preliminary Jurisdictional Determination and Function-Based Assessment of Impact Sites

A preliminary jurisdictional determination (PJD) of the extent of wetlands and waters along the Project 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 as outlined in the Corps Wetland Delineation Manual and the Regional Supplement to the Corps Wetland Delineation Manual: Arid West Region (Environmental Laboratory 1987, Corps 2008a) also occur at two impact sites along the margins of intermittent streams.

A function-based assessment of 30 impact sites along the Project 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 function-based 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 in 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.

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

As outlined in the Conceptual HMMP, the combined average CRAM score of representative impact sites for the Project 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 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. Where the stream is directly filled the CRAM score is reduced to zero (0) because the habitat is no longer present. The indirect effects of the Suncrest Substation on downstream areas is projected to be a drop of 38.7 percentage points in overall CRAM score. This is the most substantial single impact of the Project as reflected in projected CRAM scores. This indirect effect to functions and services also accounts for the substantial portion of the 11.6-point drop for all intermittent streams combined. 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 includes approximately 706 acres[1] on nine parcels. It is located within the central portion of the Upper Sweetwater River Watershed (HUC 12) which is situated within the eastern portion of the San Diego River Watershed (HUC 8) (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. The landscape is characterized by gently rolling hills and shallow valleys with dendritic streams and drainages. 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

Jurisdictional Areas	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

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

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 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 chamise chaparral, northern/southern mixed chaparral or Engelmann and mixed 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 disturbed 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*).

Native and non-native grassland habitats are present with this mitigation site. Native grassland patches are found to occur in two areas with the larger area located on the western half of the site and the smaller area located on the south eastern portion. Both areas of native grassland habitat are considered disturbed. There are three areas of non-native grassland areas adjacent to dirt roads and/or disturbed areas. Two of the three patches are located on the northeastern portion of the site while the remaining patch is near the southwestern portion of the site. Wet montane meadow habitat is also present within disturbed wetland and mixed oak woodland habitats and makes up less than 1 percent of the total lands on the site. A small portion, located in the southeastern half of the site is classified as disturbed habitat. The remainder of the property is considered developed, though at a very small percentage. These areas consist of the few paved roads that run east-west through the mitigation site (SDG&E 2010a).

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.

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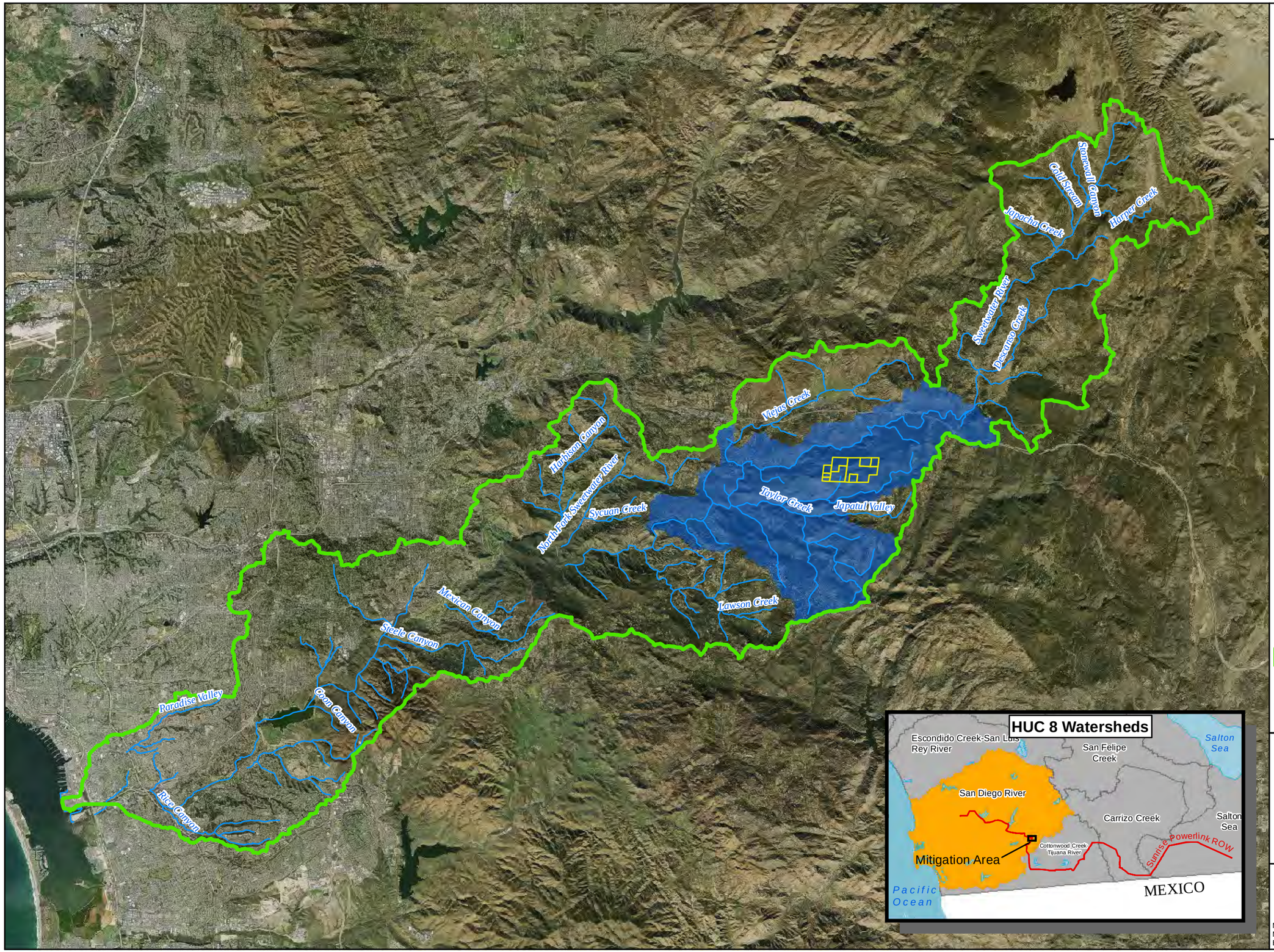
California

Figure 4

Lightner
Mitigation Site:

Upper Sweetwater
Watershed



Legend

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

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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_20110107.mxd

5.2.1 Baseline CRAM of the Lightner Mitigation Site

Function-based 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 conditions and functions and services of streams and wetlands being used as mitigation for impacts to WOUS and WOS along the Project ROW. Function-based 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 function-based 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 the mitigation sites should not be directly compared to riverine CRAM scores for Project 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%. In addition, stream 109-S-1, which will be impacted by the proposed Suncrest Substation, was assessed. During construction, approximately 1,782 linear feet of intermittent stream 109-S-1 will be culverted. Stream 109-S-1 is an intermittent stream that received an overall CRAM score of 87.8%

Buffer & Landscape Context

Both streams L-S-1 and L-S-10 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 due to the

site's relatively remote setting and undisturbed surroundings. Stream 109-S-1 scored a 100% for the Buffer and Landscape Context attribute.

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 109-S-1 received a 75% for the Hydrology attribute due to some degradation and a rating of "B" for Channel Stability.

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.

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. Stream 109-S-1 received a 62.5% for the Physical Structure attribute due to a rating of "B" for Structural Patch Richness (only nine patch types were observed) and a rating of "C" for Topographic Complexity (only one bench was present).

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. Stream 109-S-1 received a 97.2% for the Biotic Structure attribute due to the presence of some invasive plant species (Percent Invasion submetric rating of "B").

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.

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Figure 5

CRAM Assessment Areas within the Lightner Mitigation Site

APN: 52302006
116.8 acres

APN: 52302001
41.8 acres

APN: 52302003
20.7 acres

APN: 52302004
20.4 acres

APN: 52302007
133.2 acres

APN: 52303012
62.8 acres

APN: 52303009
45.4 acres

APN: 52303013
324.8 acres

APN: 52303014
43 acres

L-S-1 AA

L-W-2 AA

L-S-10 AA
(Impact Assessment)

L-S-10 AA

Bell Bluff Truck Trail

Bell Bluff Truck Trail

Substation

Staging Area

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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Date: January 2011
Base Source: NAIP, 2005; San Diego County
Map By: Derek Chan
Filepath: L:\Acad 2000 Files\17000\17128-3\GIS\ArcMap\CRAM\Lightner_CRAM_20110107.mxd

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

Using proposed mitigation plans and data collected at the mitigation sites, CRAM was used to predict how these sites may improve following mitigation activities. The projected CRAM 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 identified in Figure 6 and discussed in detail in Section 7. 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.

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, as described below.

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 (i.e., within 10 to 20 years). 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 (i.e., after 10+ years) 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.

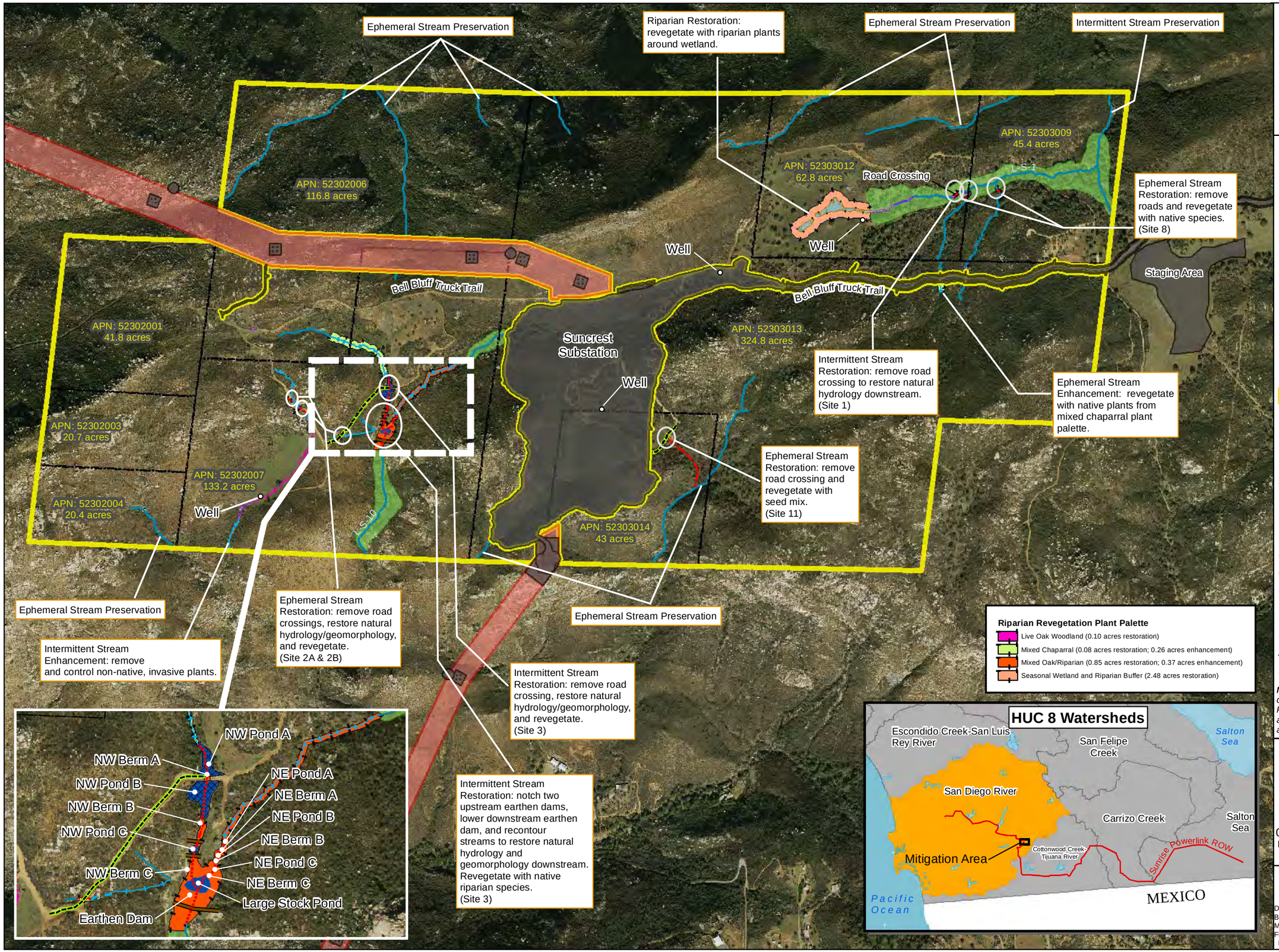

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Figure 6.

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
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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

5.2.3 Conclusions of CRAM for Mitigation at the Lightner Mitigation Site

Mitigation activities for the Project should provide improvements in the same areas of functions and services 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 functions and services 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).

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. Mitigation actions at the Lightner Mitigation Site should allow improvements in the areas of Buffer & Landscape Context, Hydrology, and Biotic Structure that are apparent 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 Biotic Structure and, less likely, Physical 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 (i.e., 10 to 20 years). 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.

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

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%

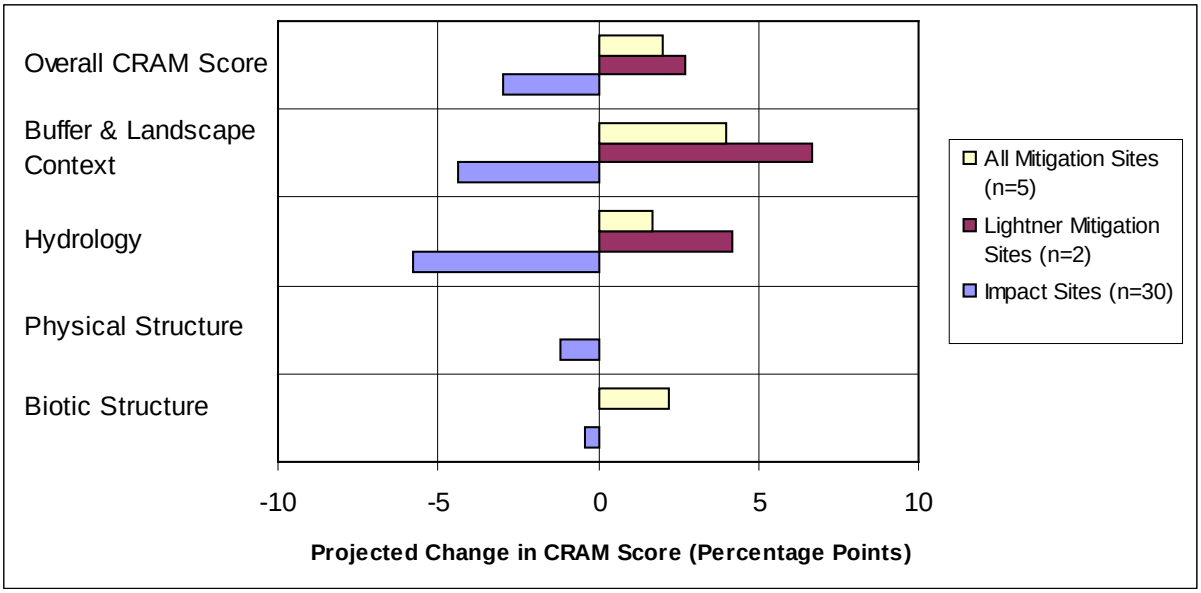


Figure 7. Projected Average Changes in CRAM Score at Stream Impact Sites and Stream Mitigation Sites 5 Years after Mitigation Implementation

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 Project 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 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 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 percent of the total mitigation acreage for intermittent and ephemeral streams, 4 percent of the Project mitigation for wetlands, and 42 percent 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 (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
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 impacts (Table 9) and temporary impacts (Table 10) for each resource type is detailed below. In addition, a summary of mitigation activities at each mitigation site is contained in Table 11. On an acreage basis, the 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 will provide improvements in the same areas of functions and services that are likely to be impacted by the Project. Overall, the stream impact sites will be offset by restoration, enhancement, and preservation of dry washes, streams, and wetlands within the mitigation sites 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 may 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 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 Sunrise Powerlink Project Mitigation for Permanent Impacts to Waters of the U.S.

Habitat Type	Permanent Impacts	Off-site Restored Mitigation Acreage	Off-site Enhanced Mitigation Acreage	Off-site Preservation Acreage	Total Mitigation Acreage for Permanent Impacts	Permanent Impact Mitigation Ratio
Desert Dry Washes	2.45	0	4.04	74.50	78.54	32.1:1
Other Streams	0.35	0.04	2.13	1.12	3.29	9.4:1
Wetlands	0.08	0	7.52	11.11	18.63	232.9:1
Total	**2.88**	**0.04**	**13.69**	**86.73**	**100.46**	**34.9:1**

Table 10. Summary of Sunrise Powerlink Project Mitigation for Temporary Impacts to Waters of the U.S.

Habitat Type	Temporary Impacts	On-site Habitat Replacement Acreage	Temporary Impacts Replacement Ratio	Off-site Preservation Acreage	Off-site Mitigation Ratio
Desert Dry Washes	6.53	6.53	1:1	13.06	2:1
Other Streams	0.55	0.55	1:1	1.10	2:1
Wetlands	0	NA	NA	NA	NA
Total	**7.08**	**7.08**	**1:1**	**14.16**	**2:1**

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[2]	**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**

[2] Totals reflects mitigation for both permanent and temporary impacts to Waters of the U.S.

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 part describes implementation methods for general mitigation activities that will be performed at the mitigation site.

7.1 Activities Planned at the Lightner 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.

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**	**-**

As described 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:

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

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, 0.55 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:

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

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 each other, with intermittent swales surrounded by mixed chaparral vegetation flowing to 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 the upper road crossings (Bell Bluff Truck Trail), 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.

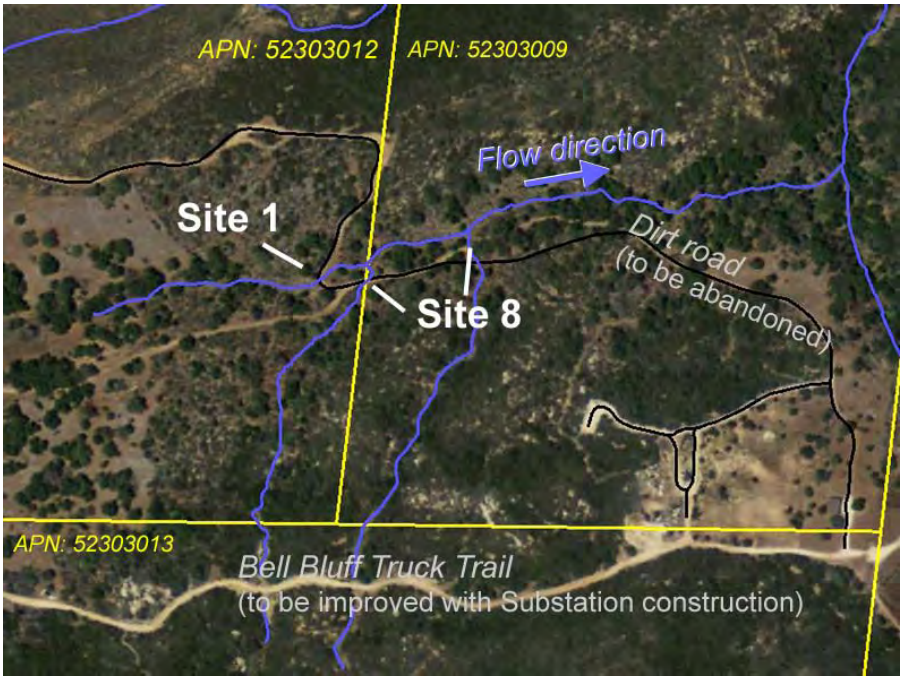
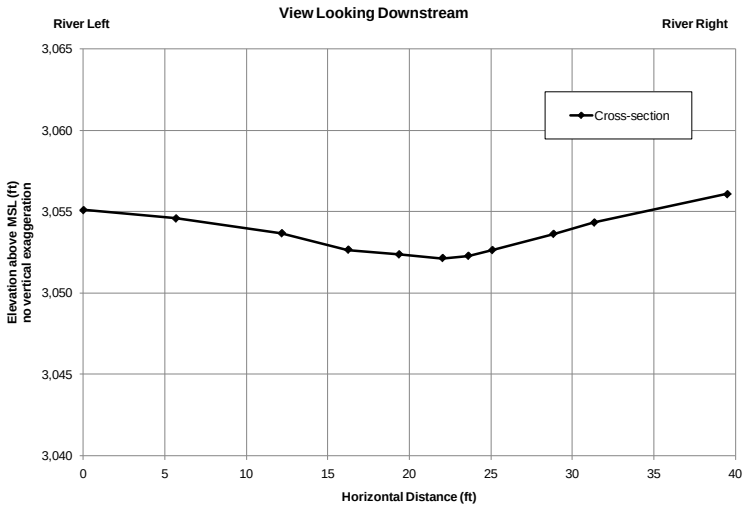


Figure 8. View of existing road crossings at Sites 1 and 8 (aerial photograph taken 25 May 2009, source: Google Earth, accessed 2010). Present day road alignment shown in black and streams shown in blue.

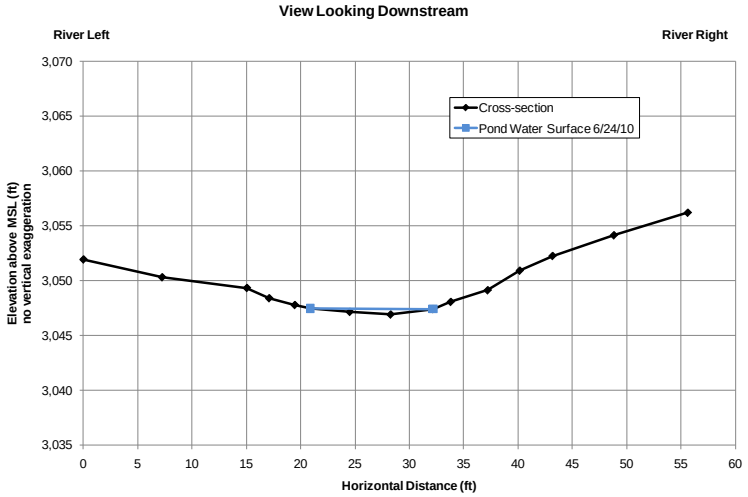
Figure 9. At Site 1 looking upstream from the road crossing at a wetland impoundment.

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

a)



b)



c)

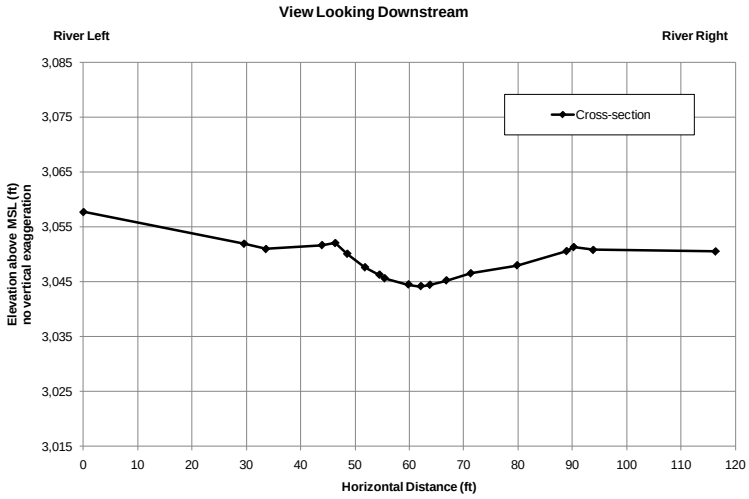


Figure 11. Cross-sections along the intermittent stream channel at Site 1: upstream of the road crossing (a), across the pond upstream of the crossing (b), and downstream of the road crossing (c).

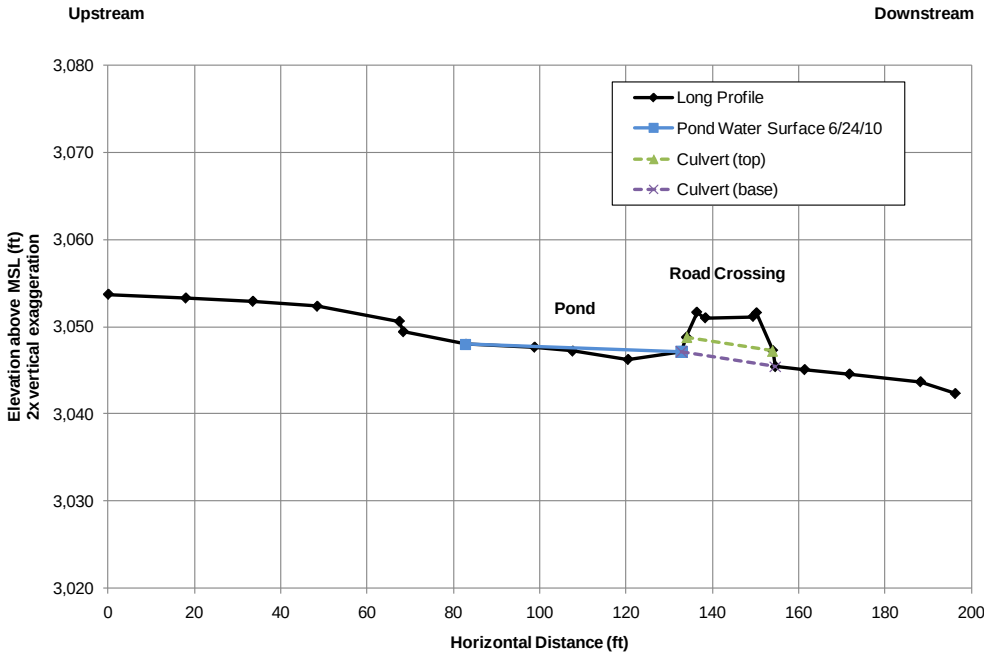


Figure 12. Longitudinal profile along the intermittent stream channel at Site 1, with flow moving downstream from left to right. The road crossing presently impounds water on its upstream side forming a seasonal pond with wetland vegetation.

7

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.

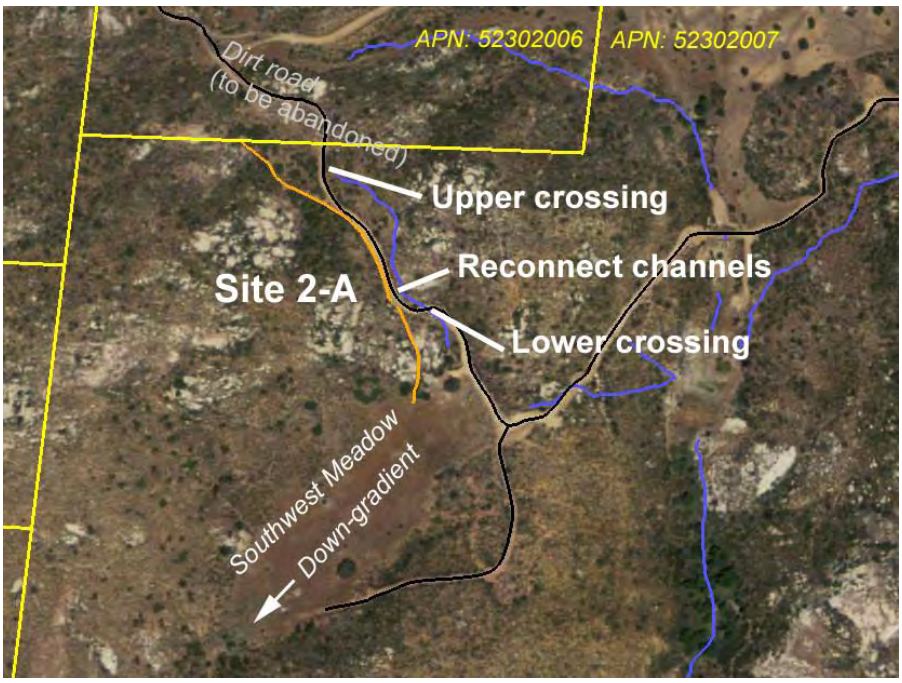


Figure 15. View of existing road crossings at Site 2-A along the stream channel that drains to the southwest grassland/meadow (aerial photograph taken 25 May 2009, source: Google Earth, accessed 2010). Present day road alignment shown in black, abandoned road and ditch shown in orange, and streams shown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

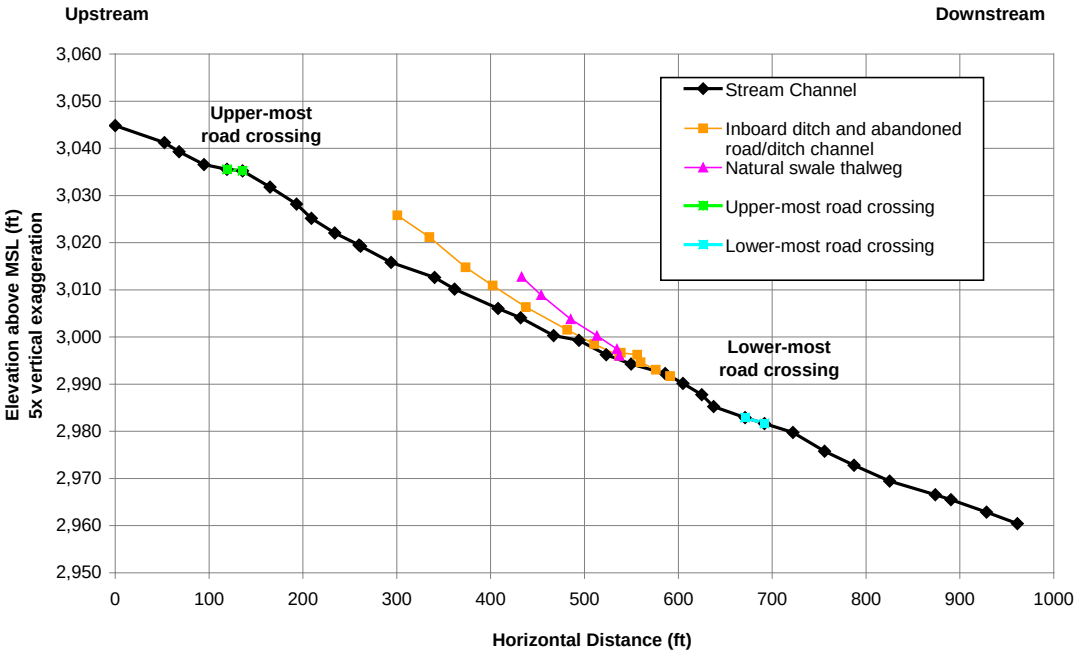
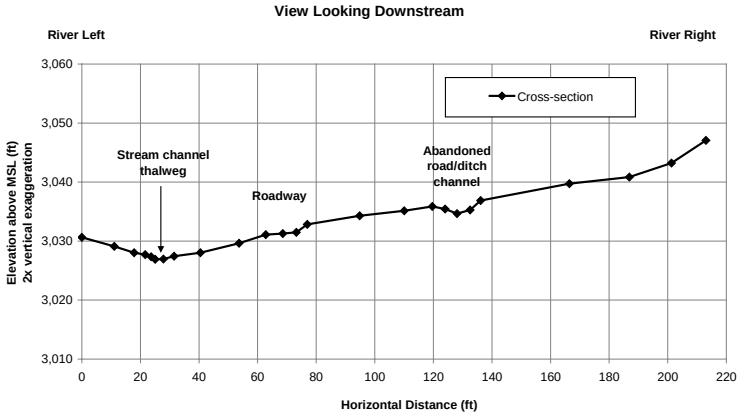
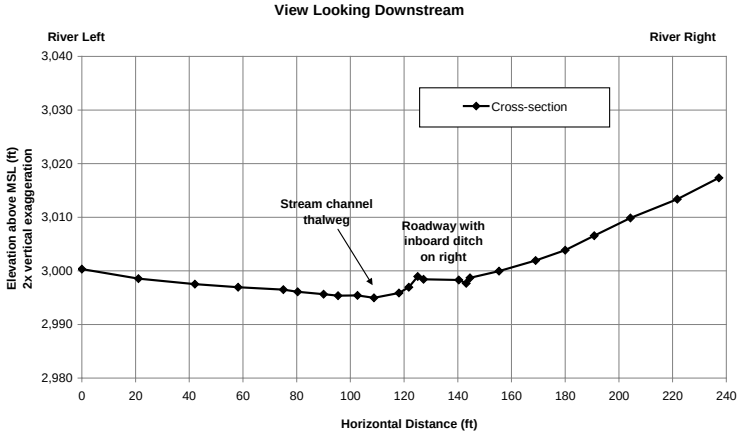


Figure 16. Longitudinal profile along the intermittent stream channel at Site 2-A, with flow moving downstream from left to right. The road crossing presently impounds water on its upstream side forming a seasonal pond with wetland vegetation.

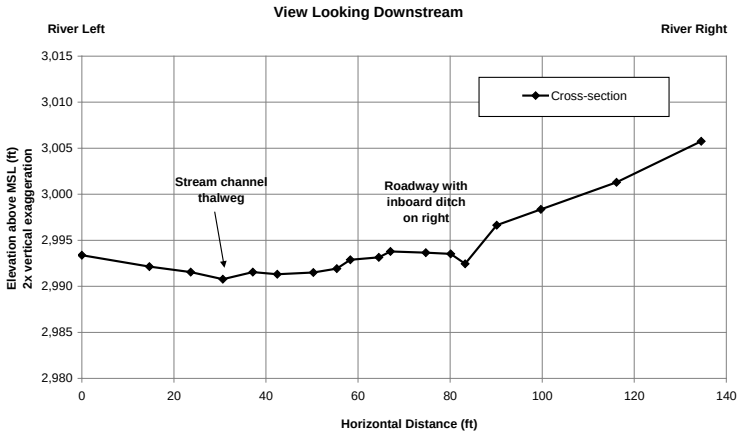
a)



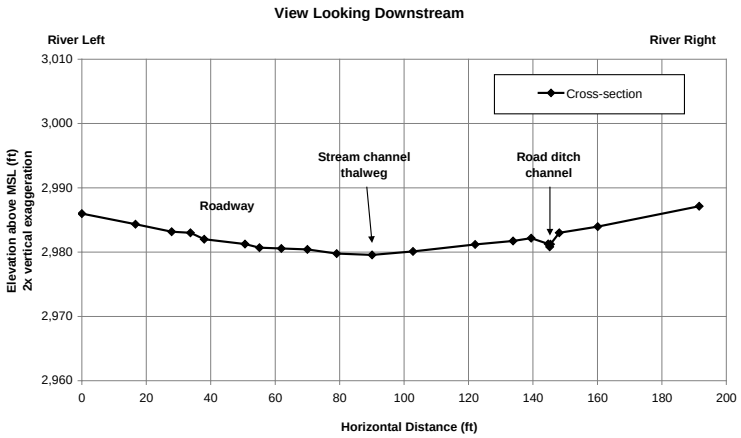
b)



c)



d)



e)

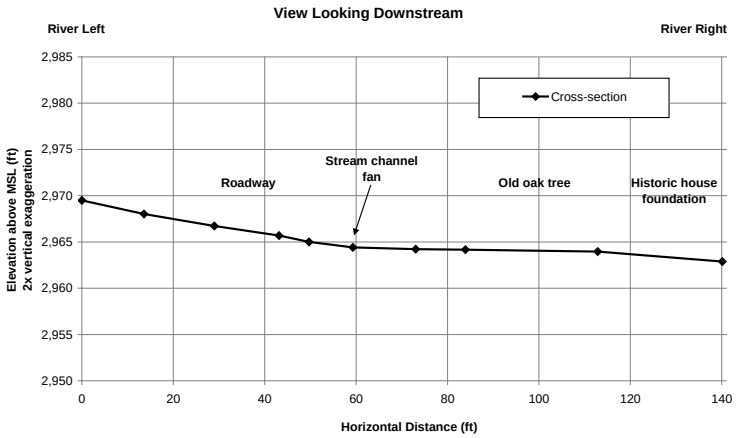


Figure 17. Cross-sections at site 2-A: upstream of the upper-most road crossing (a), upstream of the confluence with a natural ephemeral swale confluence and the proposed stream and ditch channel confluence (b), downstream of the proposed stream and ditch channel confluence (c), downstream of the lower-most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

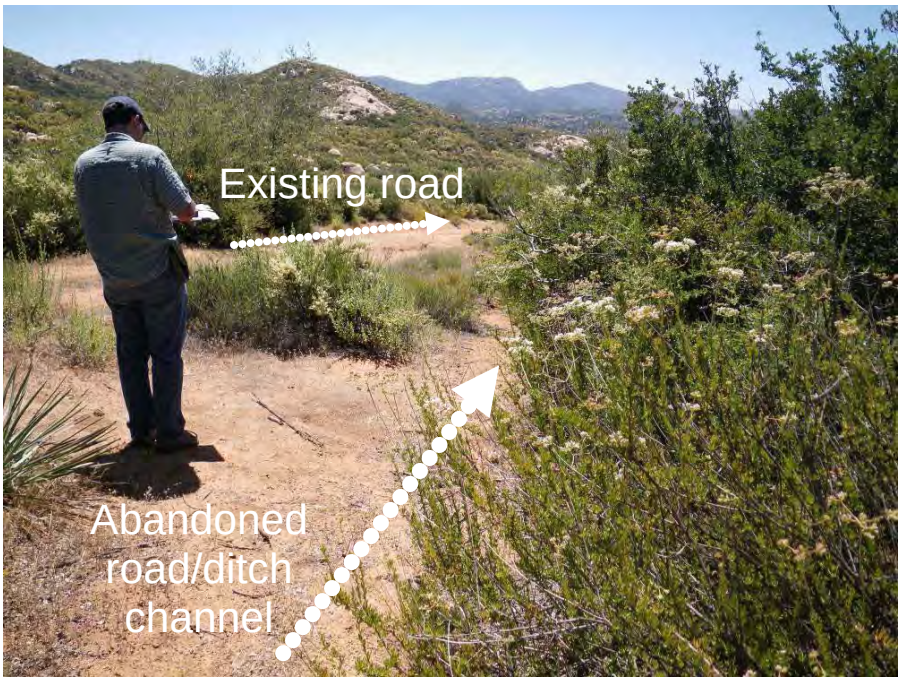


Figure 18. At Site 2-A looking downstream along abandoned road/ditch channel towards its confluence with the existing roadway. At the road, this channel continues along an inboard ditch.

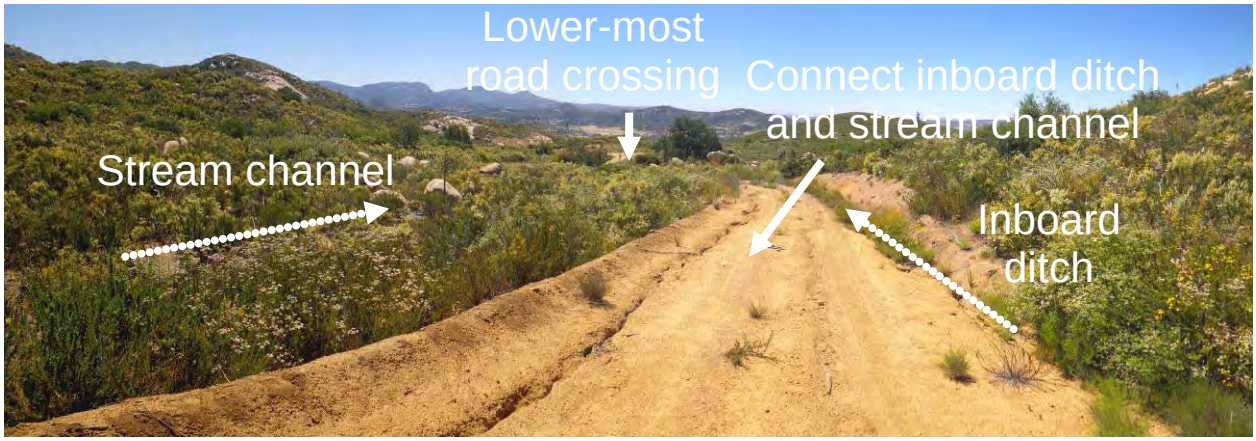


Figure 19. At Site 2-A looking down-gradient along the roadway with the stream channel running parallel to the left and an inboard ditch running on the right. The inboard ditch connects the abandoned road/ditch channel upstream to the ditch channel downstream.

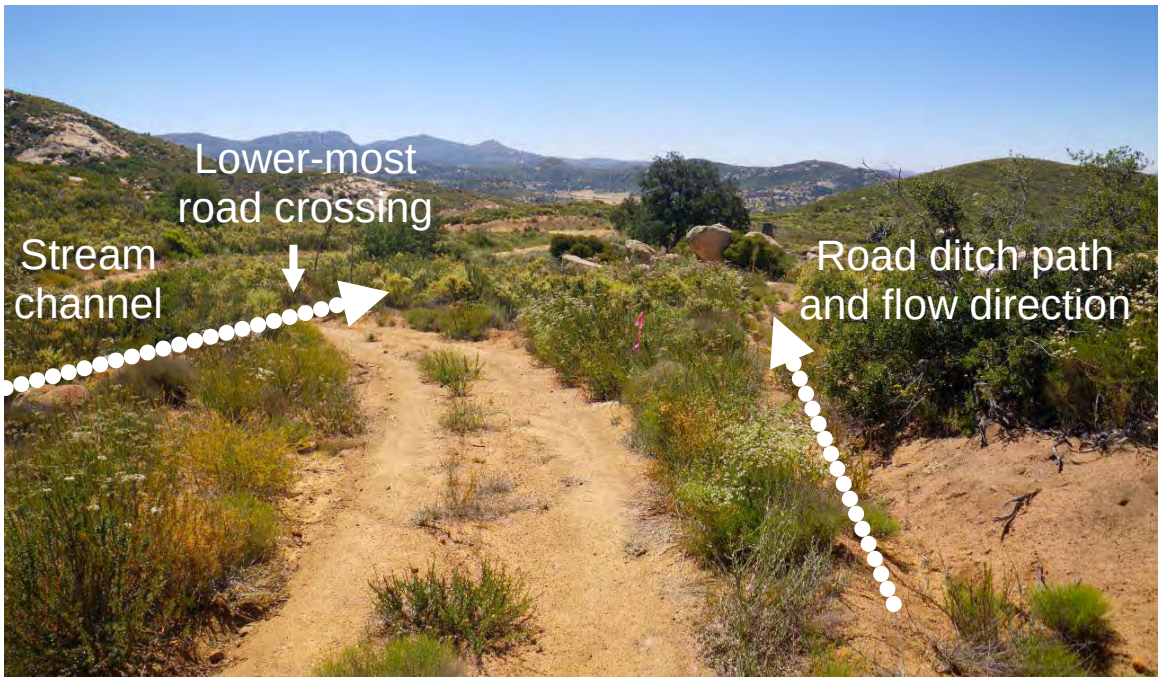


Figure 20. At Site 2-A looking down-gradient along the roadway with the inboard ditch diverting away to the right and the stream channel crossing on the left.

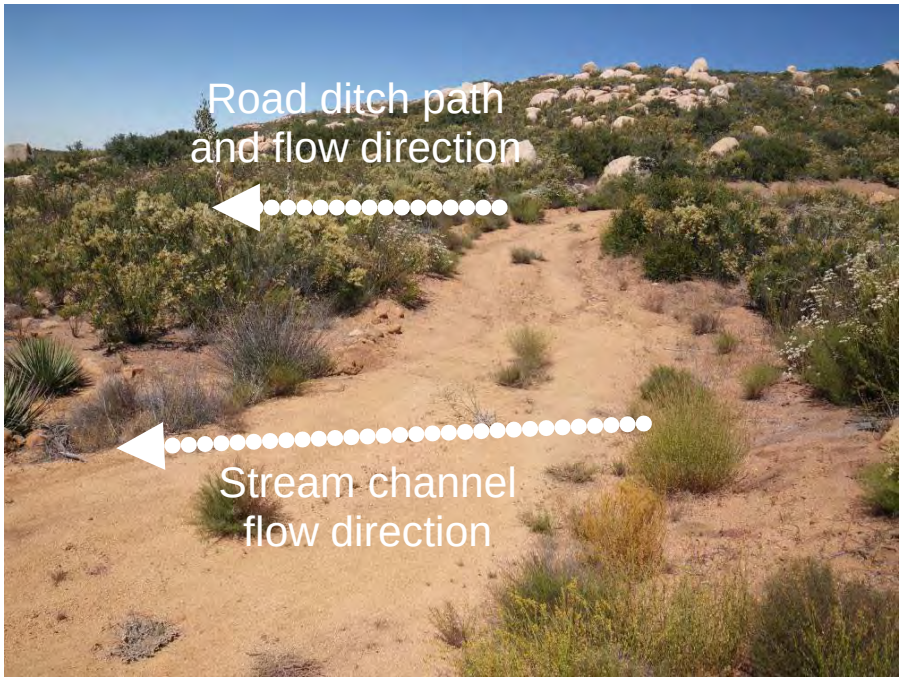


Figure 21. At Site 2-A looking at the lower-most road crossing of the stream channel that drains to the southwest grassland/meadow. The road ditch is also shown here.

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 the upper watershed portion of a weakly defined ephemeral stream.

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.

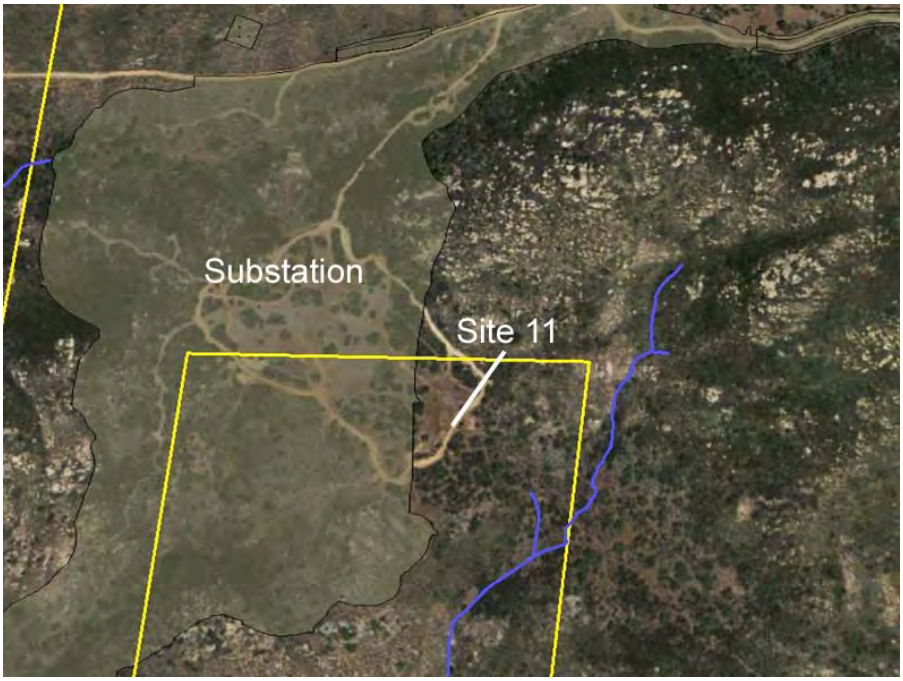


Figure 25. View of existing road crossing at Site 11 above an ephemeral stream channel and situated on the east-side of the substation (aerial photograph taken 25 May 2009, source: Google Earth, accessed 2010). Present day road-loop alignment seen in the aerial photograph and streams shown in blue. Flow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

restore more natural stream flow downstream of the large stock pond, modifications to the existing outlet dam structure and contour will be undertaken as part of the mitigation. 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, thus improving the hydrology of these stream reaches. 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 specific design for the dam and spillway will be determined based on a hydrologic study of the catchment area to evaluate the 100-year, 24-hour stormwater flows and to perform a hydraulic analysis. In addition, a determination will need to be made as to whether the existing dam qualifies as being under the jurisdiction of the California Department of Water Resources (DWR) Division of Dam Safety and, if so, what steps are required to secure DWR approval of the modification.

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 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.

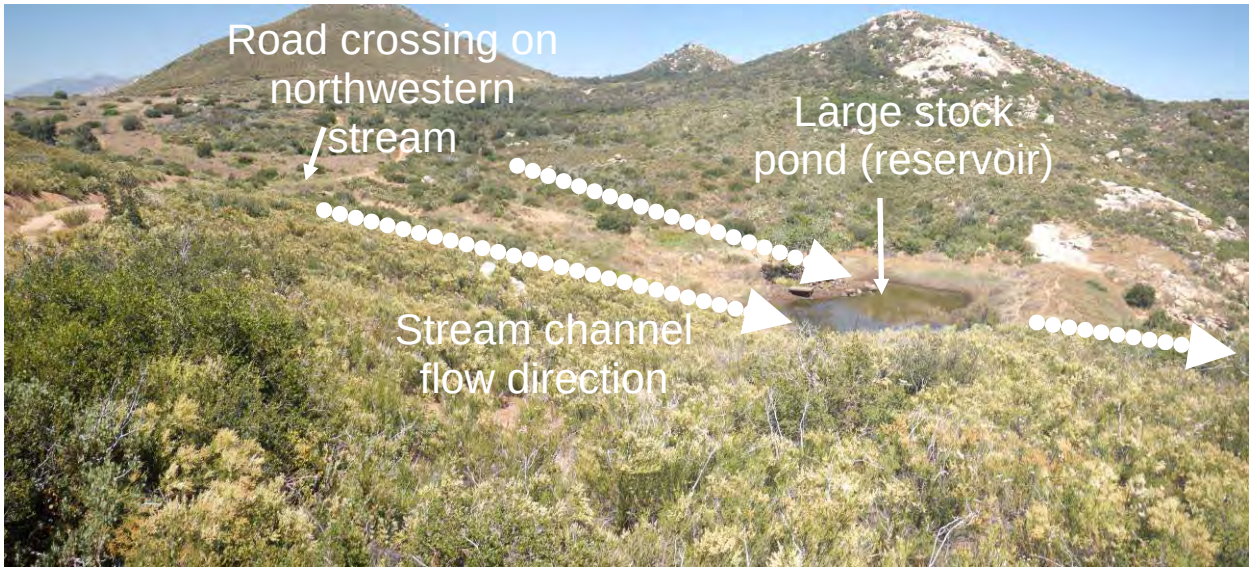


Figure 29. Eastward view of the large stock pond (reservoir), dam, road crossing, and northwestern and northeastern stream channels at Site 3. Removal of road crossing and pond storage berms and lowering of the large stock pond (reservoir) dam will enhance hydrologic connectivity from the headwaters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

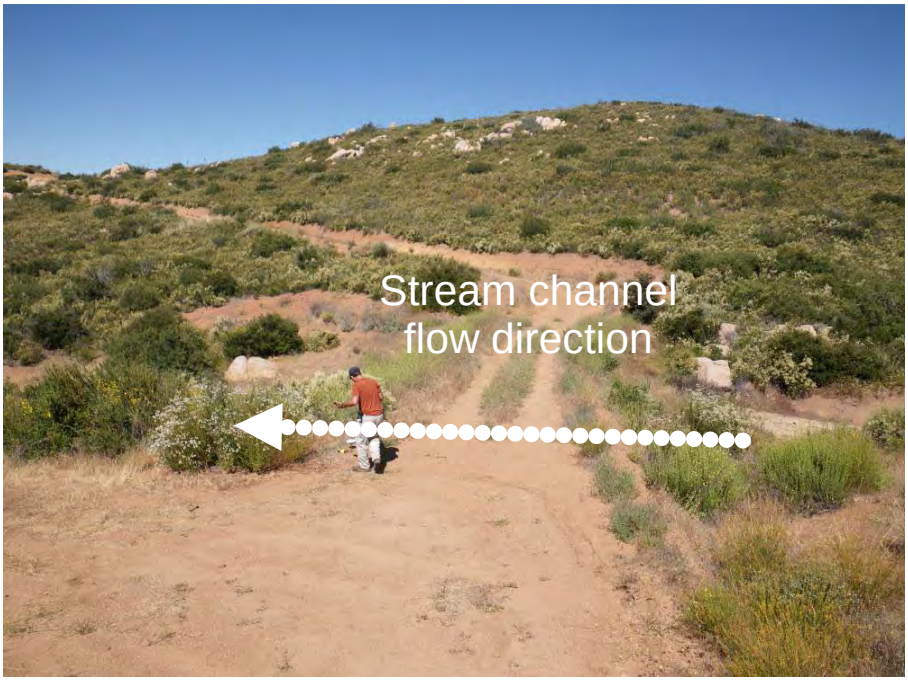
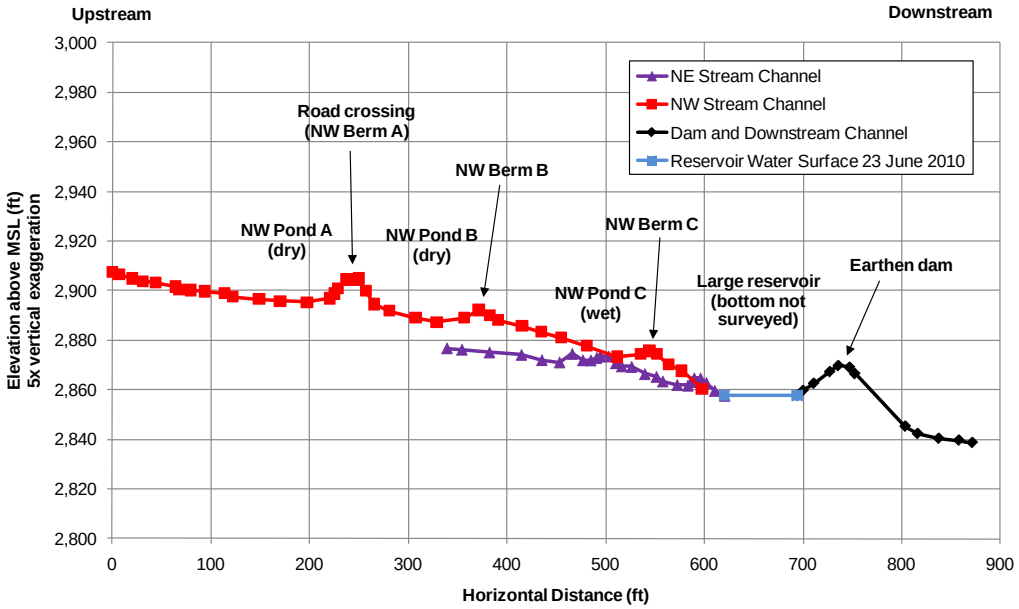


Figure 30. View of road crossing over the northwestern stream channel with dry ponds (NW Ponds A and B) on the upstream and downstream sides at Site 3.

a)



b)

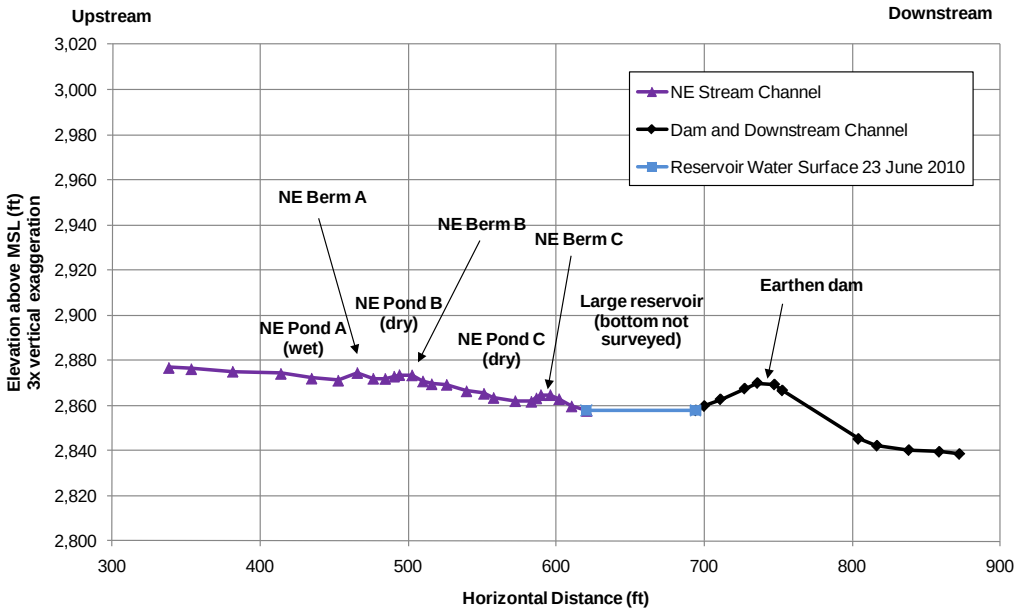
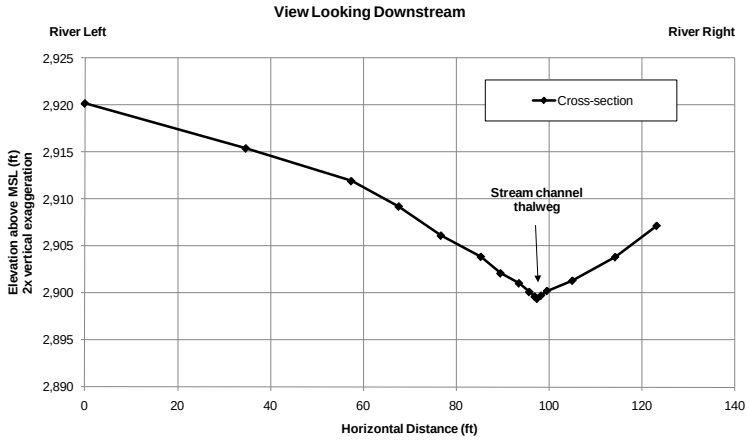
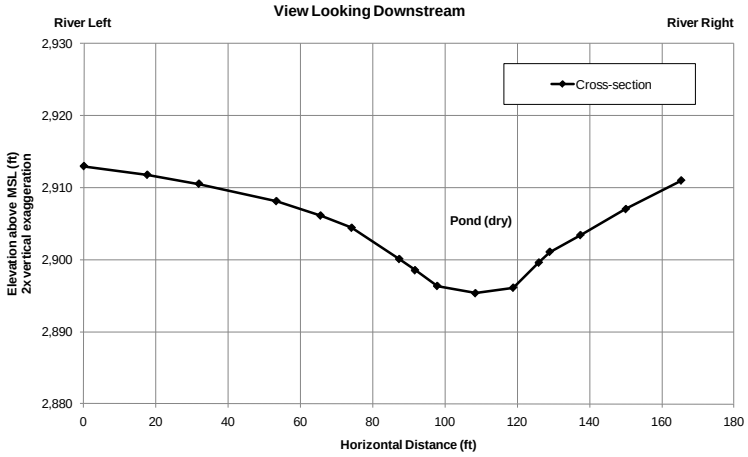


Figure 31. Longitudinal profile along two intermittent stream channels that drain into the large stock pond (reservoir) at Site 3, with flow moving downstream from left to right (a). The longitudinal profile along the northeastern stream channel is shown as reference in (a) and alone in (b).

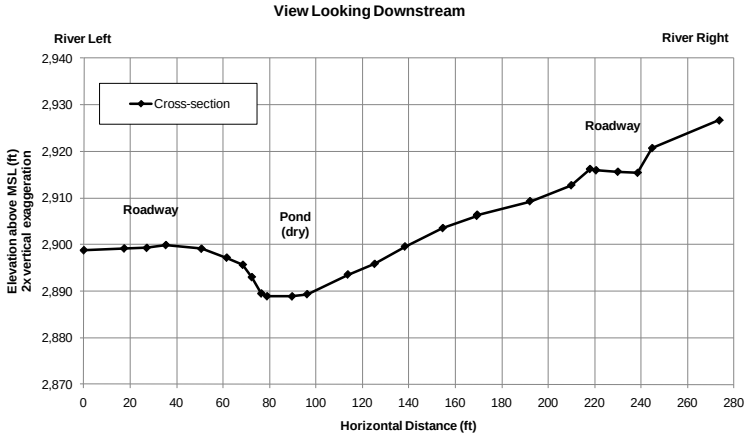
a)



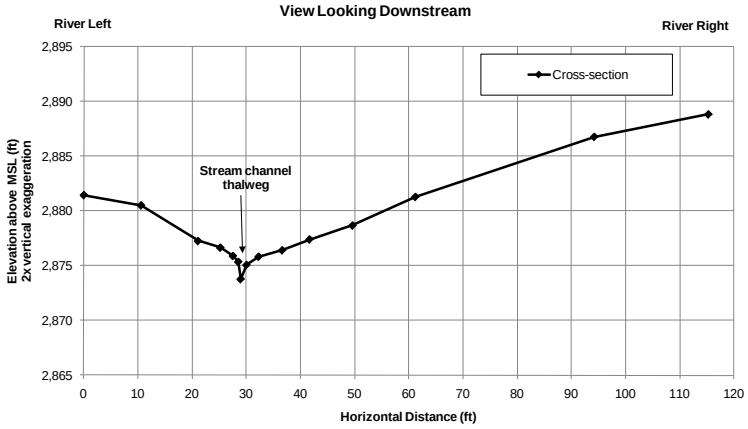
b)


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)


View Looking Downstream
River Left
River Right
Cross-section
Stream channel
thalweg
Elevation above MSL (ft)
2x vertical exaggeration
Horizontal Distance (ft)
2,895
2,890
2,885
2,880
2,875
2,870
2,865
0
10
20
30
40
50
60
70
80
90
100
110
120

e)

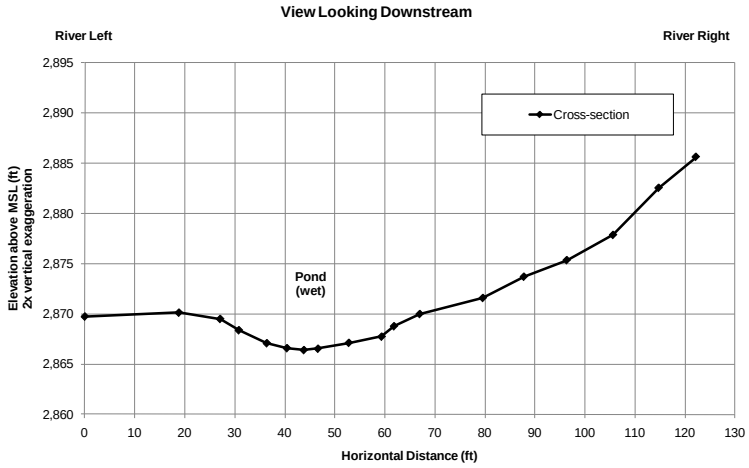
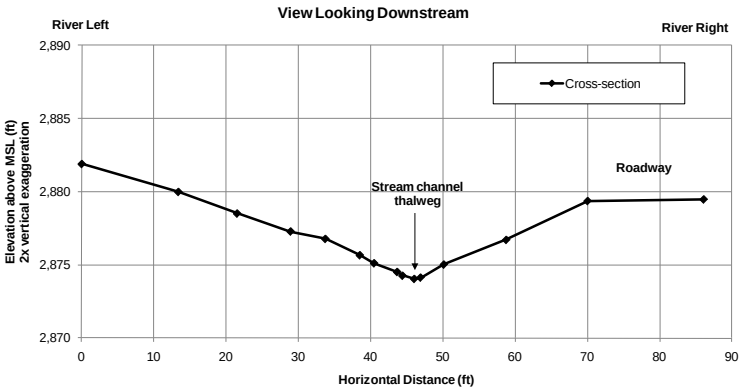
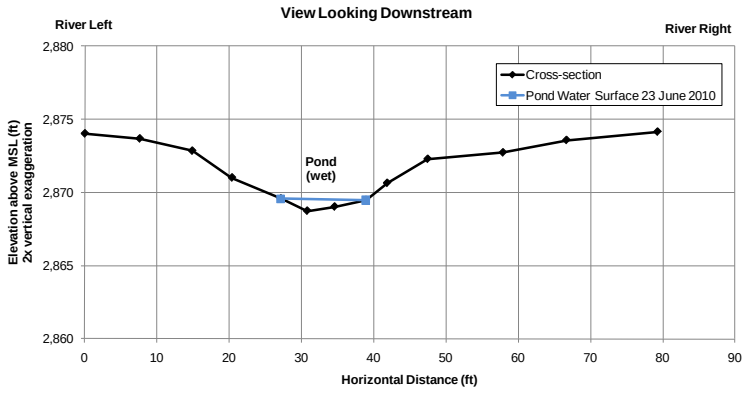


Figure 32. Cross-sections along the northwestern stream channel above the large stock pond (reservoir) at Site 3. The cross-sections span the natural stream channel above NW Pond A (a), the NW Pond A above the road crossing (b), the NW Pond B below the road crossing (c), the stream channel between NW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

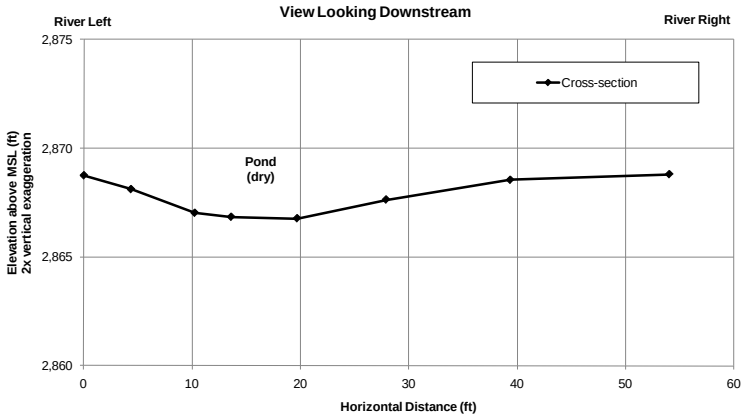
a)



b)



c)



d)

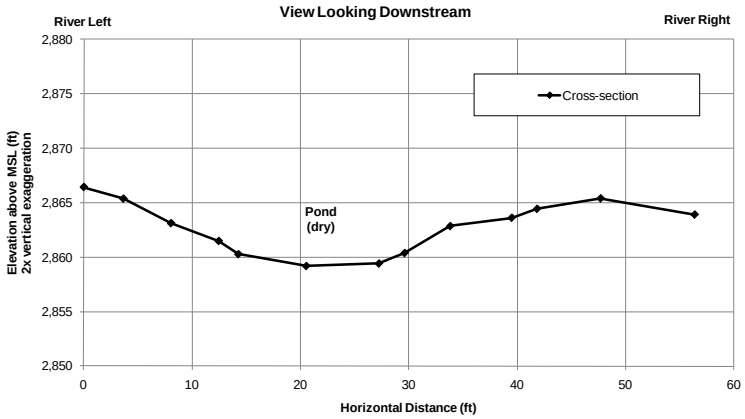


Figure 33. Cross-sections at Site 3 along the northeastern stream channel above the large reservoir. The cross-sections span the natural stream channel above NE Pond A (a), the NE Pond A (b), the NE Pond B (c), and the NE Pond C above the large reservoir (d).

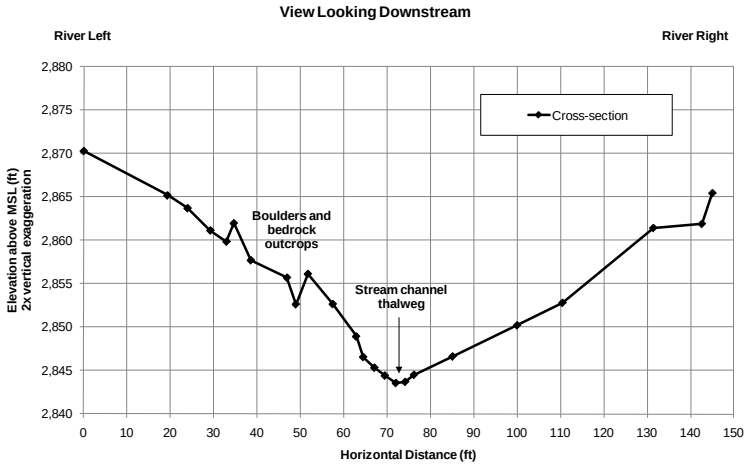


Figure 34. Cross-section of the stream channel downstream of the large reservoir dam at Site 3. Boulders and bedrock outcrops are present on the river-left upland slopes and the dam spillway is present in the notch near the top of the river-right upland slope.

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

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 Lightner 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.

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 and are summarized in Table 14 below. 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. Mitigation implementation activities will also be coordinated with all applicable wildlife work windows and survey requirements listed in the FEIR/EIS, BO, and LSAA.

The timing of weed removal activities will vary depending on weed type (annual or perennial) and weed removal method (manual or mechanical means). In all cases, the contractor will coordinate with the consulting biologist to determine the exact timing of weed removal activities. In Years 1 and 2, annual weeds specified to be removed by manual means, including the priority species tocalote, will be removed two times during the Spring, between approximately February 1 and June 30. During Years 3-5, annual weeds within manual removal areas will be removed twice annually at a minimum.

Perennial weeds, specifically priority species shortpod mustard, specified to be removed manually will be removed once a month during the growing season, occurring between approximately February 1 and August 31, during Year 1. In Year 2, perennial weeds will be removed four times during the growing season. During Years 3-5, perennial weeds will be removed twice annually at a minimum.

Weed removal activities occurring by mechanical means will take place two times during the Spring in Year 1, once between approximately February 1 and April 15, and once between April 16 and June 30. During Years 2-5, mechanical weed removal activities will occur twice annually at a minimum.

7.2 General Mitigation Implementation Methods and BMPs

This section describes general methods for implementation of mitigation activities, including site preparation, weed removal, planting, and erosion control Best Management Practices (BMPs). In addition, all mitigation activities will avoid impacts to nesting birds and will follow the breeding season dates listed in the Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Project (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 14), above. Specifics on the implementation of these methods are described in more detail below.

Table 14. Sequence and Timing of Mitigation Activities at the Lightner Property[1]

	Monitoring Years					
	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Site Preparation						
Grading	Between April 15 & October 15					
Seeding	Between Oct. 1 & Nov. 1, or as directed, in conjunction with erosion control					
Planting	Between Nov. 1 & Jan. 31					
Weed Removal						
Manual removal of *annual* weeds		Twice between Feb. 1 and June 30.	Twice between Feb. 1 and June 30.	Twice between Feb. 1 and June 30.	Twice between Feb. 1 and June 30.	Twice between Feb. 1 and June 30.
Manual removal of *perennial* weeds		Once a month between Feb. 1 & Aug. 31.	At least 4 times between Feb. 1 & Aug. 31.	Twice between Feb. 1 and Jun. 30.	Twice between Feb. 1 and Jun. 30.	Twice between Feb. 1 and Jun. 30.
Mechanical removal of weeds		Twice between Feb. 1 and June 30.	Twice between Feb. 1 and June 30.	Twice between Feb. 1 and Jun. 30.	Twice between Feb. 1 and Jun. 30.	Twice between Feb. 1 and Jun. 30.

[1]Timing of all mitigation implementation activities will be coordinated with applicable wildlife work windows and survey requirements listed in the FEIR/EIS, BO, and LSAA.

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 methods include:

- Cut into manageable size and dispose of on-site to create brush piles for wildlife
- Removal of material from the site

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. 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 for erosion control and for restoration of temporarily disturbed sites is presented in Table 15.

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 Restoration Plan for Sensitive Vegetation in Temporary Impact Areas (ICF and Chambers 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.

Table 15. 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

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 16.

Table 16. 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 17. Contents of seed mix to be used are shown in Table 15. 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 17. 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 18.

Table 18. 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 19.

Table 19. 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. In addition, reseeding will occur in areas that involve grading and weed removal as specified in the Storm Water Prevention and Protection Plan (SWPPP, SDG&E 2010b).

8.0 HMMP MONITORING AND PERFORMANCE CRITERIA

8.1 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.

8.2 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. Where possible, the monitoring program will implement the South Coast Index of Biological Integrity, a part of the SWQCB Surface Water Ambient Monitoring Program (SWAMP), in conjunction with CRAM, to determine 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 (e.g., non-native, invasive species removal and replanting for enhancement activities or grading and replanting for restoration activities) at the site and the completion of preservation agreements between SDG&E and the long-term land manager. 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.

8.2.1 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, as needed. Most likely, a hydrologist and cross sections will only be needed at Site 3. Any area where removal of road crossings or connection of existing ephemeral streams is the only activity should only require monitoring for erosion and erosion repair when observed through replanting, regrading, or other mechanism deemed appropriate. 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 and/or sedimentation issues that are determined to be detrimental to the goals of the restoration will be addressed/remedied 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. Any new use of rock or hard materials will need Corps approval.

8.2.2 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. The monitoring method used will depend upon the vegetation type being observed following guidelines issued by the Bureau of Land Management (BLM 1999). In general, quadrats are not recommended for estimating cover due to this methods' inability to quantify overall success of mitigation activities. Therefore, quadrats will be used only in cases where short-stature, herbaceous species are present. Rather, we recommend a visual estimate of percent cover of annual vegetation at each proposed mitigation site and documentation of survival and percent cover of all perennial plant species. Each species present will be identified to the species level and be 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 (Table 19). 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 (Table 20). 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 (Table 21). 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.

Table 20. Minimum Survivorship/Aerial Coverage Criteria for Mitigation Plantings

Type of Planting	Minimum Survivorship Rate Criteria							
All mitigation plantings	**Year 1 (after planting)**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**2 years with no supplemental irrigation**		**Year 8+**
						Year 6	**Year 7**	
	75%	80%	80%	80%	80%	80%	80%	80%
Subset of perennial woody vegetation mitigation plantings (Use either Option A or Option B)	**Option A: Minimum Survivorship Rate Criteria**							
	Year 1 (after planting)	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**2 years with no supplemental irrigation**		**Year 8+**
						Year 6	**Year 7**	
	75%	80%	80%	80%	80%	80%	80%	80%
	Option B: Minimum Aerial Coverage Criteria							
	Year 1 (after planting)	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8+**
	75%	80%	80%	70%	70%	90%	90%	90%

Table 21. Percent Cover Criteria for Perennial and Annual Invasives

Non-native invasive species with severe (A) or moderate (B) Cal-IPC invasive impact	Percent Cover	
	Within Waters	**In Buffer Areas**
Perennial Species	0%	Not to exceed % cover of reference sites
Annual Species	5%	Not to exceed % cover of reference sites

8.2.3 Quantitative CRAM Evaluation

Purpose: Provide quantitative evaluation of preserved streams to inform adaptive management through comparison of CRAM scores throughout the monitoring period.

Methods: CRAM methodology will be applied to a subset of enhanced wetlands and streams on the Lightner property. CRAM AAs will remain the same for all assessments during the monitoring period to enable consistent comparison of performance. Evaluation of wetlands using CRAM will be led by certified CRAM practitioners trained in the riverine and depressional CRAM modules or a more specific module for these areas, if developed in the future. A CRAM assessment was performed in June 2010 to gather data on baseline conditions. CRAM assessments will be performed at Year 1 (following enhancement activities), at Year 3, and at Year 5. The results of these wetland evaluations will be presented as part of the annual monitoring reports. CRAM will be conducted in conjunction with other Project monitoring activities, and will occur between February and June of each monitoring year, when plant species are most identifiable.

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.

8.2.4 Qualitative Monitoring for Non-native, Invasive Species

Purpose: To monitor conditions for non-native, invasive plant 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 the 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 11.0).

8.2.5 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.

8.3 Monitoring Schedule and Reporting Requirements

Monitoring at this mitigation site will include hydrology and planted vegetation monitoring, CRAM assessments, non-native, invasive plant species monitoring, wildlife monitoring, and other monitoring, as required. A summary of the different types of monitoring and the timing of monitoring activities is summarized below in Table 22. A mitigation monitoring report will be prepared for the mitigation site to enable clear communication to the land manager at this location. Reporting will occur annually. Reports including quantitative and qualitative monitoring years (Years 1, 3, and 5) will be a full report with analysis. Reports including limited quantitative monitoring and qualitative monitoring (Years 2 and 4) will consist of a memorandum discussing the general conditions of the site and management actions implemented in that year and/or recommended for the following year. The report will be submitted to the Corps, CDFG, and SWRCB by October 31 of each monitoring year.

Table 22. Monitoring and Reporting Activities at the Lightner Mitigation Site

	Monitoring Years				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Quantitative Monitoring					
Hydrology and Erosion Control	Annually (late spring or early summer)		Annually (late spring or early summer)		Annually (late spring or early summer)
CRAM	Annually (late spring or early summer)		Annually (late spring or early summer)		Annually (late spring or early summer)
Planted Vegetation	Annually (spring to summer)	Annually (spring to summer)	Annually (spring to summer)	Annually (spring to summer)	Annually (spring to summer)
Qualitative Monitoring					
Non-native, invasive plant species	Quarterly	Bi-annually	Annually (spring to summer)	Annually (spring to summer)	Annually (spring to summer)
Wildlife	Spring + Fall	Spring + Fall	Spring + Fall	Spring + Fall	Spring + Fall
Reporting					
Due by October 31	Quantitative + 2 Wildlife Surveys Summary	Qualitative+ 2 Wildlife Surveys Summary	Quantitative+ 2 Wildlife Surveys Summary	Qualitative+ 2 Wildlife Surveys Summary	Quantitative+ 2 Wildlife Surveys Summary

9.0 MAINTENANCE OF HMMP WETLANDS AND STREAMS DURING THE MONITORING PERIOD

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, at minimum, 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.

Adaptive management strategies will be implemented for monitoring activities throughout the entire monitoring period. All maintenance and monitoring activities will be amended as needed based on monitoring results.

10.0 INITIAL MANAGEMENT OF THE MITIGATION SITE UNDER THE HAP/HMP

As discussed in Section 1.3, management of the Lightner Mitigation Site as a whole will occur under the institutional and funding arrangements established under the revised final HMP and PAR for the site. This section presents the proposed management tasks for the site during the first five years of HMP implementation and indicates how the tasks would be coordinated with HMMP implementation and maintenance activities during that the period. This section also identifies the estimated funding requirements for initial HMP management of the site. The tasks and funding estimates are from the September 2010 HAP/HMP and are subject to change. Actual HMP management tasks and funding will be as specified in the revised final HMP approved by the agencies (see Section 1.3).

10.1 HAP/HMP Management Tasks

Table 23 identifies the initial HMP management tasks (i.e., tasks in years 1-5 of HMP implementation) identified in the HMP for all Project mitigation sites, the specific tasks proposed for the Lightner site, and the interface between HMMP and HMP activities during the initial management period. During the first three years of HMP implementation (which will follow the final selection of a land manager), the land manager will prepare annual work plans and budgets that indicate which tasks will be implemented and how management funds will be allocated. The annual work plans will be replaced by a five-year work program developed by the land manager by year 3 of HMP implementation. The five-year work program will guide ongoing management activities and the completion of initial HMP-related tasks. Based on this time table, HMMP restoration and enhancement activities, including required monitoring and maintenance of HMMP wetlands, streams, and riparian areas, will have been initiated prior to or concurrent with the initial phase of HMP implementation.

Table 23. Initial HAP/HMP Management Tasks and Interface with HMMP Measures at the Lightner Mitigation Site

September 2010 HAP/HMP		Interface with HMMP Tasks
Initial Management Tasks at All Sites	**Initial Tasks at Lightner**	
Access Controls		
To control access and deter illegal uses, gates, fences and signs will be installed and property patrols will be conducted. Fencing will be used selectively where access to areas with highly sensitive resources or hazards needs to be precluded and where the fencing would not interfere with wildlife movement. Signs, gates, and fencing will be maintained and replaced as needed.	Bollards, a gate, approximately 10 signs, and some fencing will be installed and maintained over the period.	The primary purpose of the HMP task is to control access to the property and sensitive areas. Placement of access controls will be coordinated with any temporary access controls installed in connection with the HMMP restoration and enhancement activities. The HMP task also will address the need for permanent protection of the resources preserved under the HMMP.
General Conditions Monitoring and Wildlife Assessment		
The land manager will patrol the property on an annual basis to monitor the general condition of the property and to identify areas of management concern. All areas that have signs of illegal activity (such as dumping, unauthorized access, off-road vehicle use, or other unauthorized actions), invasive species problems, erosion issues, or other habitat degradation problems will be mapped using Geographic Positioning System (GPS) technology. A general assessment of wildlife habitat conditions will be coordinated and reported with the general conditions monitoring. All properties will be assessed for the potential occurrence of listed and other special status species.	Same as for other sites, plus coordination with HMMP activities.	The annual inspections under the HMP will be coordinated with HMMP maintenance and monitoring tasks. HMMP areas will be included in the HMP assessments. Mitigation monitoring and recommendations for maintenance related to the HMMP areas will be coordinated with the designated land manager.

Table 23. Initial HAP/HMP Management Tasks and Interface with HMMP Measures at the Lightner Mitigation Site

September 2010 HAP/HMP		Interface with HMMP Tasks
Initial Management Tasks at All Sites	**Initial Tasks at Lightner**	
Vegetation and Invasive Species Mapping		
A qualified biologist will map the type, species dominance, and boundaries of all vegetation communities using the vegetation classification system commonly used by the management entity, and note the overall quality of the habitat. Concurrently, invasive plant species will be mapped in a manner appropriate to the species and extent of infestation (e.g., individual plants or general extent of a population). Target invasives are those listed by the California Invasive Pest Council (CalIPC) as highly or moderately invasive (Cal-IPC 2006). Information from the wildlife assessment regarding the location of observed exotic wildlife that may be a threat to listed species (e.g., cowbirds, bullfrogs, feral pigs) also will be included on the invasive species map. The mapping will be completed by the third year of property management.	Same as for other sites, plus coordination with HMMP activities.	The HMP mapping is for the entire mitigation site and will be prepared over a three-year period. Data collected for HMP mapping will be shared with the HMMP team and vice versa. Data collection and mapping protocols described in the HMMP will be coordinated with the designated land manager.
Species Surveys		
On properties identified as mitigation for impacts to a listed species, focused surveys for that species will be conducted during start-up management and repeated as part of ongoing management. The surveys will be conducted by a qualified biologist using established protocols. The purpose of the surveys is to establish baseline information about occurrence and conditions and the basis for ongoing monitoring. If other listed species are known or have a high likelihood to occur on the property, surveys also will be conducted for those species. Surveys for non-listed special status species will be planned on a property-by-property basis.	No listed species are known to occur on the property. Surveys for Hermes Copper and Quino (potential habitat occurs onsite) will be conducted every other year. The felt-leaved mondardella population will be surveyed twice during the period.	HMP species surveys will be coordinated with the semi-annual HMMP surveys.

Table 23. Initial HAP/HMP Management Tasks and Interface with HMMP Measures at the Lightner Mitigation Site

September 2010 HAP/HMP		Interface with HMMP Tasks
Initial Management Tasks at All Sites	**Initial Tasks at Lightner**	
Invasive Species Control		
A vegetation management component will be prepared as part of the 5-yr work program. The component will (1) identify the location and extent of target invasive species, 2) determine the threat posed to sensitive vegetation communities, (3) prioritize remedial management actions based on the level of threat, (4) identify methods that will be used and (5) provide a schedule for the management actions. Annual work plans in years 1-3 (prior to 5-yr work program) may include weed control measures.	Invasive plant control measures will be initiated based on the results of the mapping effort and the priorities established in the 5-yr work program. Planning and implementation will be coordinated with HMMP activities on the site.	Weed control efforts undertaken as part of the HMMP implementation tasks will be communicated to the land manager. Weed control plans and measures under the HMP and HMMP will be coordinated once HMP management has commenced.
Road Maintenance and Road Decommissioning		
As part of the conditions assessment and vegetation mapping, existing roads on the property will be mapped, and roads required for property management and emergency response will be identified. The 5-yr work program will identify existing roads not required for property management for decommissioning and establish an inspection and maintenance schedule for retained roads (excluding Project access roads, which will be maintained by SDG&E). On properties crossed by Project access roads, use of those roads for property management will be planned and coordinated with SDG&E.	Most road decommissioning will occur under the HMMP and will be initiated during the initial period. Maintenance of retained roads would occur as needed as part of the HMP management. Use of the Project access roads will be coordinated with SDG&E.	HMP planning and implementation of road maintenance and decommissioning will be coordinated with the HMMP road decommissioning measures. Use of the project access road for HMMP activities will be coordinated with SDG&E. Maintenance of retained internal roads that cross HMMP areas will occur under the HMP.

Table 23. Initial HAP/HMP Management Tasks and Interface with HMMP Measures at the Lightner Mitigation Site

September 2010 HAP/HMP		Interface with HMMP Tasks
Initial Management Tasks at All Sites	**Initial Tasks at Lightner**	
Erosion Control and Remedial Restoration		
The land manager may be responsible for controlling minor erosion problems related to road use and invasive species removal. Erosion control activities may include minor earth work or the installation of gravel bags, silt fencing, or fiber rolls to control runoff and sedimentation. Hydroseeding and selective plantings also will be used where needed. The 5-yr work program will include an erosion control component.	Same as for other sites, plus coordination with HMMP activities and erosion control measures in the Project ROW and at Suncrest Substation.	HMMP erosion control at restoration and enhancement sites will be coordinated with HMP tasks as required.
Trash Removal		
The land manager will monitor the property for illegal dumping and provide for the collection and disposal of trash on an as-needed basis.	Same as for other sites, plus coordination with HMMP maintenance activities.	Trash collection and monitoring under the HMP will be coordinated with the same efforts within the HMMP activity areas.
Fire Management		
The 5-year work program will include a fire management component developed in cooperation with the responsible fire agencies and in compliance with applicable State and local policies and regulations.	Same as for other sites.	The fire management component will take into consideration the location and sensitivity of the resources covered by the HMMP.
GIS Database		
The land manager will establish and maintain a GIS database for the property and management program. For properties in San Diego County, the database will be compatible with the MSCP regional database.	Same as for other sites in San Diego County.	Data collected for HMMP purposes will be provided to the land manager for inclusion in the site database. HMP data will be shared with the HMMP team.

Table 23. Initial HAP/HMP Management Tasks and Interface with HMMP Measures at the Lightner Mitigation Site

September 2010 HAP/HMP		Interface with HMMP Tasks
Initial Management Tasks at All Sites	**Initial Tasks at Lightner**	
Planning and Coordination		
During years 1-5, the land manager will prepare a 5-year work program that identifies and prioritizes biological resource and land stewardship tasks for the period and includes a five-year staffing and materials budget. The 5-year work program will be completed no later than year 3 and updated every three years. Annual work plans and annual budgets will be based on the priorities set in the 5-year work program. Prior to year 3, management will be guided by annual work plans prepared by the land manager, The annual work plans will cover the general conditions assessment, surveys, mapping, and other data collection required to guide management of the property. The work plans also may include access control, invasive species control, and erosion control measures that the land manager determines are necessary.	Same as for other sites, plus coordination with HMMP plans and activities.	The 5-year work program for the HMP will take into consideration the location and status of any HMMP activities in progress during the period covered by the program; the 5-year program also will provide for the transition of management of the HMMP preserved waters and riparian habitat by the site land manager once the initial monitoring of HMMP areas has been completed. The interim work program will identify and provide for the coordination of the HMP and HMMP tasks.
Annual Reporting		
The land manager will prepare annual reports that identify management activities conducted in the prior 12 months, activities planned for the upcoming 12-months, expenditures for the past 12 months, proposed allocation of funds for the next 12 months, performance of the endowment in the prior year (if applicable), and the balance of endowment at the end of the prior year (if applicable).	Same as for other sites, plus coordination with HMMP reporting.	The HMP annual report will include a section on HMMP activities. The land manager will provide the HMMP team with a status report on initial management activities for inclusion in the HMMP annual reports.
Public Education/Information		
Web-ready public information/education materials regarding the property's resources and any restrictions that apply to public access will be prepared and posted on the land manager/owner's website during the start-up management phase.	Same as for other sites.	Information about the HMMP goals and activities will be included in the HMP education/information materials.

10.2 Funding Requirements

Based on the PAR conducted for the September 2010 HAP/HMP, start-up management costs are estimated at $364,446 for the five-year period ($72,889 annually). The PAR assumptions and spreadsheet for initial management of the Lightner site are included as Appendix C. A revised PAR will be prepared with the designated land manager as part of the revised final HMP for the site.

11.0 LONG-TERM MANAGEMENT OF THE MITIGATION SITE UNDER THE HAP/HMP

In the September 2010 HAP/HMP, a distinction is made between initial (start-up) management and ongoing (long-term) management of the mitigation sites. Generally initial and long-term management include the same categories of management tasks and would be implemented by the same entity (the land manager). In this regard, long-term management of the site begins during the initial management period. The difference is that there are data collection, planning, and capital tasks and costs in the initial period that would not be required at the same level in subsequent years. This section presents the proposed management tasks for the site after the initial period (i.e., beginning year 6) and discusses the interface between HMMP activities and goals and the long-term management of the site under HMP. This section also identifies the estimated funding requirements for ongoing management of the site. The tasks and funding estimates are from the September 2010 HAP/HMP and are subject to change. Actual tasks and funding will be as specified in the revised final HMP approved by the agencies (see Section 1.3).

11.1 Proposed Management Tasks

Table 24 identifies the ongoing management tasks under the HAP/HMP at all mitigation sites, specific tasks proposed for the Lightner site, and the interface between the HMMP and HAP/HMP in terms of long-term management activities and goals. The transition from maintenance of areas under the HMMP to management under the HAP/HMP would occur following the final year of monitoring under the HMMP.

11.2 Funding Requirements

Based on the PAR conducted for the September 2010 HAP/HMP, ongoing long term management costs are estimated at approximately $30,000 annually. The HAP/HMP assumes that funding for annual management tasks would be provided through a non-wasting endowment established for the site. To generate approximately $30,000 annually, approximately $1,500,000 is needed as the principal for a non-wasting endowment. The PAR assumptions and spreadsheet for ongoing management of and the management endowment for the Lightner site are included as Appendix C. A revised PAR and endowment estimate will be prepared as part of the revised final HMP for the site.

Table 24. Ongoing HAP/HMP Management Tasks and Interface with HMMP Tasks at the Lightner Mitigation Site

September 2010 HAP/HMP		Interface with HMMP Tasks
Ongoing Management Tasks at All Sites	**Ongoing Tasks at Lightner**	
Access Controls		
Signs, gates, and fencing will be maintained and replaced as needed as part of property management.	Same as for other sites.	Any permanent access controls needed to protect the preserved waters would be installed and maintained as part of ongoing management under the HMP.
General Conditions Monitoring and Wildlife Assessment		
Same as during initial management period (annual assessments),	Same as for other sites, plus coordination with implementation and completion of HMMP monitoring.	Same as during the initial management period (HMMP areas included in the annual HMP assessments).
Vegetation and Invasive Species Mapping		
Vegetation and invasive species mapping will be updated every three years to five years.	Mapping will be updated every three years.	Same as during initial management period for as long as HMMP monitoring continues.
Species Surveys		
Generally same as during initial management period, with frequency of surveys determined in the 5-yr work program based on site conditions and assessment results.	Surveys for Quino and Hermes Copper will be conducted every three to five years. The status of the felt-leaved monardella will be assessed as part the vegetation mapping update and general conditions monitoring.	HMP surveys would continue to be coordinated with the semiannual HMMP surveys for the duration of the HMMP monitoring period.
Invasive Species Control		
Annual implementation of measures identified in vegetation management component of the 5-yr work program.	Same as for other sites, with coordination with HMMP maintenance activities.	Management transitioned to HMP following the final year of mitigation monitoring.

Table 24. Ongoing HAP/HMP Management Tasks and Interface with HMMP Tasks at the Lightner Mitigation Site

September 2010 HAP/HMP		Interface with HMMP Tasks
Ongoing Management Tasks at All Sites	**Ongoing Tasks at Lightner**	
Road Maintenance and Road Decommissioning		
Inspection and maintenance of retained internal roads and decommissioning of roads as per schedule in 5-yr work program. Ongoing coordination for use of Project access roads.	Same as for other sites, except most decommissioning completed under HMMP.	It is anticipated that HMMP road decommissioning would be complete prior to transfer of management responsibilities to the land manager.
Erosion Control and Remedial Restoration		
Implementation of erosion control as per measures and guidelines in the 5-yr work program.	Same as for other sites, plus coordination with HMMP activities and erosion control measures in the Project ROW and at Suncrest Substation.	HMMP erosion control at restoration and enhancement sites will be coordinated with HMP tasks as required. Management transitioned to HMP following the final year of HMMP monitoring.
Trash Removal		
Generally the same as during the initial management phase but as specified in the 5-yr work program.	Same as for other sites.	Same as during initial period for duration of HMMP maintenance and monitoring period. Continued under HMP thereafter.
Fire Management		
As specified in fire management component of 5-yr work program.	Same as for other sites.	The provisions of the 5-yr work program will apply to the HMMP areas during and after HMMP implementation.
GIS Database		
Database maintained annually.	Same as for other sites.	Same as during initial management period.

Table 24. Ongoing HAP/HMP Management Tasks and Interface with HMMP Tasks at the Lightner Mitigation Site

September 2010 HAP/HMP		Interface with HMMP Tasks
Ongoing Management Tasks at All Sites	**Ongoing Tasks at Lightner**	
Planning and Coordination		
5-yr work program updated every 3 years.	Same as for other sites, with coordination with HMMP activities.	The transition of management of areas from under the HMMP to under the HMP will be planned and accommodated in the updated to the 5-yr work programs.
Annual Reporting		
Generally the same as during the initial management period, in format specified in 5-yr work program.	Same as for other sites, with coordination with HMMP activities.	Same as during initial management period for duration of HMMP reporting period.
Public Education/Information		
The annual reports and any notices issued as part of access controls will be the primary vehicle for public information/education.	Same as for other sites.	Same as during initial management period for duration of HMMP reporting period.

12.0 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.

12.1 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.

12.2 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, which prioritizes biological resource and land stewardship tasks and includes five-year staffing and materials budget, 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.

12.3 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.

13.0 FINANCIAL ASSURANCES

13.1 Estimated Costs for Mitigation Measures

The cost for mitigation measures for inclusion in the Financial Assurance mechanism was developed and submitted to the Corps of Engineers and a Performance Bond was purchased by SDG&E for these amounts on January 19, 2011. These specific costs for the Lightner Mitigation Site are provided in Appendix D. They include a cost for land acquisition, implementation of the HMMP, monitoring during the first five years, and long-term maintenance and remediation (covered under the endowment cost).

13.1.1 Land Acquisition

The Lightner Mitigation Site is already owned by SDG&E. However, the Corps has required financial assurances adequate to cover acquisition of a replacement site if necessary.

The appraisal and valuation process is an exhaustive one; employing numerous comparable Sold properties within a finite range of the Subject property. Numerous aspects of the properties are physically viewed and studied which include: location, size, and shape of the property, topography, improvements, utilities, street improvements, zoning/general plan, price, terms of sale and method of transaction, Buyer, Seller and any miscellaneous comments regarding anything relating to the property and or sales transaction. In addition, standards regulated by the CPUC require the "highest and best use value, *just compensation*" to be paid for properties per a certified appraisal document.

The purchase price paid for the property was determined by these standard appraisal methods that required analysis of comparable properties in the region; therefore, should the Corps seek to purchase similar lands under the Letter of Credit, the land valuations for comparable properties would be similar to that paid by SDG&E.

13.1.2 Plan Implementation

Implementation costs for the HMMP restoration and enhancement measures are estimated to be $789,625, as shown in Table 25 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.

Table 25. Lightner Mitigation Costs

Category	Cost
Acquisition	
"Replacement" Assurances[1]	$6,000,000
HMMP Mitigation Activities	
Preservation, Restoration, Enhancement	$789,625
5-year Monitoring Costs for HMMP	$322,922
Maintenance/Remediation	$405,876
Management of Mitigation Site under HAP/HMP	
Start-up and Long-term (In Perpetuity)	$1,844,094

1 SDG&E has acquired the Lightner Mitigation Site; the Corps has required financial assurances to cover acquisition of a replacement site if necessary.

13.1.3 Monitoring and Maintenance for Performance Period

Monitoring costs for the HMMP are estimated to be $322,922, as shown in Table 25. These costs represent the first five years of monitoring. In addition, maintenance costs from the HMP are estimated to be $405,876 for the first five years.

13.1.4 Long-Term Maintenance

Long-term endowment costs are estimated at $1.8 million, as shown in Table 25. This endowment estimate is based on the amount of money needed to generate, on an annual basis, the annual maintenance costs (assuming a five percent return on the money and three percent inflation). Five percent is the nominal rate and includes inflation (which is added to the endowment to make it "non-wasting") and that three percent is the "real" rate, available for habitat management.

13.1.5 Remediation

Remediation costs are combined with maintenance costs in Table 25. Remediation efforts could include replanting, weed removal, and erosion control.

13.2 Form of Assurances

Financial assurance has been guaranteed to the Corps by SDG&E through a Performance Bond issued on January 19, 2011 that covers the estimated costs for each of the five Final HMMPs. The bond calls out the amounts for HMMP implementation at Lightner as identified in Table 24 based on implementation costs detailed above. SDG&E also is in the process of preparing a Letter of Credit as financial assurance to CDFG for LSAA implementation. The CDFG LOC will be provided on or before May 27, 2011.

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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.*

				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

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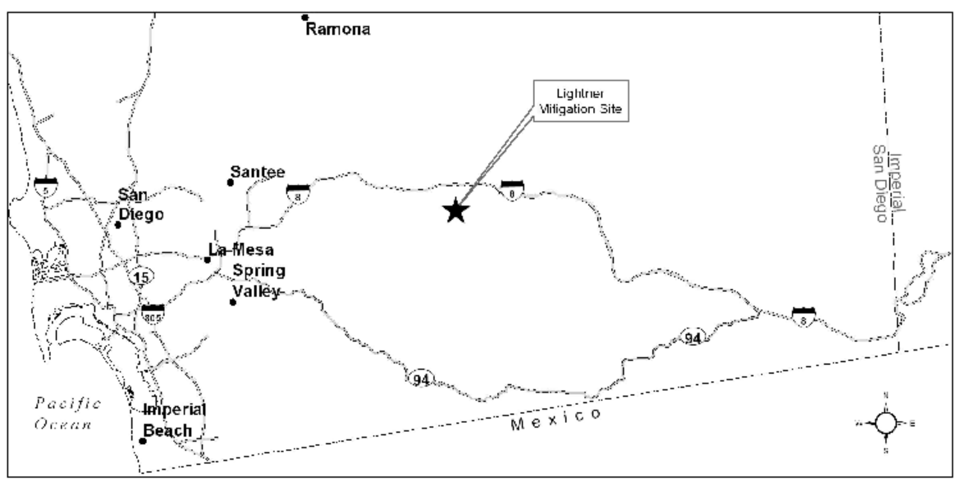
SHEET INDEX

SUNRISE POWERLINK

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

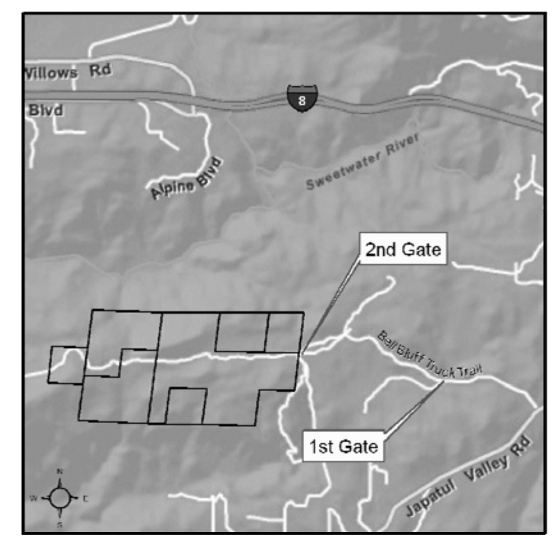
NOT FOR CONSTRUCTION

LOCATION MAP

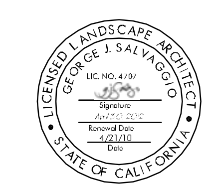


NOTES:
1. LIGHTNER PROPERTY MITIGATION SITE MAY BE ACCESSED VIA INTERSTATE 8.
2. CONTRACTOR SHALL NOT ACCESS SITE WITHOUT PRIOR PERMISSION FROM LAND MANAGER.

SITE MAP

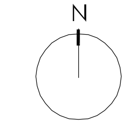


DIRECTIONS TO LIGHTNER PROPERTY MITIGATION SITE:
FROM INTERSTATE 5, TAKE INTERSTATE 8 EAST AND EXIT AT JAPATUL VALLEY ROAD. CONTINUE APPROXIMATELY 2 MILES TO BELL BLUFF TRUCK TRAIL. TURN RIGHT ONTO BELL BLUFF TRUCK TRAIL AND CONTINUE NORTHWEST 0.7 MILES TO FIRST GATE (KEYS REQUIRED). ENTER SITE AT SECOND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



Date	Issues And Revisions	No.
4/21/10	PERMIT SET	

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



COVER SHEET

Sheet

L-1

Legend

Road Surface - To be improved by others during substation construction

Road Surface - Abandon in place

xxxxxxxx Road Surface - Remove for stream restoration

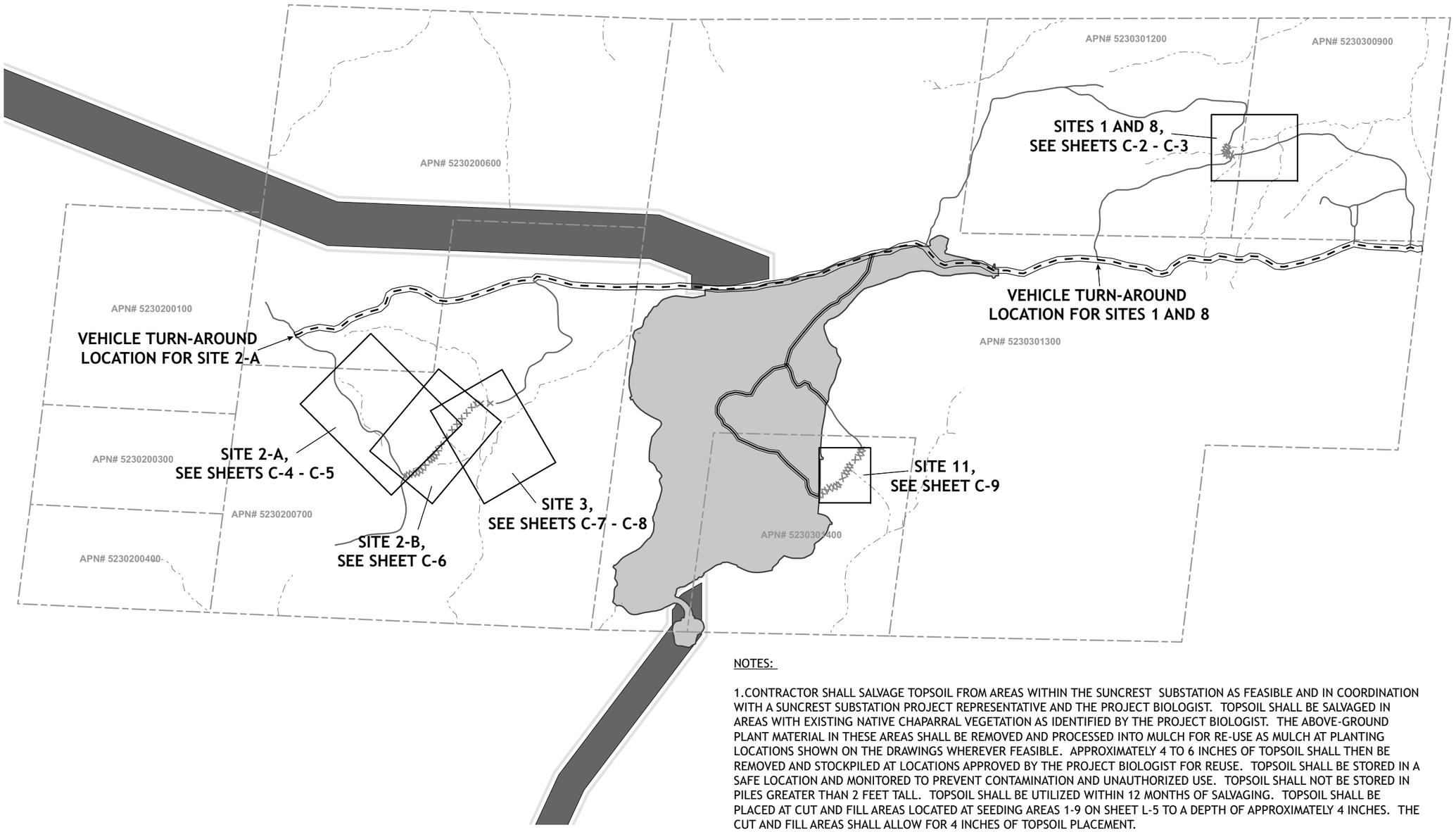
Road Surface - Remove with substation construction by others

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.
04/21/11	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

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

SCALE: 1" = 20'

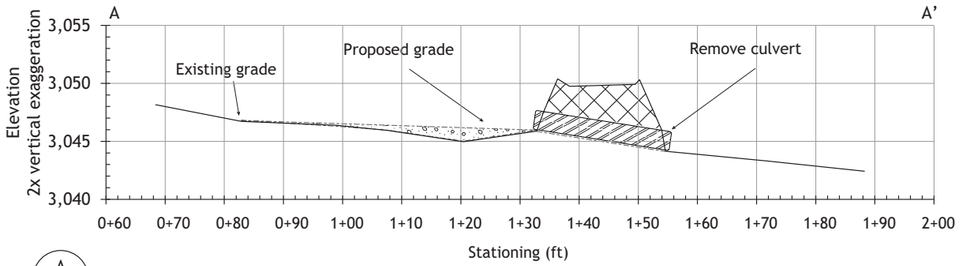
0 20
SCALE: 1 " = 20'

N

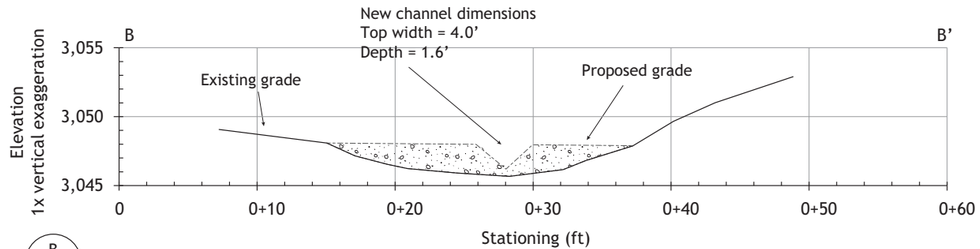
SITES 1 AND 8

Sheet

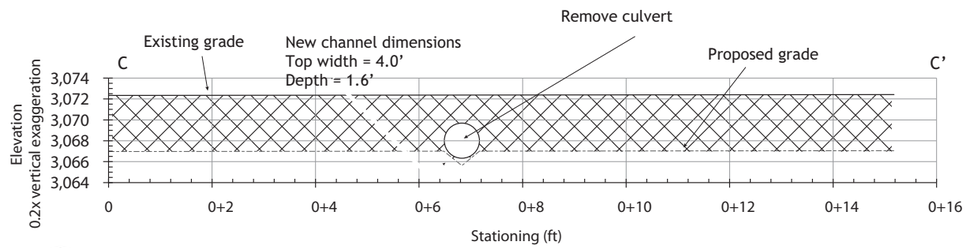
C-2



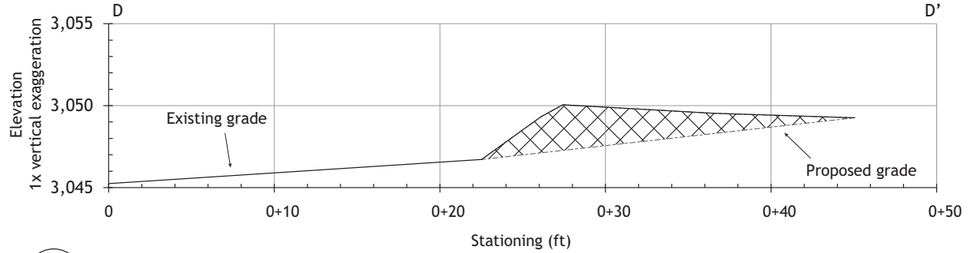
A
C-2 CROSS SECTION OF POND AND ROAD REMOVAL



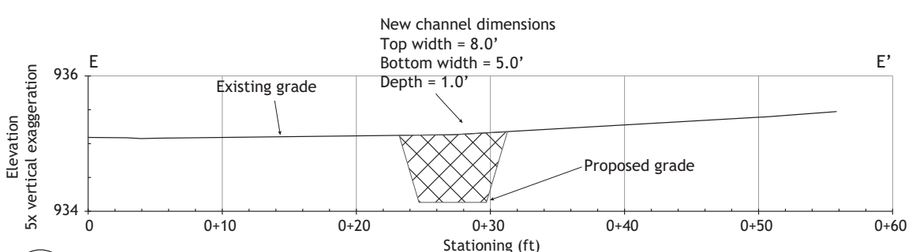
B
C-2 CROSS SECTION OF POND REMOVAL



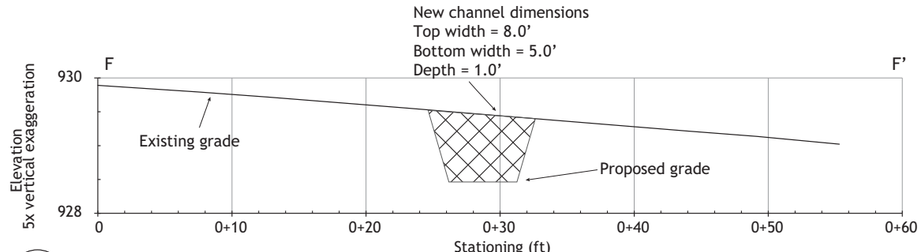
C
C-2 CROSS SECTION OF ROAD FILL REMOVAL



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

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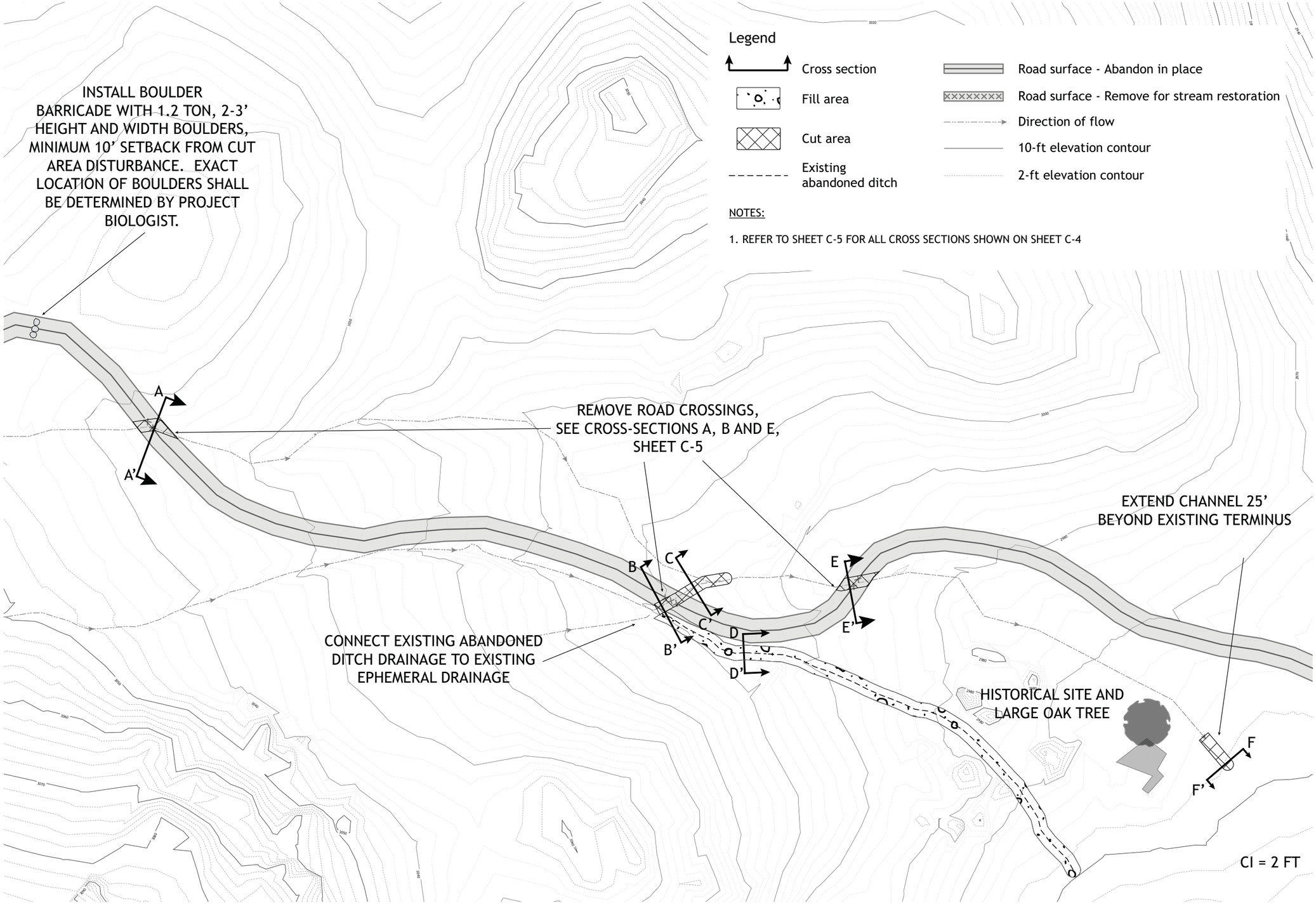
PROJECT #17128-3
DRAWN BY: ISP, EKT
CHECKED BY: GTL, DBB
ORIGINAL DRAWING SIZE: 24 X 36

SITES 1 AND 8

Sheet

C-3



1 SITE 2-A

wra
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04/21/11	PERMIT SET	

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

SCALE: 1" = 30'

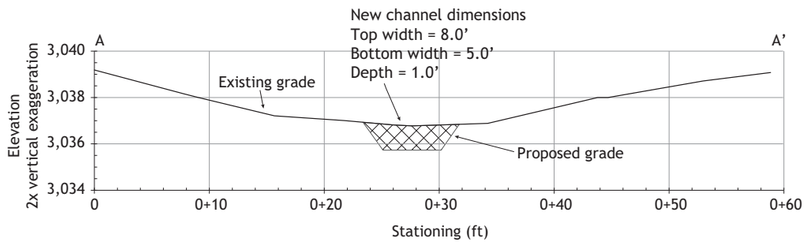
0 30
SCALE: 1 " = 30'

N

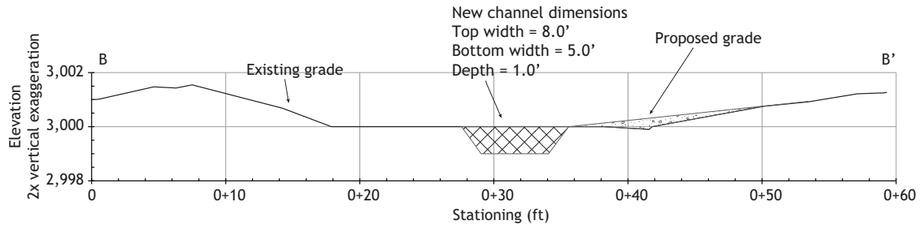
SITE 2-A

Sheet

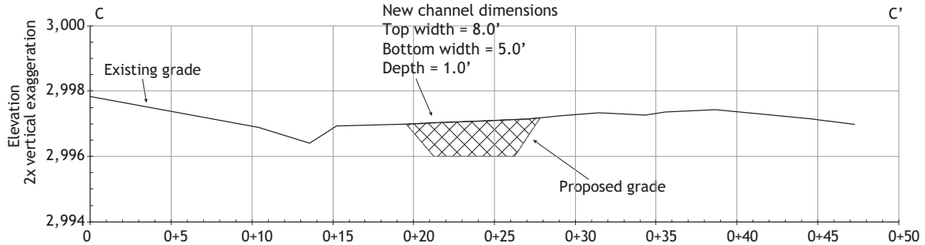
C-4



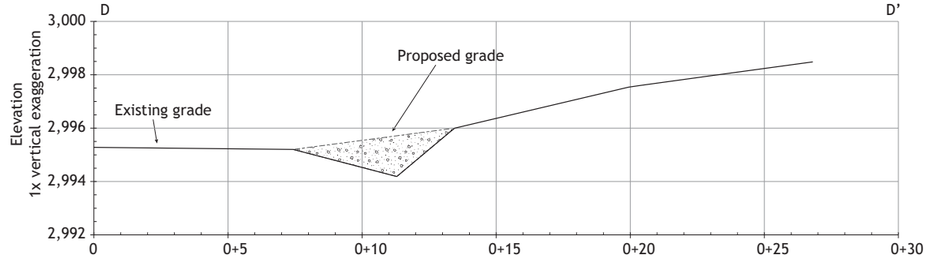
A / C-4 CROSS SECTION OF UPPER ROAD CROSSING REMOVAL



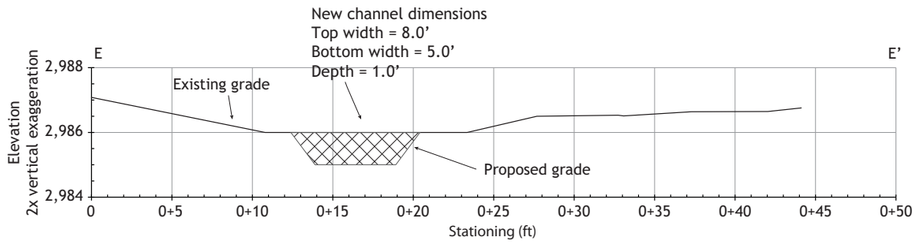
B / C-4 CROSS SECTION OF MIDDLE ROAD CROSSING



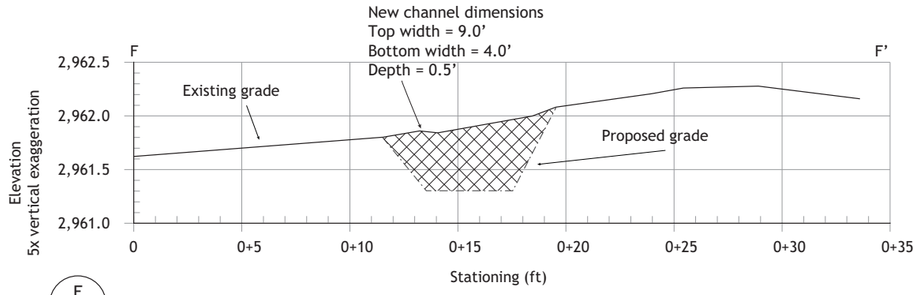
C / C-4 CROSS SECTION OF CHANNEL CONNECTION



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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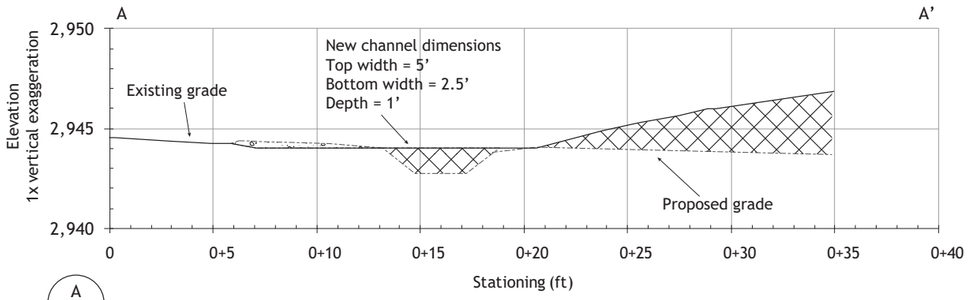
04/21/11	PERMIT SET	

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

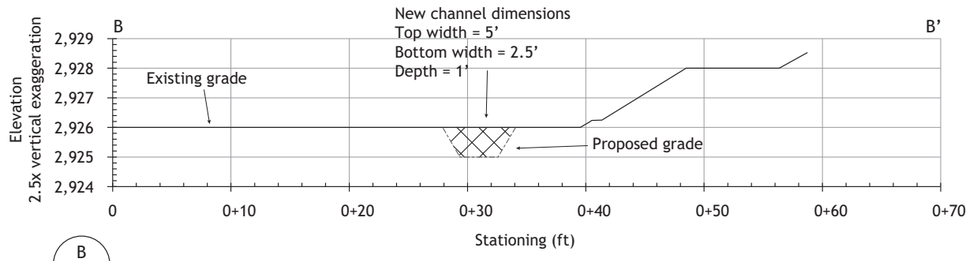
SITE 2-A

Sheet

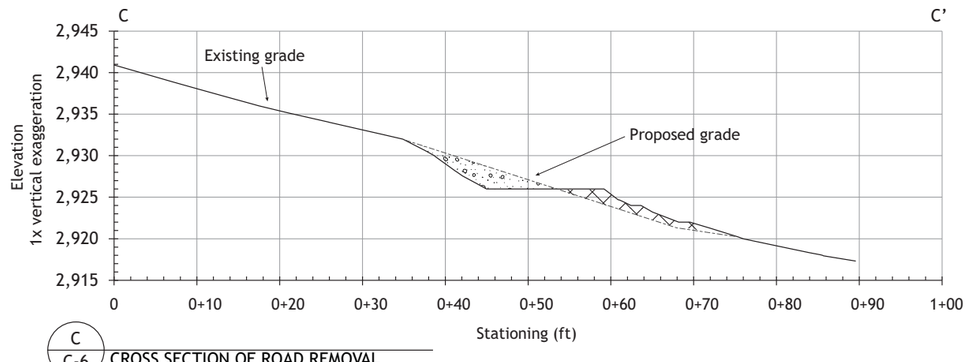
C-5



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

MATCH LINE TO SHEET C7

STREAM CROSSING #1

STREAM CROSSING #2

A
A'
B
B'
C
C'

1 SITE 2-B

CI = 2 FT

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04/21/11	PERMIT SET	

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

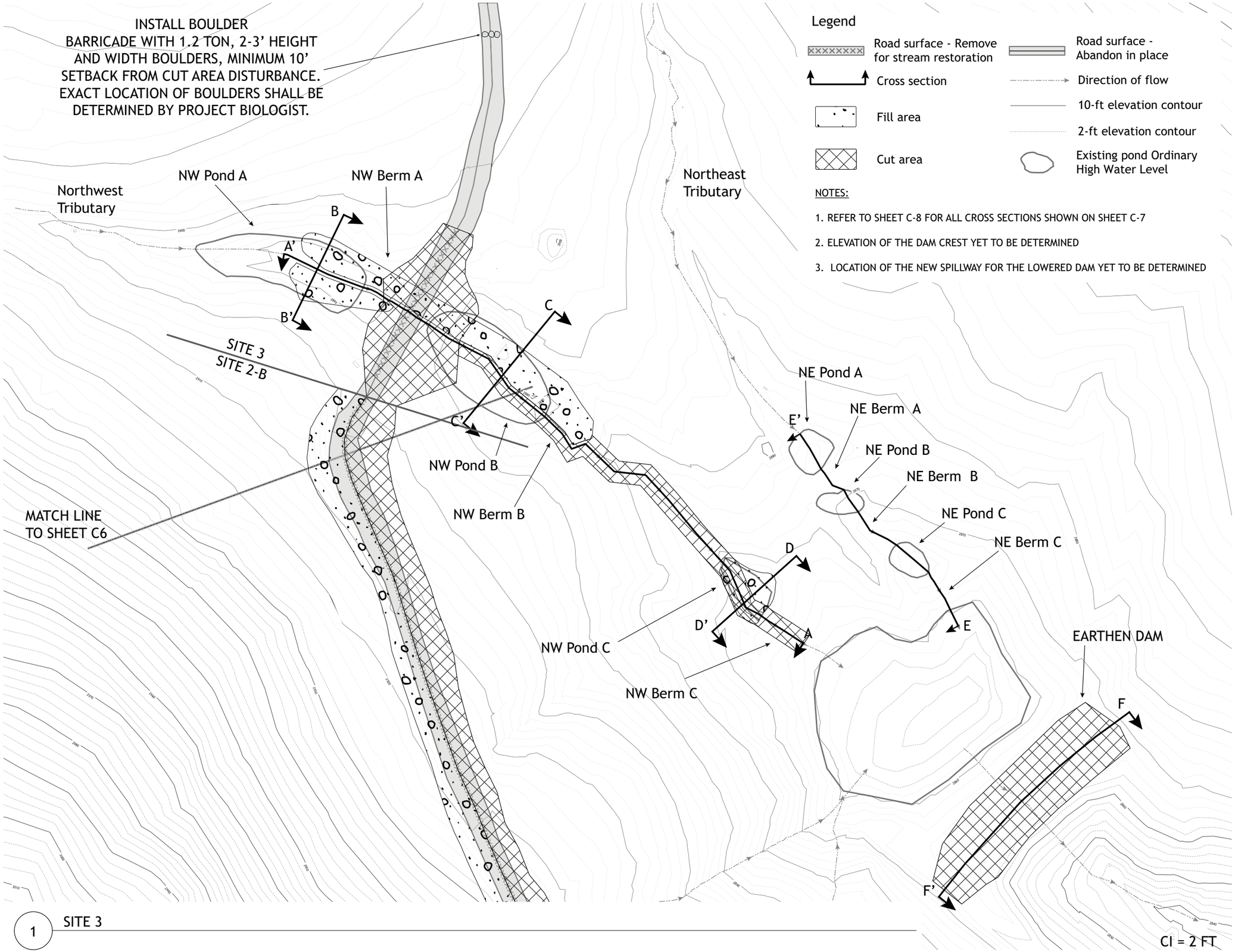
SCALE: 1" = 25'

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
- 2-ft elevation contour
- Cut area
- Existing pond Ordinary High Water Level

NOTES:

1. REFER TO SHEET C-8 FOR ALL CROSS SECTIONS SHOWN ON SHEET C-7
2. ELEVATION OF THE DAM CREST YET TO BE DETERMINED
3. LOCATION OF THE NEW SPILLWAY FOR THE LOWERED DAM YET TO BE DETERMINED

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ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 25'

0 25
SCALE: 1 " = 25'

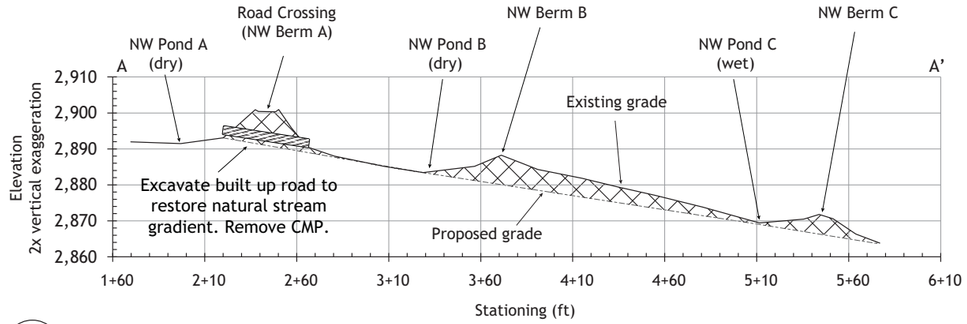
N

SITE 3

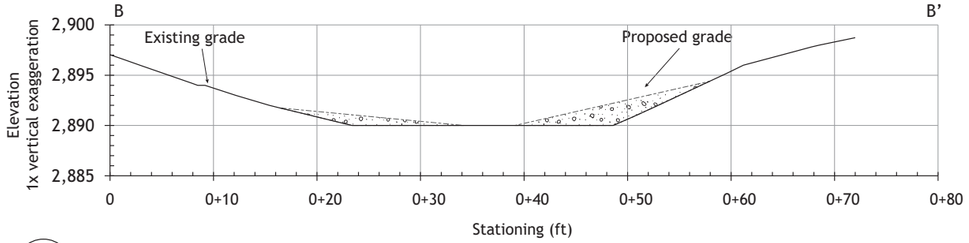
Sheet

C-7

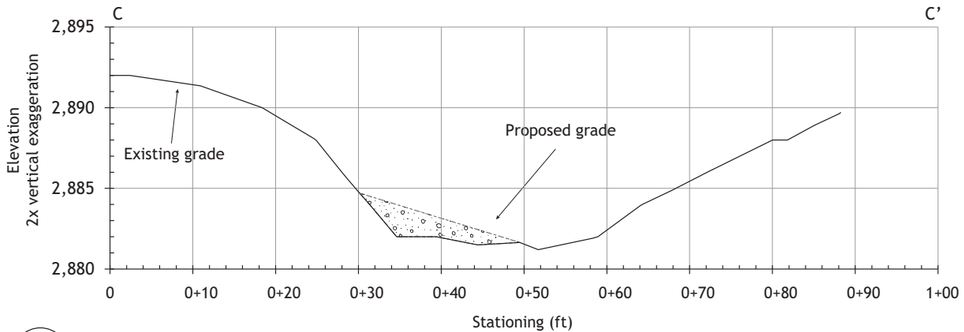
1 SITE 3



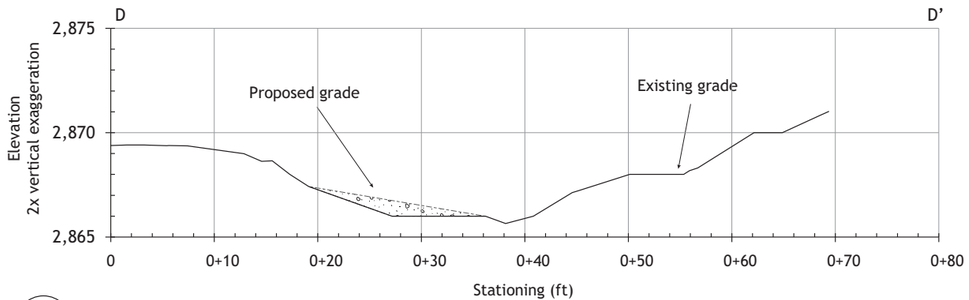
A
C-7 CROSS SECTION OF POND AND ROAD REMOVAL



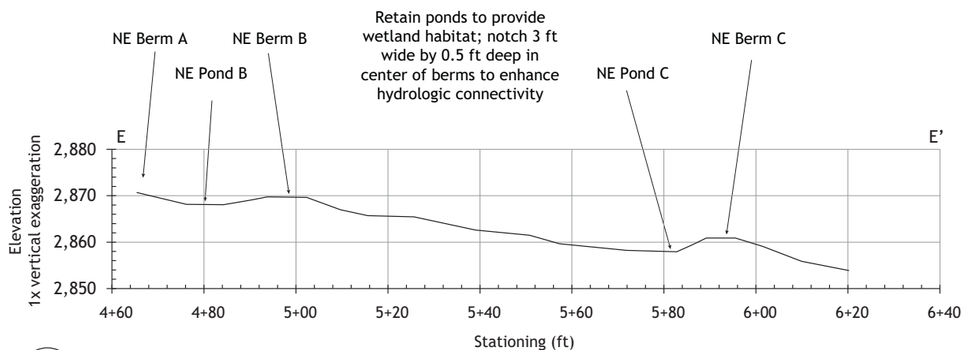
B
C-7 CROSS SECTION OF NW POND A REMOVAL



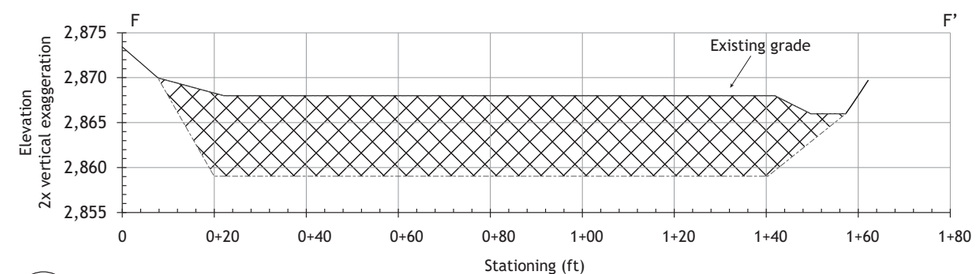
C
C-7 CROSS SECTION OF NW POND B REMOVAL



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

Legend

- Rock armoring
- Fill area
- Cut area

wra
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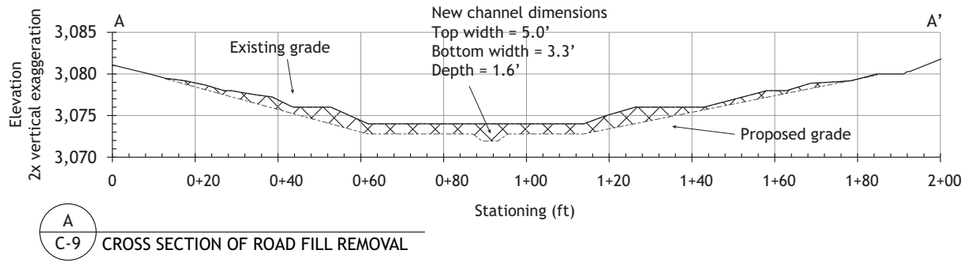
04/21/11	PERMIT SET	

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

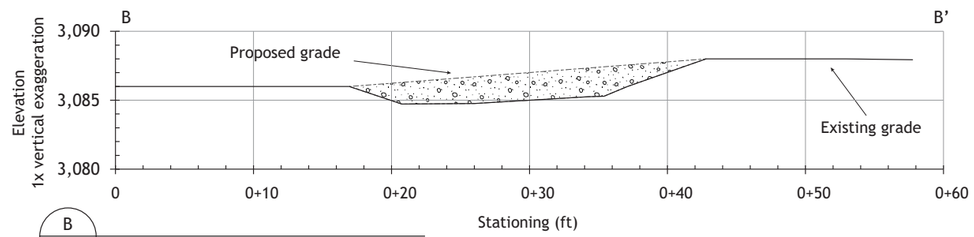
SITE 3

Sheet

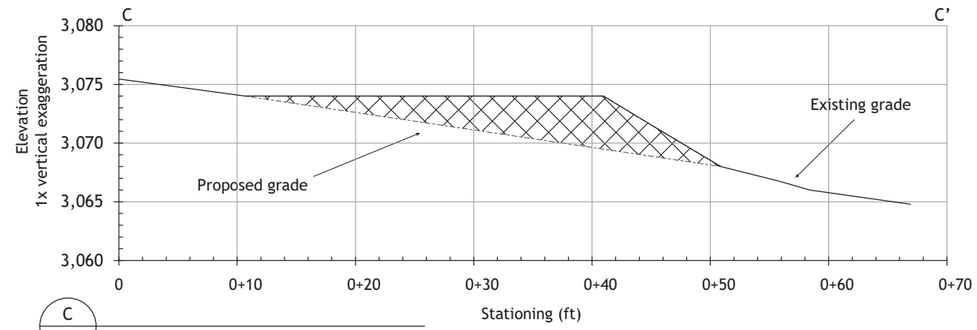
C-8



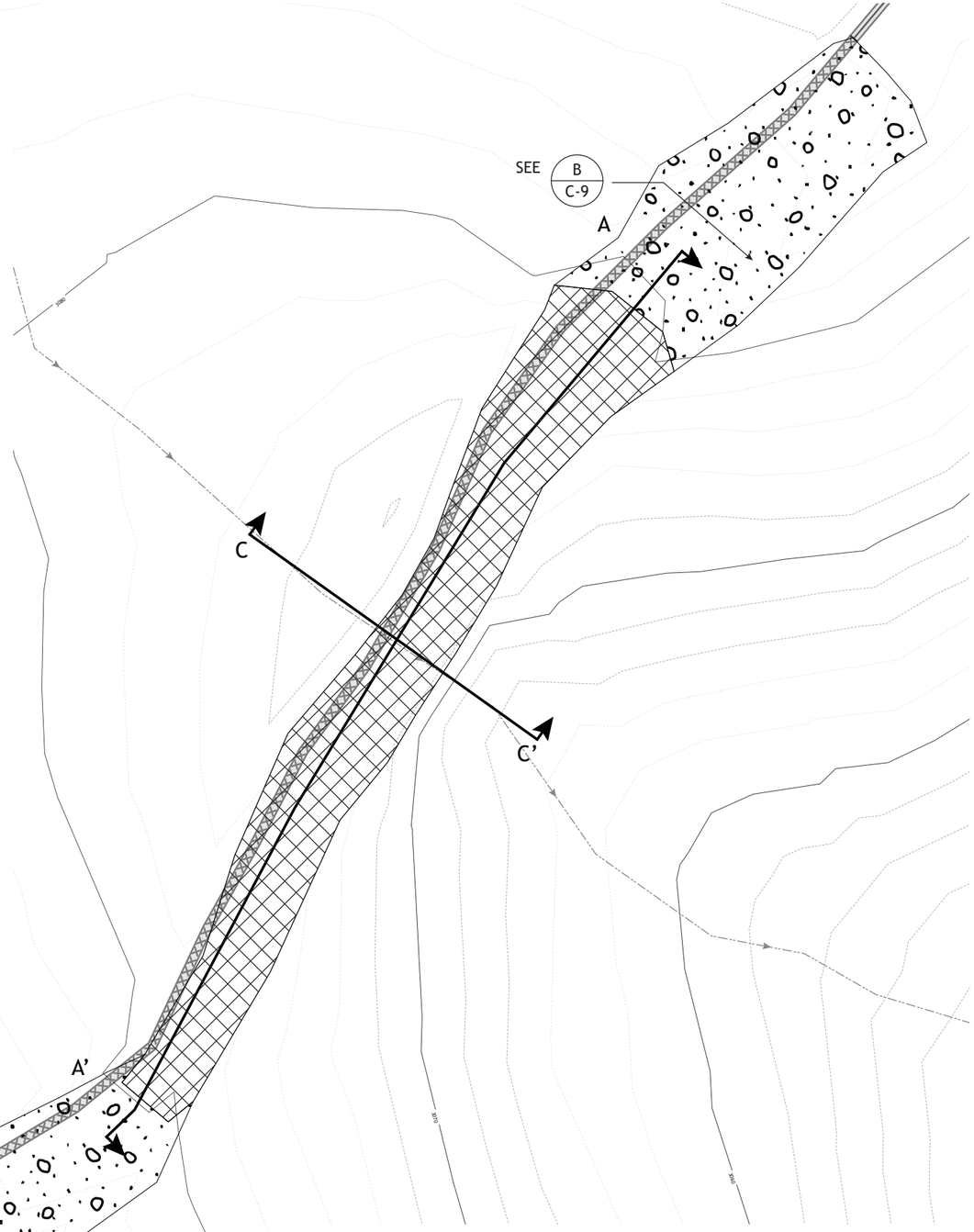
A / C-9 CROSS SECTION OF ROAD FILL REMOVAL



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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Stillwater Sciences
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Berkeley, CA 94705
(510) 848-8098 Phone

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.
04/21/11	PERMIT SET	

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

SCALE: 1" = 12'

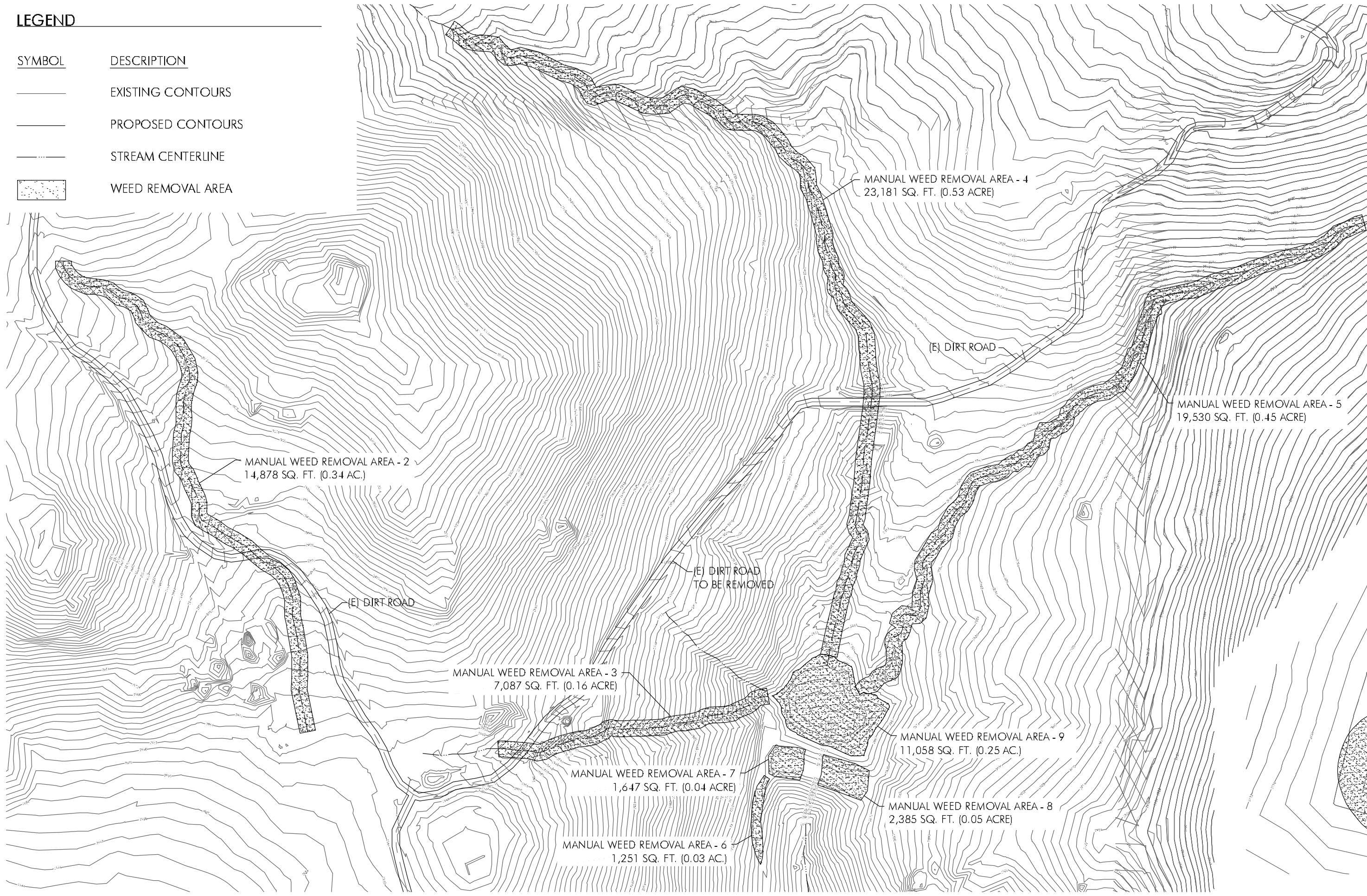
0 12
SCALE: 1" = 12'

N

SITE 11

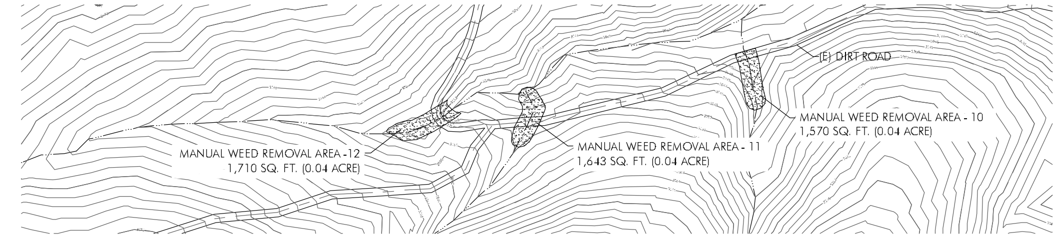
Sheet

C-9



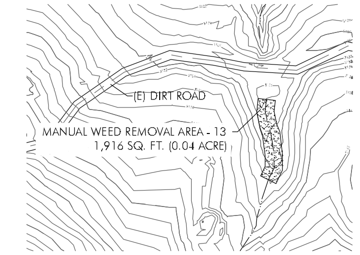
1 WEED REMOVAL AREA 1

1" = 100'



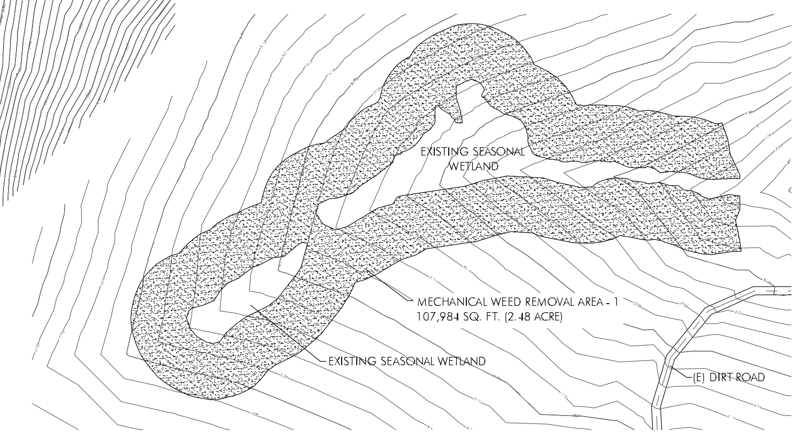
2 WEED REMOVAL AREA 2

1" = 100'



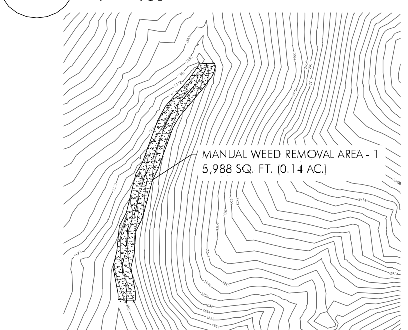
3 WEED REMOVAL AREA 3

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 QUINO CHECKERSPOT BUTTERFLY (*EUPHYDRYAS EDITHA QUINO*) AND 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 WEED TOCALOTE (*CENTAUREA MELITENSIS*) AND THE PERENNIAL WEED 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 SHORTPOD MUSTARD (*HIRSCHFELDIA INCANA*), 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*) AND TOCALOTE (*CENTAUREA MELITENSIS*).
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.

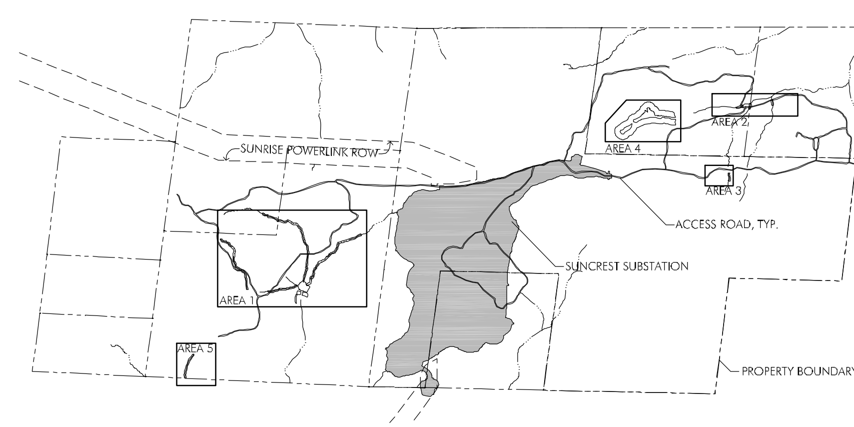
MECHANICAL WEED REMOVAL AREAS

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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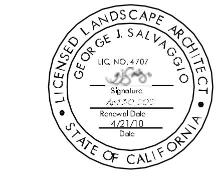
SUNRISE POWERLINK

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

NOT FOR CONSTRUCTION



Date	Issues And Revisions	No.
4/21/10	PERMIT SET	

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

SCALE: 1" = 100'

0 100
SCALE: 1" = 100'
N

LIGHTNER PROPERTY
WEED REMOVAL PLAN

Sheet

L-2

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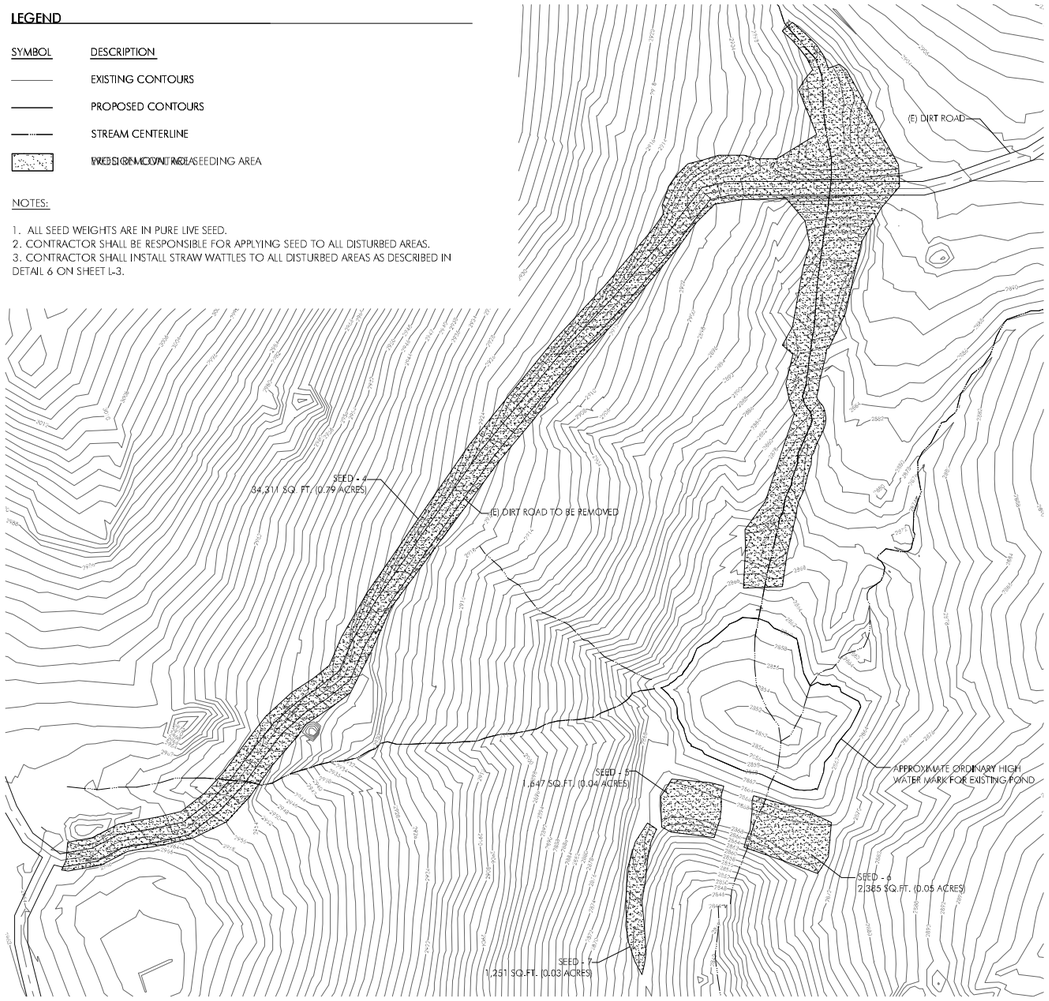
LEGEND

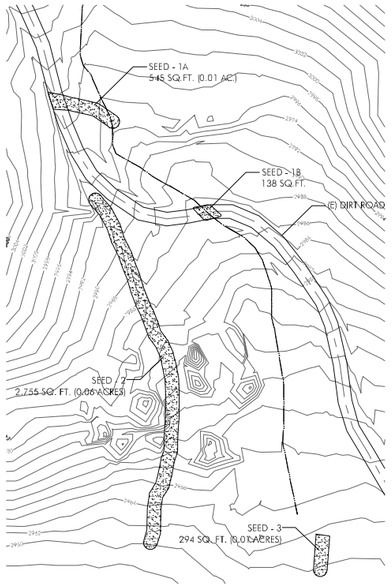
SYMBOL	DESCRIPTION
	EXISTING CONTOURS
	PROPOSED CONTOURS
	STREAM CENTERLINE
	PROPOSED EROSION CONTROL SEEDING AREA

NOTES:

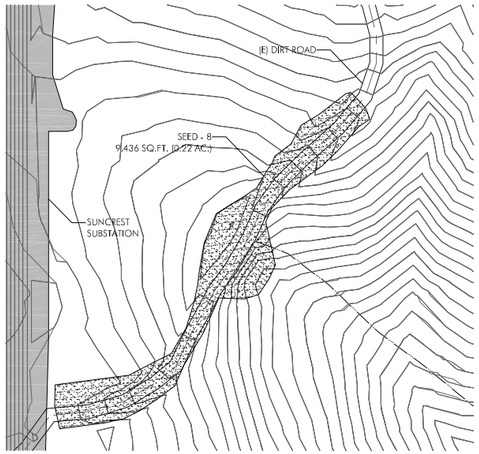
1. ALL SEED WEIGHTS ARE IN PURE LIVE SEED.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR APPLYING SEED TO ALL DISTURBED AREAS.
3. CONTRACTOR SHALL INSTALL STRAW WATTLES TO ALL DISTURBED AREAS AS DESCRIBED IN DETAIL 6 ON SHEET L-3.



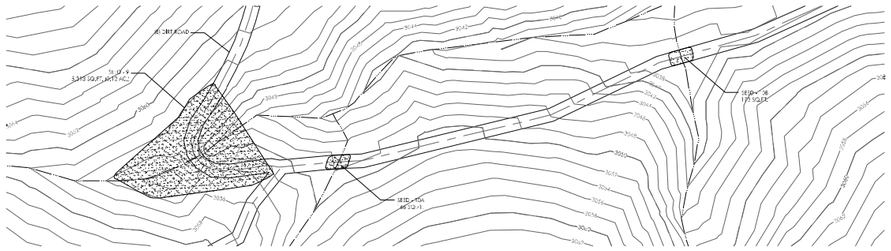
1 AREA - 1
1" = 50'



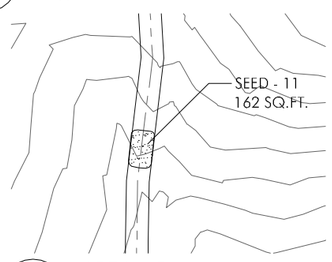
2 AREA - 2
1" = 50'



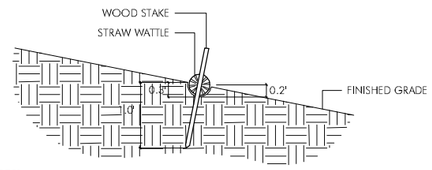
3 AREA - 3
1"=50'



4 AREA - 4
1"=50'



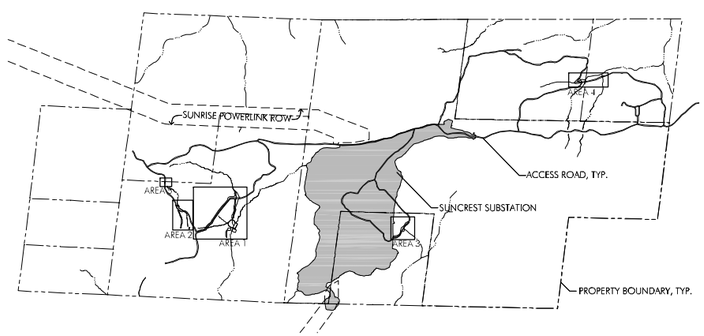
5 AREA - 5
NOT TO SCALE



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**

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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
4/21/10
Renewal Date
4/21/10
Date
STATE OF CALIFORNIA

Date	Issues And Revisions	No.
4/21/10	PERMIT SET	

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

SEE PLANS

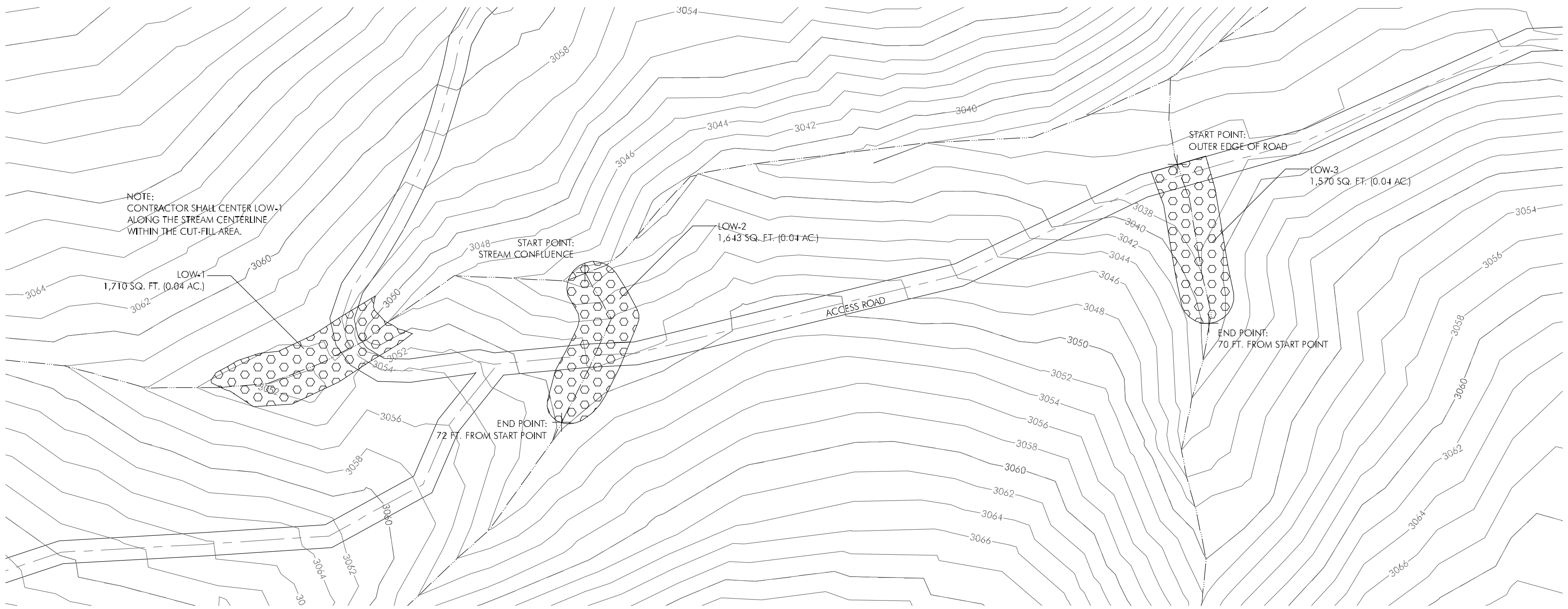
0 50
SCALE: 1" = 50'

N

EROSION CONTROL AND SEEDING PLAN

Sheet

L-3



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.

1 LIVE OAK PLANTING PLAN

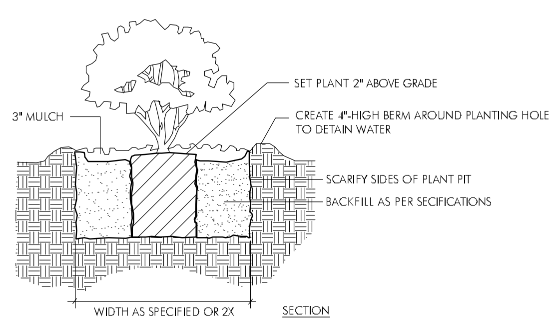
1" = 30'

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

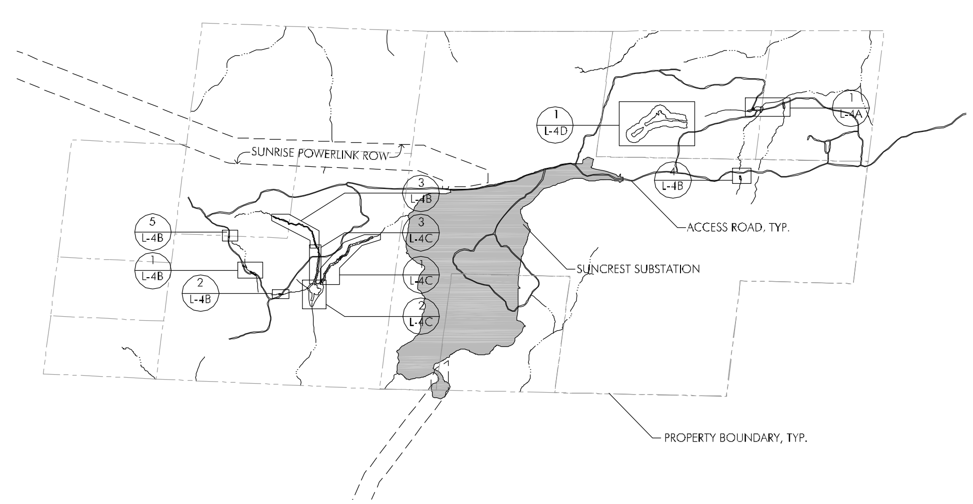
QUANTITY ESTIMATES - LIVE OAK WOODLAND

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'

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
STATE OF CALIFORNIA
4/21/10

Date	Issues And Revisions	No.
4/21/10	PERMIT SET	

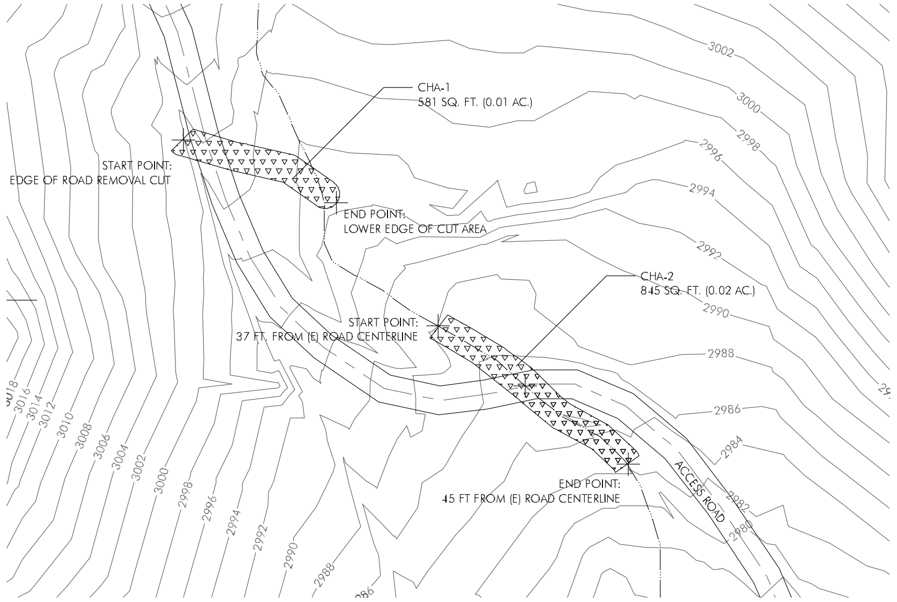
PROJECT #17128-3
DRAWN BY: ICM, KET
CHECKED BY: GJS
ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 30'

LIVE OAK PLANTING PLAN, KEY MAP & IRRIGATION NOTES

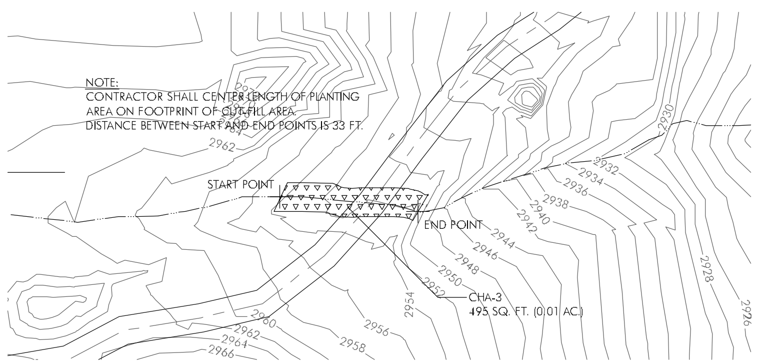
Sheet

L-4A



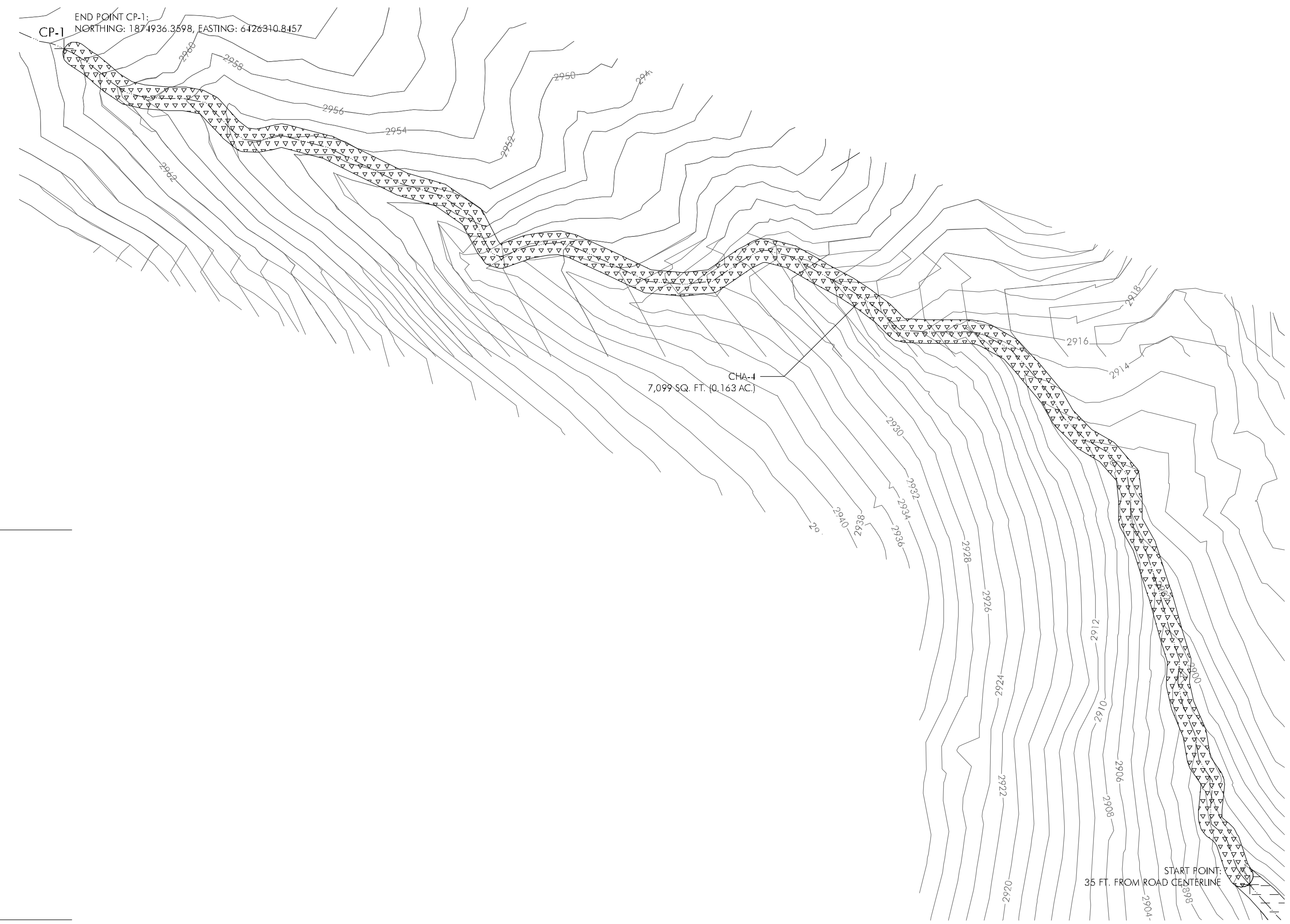
1 MIXED CHAPARRAL PLANTING PLAN

1" = 30'



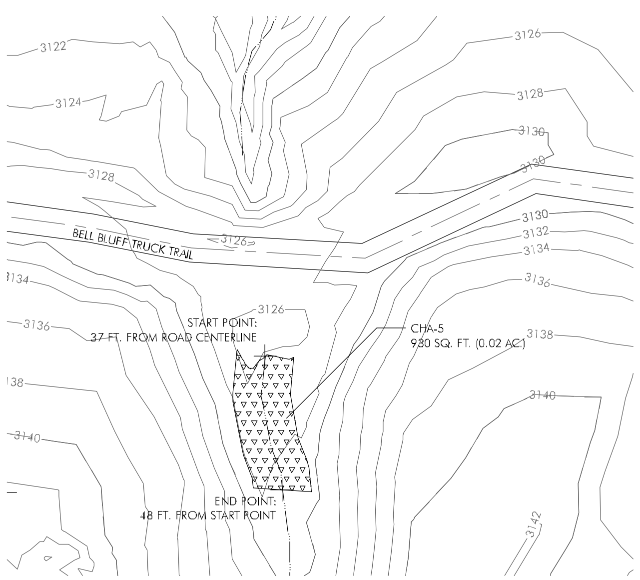
2 MIXED CHAPARRAL PLANTING PLAN

1" = 30'



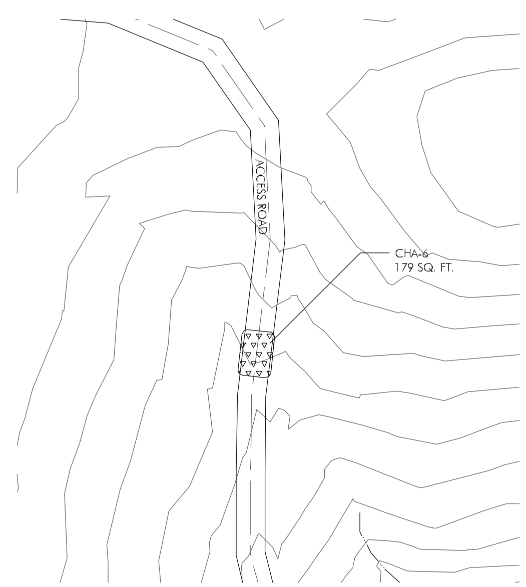
3 MIXED CHAPARRAL PLANTING PLAN

1" = 30'



4 MIXED CHAPARRAL PLANTING PLAN

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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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 · STATE OF CALIFORNIA · 4/21/10

Date	Issues And Revisions	No.
4/21/10	PERMIT SET	

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

SCALE: 1" = 30'

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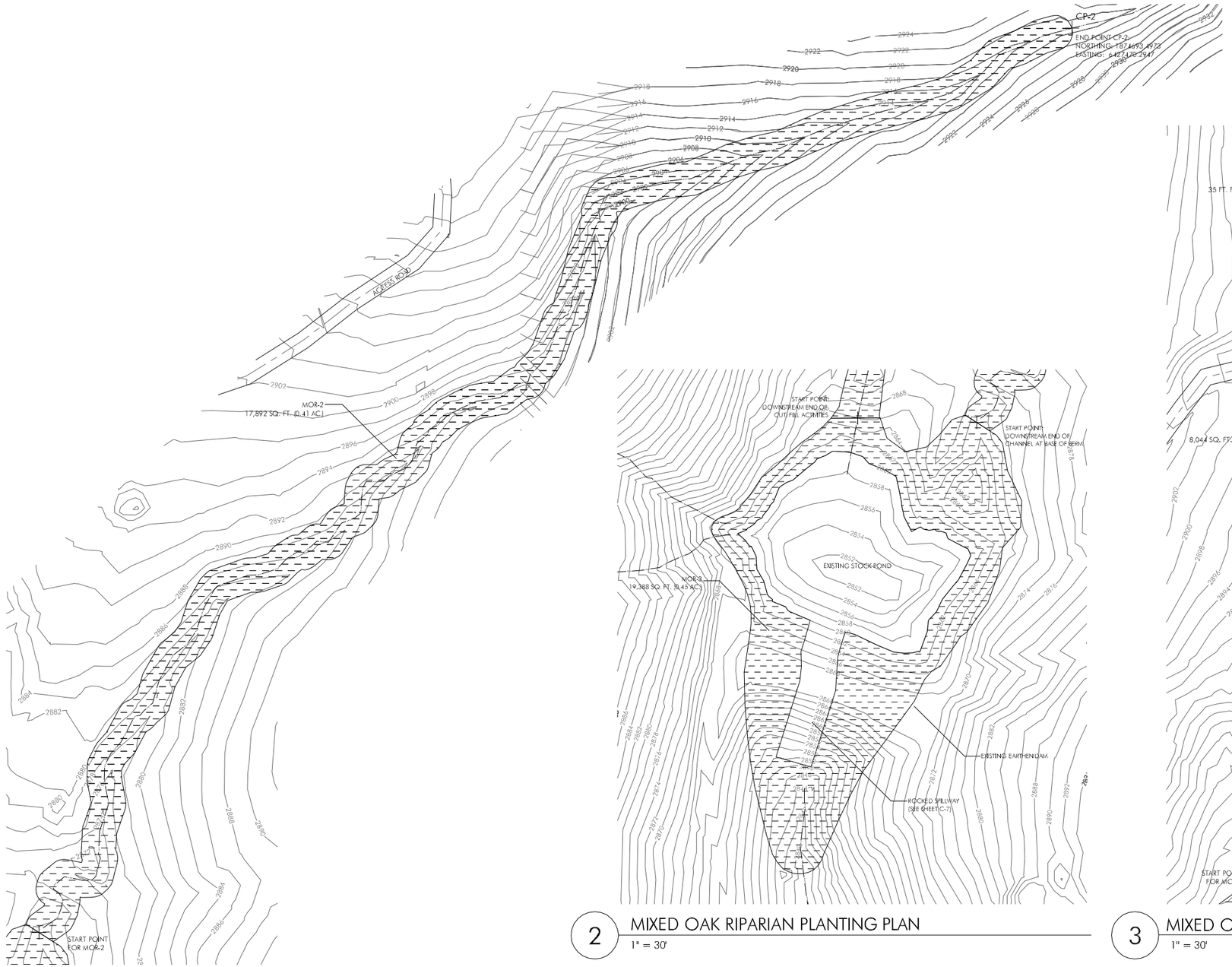
MIXED CHAPARRAL PLANTING PLAN

Sheet

L-4B

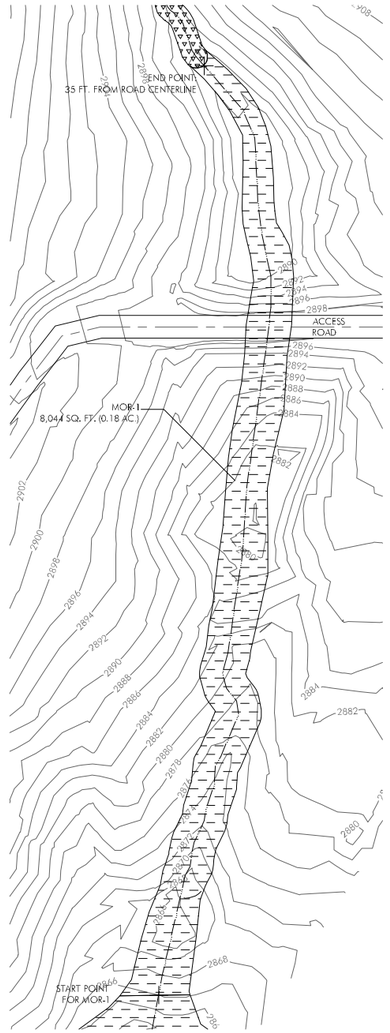


1 MIXED OAK RIPARIAN PLANTING PLAN

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.

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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: 4/21/10
Date
STATE OF CALIFORNIA

4/21/10 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'

0 30
SCALE: 1" = 30'

N

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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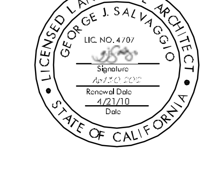
LIGHTNER PROPERTY WATERS MITIGATION PLAN

SAN DIEGO COUNTY, CALIFORNIA

CORPS FILE NUMBER: 2007-00704-SAS

NOT FOR CONSTRUCTION



Date	Issues And Revisions	No.
4/21/10	PERMIT SET	

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

SCALE: 1" = 30'

N

RIPARIAN BUFFER PLANTING PLAN

Sheet

L-4D

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SHEET INDEX

SUNRISE POWERLINK

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

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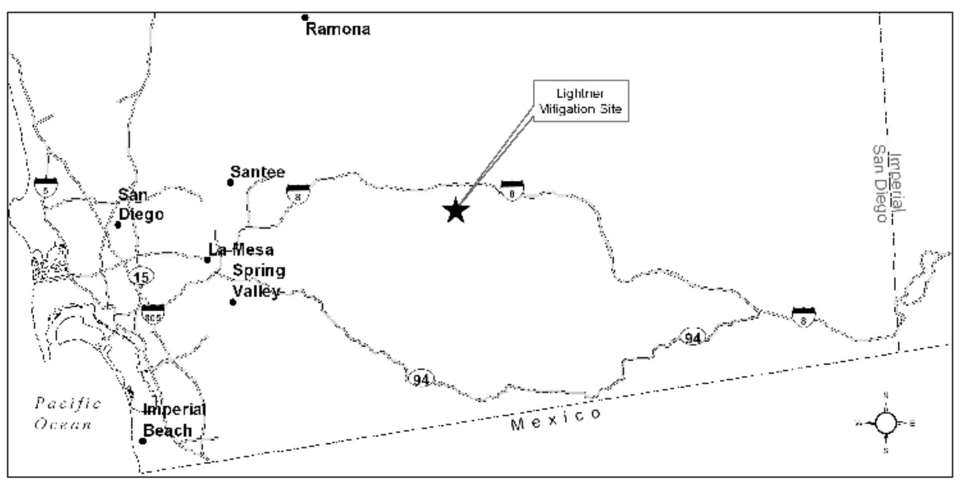
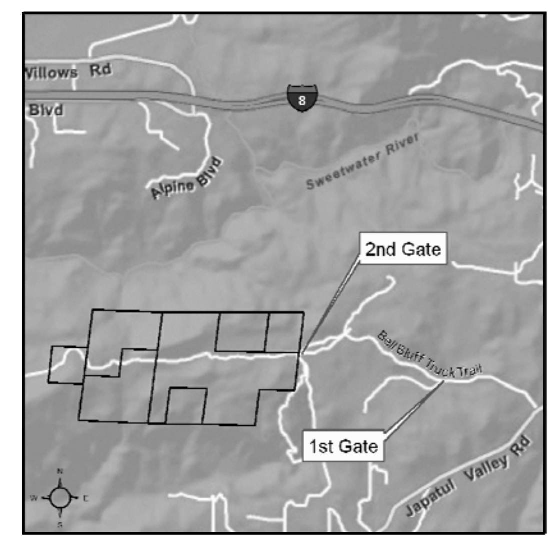
LOCATION MAP



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
Renewal Date 4/21/10

Date	Issues And Revisions	No.
4/21/10	PERMIT SET	

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

N

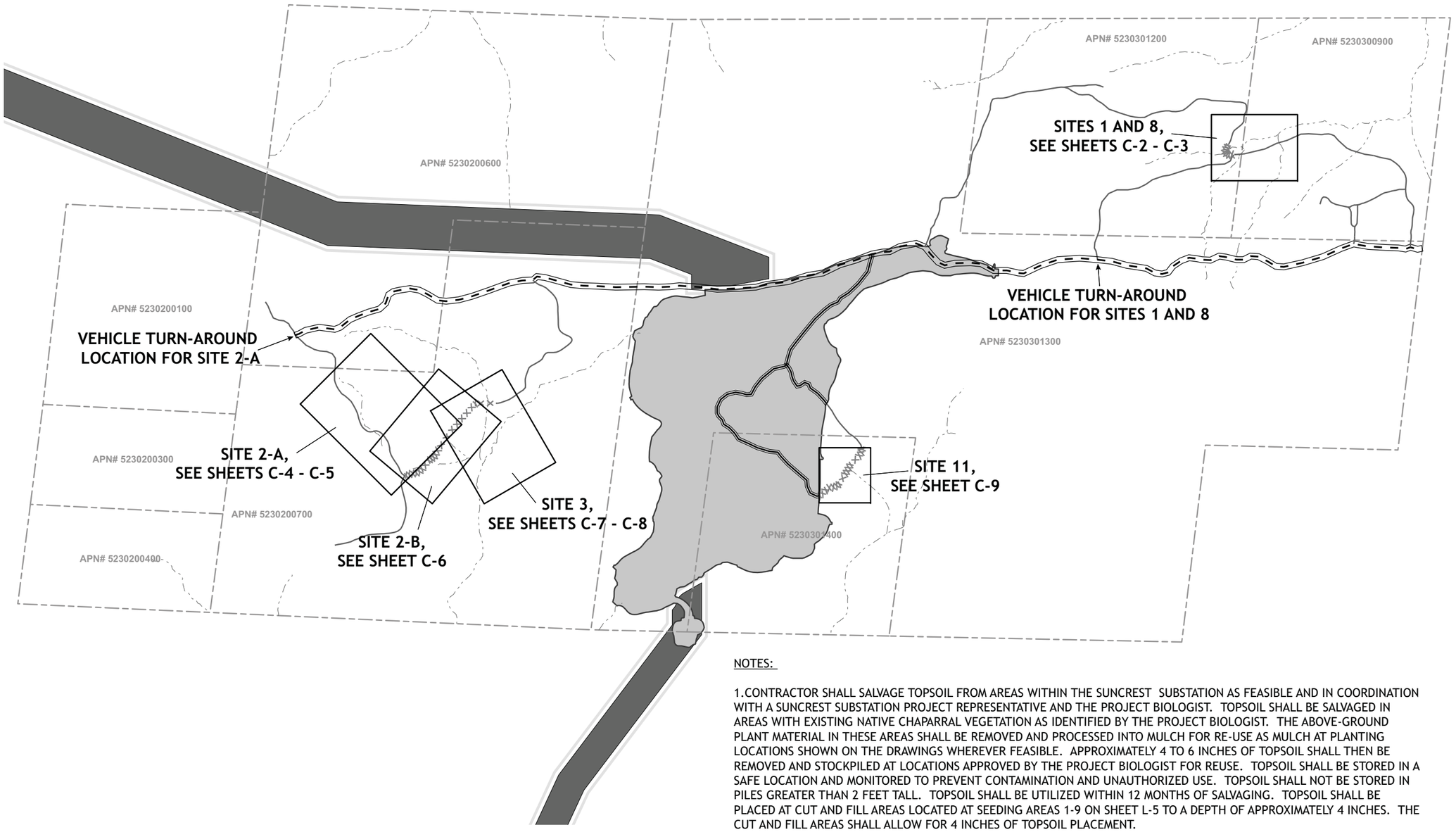
COVER SHEET

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.

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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.
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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
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(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
CORPS FILE NUMBER: 2007-00704-SAS

NOT FOR CONSTRUCTION

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

Date	Issues And Revisions	No.
04/21/11	PERMIT SET	

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

SCALE: 1" = 20'

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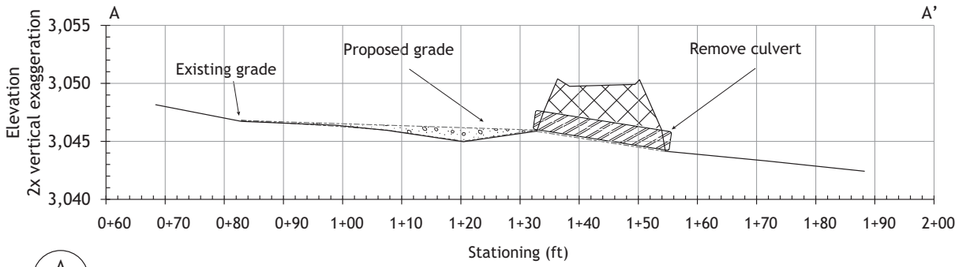
SCALE: 1 " = 20'

N

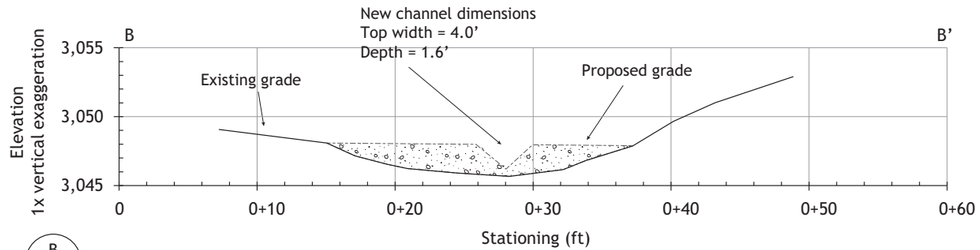
SITES 1 AND 8

Sheet

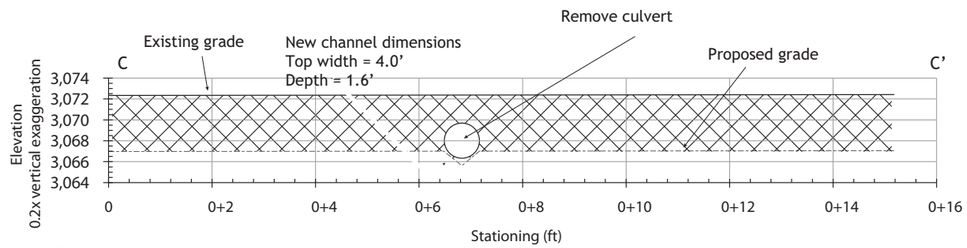
C-2



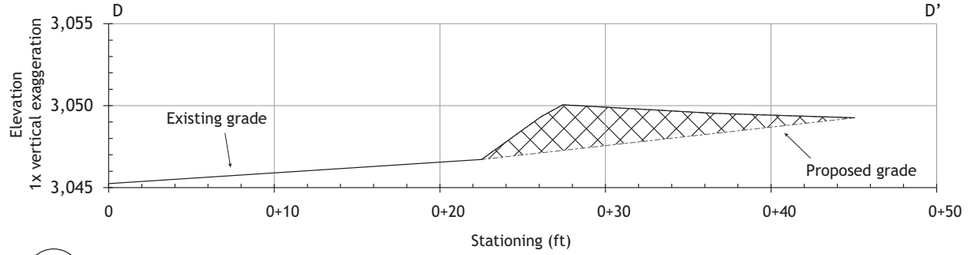
A
C-2 CROSS SECTION OF POND AND ROAD REMOVAL



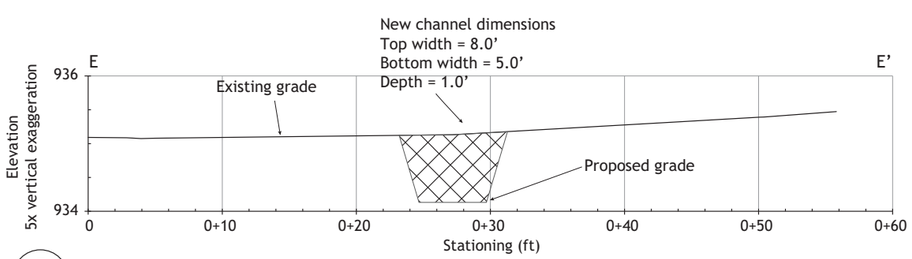
B
C-2 CROSS SECTION OF POND REMOVAL



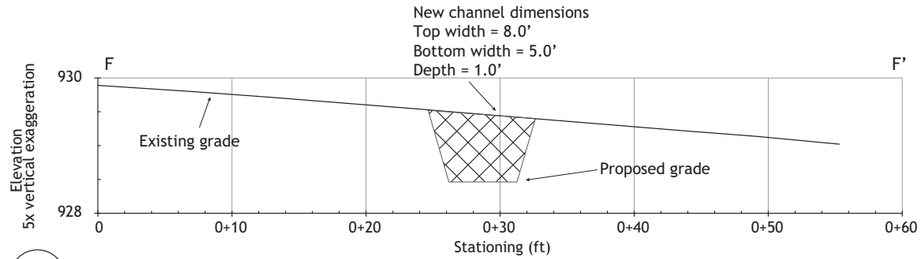
C
C-2 CROSS SECTION OF ROAD FILL REMOVAL



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

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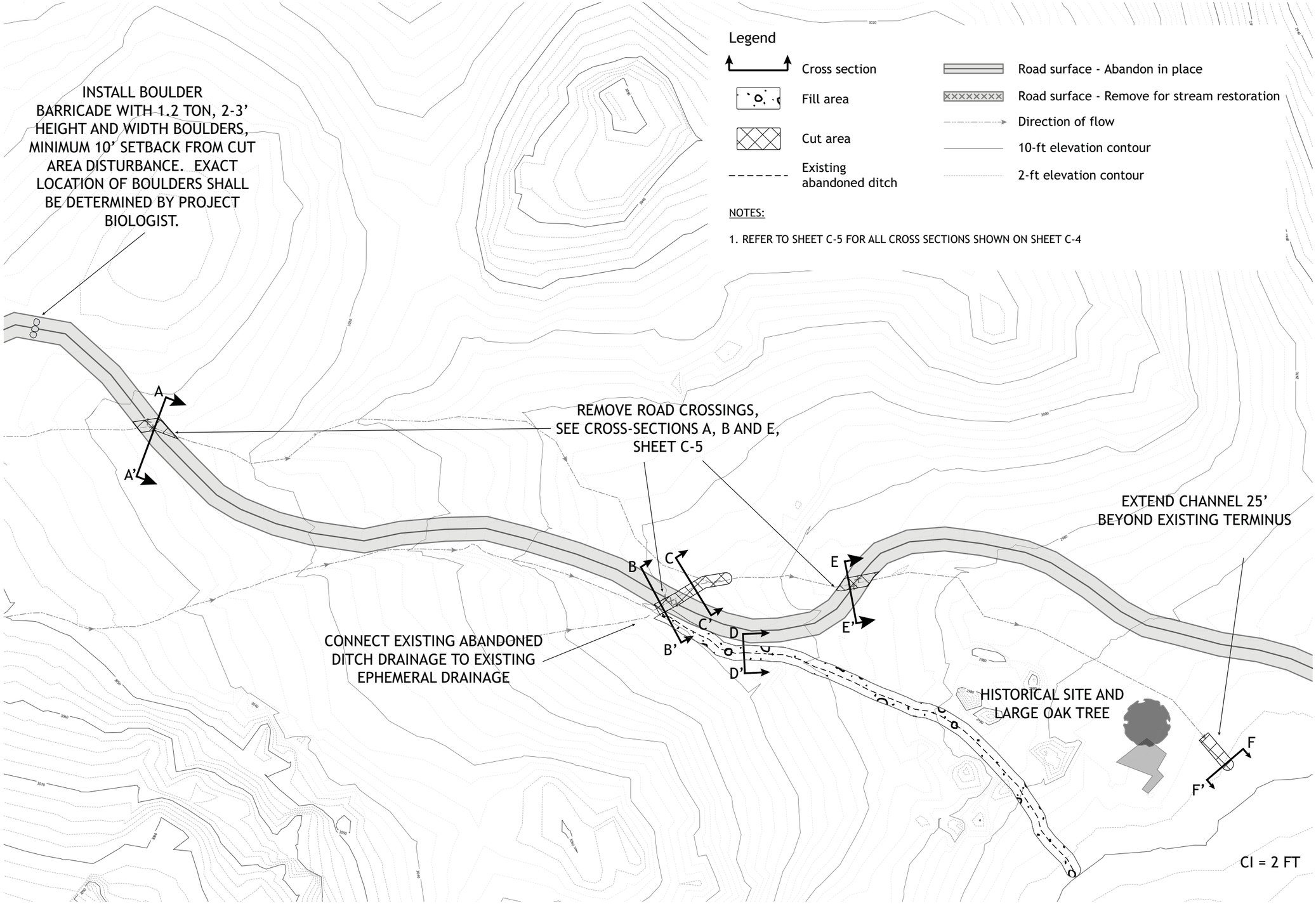
CHECKED BY: GTL, DBB
ORIGINAL DRAWING SIZE: 24 X 36

SITES 1 AND 8

Sheet

C-3



Legend

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

NOTES:

1. REFER TO SHEET C-5 FOR ALL CROSS SECTIONS SHOWN ON SHEET C-4

1 SITE 2-A

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

SCALE: 1" = 30'

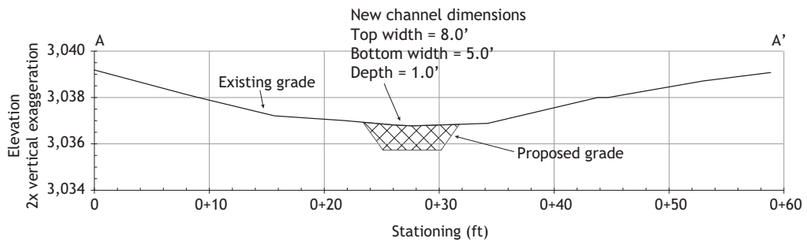
0 30
SCALE: 1 " = 30'

N

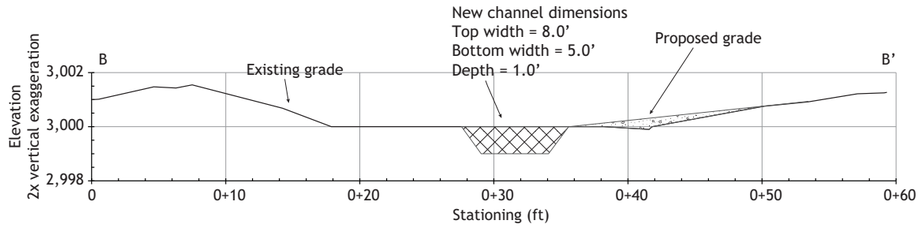
SITE 2-A

Sheet

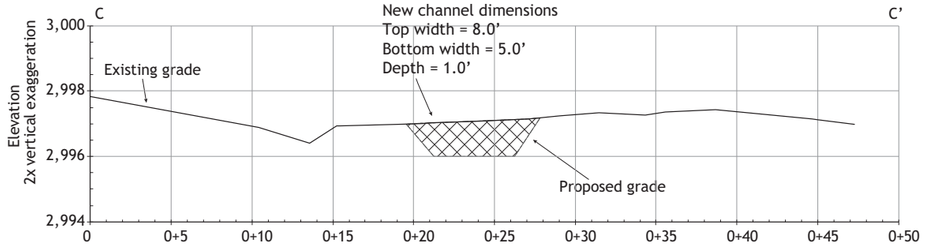
C-4



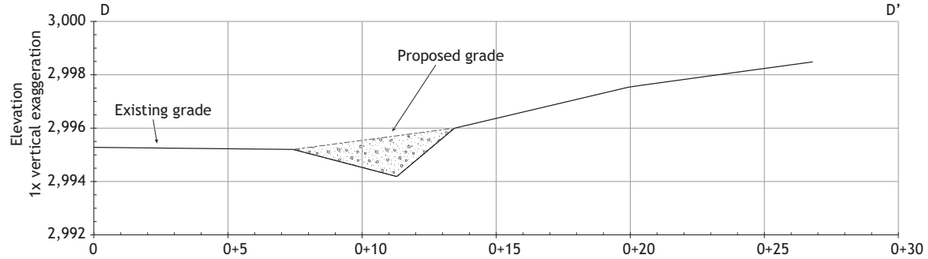
A / C-4 CROSS SECTION OF UPPER ROAD CROSSING REMOVAL



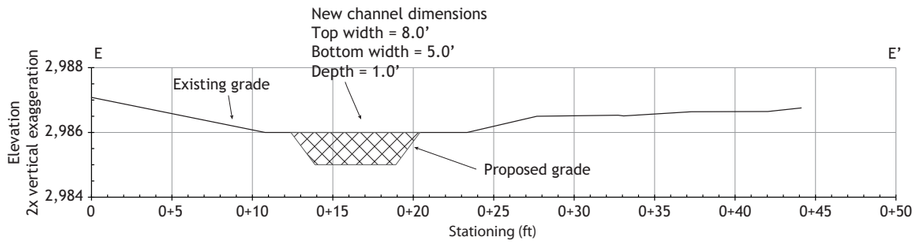
B / C-4 CROSS SECTION OF MIDDLE ROAD CROSSING



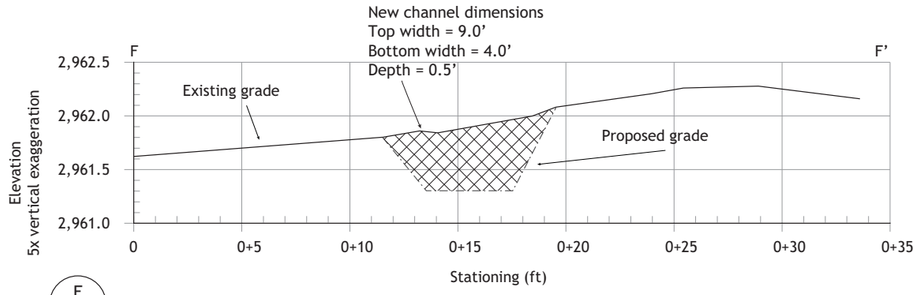
C / C-4 CROSS SECTION OF CHANNEL CONNECTION



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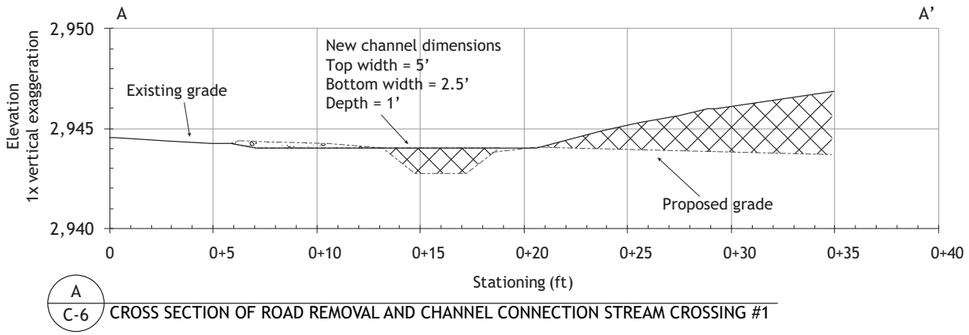
ORIGINAL DRAWING SIZE: 24 X 36

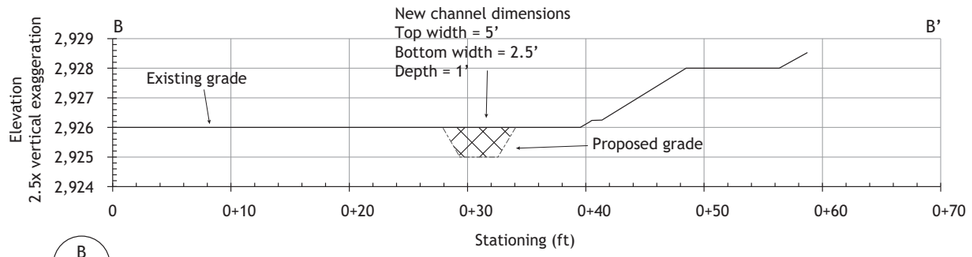
SITE 2-A

Sheet

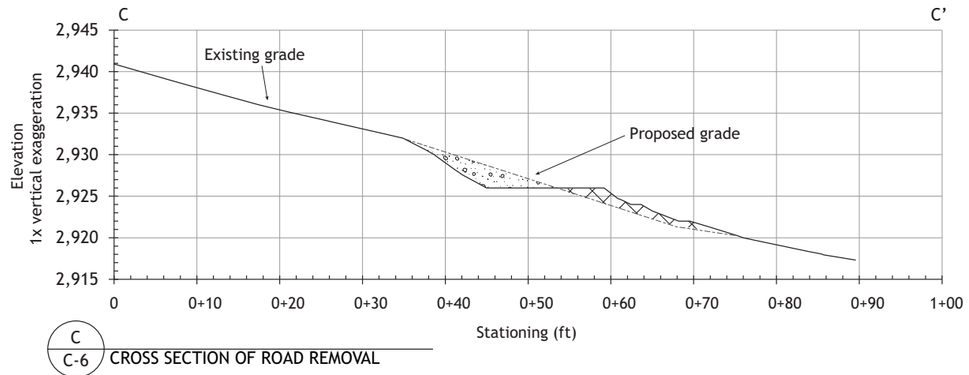
C-5



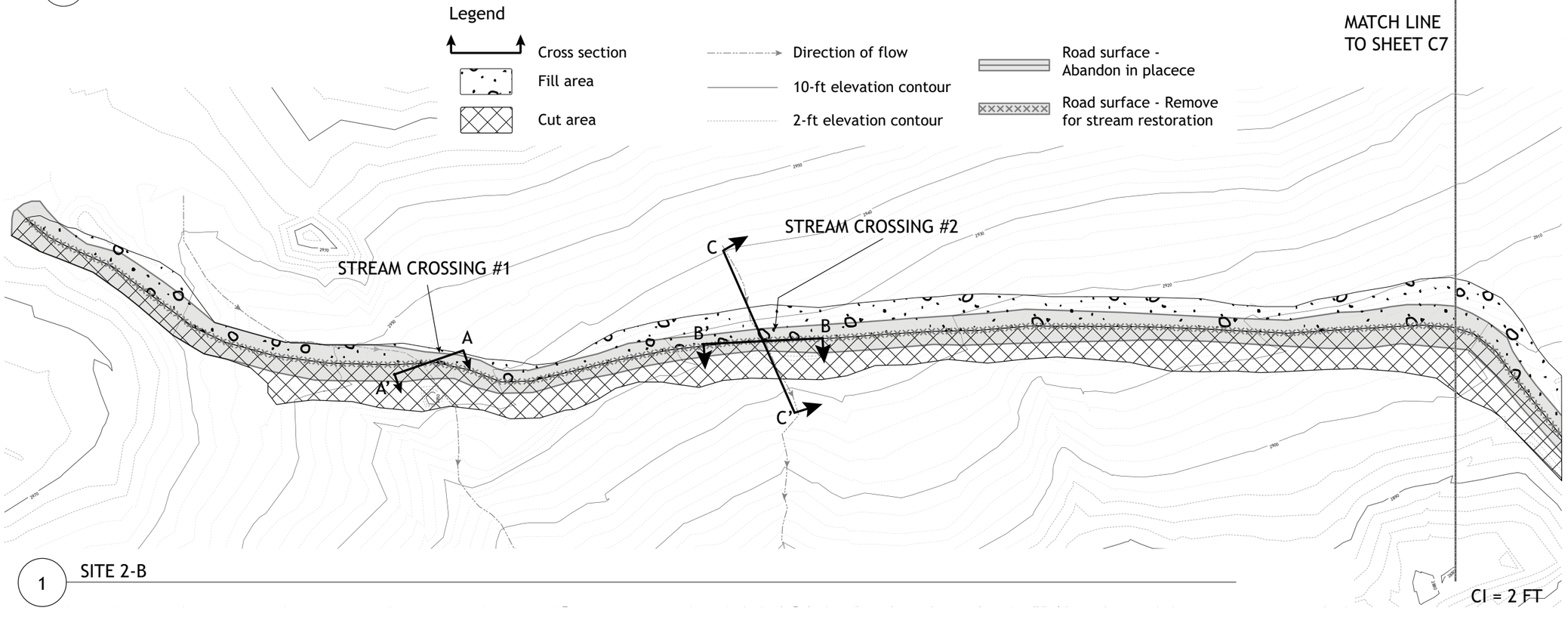
A / C-6 CROSS SECTION OF ROAD REMOVAL AND CHANNEL CONNECTION STREAM CROSSING #1



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



C / C-6 CROSS SECTION OF ROAD REMOVAL



1 SITE 2-B

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

SCALE: 1" = 25'

0 25
SCALE: 1 " = 25'

SITE 2-B

Sheet

C-6

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.

Northwest Tributary

NW Pond A

NW Berm A

Northeast Tributary

B

A'

B'

C

C'

SITE 3

SITE 2-B

NW Pond B

NW Berm B

MATCH LINE TO SHEET C6

NW Pond C

NW Berm C

D

D'

A

NE Pond A

E'

NE Berm A

NE Pond B

NE Berm B

NE Pond C

NE Berm C

E

EARTHEN DAM

F

F'

1 SITE 3

CI = 2 FT

Legend

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

NOTES:

1. REFER TO SHEET C-8 FOR ALL CROSS SECTIONS SHOWN ON SHEET C-7
2. ELEVATION OF THE DAM CREST YET TO BE DETERMINED
3. LOCATION OF THE NEW SPILLWAY FOR THE LOWERED DAM YET TO BE DETERMINED

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ORIGINAL DRAWING SIZE: 24 X 36

SCALE: 1" = 25'

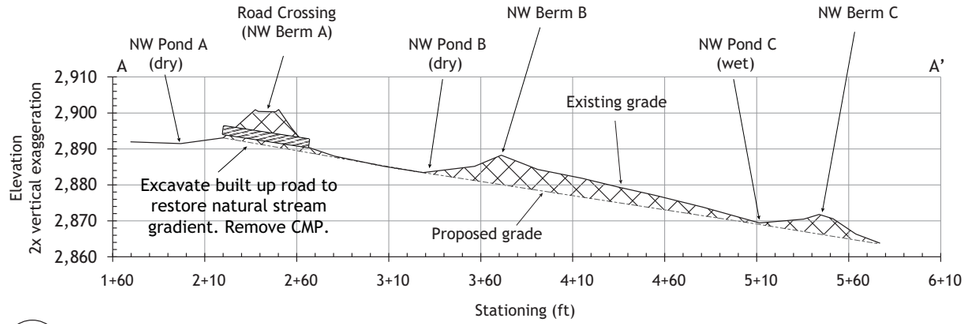
0 25
SCALE: 1 " = 25'

N

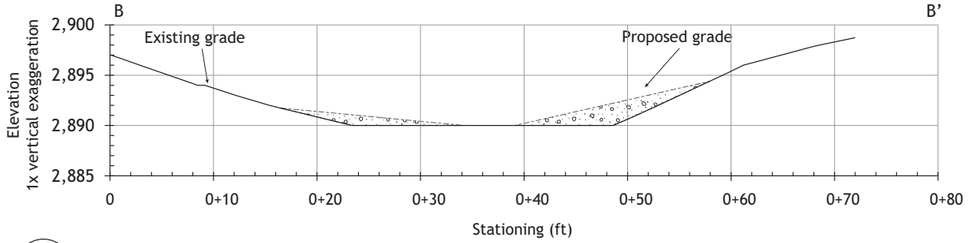
SITE 3

Sheet

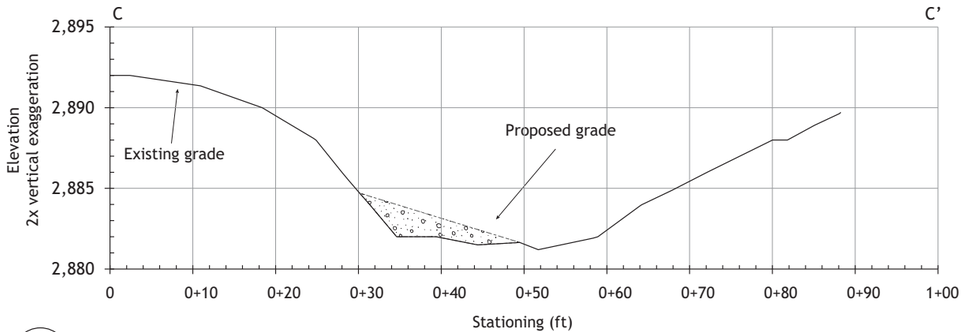
C-7



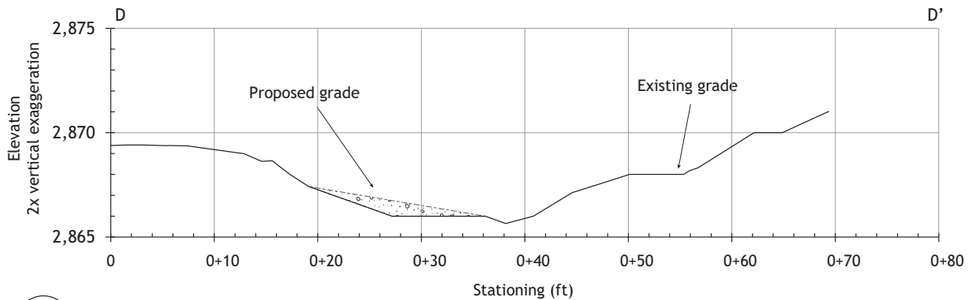
A
C-7 CROSS SECTION OF POND AND ROAD REMOVAL



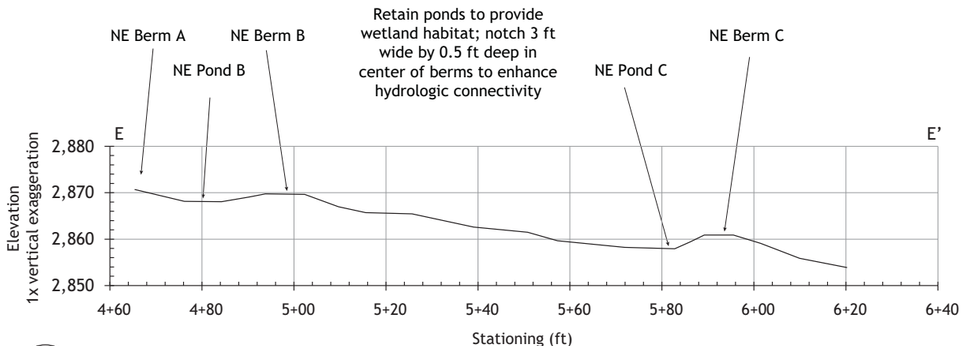
B
C-7 CROSS SECTION OF NW POND A REMOVAL



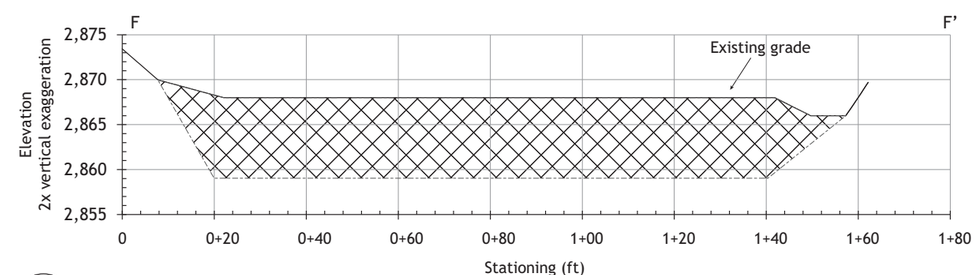
C
C-7 CROSS SECTION OF NW POND B REMOVAL



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

Legend

- Rock armoring
- Fill area
- Cut area

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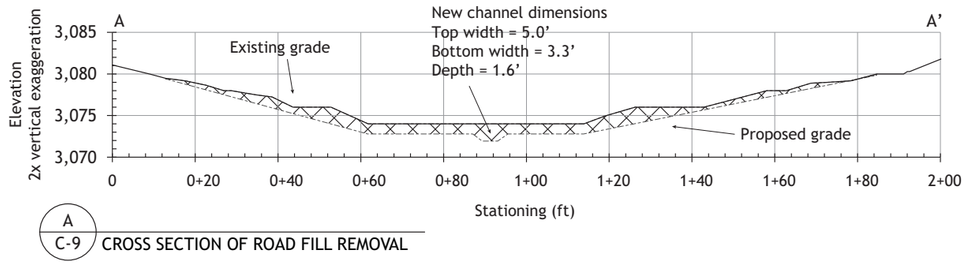
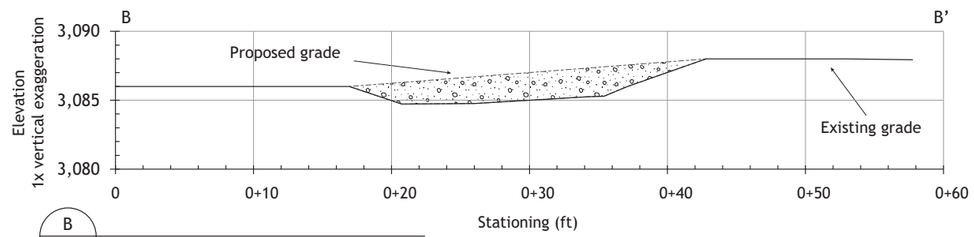
SITE 3

Sheet

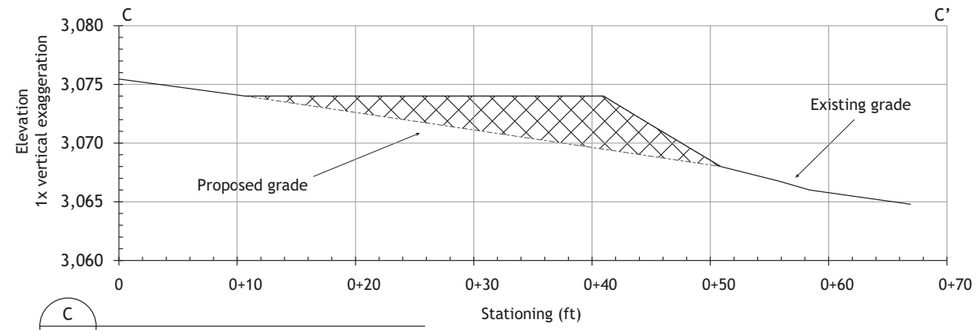
C-8



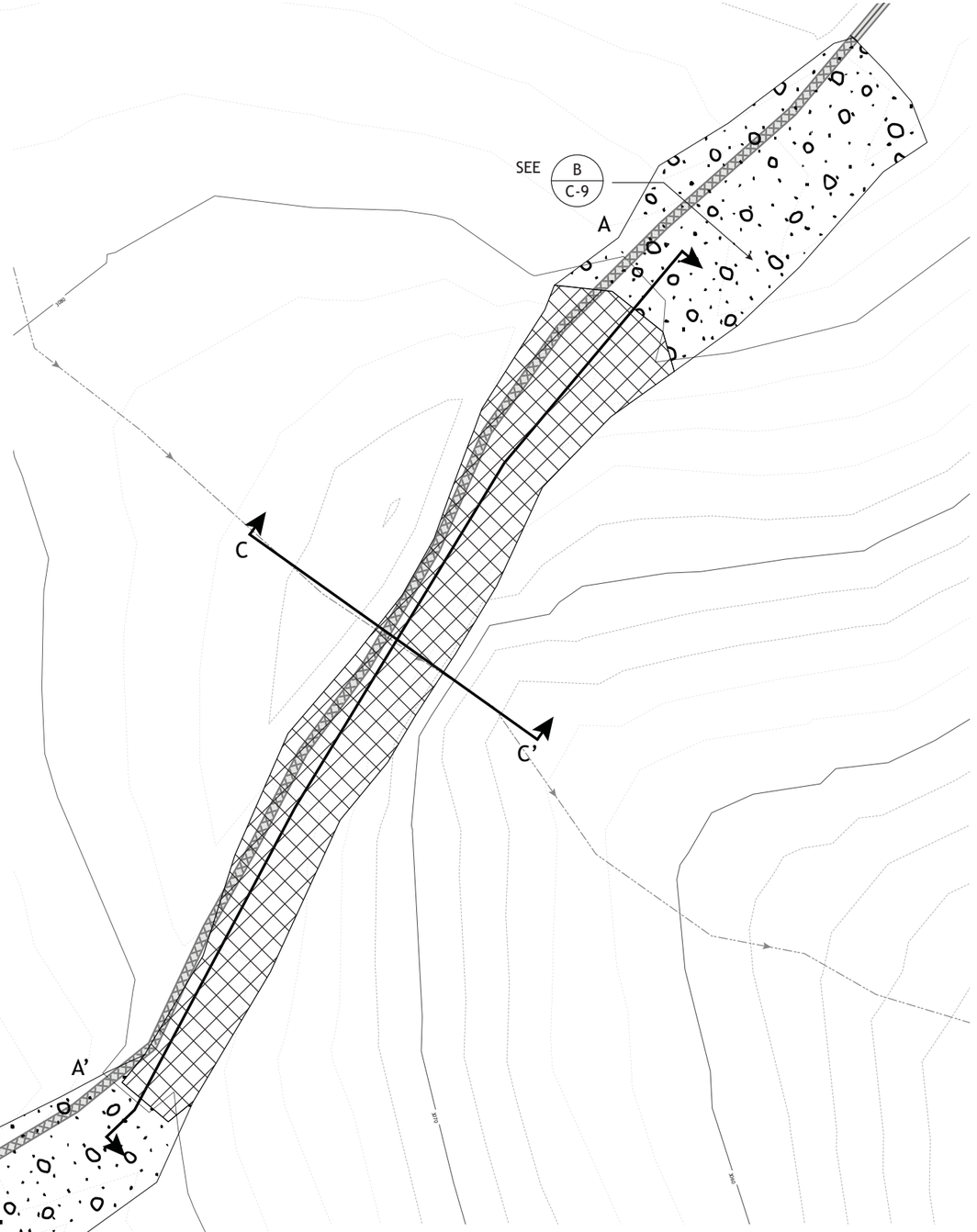
A / C-9 CROSS SECTION OF ROAD FILL REMOVAL



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

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

SCALE: 1" = 12'

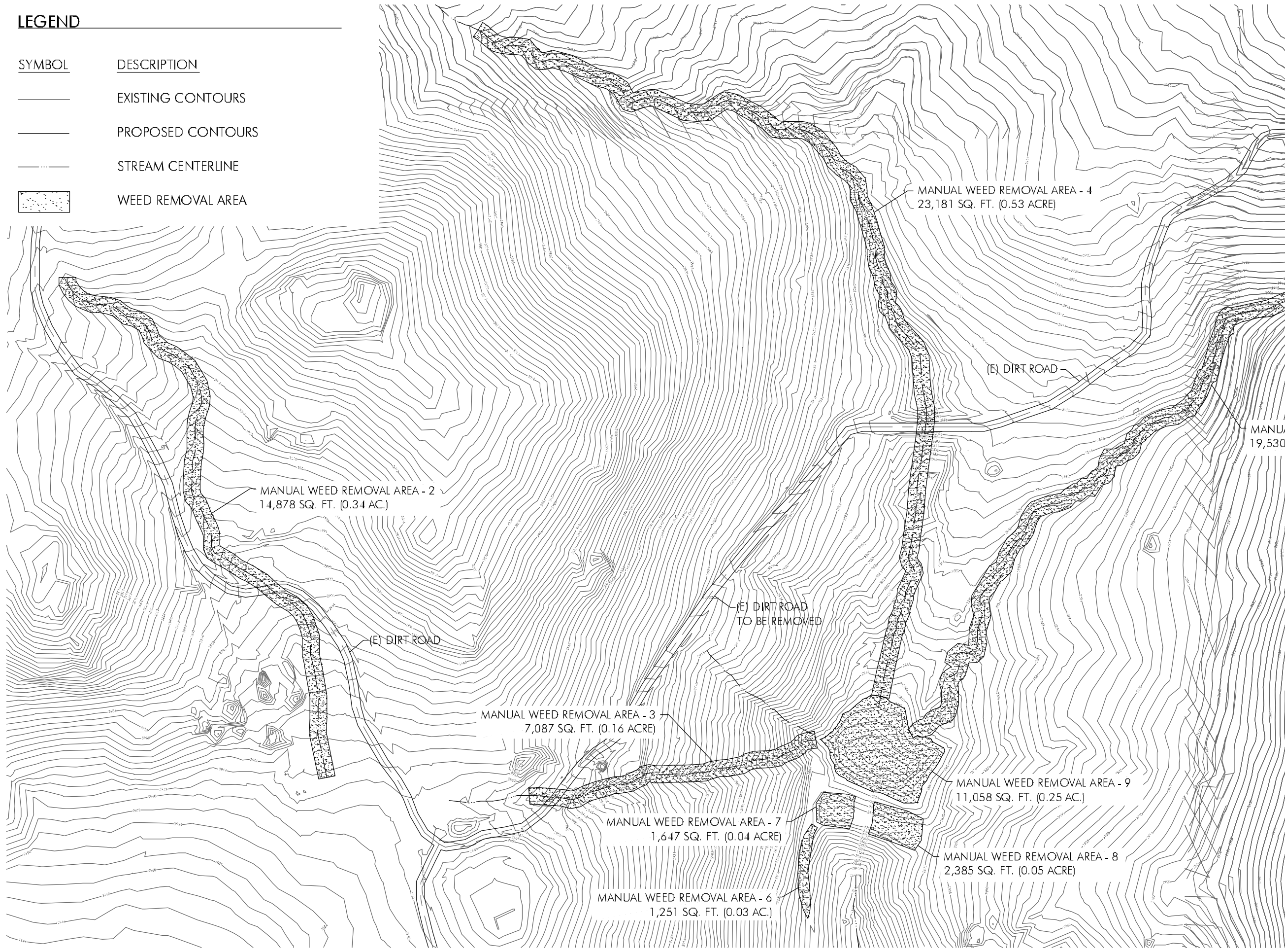
0 12
SCALE: 1" = 12'

N

SITE 11

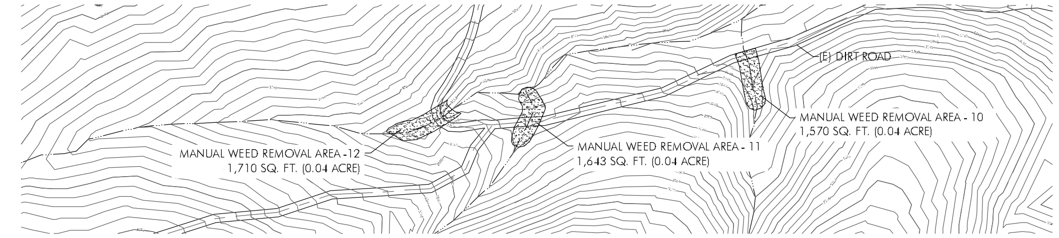
Sheet

C-9



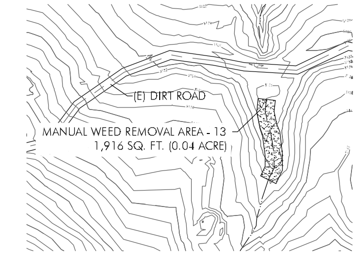
1 WEED REMOVAL AREA 1

1" = 100'



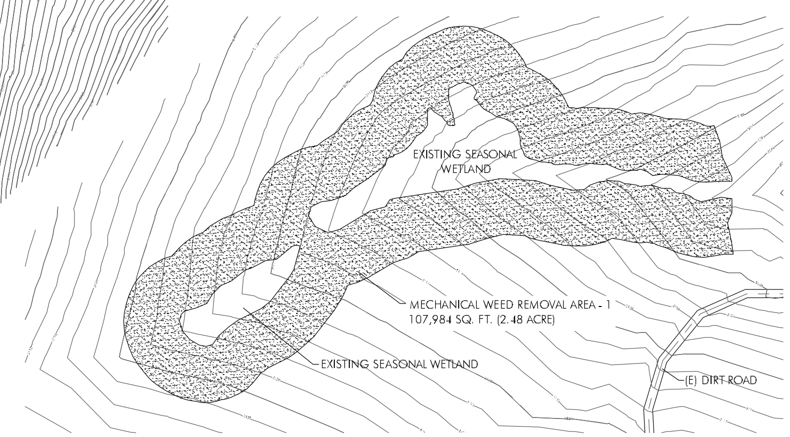
2 WEED REMOVAL AREA 2

1" = 100'



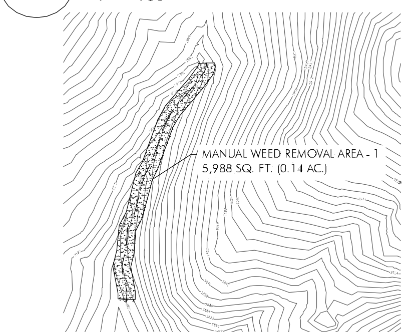
3 WEED REMOVAL AREA 3

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 QUINO CHECKERSPOT BUTTERFLY (*EUPHYDRYAS EDITHA QUINO*) AND 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 WEED TOCALOTE (*CENTAUREA MELITENSIS*) AND THE PERENNIAL WEED 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 SHORTPOD MUSTARD (*HIRSCHFELDIA INCANA*), 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*) AND TOCALOTE (*CENTAUREA MELITENSIS*).
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.

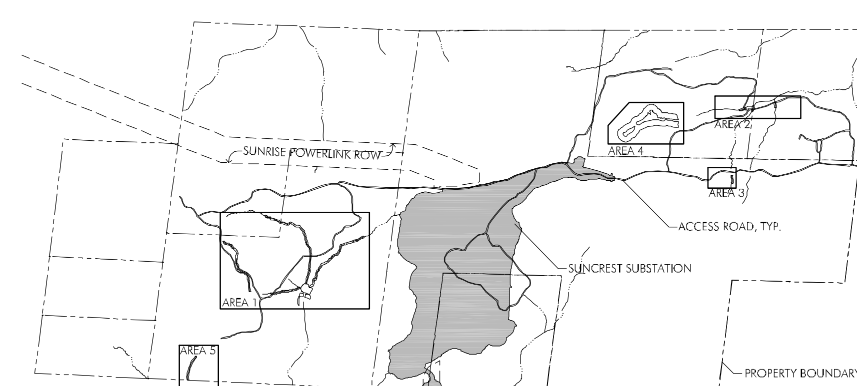
MECHANICAL WEED REMOVAL AREAS

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
ENVIRONMENTAL CONSULTANTS
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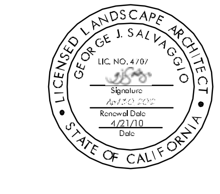
San Rafael, CA 94901
(415) 454-8868 Phone
(415) 454-0129 Fax

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.
4/21/10	PERMIT SET	

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

SCALE: 1" = 100'

0 100
SCALE: 1" = 100'
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LIGHTNER PROPERTY
WEED REMOVAL PLAN

Sheet

L-2

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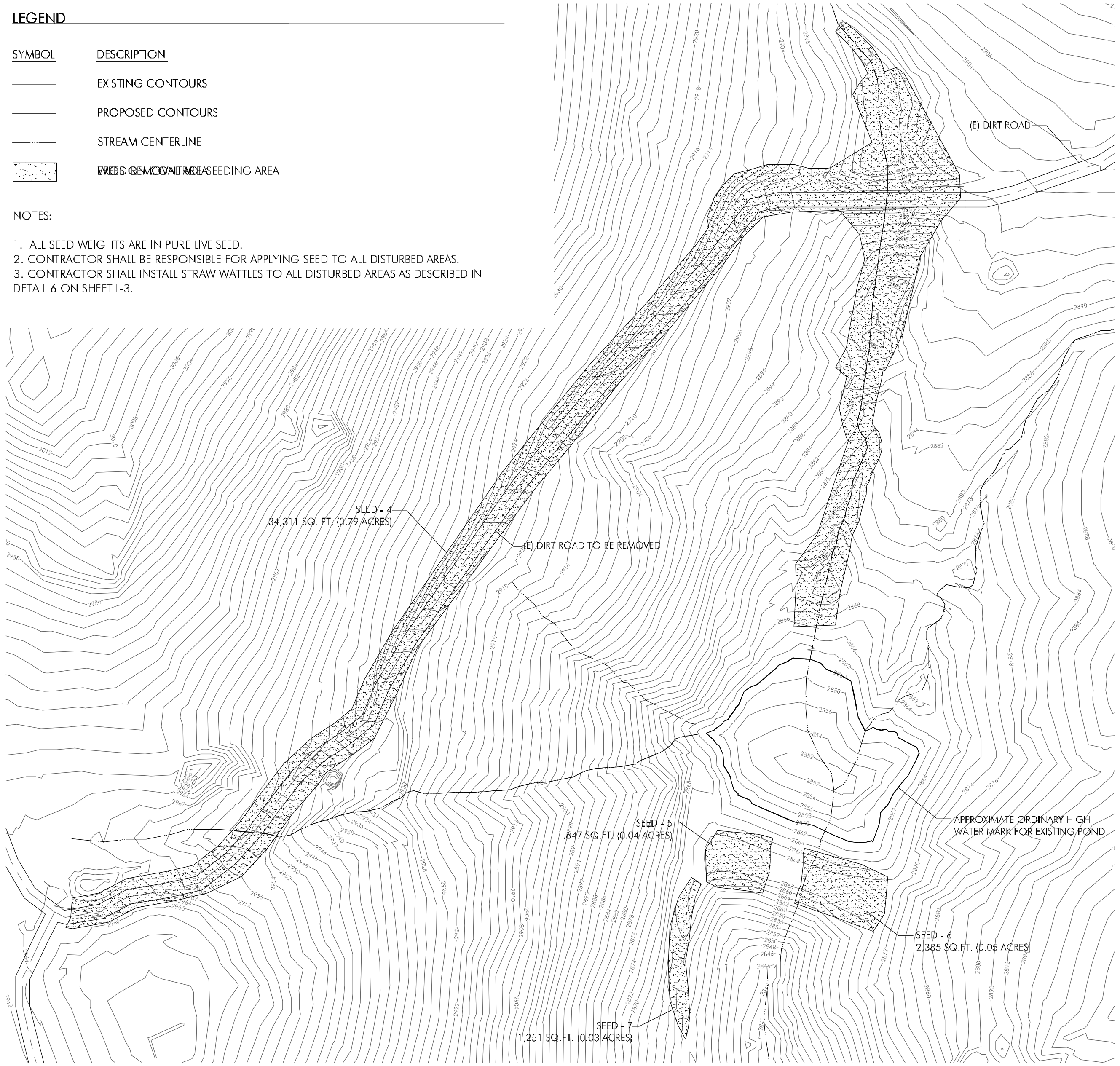
LEGEND

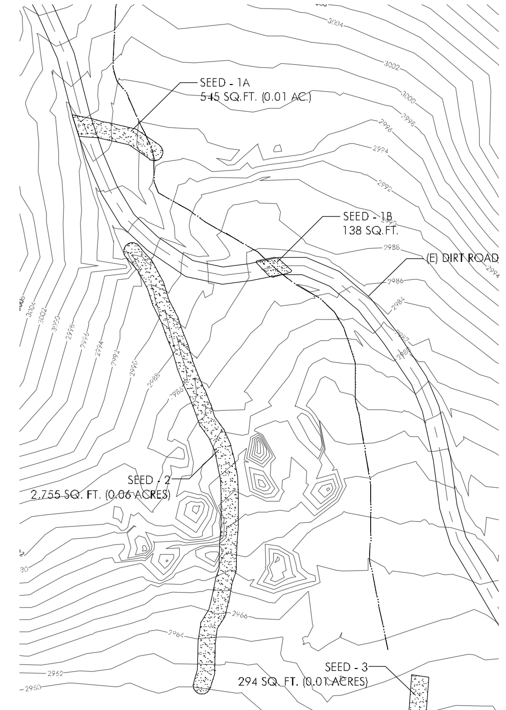
SYMBOL	DESCRIPTION
———	EXISTING CONTOURS
———	PROPOSED CONTOURS
—·—·—	STREAM CENTERLINE
(stippled box)	EROSION CONTROL/SEEDING AREA

NOTES:

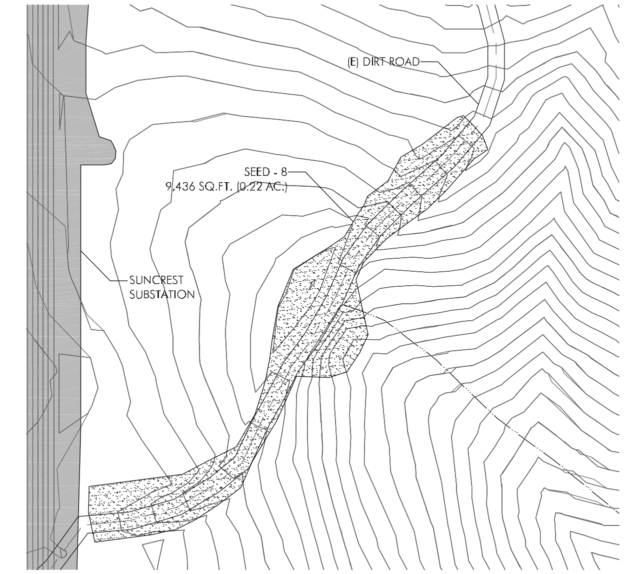
1. ALL SEED WEIGHTS ARE IN PURE LIVE SEED.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR APPLYING SEED TO ALL DISTURBED AREAS.
3. CONTRACTOR SHALL INSTALL STRAW WATTLES TO ALL DISTURBED AREAS AS DESCRIBED IN DETAIL 6 ON SHEET L-3.



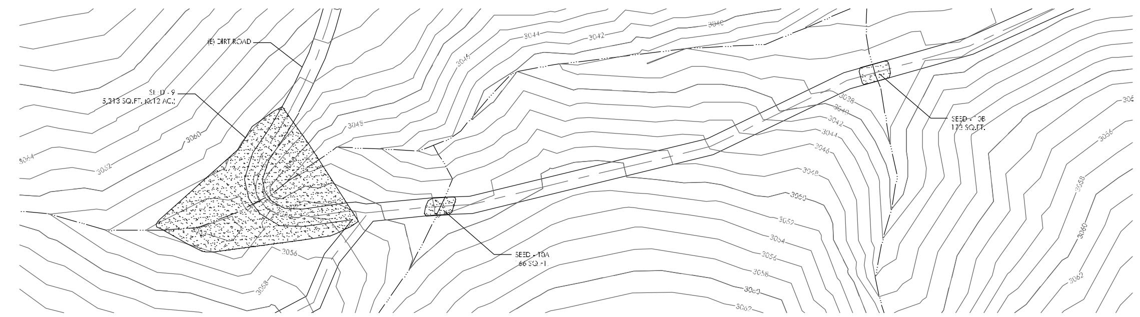
1 AREA - 1
1" = 50'



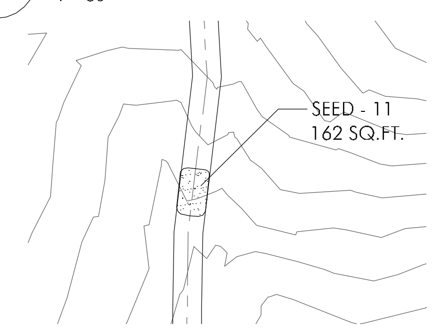
2 AREA - 2
1" = 50'



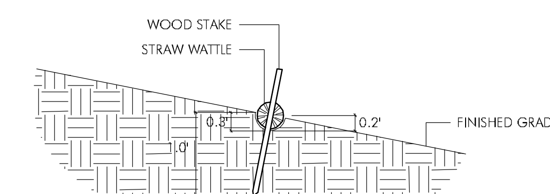
3 AREA - 3
1"=50'



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.

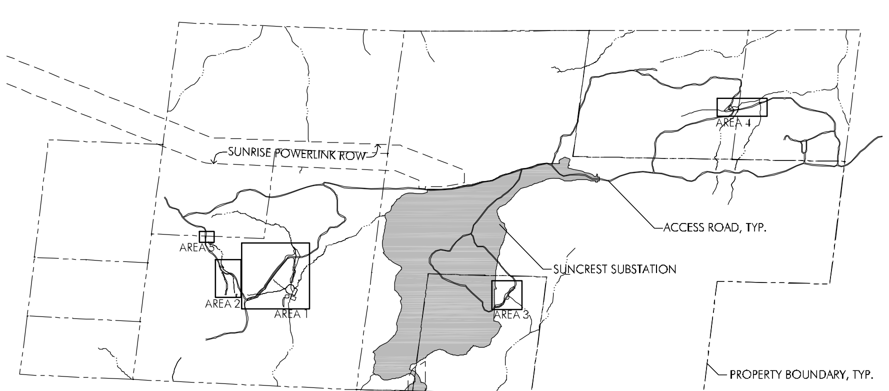
6 STRAW WATTLE
NOT TO SCALE

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**



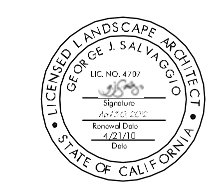
KEY MAP
1" = 1000'

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

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.
4/21/10	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

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ENVIRONMENTAL CONSULTANTS
LANDSCAPE ARCHITECTS AND PLANNERS
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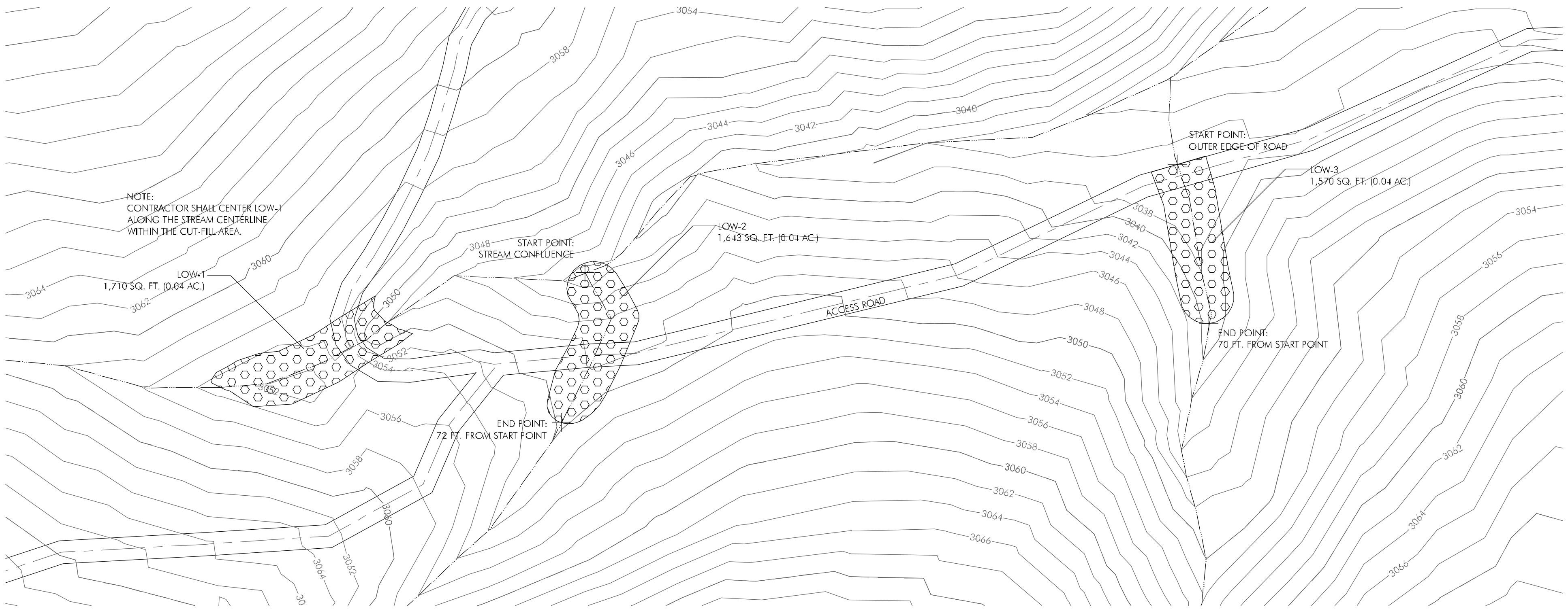

LEGEND

- 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.

SUNRISE POWERLINK

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

NOT FOR CONSTRUCTION

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**

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.

LICENSED LANDSCAPE ARCHITECT
GEORGE J. SALVAGGIO
STATE OF CALIFORNIA
4/21/10

Date	Issues And Revisions	No.
4/21/10	PERMIT SET	

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

SCALE: 1" = 30'

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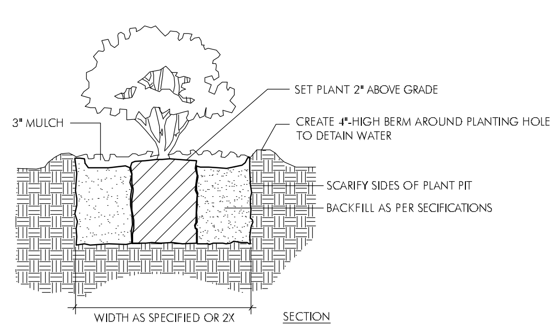
LIVE OAK PLANTING PLAN, KEY MAP & IRRIGATION NOTES

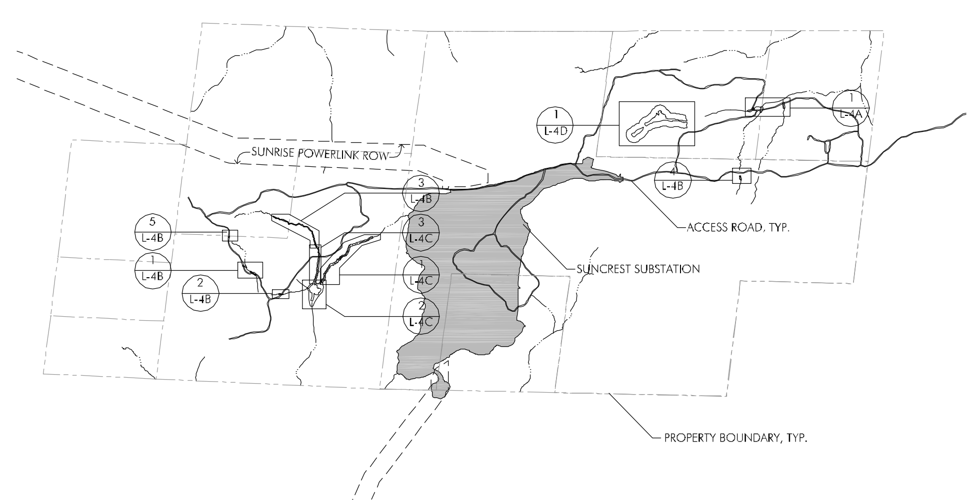
Sheet

L-4A



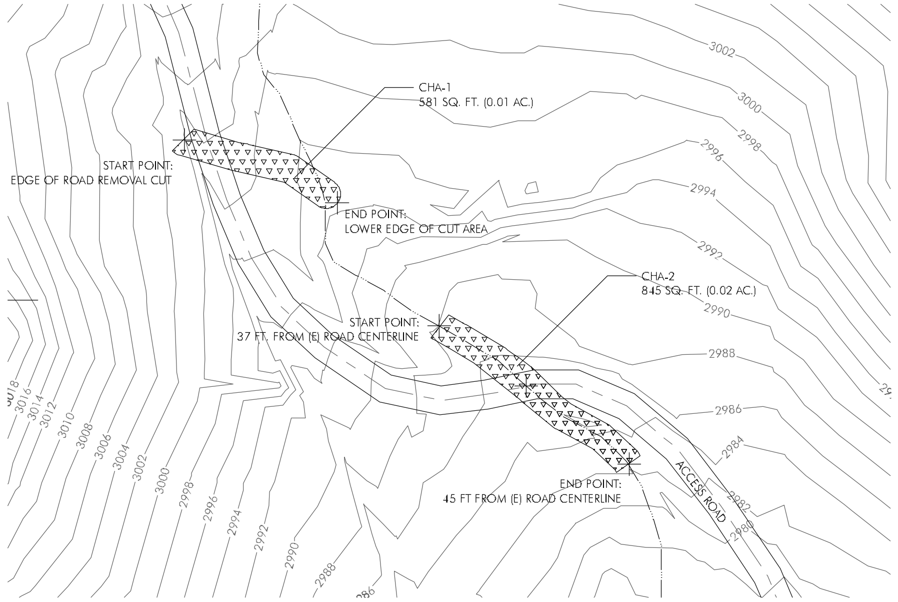
2 TREE AND SHRUB PLANTING DETAIL

NOT-TO-SCALE



3 KEY MAP

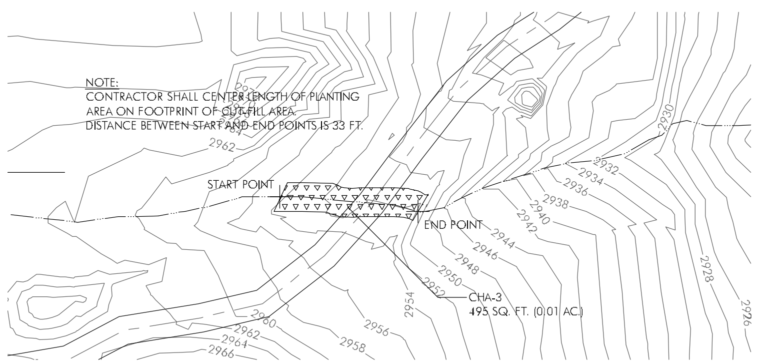
1" = 1000'



1

MIXED CHAPARRAL PLANTING PLAN

1" = 30'



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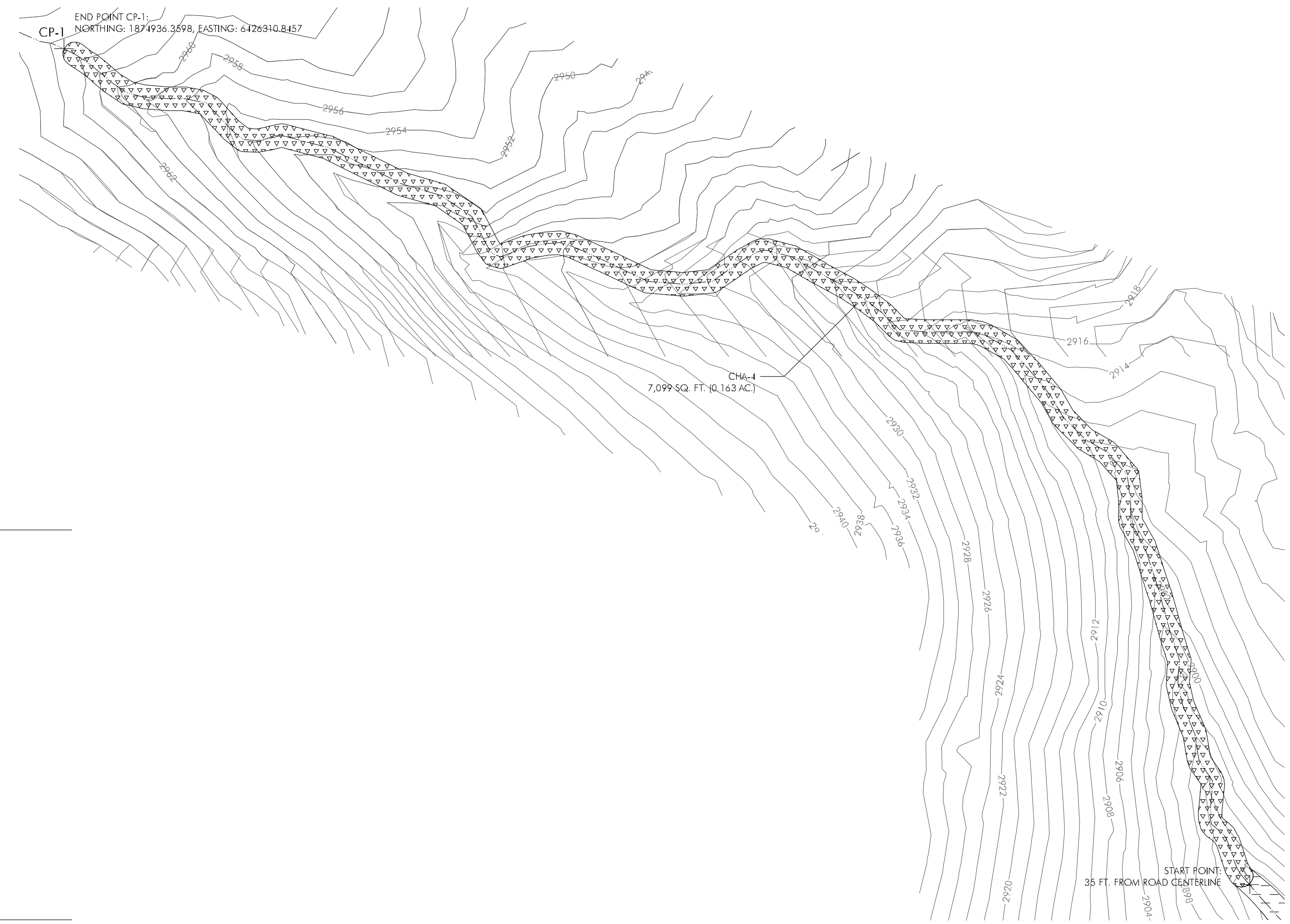
MIXED CHAPARRAL PLANTING PLAN

1" = 30'



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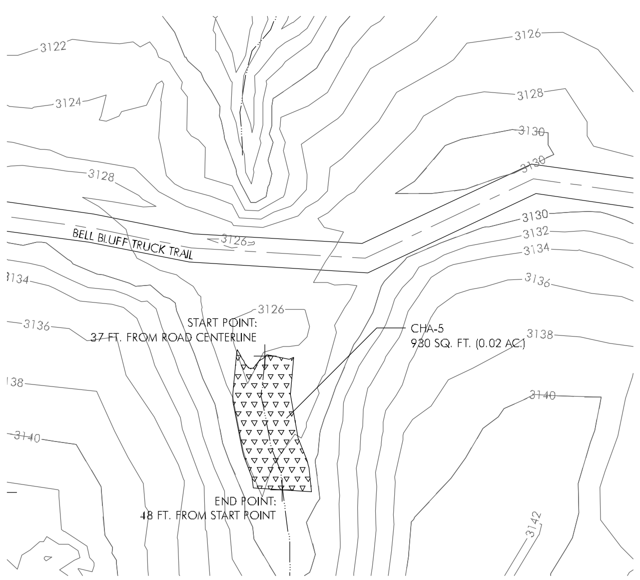
MIXED CHAPARRAL PLANTING PLAN

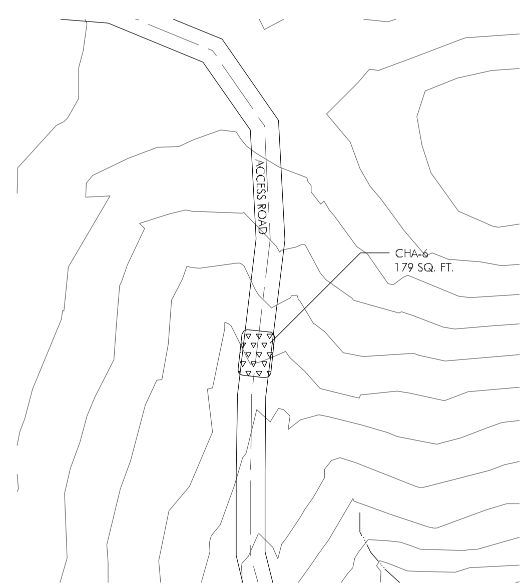
1" = 30'



4

MIXED CHAPARRAL PLANTING PLAN

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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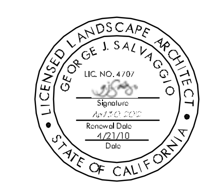
SUNRISE POWERLINK

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

NOT FOR CONSTRUCTION



Date	Issues And Revisions	No.
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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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SCALE: 1" = 30'
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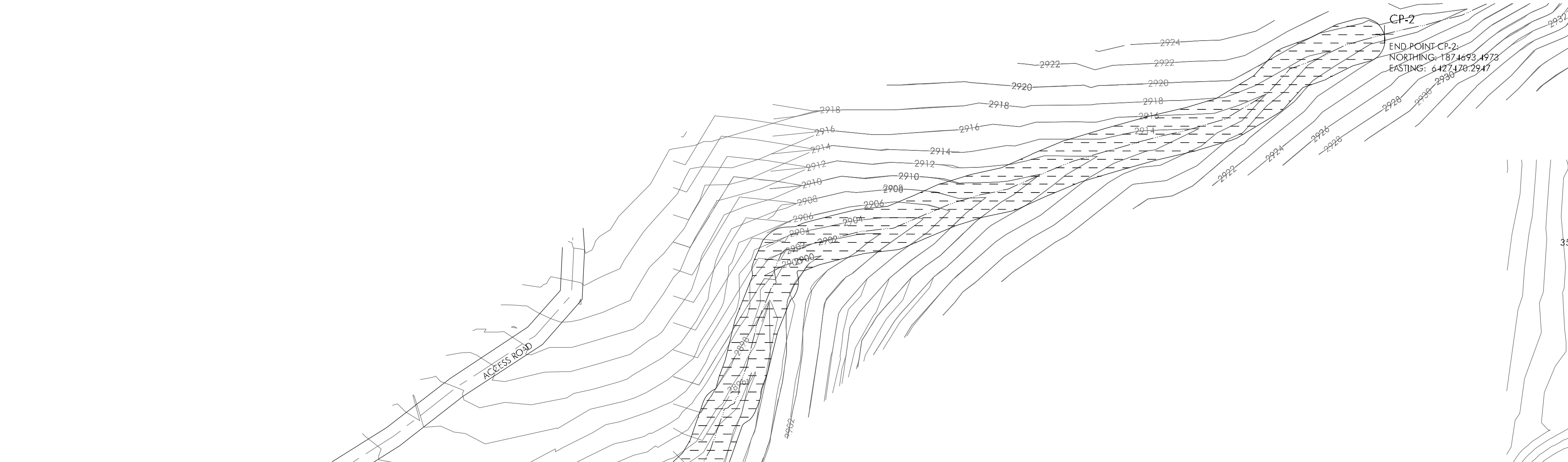
MIXED CHAPARRAL PLANTING PLAN

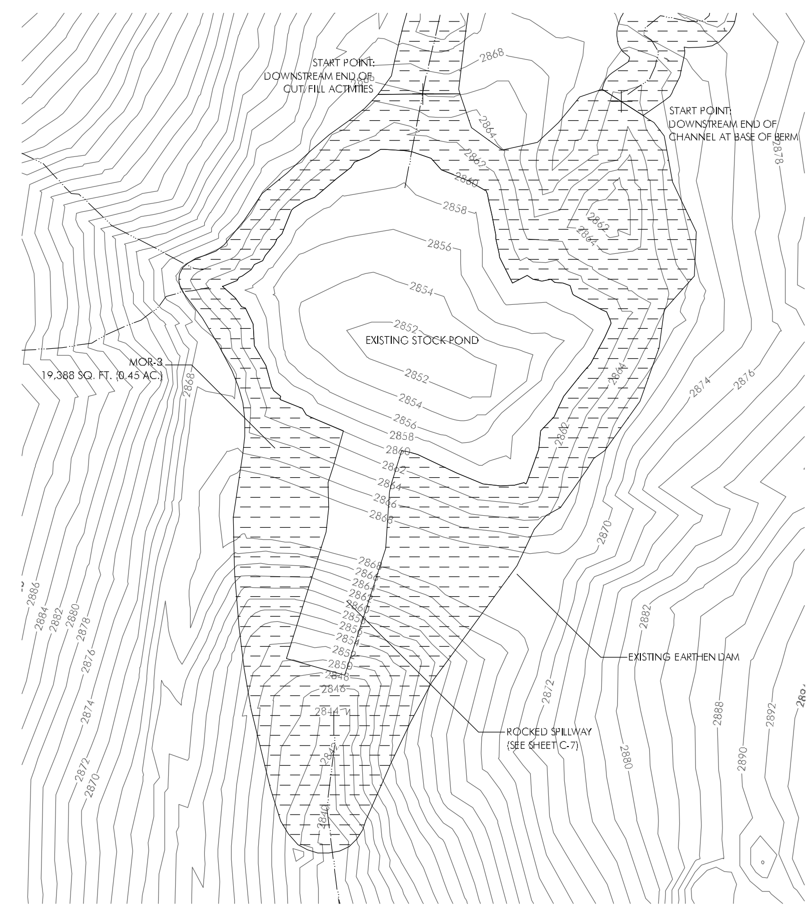
Sheet

L-4B



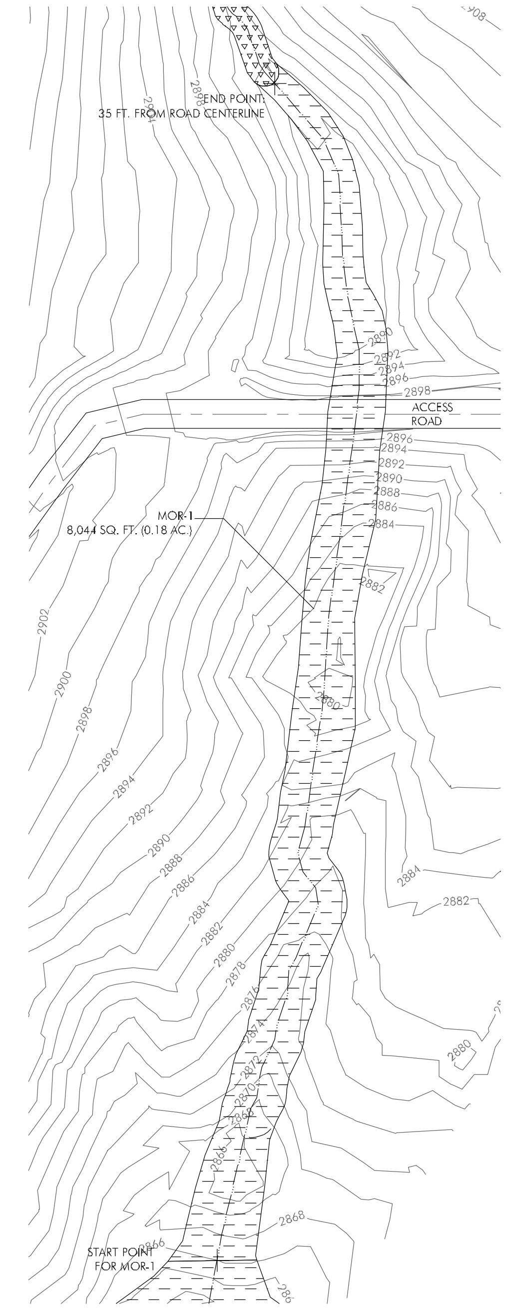

1 MIXED OAK RIPARIAN PLANTING PLAN

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 20-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.

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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
Renewal Date
4/21/10
Date

Date	Issues And Revisions	No.
4/21/10	PERMIT SET	

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

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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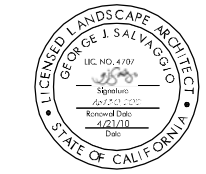
SUNRISE POWERLINK

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

NOT FOR CONSTRUCTION



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

SCALE: 1" = 30'

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SCALE: 1" = 30'
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RIPARIAN BUFFER
PLANTING PLAN

Sheet

L-4D

Appendix C

PAR Analysis for the Lightner Mitigation Site from the September 2010 HAP/HMP

Note: This appendix includes the PAR assumptions and PAR spreadsheets for the Lightner Mitigation Site from the September 2010 HAP/HMP. A discussion of the interest rate, inflation, and reinvestment assumptions for a non-wasting endowment also is included as an attachment to the PAR assumptions sections.

ASSUMPTIONS APPLIED IN THE PRELIMINARY PROPERTY ANALYSIS RECORD FOR THE MITIGATION SITES[1]

INTRODUCTION

Because the properties are located in different ecoregions and support different sensitive vegetation communities and species, each mitigation property requires its own suite of management and monitoring tasks that will supplement the general management that will be performed at each site to mitigate project impacts. The costs to perform these management tasks are produced by a PAR, which identifies the individual tasks and assigns labor and materials costs for each task. Management is conducted in two phases. Phase 1 is a five-year start-up period during which initial access control measures are installed, baseline inventory surveys are conducted, and intensive management actions are taken to bring the property to a condition that provides the baseline for future monitoring. Phase 2 is ongoing management, which consists of annual maintenance in perpetuity. Phase 2 costs are given as an average annual estimate of implementation. The PAR then calculates an endowment amount that would yield enough interest (at a conservative rate) to cover the annual in-perpetuity management costs without having to use the principal (i.e., a non-wasting endowment).

GENERAL ASSUMPTIONS FOR COST ANALYSIS

The cost analysis incorporates several general. Any changes to these assumptions would require a re-evaluation of the cost estimate.

Land Assumptions

1. *Total Acreage* is the acreage of the mitigation land that will be managed on each property, which does not include permanent or temporary project impacts or the right-of-way, if they occur on the property. *Land Stewardship* activities will be conducted on this acreage in perpetuity.

2. Taxes, district fees and other levies are the responsibility of the land owner and are not included in this analysis.

3. Management of storm water conveyance structures will not be the responsibility of the Land Manager.

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[1] This document is Part 3 of the September 2010 of Habitat Acquisition Plan/Habitat Management Plan for the Sunrise Powerlink Project. The assumptions are being refined and a revised Property Analysis Record (PAR) in connection with selection of the land manager and preparation of a revised final management plan for each mitigation site. Selection of the land manager and preparation of the revised final management plans and revised final PAR for the HMMP mitigation sites is subject to approval by the Corps, SWRCB, and CDFG.

Funding Assumptions

1. Funding will be through a one-time payment for five-year start-up costs and interest earned on endowments provided by SDG&E for annual ongoing management costs.

2. Management and monitoring tasks in this cost analysis are based on requirements outlined in the MMCRP and conditions of the BO issued by the USFWS.

3. A separate cost analysis has been conducted for each property, and reflects the specific mitigation requirements and property site conditions.

COST JUSTIFICATION AND LINE ITEM ASSUMPTIONS

The cost breakdown for biological management and monitoring is divided into the following sections: Facilities Maintenance and Access Control, Biological Inventory and Monitoring, Habitat and Land Management, Preserve Management Plan and Reporting, and Contingencies and Administration. As described in the individual HMPs, "land stewardship," which is the overall management of the property as a whole, consist of access control (Facilities Management and Access Control section of the PAR), general condition monitoring (a line item within Biological Inventory and Biological Monitoring sections of the PAR), and trash removal (a line item within the Habitat/Land Management section of the PAR). The dollar amount required for management is based on the analysis below.

Each PAR is presented in two components: Start-up Costs and Annual Costs in Perpetuity. Start-up costs cover the initial investment in infrastructure and surveys to begin monitoring and reporting, and maintenance, monitoring and reporting that would occur in the first 5 years of implementation. Annual Costs in Perpetuity provides an average annual estimate of implementation of the HMP. An annual inflation rate (3.0%) is applied to the annual cost which is used to generate an estimate of an endowment that would yield an amount, assuming a 5% return[2], to pay for the annual management and monitoring. To this endowment estimate the start-up cost is added to provide a total initial endowment estimate.

Facilities Maintenance and Access Control

Gates, fencing, and signs are included in the cost analysis as needed to protect mitigated species or habitats from unauthorized access. The HMP includes the start-up and long-term maintenance costs for facilities other than those provided by SDG&E for Operations and Maintenance (e.g., gates for maintenance access roads).

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[2] The calculation of the endowment amount assumes that 3% of the return will be reinvested in endowment (to keep pace with inflation) and 2% would be allocated annually for management tasks. See Attachment for documentation that a 5% nominal interest rate and 2% real interest rate are consistent with historical experience and market data and comparable to values assumed by the Social Security Board of Trustees in their long-term analysis of Social Security funds.

Fencing

Fencing will be an important aspect of land management, since unauthorized use can destroy sensitive resources and undermine the biological value of the mitigation. Several assumptions have been made for the cost analysis. Some properties (e.g. Lightner and Long Potrero) will require fencing whereas others (e.g. Chocolate Canyon, Desert Cahuilla Land Transaction, El Capitan, Hamlet, Lakeside, Nabi and Suckle) will not. Fencing discussed in this section is limited to the perimeter or portions of the properties. The entire perimeter of each parcel will not need to be fenced as there is steep topography, adjacent protected land, vacant land or existing fencing associated with private property present at the property boundaries. Details for each property are provided in the individual PARs. A combination of smooth wire or chain link will be used for the mitigation sites. Fencing costs are estimated at $15 per linear foot and based on the average cost of the two types of fencing. It is estimated that 10% of the fencing installed during the start-up period will need to be replaced annually.

Gates and Barriers

Gates will be required to block unauthorized access but allow access for the Land Managers and emergency services personnel. Gates will be installed on the perimeter at main access points into the property if needed. High quality 16-foot swinging arm gates firmly planted into the ground are recommended since they are most resistant to vandalism and destruction. A typical 16-foot swinging arm gate will cost about $5,000 including installation. These gates will need to be serviced annually and replaced every 20 years.

Concrete bollards are fixed barriers to vehicular access that are firmly planted into the ground to resist being removed or pushed over by vehicles. They will be used to prevent vehicles from bypassing gates. Four bollards are expected to be needed at $75 per bollard for each gate. Long-term maintenance consists of replacement every 10 years.

Signage

Signage will be used to indicate boundaries, cite regulations, and identify areas of habitat restoration. Signs are estimated at $15 per sign, which is an average cost for small signs of this type (e.g., 8 in. by 13.5 in.). Signage is susceptible to vandalism and/or removal; therefore, in addition to initial installation, it is expected that an average of 20% of signs will need replacement each year.

Biological Monitoring

Monitoring costs include baseline inventory surveys to be conducted during the first five-years and long-term monitoring for mitigated species and habitats. For the purpose of this cost analysis, the following definitions are used. A *baseline survey* is conducted at a certain point in time and is used as the benchmark against which subsequent surveys will be compared. *Baseline surveys* can take place during a single year or can be conducted over a period of time to encompass the natural fluctuation in the density or distribution of a population or structure of a plant or animal community. *Monitoring surveys* are conducted over a given period of time or in perpetuity, and are compared to the baseline survey results to indicate changes in populations or habitat conditions over time. Negative changes over time (e.g., showing a more restricted sensitive species population distribution) will alert the land manager and may trigger specific remedial management actions. Note that long-term monitoring may be

conducted less frequently than surveys conducted during the five-year start-up period if appropriate for a given species.

Habitat-Related Monitoring

Habitat-related monitoring includes general condition monitoring, general wildlife habitat assessment, vegetation mapping, invasive species mapping, and species-specific habitat assessment. Some of these activities can be conducted concurrently as described below. Unless otherwise specified, the estimated survey rate (acres/hour) includes field preparation and travel time.

General Condition Monitoring and Wildlife Habitat Assessment

General condition monitoring will be conducted to identify threats to sensitive habitats and species. Threats may include invasive species, erosion problems, illegal trespass (e.g., off-road vehicles or graffiti, etc.), trash or illegal dumping. In addition, the general overall health a quality of wildlife habitat will be assessed during this effort. One visit will be conducted annually at an estimated rate of 10 acres/hour.

Vegetation Communities and Invasive Species Mapping

Baseline mapping of vegetation communities and invasive species will be conducted during the start-up period and updated annually for the remainder of this period. Updates will continue every three years thereafter. This effort is expected to be more intense than that described for general condition monitoring, in which general presence/absence information will be recorded for invasive species. Mapping will consist of defining boundaries and noting the density, species, and level of threat. This effort is estimated to be conducted at 7.5 acres/hour

Species-specific Habitat Assessments

Some species may require ongoing habitat assessments to inform species-specific monitoring. This type of assessment is more specific than that described for general condition monitoring, as it takes into consideration the particular habitat needs of a given species. For example, a habitat assessment for the least Bell's vireo and southwestern willow flycatcher might focus on such habitat characteristics as canopy structure or dominant plant species. This type of assessment is expected to be conducted concurrently with vegetation communities and invasive species mapping, as this is a more intense effort than general condition monitoring.

Information gathered from the general conditions monitoring and invasive species mapping will be used to prepare a vegetation management plan, which will include a list and assessment of threats to biological resources, management priorities, and a work plan for habitat management. The plan will be updated annually.

Focused Species Survey Methods

Surveys for mitigated species will be conducted according to established protocols (either USFWS presence/absence protocols or preserve-specific monitoring protocols[3]), USGS guidelines, or recommendations of species experts. A brief summary of each approach is provided below. Field preparation and travel time is built into the estimated number of acres covered per hour.

[3] If not otherwise specified, preserve-specific monitoring protocols include USFWS presence/absence protocols that have been specifically modified to fulfill long-term preserve monitoring goals.

- Felt-leaved monardella, modified from McEarchen (in progress and 2009). Baseline surveys for felt-leaved monardella will be conducted on the Lightner property twice during the start-up period. The surveys will be conducted to assess the current condition and extent of the population, potential threats, and condition of the surrounding habitat. Each survey is expected to be conducted in 10 hours.

- Lakeside Ceanothus. Baseline surveys for Lakeside ceanothus will be conducted on the El Capitan property. The surveys will assess the current condition of the population, level of seedling recruitment, potential threats, and condition of the surrounding habitat. Each survey will take 30 hours, and be conducted twice during the start-up period.

- Quino: USFWS protocol (2002). Baseline surveys and long-term monitoring of the Quino checkerspot butterfly will be conducted every three years on the Long Potrero and Lightner properties. The Hermes butterfly will be surveyed on the Lightner property concurrently. Each flight season (usually between late February and late April) consists of five field visits which are conducted one week apart at 15 hours/acre. Surveys will occur within scrub and grassland habitats (the survey acreage may be reduced if a habitat assessment is conducted to determine excludible habitat.). A report will be prepared and submitted to the USFWS 45 days after the last survey.

- Arroyo Toad: USFWS MSCP Animal Survey Protocol (USFWS 2009) and USGS Monitoring Protocol for the arroyo toad (USGS 2003). Baseline surveys and long-term monitoring will be conducted for the arroyo toad on the Long Potrero property every three years. Three field visits per survey will be conducted during the breeding season (March through June) at an estimated 2.5 acres/hr of suitable habitat. Report due to USFWS 30 days after final surveys or positive sighting. To be conducted every three years during start-up and ongoing management periods.

- Barefoot banded gecko: CDFG protocol (in prep). Baseline surveys and long-term monitoring of the barefoot banded gecko will be conducted on the Suckle property. Surveys will consist of four visits between May 1 and July 31 at an estimated rate of 2.5 acres/hr. Ten percent of the site will be surveyed. Surveys will be conducted annually during the start-up period, and every three years thereafter.

- Gnatcatcher: modified USFWS survey protocol (1997). Focused species surveys will be conducted on the Lakeside property. Surveys will consist of one visit during the breeding season (February 15 – August 30) at an estimated rate of 10 acres/hr. A report is due to USFWS within 45 days of the final survey. Surveys will be conducted every three years during start-up and ongoing monitoring periods.

- Least Bell's vireo: USFWS Survey Guidelines (2001) as modified. Least Bell's vireo surveys will be conducted on the Chocolate Canyon property. Three survey visits will be conducted 10 days apart, between April 15 and July 31 at an estimated rate of 3 acres/hr in riparian scrub, forest, or woodland habitat. A report is due to USFWS 45 days after the last survey. Surveys will be conducted annually during the start-up period and every three years thereafter.

- Southwestern willow flycatcher: USFWS monitoring protocol (2010) as modified. To be conducted concurrently with least Bell's vireo surveys

- Peninsular Bighorn Sheep Project Monitoring will be conducted independently by California State Parks and is not part of this HMP Surveyors will enter all the data into a spreadsheet or GIS database, analyze the data, and create survey reports for each survey season as required by the USFWS. The additional cost of reporting and data management is calculated at 25% of the total survey effort.

HABITAT/LAND MANAGEMENT

Habitat management consists of actions that are directed at maintaining habitat quality for mitigated species through invasive species control, erosion control, trash removal, and minor habitat remediation, as described below.

Invasive Species Control

Control of invasive plant species will be one of the most important aspects of habitat management. The common non-native plant species in the dominant habitats (coastal sage scrub, grassland and chaparral) are usually non-native grasses, mustards (*Brassica* ssp and *Hirschfeldia incana*), star-thistle (*Centaurea melintensis*), fennel (*Foeniculum vulgare*) and many others. Non-native plant species that occur in riparian areas, such as arundo (*Arundo donax*), pampas (*Cortaderia selloana*) and tamarisk (*Tamarix* spp.), will be removed through the jurisdictional resources habitat mitigation Plan. This cost analysis assumes that there will be an initial intensive effort to remove the most damaging invasive species (as per California Invasive Plant Council (CalIPC)) recommendations, and that invasive species removal will most likely be a continual process in perpetuity. Although invasive species removal can be conducted by laborers, this activity must be supervised by a qualified biologist to ensure that sensitive species and habitats are not damaged during the removal process.

Difficult-to-remove or widespread invasive species:
The cost estimate assumes that a small staff of laborers will be needed for widespread and/or difficult to remove invasive species. Cost assumptions include: 25 acres/crew day, $1,600 per crew day (5 laborers/crew, $64/ hour labor cost plus equipment cost), on approximately one to ten percent of the total property in a given year. The activity may include mowing, herbicide treatment, hand removal, debris removal, etc. Equipment needed for this activity may include weed-whips, gardening tools, chain saws and other tools as well as rental equipment such as mowers for removal of non-native grasses. The frequency of treatment varies from annually to every five years depending on the local conditions of a given property.

Other invasive species:
Smaller scale infestations and/or species that are less difficult to remove can be conducted by laborers at an estimated cost of $45/hour at an estimated rate of 0.25 acre per hour. Much of this work will likely be done by hand or with small equipment. Generally, this level of invasive species removal is expected to occur annually on one to five percent of the property depending on local conditions.

Erosion Control and Road Maintenance

Erosion control and road maintenance for this cost estimate is meant to cover minor problems, for example erosion repairs along degraded habitat or near unused or old trails. It does not include the construction of erosion control devices, such as cement berms or culverts, or any measures that would require permits, engineering or major contracting. In general, maintenance of roads is not the responsibility of the Land Manager, except for existing roads that are required for management access and not already maintained by SDG&E for access to the transmission line and related structures.

Erosion control materials are estimated to cost $600 per acre. Materials will consist of gravel bags (250 bags at $1.50/bag), fiber roles and stakes (12 rolls at $28/roll), and silt fencing (500 feet at $25/100-ft roll). This management task can be conducted by laborers, and assumes $45/hour at a rate of eight labor hours per acre on five percent of the property on an annual basis. As with invasive species removal, this activity must be supervised by a qualified biologist to ensure that sensitive species and habitats are not damaged during erosion control activities.

Trash Removal

Trash removal is a land steward task that is more important in open space areas that are more accessible to the public (e.g. Suckle) as compared to areas that are far from public facilities (e.g., El Capitan). Because the Sunrise mitigation parcels will not be open to the public, the need for trash removal is lower than for a property that has active recreation. Trash removal is based on a cost of $100/acre for one percent to five percent of the property and will be conducted every one to five years depending on the property.

Habitat Remediation

Habitat remediation consists of minor rehabilitation of habitat from the effects of erosion, unauthorized access or removal of exotics; it 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 decompaction, seeding with the imprinting method, more active exotic species control etc.), but will not include irrigation as part of this HMP. Major restoration, restoration for mitigation purposes (e.g., those identified in the Habitat Mitigation Monitoring Plan (HMMP) for this Project) and/or the development of restoration plans are not included in this HMP.

Habitat remediation is included during the start-up period for most properties and is also an integral part of the habitat management in perpetuity. Costs are estimated based on one percent to five percent of the total acreage of each property every two to five years. Remediation efforts, including

labor and materials, will vary in cost between $300/acre for minor habitat repair and $1,000/acre for a more active effort, which is required to restore decommissioned roads and trails.

PRESERVE MANAGEMENT PLANS AND REPORTING

Annual Reports

Annual reports will include a threats assessment, work plan, budget plan, and a financial summary (including the status of endowments). Reporting will be prepared annually and be submitted to the appropriate wildlife, or other public agency. Preparation of annual reports is expected to take approximately 20 hours during the start up period and 10 hours thereafter.

Five Year Work Programs

Using the results from the general condition monitoring, wildlife habitat assessments, vegetation communities mapping, invasive species mapping and species-specific habitat assessments, 50year work programs will be prepared and regularly updated. The plan will include a threats assessment, prioritization, monitoring protocols and schedules, and a work plan. The plan is expected to be completed in year three and updated annually thereafter. Some interim land management will occur during years one and two. Initial report preparation is estimated to take 30 to 60 hours during the start-up period, and updates will take 10 to 30 hours annually.

GIS Database Management

GIS tasks will include the management of survey data submitted by the surveyors (including GPS data), and the preparation of maps and graphics to assist in the data analysis, to be conducted by the land manager, and in the preparation of annual reports and preserve management plans. GIS-related activities are estimated to take 8 hours annually during the start up period and 4 hours thereafter.

CONTINGENCIES AND ADMINISTRATION

This cost estimate includes a provision for contingencies at a rate of 10% of the budgeted expenses to provide a cushion for extra and unforeseen costs. There is also a provision for administrative overhead at 15% to provide for the cost of maintaining an office, office supplies, and administrative staff to assist with paperwork and other administrative costs.

LABOR RATE ASSUMPTIONS

The following table summarizes the labor rate assumptions used for this cost analysis. Labor rates usually vary from organization to organization which should be considered during discussion of this cost analysis. The cost analysis is based on ‘fully burdened’ labor rates, which includes labor costs and overhead to allow for staffing, materials, and equipment.

Position	Hourly Rate*
Land Manager	$100
Plant Ecologist	$90
Entomologist	$90
Herpetologist	$90
Ornithologist	$90
Mammalogist	$90
Biological Supervisor	$160
Laborer	$45
GIS Specialist	$90

* Charge rates, not pay rates - includes benefits, including health care, 3% matching in a 401k, vacation (120 days), sick (40 hours) and paid holidays (72 hours).

ENDOWMENTS

SDG&E will establish "non-wasting" endowments for each mitigation property, based on this cost analysis, to provide for the management and monitoring of biological resource. Start-up costs will be provided through an initial one-time payment into the endowment account. Annual ongoing management costs will be funded through annual interest earned on the endowment principal. It is assumed that the cost of ongoing management will increase by approximately 3.0% annually, based on the average annual U.S. Bureau of Labor Statistics Consumer Price Index inflation rates over the last 20 years (e.g., between 1989 and 2009). The average annual rate of return is estimated to be 5%. The average estimated reinvestment is estimated at 3%. [4]

[4] See footnote 2 and Attachment.

ONAKA PLANNING & ECONOMICS

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November 1, 2010

Mr. Donald E. Haines
Environmental Resource Manager
Sunrise Environmental Services
Sunrise Powerlink Project
8315 Century Park Court, CP21G
San Diego, CA 92123-1548

Re: Sunrise Powerlink Project Environmental Mitigation — Interest Rate Assumptions for Calculating Endowment for On-Going Habitat Management

Dear Mr. Haines:

As requested, I have reviewed the assumptions used to calculate estimated endowment amounts in connection with the Sunrise Powerlink Project environmental mitigation — namely, nominal interest rate of 5% per year and inflation rate of 3%, which is also annual reinvestment rate of the endowment fund, resulting in real interest rate of 2%.[1] This letter examines these assumptions in light of historical experience in the U.S. and in comparison to those employed by the Trustees of the Social Security trust funds in a 75-year actuarial study.

Nominal Interest Rate

Nominal interest rate represents the annual return on endowment investment, assumed to consist primarily of government bonds. Although other types of investment can generate higher returns over short time periods, they are subject to risks which over time will diminish those returns. Returns on bonds can also vary depending on risks associated with future inflation and borrower default. The U.S. Treasury bonds represent the least risk, or safest, investment in the financial market. Since the endowment principal will be kept intact, or only increased to keep pace with inflation, very long-term Treasury bonds can be used, such as 10-, 20-, and 30-year bonds.

From 1970 to 2009, interest rates on 30-year Treasury bonds, averaged over 10-year periods, varied from 5.0% (from 2000 to 2009) to 10.6% (from 1980 to 1989), as shown below. Interest rates on 10-year bonds, also averaged over 10-year periods, varied from 4.5% (from 2000 to 2009) to 10.6%

1. For a nominal interest rate, R_{nom}, and inflation rate, P_{infl}, the real interest rate, R_{real}, or net revenue from endowment after reinvestment for inflation, is $R_{real} = (1 + R_{nom}) / (1 + P_{infl}) - 1$, which may be approximated by $R_{real} \approx R_{nom} - P_{infl}$. To generate a constant annual revenue, M, for habitat management, the required endowment is $E = M / R_{real}$. This assumes that the endowment will grow through annual reinvestment of $\Delta E = E \times P_{infl}$.

(from 1980 to 1989).[2] These rates clearly reflect prevailing economic conditions — high rates during periods of high inflation (which occurred roughly from 1973 to 1982) and low rates during recessions, of which there were two during the 2000s.

Average Interest Rates of 10- and 30-Year
U.S. Treasury Bonds, 1970 to 2009 (Percent)

	1970-79	1980-89	1990-99	2000-09
10-Year U.S. Treasury Bonds	7.5	10.6	6.7	4.5
30-Year U.S. Treasury Bonds	8.5 [1]	10.6	7.0	5.0 [2]

Source: Federal Reserve Board.
1. Average for 1977 through 1979.
2. No 30-year U.S. Treasury bonds were issued from 2003 to 2005.

The 5% nominal interest assumed in planning environmental mitigation for the Sunrise Powerlink Project is consistent with recent historical experience. It may be considered conservative (that is, low), since it is equal to the average interest rate on 30-year Treasury bonds from 2000 to 2002 and from 2006 to 2009, when the U.S. saw two national recessions.

The Board of Trustees of the Social Security trust funds [3] reports annually to the U.S. Congress on the funds' actuarial (financial) status. The latest report was issued in August 2010 (Trustees Report).[4] The actuarial analysis covers a 75-year projection period, over which it makes various assumptions on future demographics and economics, including inflation and interest rates. The Social Security funds are invested in special U.S. Government obligations, and the funds' nominal interest rate is the average interest rate of those securities. Historically, these rates have been very close to those of 10-year Treasury bonds, ranging from 4.5% (from 2000 to 2010) to 10.3% (from 1980 to 1990).

2. Interest rates on longer term bonds are usually higher than those with shorter terms, reflecting the higher inflation risk. Interest rates of 20-year bonds tend to fall in between those of 10- and 30-year bonds.
3. The two Social Security trust funds are the Old-Age, Survivors, and Disability Insurance (OASDI) Fund and the Disability Insurance (DI) Fund. The trustees include the Secretaries of the Treasury, Labor, and Health and Human Services, the Commissioner of Social Security, and others.
4. *2010 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*, Washington, D.C.: USGPO, August 2010.

For this year (2010), the Trustees Report expects the nominal interest rate to stay low (between 3.2% and 3.6% for the high- and low-cost assumptions, respectively).[5] However, it is expected that interest rates will recover by 2012 (to between 5.3% and 6.9%) and that the long-term average will be between 5.4% and 5.9% for the low- and high-cost assumptions, with intermediate-cost assumption of 5.7%. The Social Security funds will be expended as needed, when payroll tax receipts are not sufficient to meet benefit obligations. Accordingly, these funds have a mix of maturities, which allows for future drawdowns. For the environmental mitigation program (where no drawdowns from the endowment are planned to occur), nominal interest rates assumed for the Social Security programs can be considered to be conservative, or low, estimates. The 5% nominal rate assumed for the Sunrise Powerlink Project is even more conservative than those used in the analysis of Social Security funds.

Inflation Rate

Consumer price inflation has varied widely from 1970 to 2010. Inflation was very high by historical standards from 1973 to 1982, peaking at 13.5% on an annual basis in 1980. In response, the Federal Reserve tightened monetary policy and reduced inflation to 3.2% by 1983. Inflation for the 1980-90 period averaged 4.7% per year. It has declined further since then, averaging 2.8% in the 1990s and 2.5% from 2000 through the first half of 2010 (see table below).

Average Annual Inflation Rate by Decade, 1970 to 2010
(Percent)

	1970-80	1980-90	1990-2000	2000-10
CPI (All Urban Consumers - U.S.)	7.8	4.7	2.8	2.5 [1]

Source: U.S. Bureau of Labor Statistics, Consumer Price Index (CPI)
1. Average through first half of 2010.

Over a nearly 40-year period from 1970 to the first half of 2010, inflation has averaged 4.1% per year. However, this is not necessarily a reliable guide to future inflation, which is caused by a combination of excess demand (demand for goods and services exceeding what the economy is capable of supplying) and excess liquidity (loose monetary policy).

An indication of the financial market's expectation of future inflation is shown by comparing the interest rate on long-term (30-year) Treasury bonds and the interest rate on the U.S. Treasury's inflation-indexed bonds, whose principal amount is adjusted to keep pace with inflation, thereby

5. The Trustees Report analyzes three projection scenarios—low-, intermediate-, and high-cost scenarios, with corresponding financial requirements on the Social Security funds.

eliminating the inflation risk. Between February and September 2010, expected long-term inflation rate varied from 2% to 2.6%, as indicated by this comparison.[6]

The Trustees Report on the financial status of Social Security funds also includes assumptions regarding future inflation, ranging from 1.8% to 3.8% per year for the low- and high-cost scenarios, with an intermediate-cost assumption of 2.9% per year.

Thus, the assumed inflation rate of 3% used for the Sunrise Powerlink Project environmental mitigation is higher than the average inflation for the past 20 years and higher than the current financial market's expectation of future inflation. However, it is consistent with the intermediate-cost assumption used for analysis of the Social Security funds.

Real Interest Rate

Although real interest rate can be derived from assumed values of nominal interest rate and inflation, it can also be examined using historical data. For the Social Security funds, the Trustees Report indicates that the real interest rate averaged 2.8% per year over a 40-year period from 1969 to 1998, varying from 0.3% in 1969-78 to 2.2% in 1999-2008.

Average Real Interest Rate on Social Security Trust Funds
1969-2008 (Percent)

	1969-78	1979-88	1989-98	1999-2008
Real Interest Rate on Social Security Trust Funds	0.3	4.5	4.3	2.2

Source: Social Security Board of Trustees, 2010 Annual Report.

It is interesting to note that, although average real interest rate was low during the first years of high inflation, it recovered quickly and was on average high for the next 20 years. More recently, real interest rate has remained below 2%, with a low of 0.6% in 2008, reflecting the substantial slowdown in economic activity.[7]

The Trustees Report projects that the real interest rate will remain low over the next several years. After this initial period, however, the Trustees project real interest rate to average 2.1% to 3.6% for the high- and low-cost scenarios, with intermediate-cost assumption of 2.9%.

6. Data for 30-Year Treasury inflation-indexed bonds are available only since February 2010.
7. Real interest rate for 2009, however, was 4.4%, reflecting additional return, or earnings, from negative inflation, or price deflation. That is, purchasing power of the trust funds increased due to lower consumer prices.

The real interest rate of 2% assumed in the Sunrise Powerlink Project environmental mitigation analysis is close to the recent experience of the Social Security trust funds. However, the Trustees Report does not expect that this condition will continue into the long-term future. That is, in relation to the assumed rate of long-term inflation (3% in the environmental mitigation analysis), assumed nominal interest rate is low, resulting in low real interest rate. It may be noted, however, that the 2% rate is close to that assumed for the high-cost scenario for the Social Security funds.

Summary Comments

In conclusion, the nominal interest rate and inflation rate assumed for the Sunrise Powerlink Project environmental mitigation analysis are consistent with historical experience and market data and comparable to values assumed in the long-term financial analysis of the Social Security funds. In fact, the resulting real interest rate, and the corresponding estimate of endowment is likely to be conservative, that is, it would have a large margin of safety.

It is understood that the Sunrise Powerlink Project would separately fund annual management expenses over an initial period of several years, prior to utilizing net interest income from the endowment fund (that is, after reinvestment for cost inflation). If the endowment were to be funded at the beginning of the initial period, then it would accumulate additional funds at the nominal interest rate. If, however, the endowment were to be funded at the end of the initial period, then it would need to reflect the annual management cost at the time of funding, including any effects of inflation in the intervening period.

If there any questions on the above or related issues, please feel free to contact me at 858-535-1420 or at onakaplanning@gmail.com.

Sincerely,

Onaka Planning & Economics [8]

Jun Onaka, Ph.D.

8. Onaka Planning & Economics (OP/E) prepared financing plans for the subregional habitat conservation plans of MSCP and MHCP in San Diego County, as well as several subarea plans. OP/E also assisted San Diego Association of Governments (SANDAG) in analyzing region-wide funding needs for habitat management and endowment.

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JUN ONAKA, Ph.D.
Fiscal and Economic Analysis and Public Finance

Jun Onaka has over 25 years' experience in conducting planning and economic studies, including fiscal and economic impact studies; demographic and socioeconomic analyses; and financing plans and feasibility studies for infrastructure improvements and public services. He has prepared fiscal and economic impact analyses of master-planned development, highways and public infrastructure improvements, and open space conservation. He has also prepared financing plans for public improvements, including transportation, water and wastewater facilities, education, parks, and open space. Dr. Onaka is the principal of Onaka Planning & Economics (OP/E), a consulting firm specializing in the economics and financing of urban development.

PROJECT EXPERIENCE — SUMMARY

Fiscal and Economic Impact Studies of Public and Private Projects — Onaka Planning & Economics (OP/E) has conducted numerous fiscal impact studies of private master plan developments, with focus on impacts to the general fund budget of the local government within whose jurisdiction the development is to take place. Studies were conducted for the Imperial County and its Local Agency Formation Commission (LAFCO), the cities of Carlsbad, Chula Vista, San Diego, and other jurisdictions.

OP/E has prepared socioeconomic projections and impact analyses pursuant to requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) for public service and infrastructure projects, such as highways, transmission lines, and correctional facilities. OP/E prepared socioeconomic impact and growth inducement studies for the California Department of Transportation (Caltrans) projects, including State Routes (SR) 54, 54/125, 56 and 76. Issues addressed included population, employment, housing, land use, community character, schools, other public services, and growth inducement. OP/E prepared socioeconomic impact analysis for a proposed electric transmission line from Lucerne Valley to Bear Valley in San Bernardino County, proposed by Southern California Edison. OP/E prepared socioeconomic analyses for construction and/or expansion of California Department of Corrections and Rehabilitation facilities in the counties of Kern, Riverside, Imperial and San Diego. OP/E also prepared socioeconomic impact studies for open space management plans (San Luis Obispo County; US Bureau of Land Management; see also regional habitat conservation plan, below).

OP/E assisted San Diego Association of Governments (SANDAG) in the preparation of a regional economic development plan, called Regional Economic Prosperity Strategy, with focus on regional income, employment, and business formation. OP/E has developed new methods of cluster analysis, a method of economic analysis regarding the structure of regional employment.

Regional Habitat Conservation Plans — OP/E prepared financing and economic analyses of regional habitat conservation plans, including the San Diego Multiple Species Conservation Program, the North San Diego County Multiple Habitat Conservation Program, and other plans prepared pursuant to the federal Endangered Species Act and the California Natural Community Conservation

Planning Act. The San Diego Multiple Species Conservation Program (MSCP) is a cooperative regional habitat conservation program of the City of San Diego (Metropolitan Wastewater Department), County of San Diego, and other jurisdictions, covering a 500-square mile area in southwestern San Diego County. OP/E estimated impacts from forecast regional growth, need for public acquisition of habitat land, and costs of land acquisition and habitat management.

The North San Diego County Multiple Habitat Conservation Program (MHCP) is a cooperative regional habitat conservation program by local jurisdictions in north San Diego County and the San Diego Association of Governments. OP/E prepared a financing and acquisition plan and land use and socioeconomic impact analysis for the MHCP. OP/E also completed financing plans for Natural Community Conservation Planning (NCCP) programs for various public agencies, including a consortium of water agencies in San Diego County and the cities of Carlsbad, Oceanside and Rancho Palos Verdes. NCCP was enacted by the California Legislature to foster cooperative conservation efforts by public agencies and private landowners consistent with federal and state Endangered Species Acts.

Public Facility Financing Plans and Feasibility Studies — OP/E prepared financing plans for public facility improvements and feasibility studies for public financing districts (1913/1915 Act assessment districts, Mello-Roos community facilities districts, reimbursement programs for shared infrastructure improvements, and development fee programs) in the cities of Carlsbad, Escondido, and San Diego. Facilities addressed by these plans and studies include arterial streets, drainage, water, wastewater, school facilities, and habitat conservation. OP/E has worked primarily with private entities engaged in planning and construction of major offsite infrastructure facilities using public financing. OP/E has also worked extensively with those firms to implement the terms of public financing districts, including reimbursements of design, field, and construction costs expended for district improvements.

Infrastructure and Public Facilities Planning — OP/E prepared analysis and projections of regional infrastructure services needed to support forecast growth in the San Diego region, as part of the Regional Comprehensive Plan for San Diego, prepared by San Diego Association of Governments (SANDAG).

PROFESSIONAL HISTORY

Onaka Planning & Economics, La Jolla, CA — Principal — 1991-Present
P&D Technologies, Inc. (previously PRC Engineering; currently P&D Consultants, a company of TCB/AECOM), San Diego, CA — Senior Project Manager — 1983-1991
Carnegie-Mellon University, Pittsburgh, PA — Assistant Professor of Urban and Regional Planning — 1980-1983

EDUCATION

Ph.D., Urban Planning, University of California at Los Angeles
A.B. (Magna Cum Laude), Applied Mathematics in Economics, Harvard University

Lightner Start Up Costs (First Five Years)

* Acreage for parcel is exclusive of substation

Facilities Maintenance/Access Control

	Specification	Unit	No. Units	Cost/Unit	Frequency (for 5 years)	Total 5-Yr Cost	Annual Cost (Total divided by 5 Yrs)	Assumptions	Comments
Fencing	Smooth strand wire or chain link	Linear Ft.	100	$15.00	1	$1,500.00	$300.00	initial installation of 100 linear feet	
Vehicle Barrier	Concrete Bollards	Item	4	$75.00	1	$300.00	$60.00	Targeted for access points into the preserve. 4 bollards per gate	
Gates	16 ft. Swinging Arm	Item	1	$5,000.00	1	$5,000.00	$1,000.00	Targeted for access points into the preserve.	
Sign - initial installation	Boundary 8" x 13.5	Item	10	$15.00	1	$150.00	$30.00	Average cost for signs. Sign types: boundary, regulations, habitat restoration. One-time cost for initial installation (10 signs).	
Sign - replacement	Boundary 8" x 13.5	Item	2	$15.00	4	$120.00	$24.00	Average cost for signs. Sign types: boundary, regulations, habitat restoration. Replacement of 20% annually for the remaining 4 years.	
SUBTOTAL CAPITAL IMPROVEMENTS						***$7,070.00***	***$1,414.00***		

Biological Inventory (Baseline Surveys)

	Specification	Unit	No. Units	Labor rate	Frequency (for 5 years)	Total Cost	Annual Cost (Total divided by 5 Yrs)	Assumptions	Comments
Land Manager	General condition monitoring and wildlife habitat assessment	Acres	705.86	$100.00	5	$35,293.00	$7,058.60	One visit annually to identify threats to habitat and species (comprehensive). 100 acres/day; 10 hour days (=10 acres/hour)	**Formula:** Total Cost = (total acres/acres per hour) * (labor cost per hour) * (number of surveys in 5 year period).
Plant Ecologist	Vegetation communities and Invasive species mapping	Acres	705.86	$90.00	5	$42,351.60	$8,470.32	Baseline mapping of vegetation communities and invasive species; 7.5 acres/hour; to be updated annually	**Formula:** Total Cost = (total acres/acres per hour) * (labor cost per hour) * (number of surveys in 5 year period).
Botanist	Felt-leaved monardella	L. Hours	10	$90.00	2	$1,800.00	$360.00	Survey populations of felt-leaved monardella in two locations twice during start-up period; assess the condition of the population and surrounding habitat. Estimated time: 10 hours, including travel.	
Entomologist	Quino checkerspot/hermes butterflies	Acres	22.5	$90.00	3	$18,225.00	$3,645.00	Surveys for Quino and Hermes butterflies will be conducted by walking transects during 5 weekly visit; 3 hrs per visit; every other year	**Formula:** Total Cost = (total acres) * (labor cost per hour) * hrs/visit* (number of survey visits in 5 year period).
Surveyors	Data entry, analysis and reporting	N/A	N/A	N/A	N/A	$24,417.40	$4,883.48	(25%) * (total survey effort)	**Formula:** 25% of time spent for (general condition monitoring; mapping, and species surveys)
SUBTOTAL BIOLOGICAL MONITORING						***$122,087.00***	***$24,417.40***		

Habitat/Land Management

* or cost per unit

	Specification	Unit	No. Units	Labor rate*	Frequency (for 5 years)	Total Cost	Annual Cost (Total divided by 5 Yrs)	Assumptions	Comments
Exotic Plant Control	Difficult to remove species (palms, Eucalyptus trees, artichoke thistle)	Acres	35	$64.00	5	$11,200.00	$2,240.00	25 acres/crew day; $1,600 per crew day (5 laborers/crew, $64/ hour labor cost; plus equipment cost); 5% of total property. Mowing, herbicide treatment, hand removal, debris removal, etc. Yearly treatment first 5 years.	**Formula:** Total Cost = (5% total acres/25 ac per crew day) * (labor cost per crew day) * (no. treatments in 5 year period).
Exotic Plant Control	Other species, labor	Acres	35	$45.00	5	$31,500.00	$6,300.00	$45/hour for each laborer; 0.25 acre/hour; 5% of total property per year. Cal-IPC high and moderate risk species.	**Formula:** Total Cost = (5% total acres/0.25 ac per hour) * (labor cost per hour) * (no. treatments in 5 year period).
Erosion Control	Materials	Acres	14	$600.00	1	$8,400.00	$1,680.00	Gravel bags (250 @ $1/bag), fiber rolls and stakes (12 @ $28/roll), silt fencing (500 ft @$25/100 ft roll) = $600/acre per 5 years, 2% property.	**Formula:** Total Cost = 2% total acres * cost per acre * no. treatments in 5 year period.
Erosion Control/ Road Maintenance	Labor	Acres	35	$45.00	5	$63,000.00	$12,600.00	$45/hour for each laborer; 8 labor hours/acre; 5% of property per 5 years	**Formula:** Total Cost = (5% total acres/acres per hr) * labor cost per acre * no. treatments in 5 year period.
Trash Removal	Trash Hauling-load	Acres	7	$100	1	$700.00	$140.00	$100/acre every 5 years for 1% of total property	**Formula:** 1% total acres * cost per acre * frequency
Habitat Remediation	Minor habitat restoration of decommissioned roads and degraded areas.	Acres	14	$1,000	1	$14,000.00	$2,800.00	$1000/acre; 2% of total property per 5 years (eg. minor habitat remediation may include soil decompacting, seeding with native seeds by hand or imprinting, raking, soil preparation, etc.). Includes labor cost and materials. Preparation of a restoration plan and project management is not included in this cost.	**Formula:** Total Cost = (2% total acresr) * (cost per acre) * no. treatments in 5 year period.
Habitat Management - all tasks	Supervision by qualified biologist	L. Hours	10	$160.00	5	$8,000.00	$1,600.00	A qualified biologist will monitor management activities in areas occupied by, or suitable for, listed species. Approximately 10 hours annually.	**Formula:** Total Cost = (number of hours) *(labor cost per hour) * (annually for 5 year period).
SUBTOTAL BIOLOGICAL MANAGEMENT						***$136,800.00***	***$27,360.00***		

Plan/Reporting

	Specification	Unit	No. Units	Labor rate	Quantity (for 5 years)	Total Cost	Annual Cost (Total divided by 5 Yrs)	Assumptions	Comments
Land Manager	Annual Reporting and Coordination	L. Hours	20	$100.00	5	$10,000.00	$2,000.00	Preparation of annual report, to include threats assessment, work plan, budget plan, and status of endowment.	**Formula:** hrs to prepare report * labor rate * frequency
Land Manager	Prepare and update management plan	L. Hours	40	$100.00	3	$12,000.00	$2,400.00	Using results from general condition monitoring and invasive species mapping, prepare and update management plan. Will include threats assessment, prioritization, and work plan. Assumes plan completed in year 3 and updated in years 4 and 5. Some interim land management will occur in years 1 and 2.	**Formula:** hrs to prepare plan * labor rate * frequency
GIS Specialist	GIS Database Management and reporting	L. Hours	8	$90.00	5	$3,600.00	$720.00	Data management and produce figures for annual report.	**Formula:** hrs required for GIS work * labor rate * frequency
SUBTOTAL REPORTING						***$25,600.00***	***$5,120.00***		

TOTAL	$291,557.00	$58,311.40

Contingencies/ Administration

	Total costs	% of Total				Total Cost	Annual Cost (Total divided by 5 Yrs)	Assumptions	Comments
Contingencies	$291,557.00	10				$29,155.70	$5,831.14		
Administrative Overhead	$291,557.00	15				$43,733.55	$8,746.71	Accountants, technical, clerical, contract managers, lawyers, etc.	
SUBTOTAL CONTINGENCIES/ADMINISTRATION						***$72,889.25***	***$14,577.85***		

	Total Cost	Annual Cost (Total divided by 5 Yrs)
GRAND TOTAL	**$364,446.25**	**$72,889.25**

Lightner Annual Cost In-Perpetuity

Facilities Maintenance/Access Control

	Specification	Unit	No. Units	Cost/Unit	Quantity	Total Annual Cost	Assumptions	Comments
Fencing	Smooth strand wire or chain link	Linear Ft.	10	$15.00	1	$150.00	Annual replacement of 10% of fencing installed during start-up (100)	
Vehicle Barrier	Concrete Bollards	Linear Ft.	4	$75.00	0.1	$30.00	maintenance incudes replacement every 10 years	
Gates	16 ft. Swinging Arm	Item	1	$5,000.00	0.05	$250.00	Targeted for access points into the preserve. To be replaced every 20 years.	
Sign	Boundary 8" x 13.5	Item	2	$15.00	1	$30.00	Average cost for signs. Signs types: boundary, regulations, habitat restoration. Aprox. Five signs per property. Replacement at 20% per year.	**Formula:** Total Cost = (total number of signs per property) * (cost per sign) * (number of years installation is needed)
SUBTOTAL CAPITAL IMPROVEMENTS						***$460.00***		

Biological Monitoring

Note: in general, these estimates do not include travel time or field prep

	Specification	Unit	No. Units	Cost/Unit	Frequency	Total Cost	Assumptions	Comments
Land Manager	General condition monitoring and wildlife habitat assessment	Acres	705.86	$100.00	1	$7,058.60	One visit annually to identify threats to habitat and species (comprehensive). 100 acres/day; 10 hour days (=10 acres/hour)	**Formula:** Total Cost = (total acres/acres per hour) * (labor cost per hour) * (frequency).
Plant Ecologist	Update of vegetation communities and Invasive species mapping	Acres	705.86	$90.00	0.33	$2,795.21	Update mapping of vegetation communities and invasive species every three years; 7.5 acres/hour.	**Formula:** Total Cost = (total acres/acres per hour) * (labor cost per hour) * (frequency).
Entomologist	Quino checkerspot/cermes butterflies	Acres	22.5	$90.00	0.33	$2,004.75	Surveys for Quino and Hermes butterflies will be conducted by walking transects during 5 weekly visits. 3 hrs/visit; every three	**Formula:** Total Cost = (total acres) * (labor cost per hour) * hrs/survey*(number of survey visits in 5 year period).
Land Manager	Data entry, analysis and reporting	N/A	N/A	N/A	N/A	$2,964.64	(25%) * Data entry and reporting effort estimated at aproximately 25% of the total survey effort required for the property.	**Formula:** 25% of time spent for (general condition monitoring; mapping, and species surveys)
SUBTOTAL BIOLOGICAL MONITORING						***$14,823.19***		

Habitat/Land Management

	Specification	Unit	No. Units	Labor Rate	Frequency	Total Cost	Assumptions	
Exotic Plant Control	Difficult to remove species (palms, Eucalyptus trees, artichoke thistle)	Acres	7	$64.00	0.33	$147.84	25 acres/crew day; $1,600 per crew day (5 laborers/crew, $64/ hour labor cost; plus equipment cost); 1% of total property. Mowing, herbicide treatment, hand removal, debris removal, etc. Treatment every 3 yrs.	**Formula:** Total Cost = (1% total acres/25 ac per crew day) * (labor cost per crew day) * (frequency).
Exotic Plant Control	Other species, Removal by Laborers	Acres	7	$45.00	1	$315.00	$45/hour for each laborer; 1 acre/hour; 1% of total property per year. Cal-IPC high and moderate risk species.	**Formula:** Total Cost = (1% total acres/1 ac per hour) * (labor cost per hour) * (frequency).
Erosion Control	Materials	Acres	7	$600.00	0.33	$1,386.00	Gravel bags (250 @ $1/bag), fiber rolls and stakes (12 @ $28/roll), silt fencing (500 ft @$25/100 ft roll) = $600/acre per 5 years, 1% property every 3 years.	**Formula:** Total Cost = 1% total acres * cost per acre * frequency.
Erosion Control/ Road Maintenance	Labor	Acres	35	$45.00	1	$1,575.00	$45/hour for each laborer; 5 acres/hour; 5% of property annually	**Formula:** Total Cost = (5% total acres/acres per hr) * labor cost per acre * frequency
Trash Removal	Trash Hauling	Acres	7	$100.00	1	$700.00	$100/acre annually for 1% of total property annually	**Formula:** 1% total acres * cost per acre * frequency
Habitat Remediation	Minor restoration due to erosion, unauthorized access, etc.	Acre	7	$300.00	0.33	$307.33	$300/acre; 1% of total property per 3 years (eg. minor habitat remediation may include seeding with native seeds, raking, soil preparation, etc.). Preparation of a restoration plan and project management is not included in this cost.	**Formula:** Total Cost = (1% total acres) * cost/acre* frequency
Habitat Management - all tasks	Supervision by qualified biologist	L. Hours	10	$160	1	$1,600.00	A qualified biologist will monitor management activities in areas occupied by, or suitable for, listed species. Approximately 10 hours annually.	**Formula:** Total Cost = (number of hours) *(labor cost per hour) * (frequency).
SUBTOTAL BIOLOGICAL MANAGEMENT						***$6,031.17***		

Plan/Reporting

	Specification	Unit	No. Units	Labor Rate	Frequency	Total Cost	Assumptions	Comments
Preserve Manager	Annual Reporting and Coordination	L. Hours	10	$100.00	1	$1,000.00	Preparation of annual report, to include threats assessment, work plan, budget plan, and status of endowment.	**Formula:** hrs to update report * labor rate * frequency
Land Manager	Update management plan	L. Hours	20	$100.00	1	$1,000.00	Using results from general condition monitoring and invasive species mapping, prepare and update management plan. Will include threats assessment, prioritization, and work plan. Every other year.	**Formula:** hrs to update plan * labor rate * frequency
GIS Specialist	GIS Database Management and reporting	L. Hours	4	$90.00	1	$360.00	Data management and produce figures for annual report.	**Formula:** hrs required for GIS work * labor rate * frequency
SUBTOTAL REPORTING						***$2,360.00***		

TOTAL	$23,674.36

Contingencies/ Administration

	Total costs	% of Total				Total Cost	Assumptions	Comments
Contingencies	$23,674.36	10				$2,367.44		
Administrative Overhead	$23,674.36	15				$3,551.15	Accountants, technical, clerical, contract managers, lawyers, etc.	
SUBTOTAL CONTINGENCIES/ADMINISTRATION						***$5,918.59***		

GRAND TOTAL	**$29,592.96**

ENDOWMENT NEEDED **$1,479,647.78** Assume 5% return on investment and 3.0% inflation yearly

Appendix D

Detailed Mitigation Implementation Cost Estimate to Support Financial Assurances

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

	HMMP Implementation, Maintenance, and Monitoring Costs				**Total Cost**	**20% Contingency Cost per Item**
	Implementation Costs					
	1.0	Mobilization	1.1	Mobilization	$30,687	$6,137
			1.2	Topsoil Salvage - Substation	$13,600	$2,720
				Subtotal	**$44,287**	**$8,857**
	2.0	Road Crossing Removal & Stream Restoration in NE (Sites 1 and 8)	2.1	Road Crossing Removal - ephemeral	$7,000	$1,400
			2.2	Total Cut Volume	$5,802	$1,160
			2.3	Total Fill Volume	$540	$108
			2.4	Net Material	$3,947	$789
			2.5	Topsoil w/seed bank	$1,299	$260
			2.6	Seeding	$427	$85
			2.7	Erosion Control Measures	$610	$122
				Subtotal	**$19,625**	**$3,925**
	3.0	Road Crossing Removal & Restoration of the Stream Channel above the SW grassland (Site 2-A)	3.1	Total Cut Volume	$322	$64
			3.2	Total Fill Volume	$1,073	$215
			3.3	Net Material	$563	$113
			3.4	Topsoil w/seed bank	$887	$177
			3.5	Seeding	$292	$58
			3.6	Erosion Control Measures	$417	$83
				Subtotal	**$3,554**	**$711**
	4.0	Road Crossing Removal & Restoration of the Stream Channel west of the stock pond (Site 2-B)	4.1	Total Cut Volume	$9,873	$1,975
			4.2	Total Fill Volume	$48,782	$9,756
			4.3	Net Material	$29,182	$5,836
			4.4	Topsoil w/seed bank	$1,735	$347
			4.5	Seeding	$570	$114
			4.6	Erosion Control Measures	$815	$163
				Subtotal	**$90,957**	**$18,191**
	5.0	Removal of Abandoned Roads & Road Stream Crossing - East of the Substation (Site 11)	5.1	Total Cut Volume	$6,481	$1,296
			5.2	Total Fill Volume	$5,741	$1,148
			5.3	Net Material	$556	$111
			5.4	Topsoil w/seed bank	$8,387	$1,677
			5.5	Seeding	$2,757	$551

			5.6	Erosion Control Measures	$3,938	$788
				Subtotal	**$27,860**	**$5,572**
6.0	Removal and Alteration of Dams to Restore/Enhance Streams (Site 3)	6.1		Total Cut Volume	$37,017	$7,403
		6.2		Total Fill Volume	$4,748	$950
		6.3		Net Material	$24,202	$4,840
		6.4		Topsoil w/seed bank	$1,291	$258
		6.5		Seeding	$424	$85
		6.6		Erosion Control Measures	$606	$121
				Subtotal	**$68,288**	**$13,658**
7.0	Removal of Non-native and Invasive Plant Species	7.1		Removal of Non-Native Invasive Plants within Enhanced Stream Channels	$18,150	$3,630
		7.2		Removal of Non-Native Invasive Plants within Specific Locations	$300	$60
				Subtotal	**$18,450**	**$3,690**
8.0	Enhancement of Wetland & Riparian Vegetation	8.1		Live Oak Woodland Plantings	$5,500	$1,100
		8.2		Mixed Chaparral Plantings	$11,000	$2,200
		8.3		Mixed Oak/Riparian Plantings	$52,000	$10,400
		8.4		Seasonal Wetland & Riparian Buffer Plantings	$124,000	$24,800
		8.5		Irrigation	$192,500	$38,500
				Subtotal	**$385,000**	**$77,000**
Maintenance Costs						
9.0	Interim Maintenance (1-5 Years)	9.1		Adaptive management - weed removal	$87,500	$17,500
		9.2		Adaptive management - Replacement plantings	$250,000	$50,000
		9.3		Trash Removal	$730	$146
				Subtotal	**$338,230**	**$67,646**
Monitoring Costs						
10.0	Monitoring (1-5 Years)	10.1		Erosion Monitoring	$50,000	N/A
		10.2		Wildlife Biologist Monitoring	$272,922	N/A
				Subtotal	**$322,922**	**$0**
				Sum of all Subtotals	**$1,319,173**	**$199,250**

Ongoing Management of Entire Mitigation Property		Ongoing Management of the Mitigation Site			**Annual Cost**	**25% Contingency/ Admin Cost per Item**
		Start-up Funding (5 years)		Annual Labor and Materials	$58,311	$14,578
				Total for Start-up Management	**$364,446**	
	1.0	Facilities Maintenance/Access Control	1.1	Fencing	$150	$38
			1.2	Vehicle Barrier	$30	$8
			1.3	Gates	$250	$63
			1.4	Sign	$30	$8
				Subtotal	**$460**	**$115**
	2.0	Biological Monitoring	2.1	Land Manager - monitoring	$7,059	$1,765
			2.2	Plant Ecologist	$2,795	$699
			2.3	Entomologist	$2,005	$501
			2.4	Land Manager-data entry	$2,965	$741
				Subtotal	**$14,824**	**$3,706**
	3.0	Habitat/Land Management	3.1	Exotic Plant Control - difficult spp.	$148	$37
			3.2	Exotic Plant Control - other spp.	$315	$79
			3.3	Erosion Control - materials	$1,386	$347
			3.4	Erosion Control/Road Maintenance - labor	$1,575	$394
			3.5	Trash Removal	$700	$175
			3.6	Habitat Remediation	$307	$77
			3.7	Habitat Management - all tasks	$1,600	$400
				Subtotal	**$6,031**	**$1,508**
	4.0	Plan/Reporting	4.1	Preserve Manager	$1,000	$250
			4.2	Land Manager	$1,000	$250
			4.3	GIS Specialist	$360	$90
				Subtotal	**$2,360**	**$590**
				Annual Management after Start-up	**$23,675**	**$5,919**
				Endowment*	**$1,479,648**	
				MANAGEMENT TOTAL	**$1,844,094**	

* See Appendix C for assumptions.

Appendix E

Title Report, County Assessor's Parcel Map, Phase One Environmental Assessment Report, Plat Map, and Williams Act/Farmland Security Zone Contracts

Provided in Hardcopy of HMMP