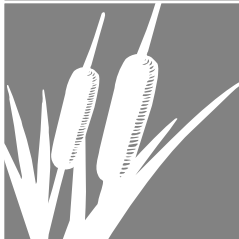


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**Dudek, Conceptual Wetlands Mitigation and Monitoring Plan,  
Vista Canyon, Los Angeles County, California (May 2009)**



Conceptual Wetlands Mitigation & Monitoring Plan

# Vista Canyon

Los Angeles County, California



MAY 2009

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**CONCEPTUAL WETLAND MITIGATION  
AND MONITORING PLAN  
VISTA CANYON  
LOS ANGELES COUNTY, CALIFORNIA**

*Prepared for:*

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**MAY 2009**

# Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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## **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon**

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# Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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## EXECUTIVE SUMMARY

This Conceptual Wetland Mitigation and Monitoring Plan (CWMMP) for Vista Canyon addresses the on-site wetlands restoration and enhancement for impacts to jurisdictional waters and riparian habitat resulting from implementation of the Vista Canyon mixed-use development project, located within the Santa Clarita Valley of unincorporated Los Angeles County. The project proponent is annexing the site into the City of Santa Clarita (City). Mitigation management and monitoring activities within the Vista Canyon project area will be subject to future mitigation requirements as part of the local planning and environmental review process through the City, as the lead agency for the proposed project. In addition, the proposed project will require subsequent federal and state permitting from responsible agencies, including the California Department of Fish and Game (CDFG), for a streambed alteration agreement required by Fish and Game Code section 1600, et seq., and the U.S. Army Corps of Engineers (ACOE), for a section 404 permit, as well as consultation with the Regional Water Quality Control Board (RWQCB). This plan will be used to address the mitigation requirements of these local, state, and federal agencies.

The Vista Canyon project area encompasses approximately 185 acres, located south and east of State Route 14 (SR-14), north of Lost Canyon Road and west of Sand Canyon Road in unincorporated Los Angeles County, directly adjacent to the City (Figures 1–3; Thomas Guide map page 4552, map grid B-3). SR-14 forms the northern boundary of the project area and provides the bulk of regional access to the area via the Interstate 5 (I-5)/SR-14 interchange. The project area is surrounded by existing development (Figure 2). The project area includes a reach of the Santa Clara River, which is under the jurisdiction of the ACOE and CDFG. This reach is generally dry except after periods of heavy rainfall, generally occurring during the winter months.

The project applicant is proposing to develop the project area with a mixed-use development consisting of up to 1,350 residential units and up to 950,000 square feet of commercial uses. Flood protection for the project area would be provided through installation of buried bank stabilization. Development of the project area would provide opportunities for riparian restoration and enhancement along a portion of the Santa Clara River.

This CWMMP addresses the restoration and enhancement of riparian/riverine vegetation communities as mitigation for impacts to wetlands and riparian habitat. The location and type of restoration includes revegetation of temporary impact areas following construction of buried bank stabilization on the north and south margins of the Santa Clara River. Enhancement areas include the entire Santa Clara riverbed and the slopes for the buried bank stabilization. The



## **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon Ranch**

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proposed project also would be required to remove existing flood revetment structures from the Santa Clara River and control invasive plant species.

To ensure that the restoration and enhancement areas within the project site develop as intended and meet success criteria required by permitting agencies, a five-year maintenance and monitoring period would be implemented. This plan defines project goals and implementation, and provides monitoring and maintenance information designed to attain the intended mitigation results.

# **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon**

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## **1.0 DESCRIPTION OF PROJECT**

This CWMMP addresses the on-site wetlands restoration and enhancement for impacts to jurisdictional waters and riparian habitat resulting from implementation of the proposed Vista Canyon project. Mitigation management and monitoring activities within the Vista Canyon project area will be subject to future mitigation requirements as part of the local planning and environmental review process through the City, as the lead agency for the proposed project. In addition, the proposed project will require subsequent federal and state permitting from responsible agencies, including CDFG, for a streambed alteration agreement required by Fish and Game Code section 1600, et seq., and ACOE, for a section 404 permit, as well as consultation with the RWQCB. This plan will be used to address the mitigation requirements of these local, state, and federal agencies.

### **1.1 Applicant/Permittee**

Vista Canyon Ranch, LLC (Vista)  
27451 Tourney Road, Suite 100  
Valencia, California 91355

### **1.2 Responsible Parties**

Dudek prepared this CWMMP, which will be part of the Environmental Impact Report (EIR) for the proposed Vista Canyon project. If the project is approved, Vista will be financially responsible for the costs associated with the implementation, monitoring, maintenance, and protection of mitigation areas as defined in this plan. Vista also will be responsible for all costs associated with completion of the mitigation requirements herein. Further, Vista will provide access to the mitigation area for habitat restoration specialists, project contractors, and permitting agency officials.

If the project is approved, the City will select a qualified Habitat Restoration Specialist to implement mitigation installation, monitoring, and long-term maintenance of the mitigation area. Vista will be responsible for the costs associated with this effort. The Habitat Restoration Specialist, in coordination with City and Vista, will review all aspects of the pertinent contract documents including, but not limited to, site protection, submittal, scheduling of formal site observations, lines of communication, and persons with stop work authority prior to project implementation. The Habitat Restoration Specialist will oversee and coordinate implementation of this conceptual plan, including final construction drawings, interpret said plans, conduct or oversee field work for project installation and monitoring during the 120-day initial maintenance period, and biological monitoring throughout the five-year maintenance and monitoring period.

## **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon**

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The Habitat Restoration Specialist will possess specific knowledge and project-level experience with wetlands restoration and enhancement projects, and at least three years of wetlands restoration experience in Southern California.

The Habitat Restoration Specialist also will be required to advise all project personnel of the on-site construction restrictions resulting from the proposed implementation of this plan, and the presence or potential presence of sensitive species and vegetation communities within or adjacent to the project area, as well as known biological related dangers on site (e.g., rattlesnakes, bee-hives, poison oak, etc.). Information about federal, state, and local laws relating to these biological resources will be discussed as part of the personnel education. Access and staging areas outside of environmentally sensitive areas will be established. Project installation monitoring will occur throughout the mitigation site construction period. Monitoring time may increase or decrease as required by field conditions and construction activities.

Vista will hire a project installation contractor and/or maintenance contractor (Restoration Contractor). The Restoration Contractor will be a qualified, licensed company, preferably with experience in wetlands restoration creation and maintenance. During the implementation phase, the Restoration Contractor will be responsible for performing project installation, including irrigation, seeding, planting, mulch installation, erosion control and other tasks as directed by the Habitat Restoration Specialist and as described in this plan. During the long-term monitoring phase, the Restoration Contractor will be responsible for maintenance of the irrigation system, weed control, erosion control, trash removal, replanting, and other tasks as directed by the Habitat Restoration Specialist and as described in this plan.

### **1.3 Project Information**

The Vista Canyon project area encompasses approximately 185 acres. The project applicant is proposing to develop the project area as a mixed-use development consisting of up to 1,350 residential units and up to 950,000 square feet of commercial uses. Flood protection for the project area would be provided through installation of buried bank stabilization.

The project area is surrounded by existing development. The project area includes a reach of the Santa Clara River, which is under the jurisdiction of the ACOE, CDFG, and RWQCB.

# Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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## 1.4 Project Location

The project site is located south and east of SR-14, north of Lost Canyon Road and west of Sand Canyon Road in unincorporated Los Angeles County, directly adjacent to the City (Figures 1–3; Thomas Guide map page 4552, map grid B-3). SR-14 forms the northern boundary of the project area and provides the bulk of regional access to the area via the I-5/SR-14 interchange. Site elevations range from approximately 1,470 feet above mean sea level (AMSL) to approximately 1,580 feet AMSL.

## 1.5 Functions and Values of Jurisdictional Areas to be Impacted

The functions and values of jurisdictional areas to be impacted were evaluated based on a combination of quantitative measures and qualitative evaluations. Resources used to evaluate the existing functions and values included a California Rapid Assessment Method (CRAM) analysis conducted by Dudek (2009), information from the *Biological Assessment Vista Canyon Ranch* (Forde and Read 2008), and a site assessment conducted by Dudek.

### 1.5.1 CRAM Analysis of Functions and Values

As part of the technical reports for the EIR, Dudek conducted a wetland functional assessment for the proposed Vista Canyon project using the most recent version of the *CRAM for Wetlands*, version 5.0.2 (Collins et al. 2008). The purpose of the CRAM was to evaluate the existing wetland functions and values within the project area compared to achievable wetlands functions/values after implementation of the proposed on-site development design.

CRAM was designed as a scientifically defensible and repeatable assessment methodology that can be used routinely to assess and monitor the condition of wetlands and riparian habitats. CRAM was developed through collaborations among the San Francisco Estuary Institute (SFEI), the Southern California Coastal Water Research Project, the Central Coast District of the California Coastal Commission, and the Moss Landing Marine Laboratory. Funding was provided mainly by the Environmental Protection Agency (EPA) through Clean Water Act Section 104b(3) grants administered by EPA Region 9.

CRAM provides a means of assessing wetland conditions based on field observations that correlate to quantitative measures of wetland function, condition, or beneficial use that vary predictably along gradients of environmental stress. Stressors such as habitat conversion, biological invasion, hydro-modification, and pollution are anthropogenic causes of changes in wetland function.

## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

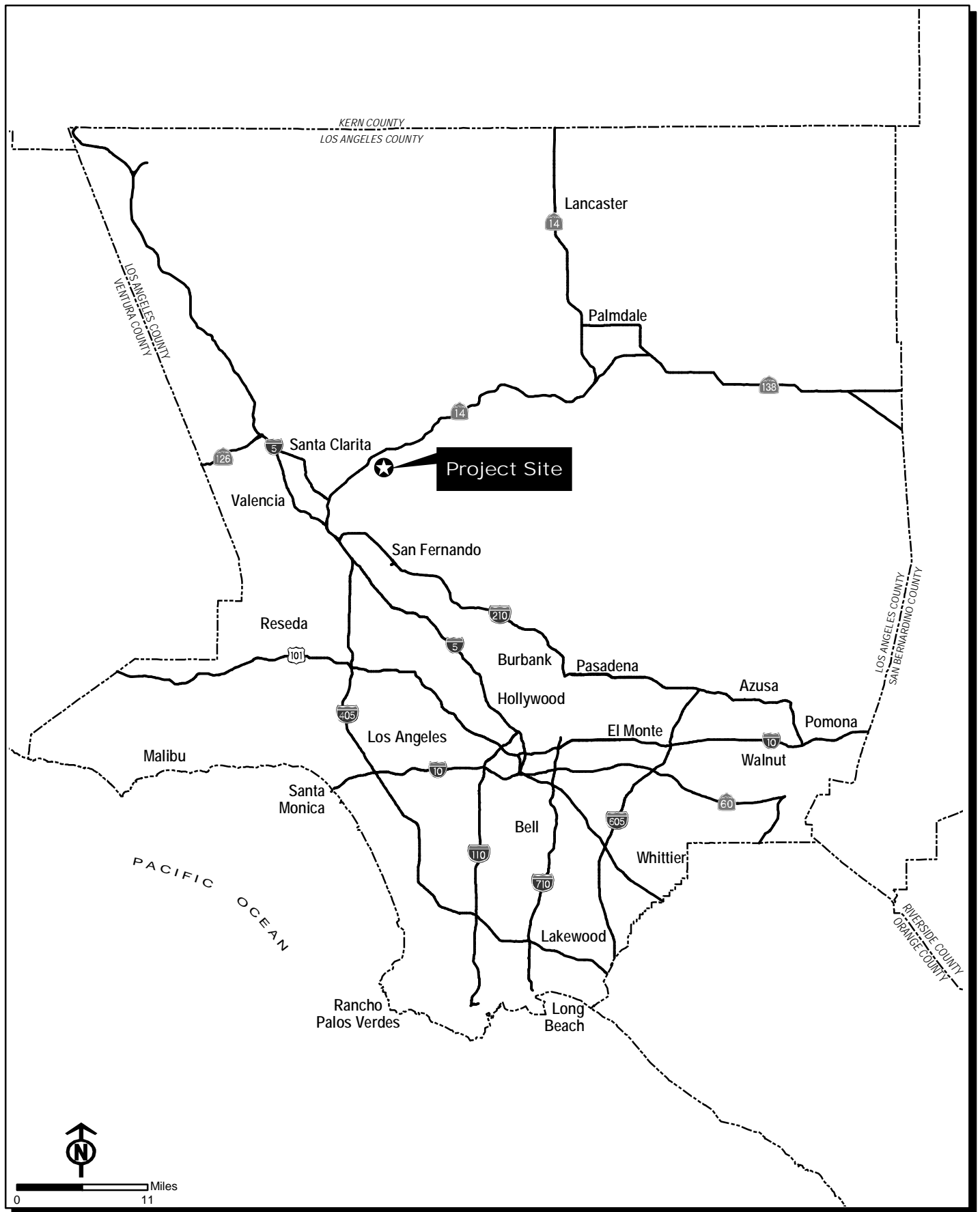
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CRAM scores are based on best-fit narrative descriptions of habitat condition among a standardized set of mutually exclusive descriptions. Each wetland class has a particular set of narrative descriptions that allow comparison of CRAM scores within a wetland class, but not between classes for local, regional, and statewide monitoring purposes. Specific details about the methodology used to conduct the CRAM analysis is found in the *California Rapid Assessment Methodology Report for the Vista Canyon Ranch Property* (Dudek 2009).

Results of the CRAM analysis for Vista Canyon were quantified according to the CRAM guidelines. Each final attribute score has a potential maximum value of 1.00. The Buffer and Landscape Context attribute had a final average score of 0.87, Hydrology a final average score of 0.84, Physical Structure a final average score of 0.79, and Biotic Structure a final average score of 0.43 (Dudek 2009). The overall CRAM score for each of the three assessment areas was calculated by averaging the four final attribute scores, and then rounding to the nearest whole integer. The total overall CRAM score can range from 0.25 to 1.00. The total overall CRAM average score was 0.74.

### 1.5.2 Qualitative Analysis of Functions and Values

Based on the *Biological Assessment Vista Canyon Ranch* (Forde and Read 2008), the project site supports a variety of vegetation communities on site, including Fremont Cottonwood – Willow Riparian Forest, Fremont Cottonwood – Riparian Scrub, Coast Live Oak Series, Riparian Scrub (active floodplain), Alluvial Scrub (terrace), Mulefat Series, Rabbitbrush Series, Big Sagebrush – Buckwheat Series, California Sagebrush – Buckwheat Series, Chamise Series, Scalebroom Series, Wild Rye – Saltbush Scrub, Saltgrass Series, Non-Native Annual Grassland – Ruderal, and Ruderal (Forde and Read 2008). Details about the characteristics of these vegetation communities are found in the *Biological Assessment Vista Canyon Ranch* (Forde and Read 2008). Specifically, the jurisdictional vegetation communities that will be impacted by the proposed project include Riparian Scrub (active floodplain) and Alluvial Scrub (terrace). Vegetation communities on the project site have been subject to repeated disturbance from utility construction and maintenance, illegal dumping, unauthorized off-road vehicle activity, flood management activities, and natural fluvial processes characteristic of the Santa Clara River floodplain. Consequently, vegetation communities throughout the majority of the site are either disturbed or in an early successional state.



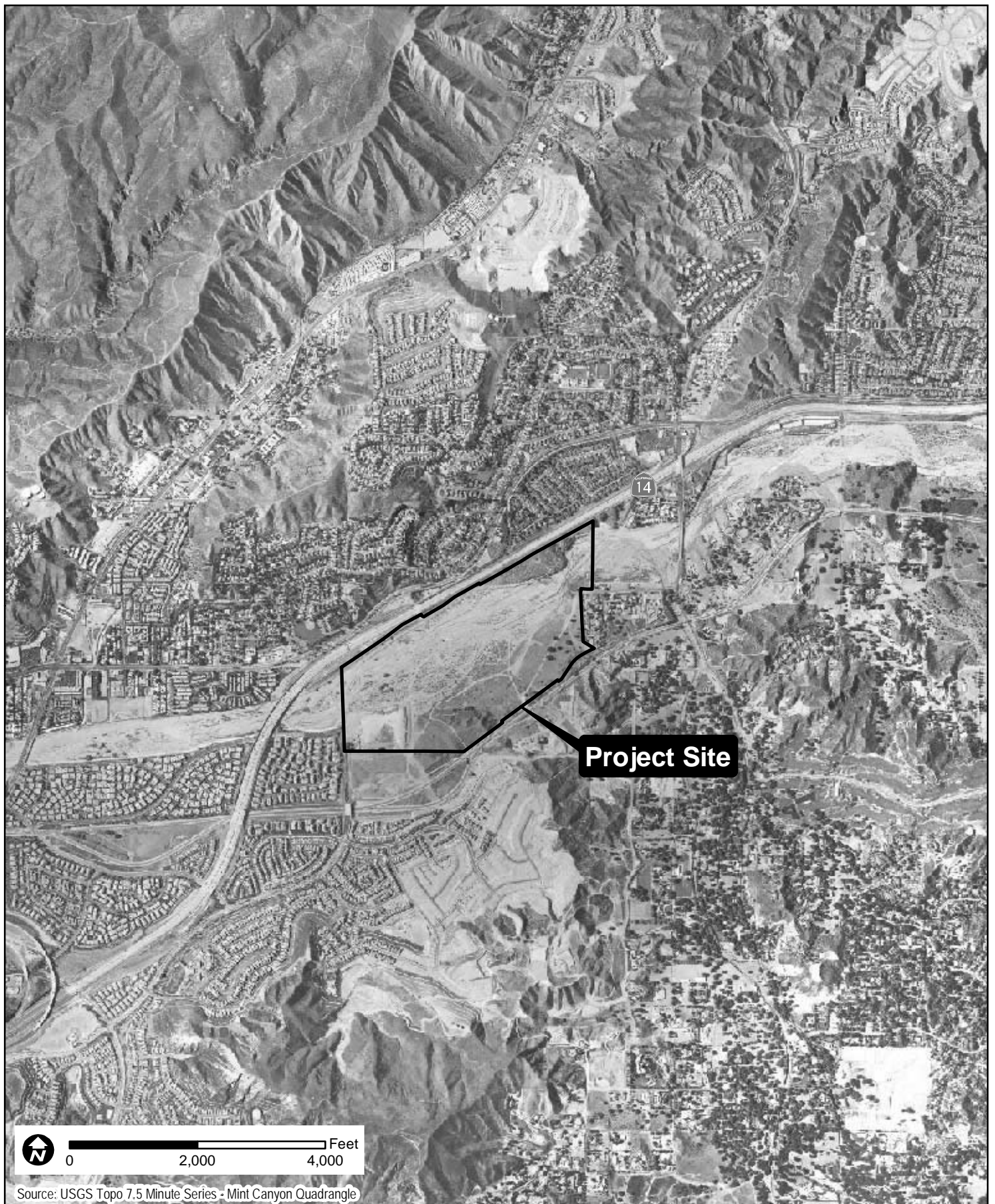
Vista Canyon Conceptual Wetland Mitigation and Monitoring Plan  
**Regional Map**

**FIGURE**  
**1**

## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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Vista Canyon Conceptual Wetland Mitigation and Monitoring Plan  
**Vicinity Map**

**FIGURE**  
**2**

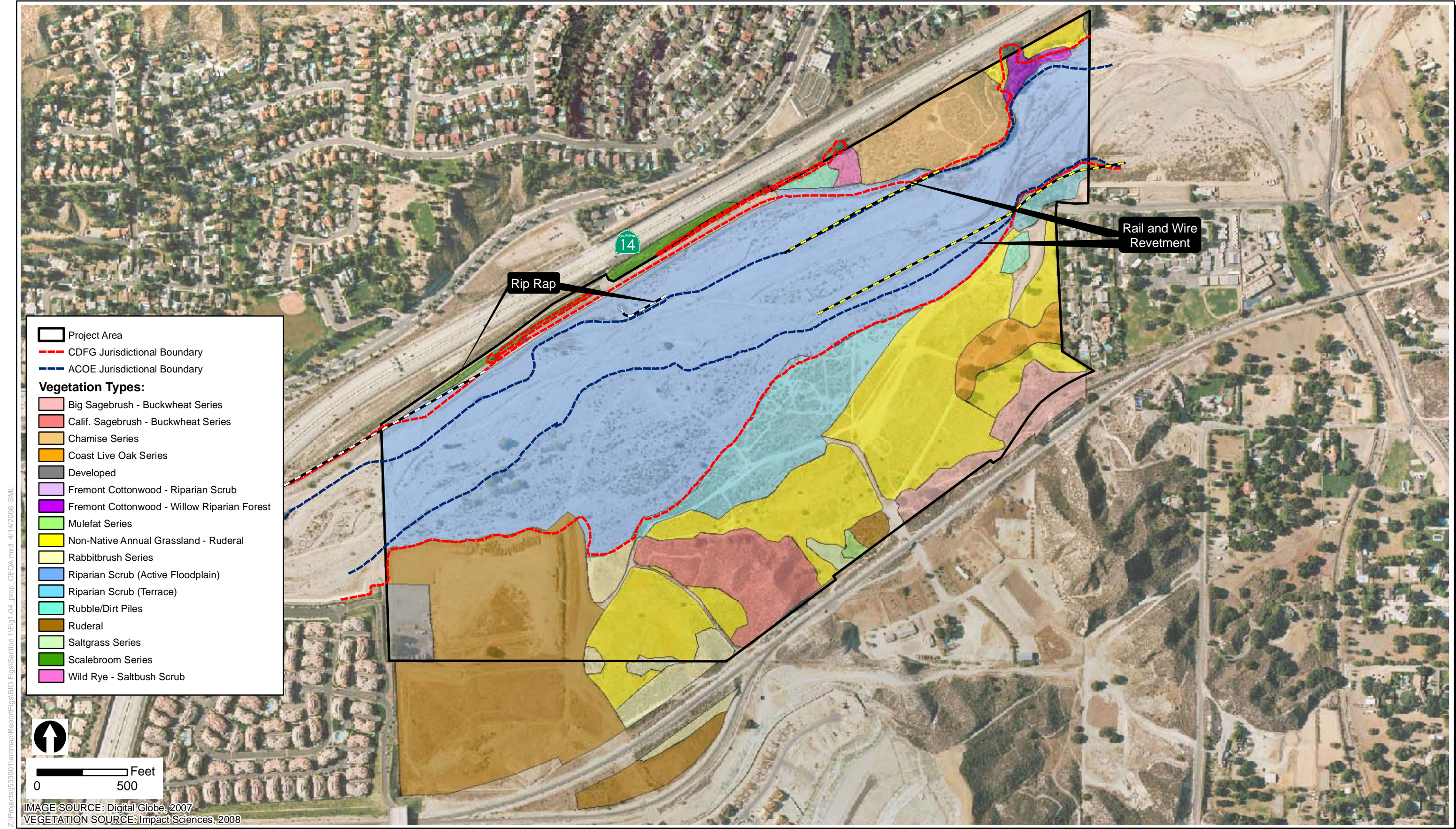


## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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Vista Canyon Conceptual Wetland Mitigation and Monitoring Plan  
**Vegetation Communities**

**FIGURE**  
**3**



## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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The active floodplain is composed of multiple braided channels and alluvial deposits consisting of a relatively low cover of herbaceous annual vegetation with occasional, sparsely spaced emergent shrubs and trees. The floodplain terraces also are composed of relatively sparse vegetation, but include significant stands of alluvial scrub species such as scalebroom (*Lepidospartum squamatum*), California buckwheat (*Eriogonum fasciculatum*), Deerweed (*Lotus scoparius*), and whipple yucca (*Yucca whipplei*).

Due to substantial site disturbance, the functions and values for wildlife are somewhat diminished. However, these vegetation communities still provide nesting, feeding and breeding opportunities for various aquatic, terrestrial and avian animals. In addition to a variety of common wildlife species known to occur on site (Forde and Read 2008), one sensitive species was documented within the jurisdictional areas, coast horned lizard (*Phrynosoma coronatum*).

The jurisdictional areas also provide functions and values typical of channel and floodplain environments, including energy dissipation during stormflow events, nutrient cycling, uptake of elements and compounds, entrapment of sediments, and hydrologic variation in flow patterns.

### 2.0 GOALS OF THE ON-SITE MITIGATION

Goals of the on-site mitigation are to:

- Satisfy the mitigation requirements of local, state, and federal agencies for wetland and riparian habitat
- Create or restore riparian and riverine vegetation communities suitable for nesting, foraging, and breeding by native animal species
- Create or restore vegetation communities to be compatible with the fluvial morphology and hydrology of the stream channel corridor
- Create or restore vegetation communities to be consistent with adjacent, existing riparian vegetation communities
- Create or restore vegetation communities to be self-sustaining and functional beyond the maintenance and monitoring period.

### 2.1 Riparian Vegetation Communities to be Established

The riparian vegetation communities proposed to be established are alluvial scrub and riparian scrub in temporary impact areas within the channel, and Great Basin sage scrub on the channel banks. The character and species composition of the restored vegetation communities is intended

## **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon**

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to be consistent with the character and species composition of existing alluvial scrub and riparian scrub. The species composition is outlined in Section 4.11.

### **2.2 Functions and Values of Vegetation Communities to be Established**

According to the CRAM analysis (Dudek 2009), implementation of the proposed project, with restoration of the intended vegetation communities, will result in an increase in the overall average assessment score of 0.74 to 0.79. Specifically, Buffer and Landscape Connectivity will decline slightly from 0.87 to 0.83, Hydrology and Physical Structure will remain the same at 0.84 and 0.79, respectively, and Biotic Structure will increase from 0.43 to 0.70.

The functions and values of the vegetation communities to be restored and enhanced are the same as those of the vegetation communities that will be impacted. Specifically, functions and values of the vegetation communities to be established include suitable breeding, foraging, and nesting habitat for avian, aquatic and terrestrial animal species. Also, the areas will function to promote nutrient cycling, nutrient and compound uptake, organic carbon export, and to be hydraulically compatible with the surrounding stream system.

### **2.3 Long-Term Monitoring Period**

To ensure that the restoration and enhancement areas meet success criteria to be established by the permitting agencies, a five-year monitoring period will be implemented. During this time, the project site will be monitored by the Habitat Restoration Specialist, who will then make recommendations to the Restoration Contractor to perform maintenance tasks necessary to keep the project site in compliance with success criteria. Should the project not meet the final sign-off criteria by the end of year five, the monitoring period will be extended until agency sign-off is obtained, but which cannot be unreasonably withheld.

## **3.0 MITIGATION AREA DESCRIPTION**

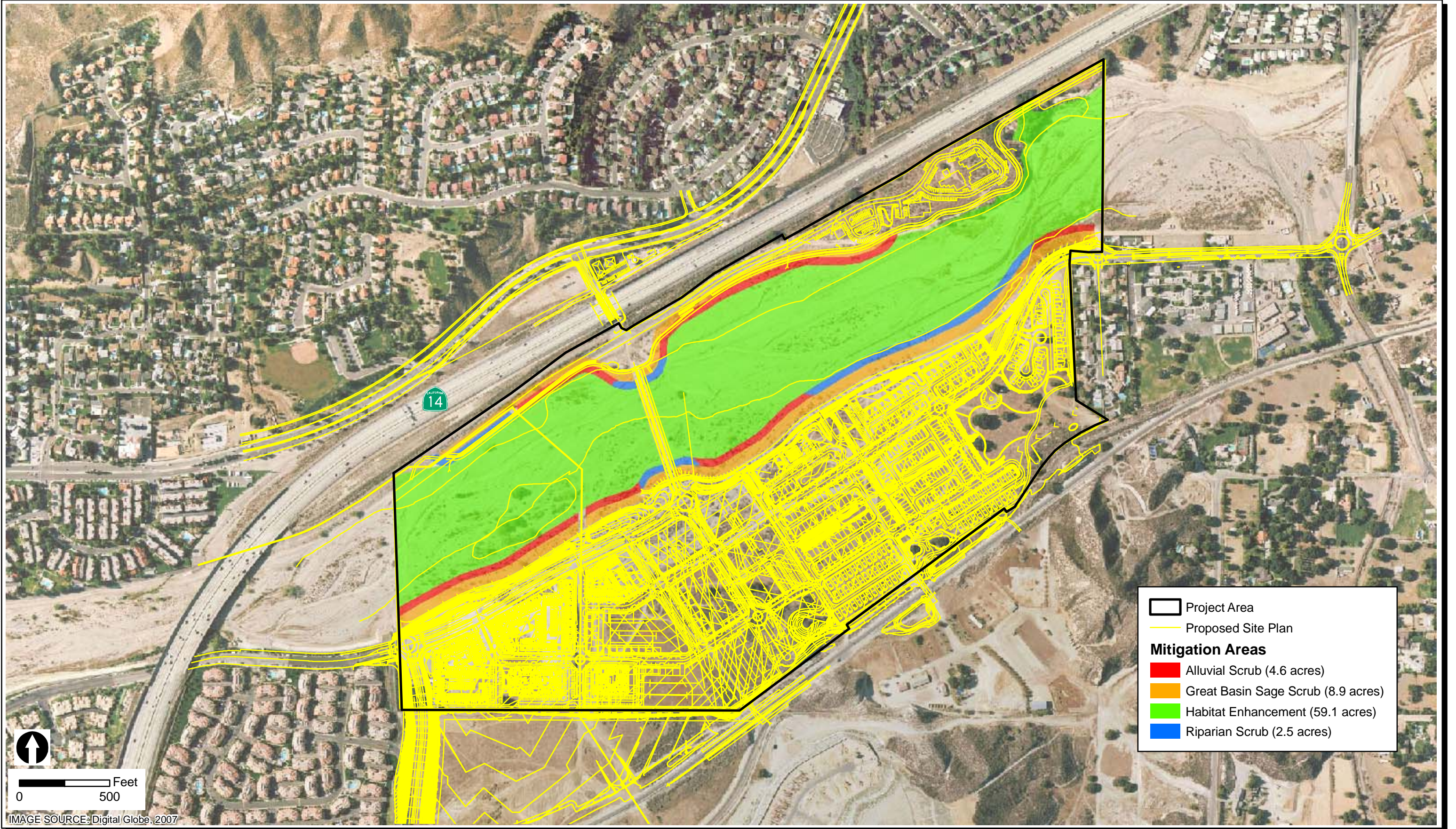
On-site restoration areas are shown in Figure 4. The riparian scrub and alluvial scrub restoration areas will be graded to stream channel elevations following construction of the buried bank protection and suitable for establishment of jurisdictional vegetation communities.

Riparian scrub and alluvial scrub occur on soils that are mapped as Riverwash (Rg). Rg is described as excessively drained and rapidly permeable sand, gravel, or cobbles that occur in intermittent stream channels (Woodruff et al. 1970).

Dudek collected soil samples and submitted them to a laboratory for agricultural suitability testing to provide additional information on project site soil conditions. The test results are included in Appendix A.



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Vista Canyon Conceptual Wetland Mitigation and Monitoring Plan  
**Wetland Mitigation Plan**

FIGURE  
4



## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

The riparian scrub vegetation community is subject to frequent, repeated disturbance from water flows during storm events, and consists of sparse, emergent vegetation that rarely persists for more than one year. Riparian scrub is planned for the areas that are expected to receive the greatest flows based on anticipated flow patterns.

Alluvial scrub also is subject to occasional water flow during large storm events, but on a less frequent basis such that woody vegetation has time to become established. Alluvial scrub is planned for the areas that are expected to receive occasional storm flows only.

Great Basin sage scrub vegetation is planned for the banks of the channel above the buried bank protection. Fill soil will be placed over the surface of the bank protection at a depth great enough for planting native vegetation.

### 3.1 Restoration and Enhancement Acreage Totals

Impacts to CDFG and ACOE jurisdictional area from the proposed project are shown in Table 1. The majority of impacts will be to riparian scrub in the active floodplain (100% of ACOE impacts and 96% of CDFG impacts).

**Table 1**  
**Jurisdictional Habitat Impact Acreage**

Vegetation Community	Impact Acres	
	ACOE	CDFG
Chamise Series	0	0.002
Disturbed Land	0	0.973
Non-Native Annual Grassland - Ruderal	0	0.001
Rabbitbrush Series	0	0.038
Riparian Scrub (active floodplain)	1.631	26.785
Riparian Scrub (terrace)	0	0.222
Scalebroom Series	0	0.003
Wild Rye – Saltbush Scrub	0	0.005
<b>Total Acreage</b>	<b>1.631</b>	<b>28.029</b>

Restoration and enhancement mitigation areas segregated by vegetation community are shown in Table 2. Riparian scrub and alluvial scrub are proposed in the channel bottom and Great Basin sage scrub is proposed on the buried bank slopes. The acreage reported in the enhancement column of Table 2 is the actual acreage of the entire enhancement area, and does not indicate mitigation credit. Mitigation credit for enhancement is usually calculated by determining the amount of the enhancement area that will undergo enhancement activities, such as invasive plant

## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

removal. For this project, the enhancement area is very sparsely vegetated, and presence of invasive plant species is relatively low. However, the CWMMP proposes to also enhance the channel by removing the old rail and wire revetment structures (locations shown on Figure 3).

**Table 2**  
**Mitigation Acreage**

Vegetation Community	Mitigation Acres	
	Enhancement	Restoration
Alluvial Scrub (AS)	0	4.6
Riparian Scrub (RS)	59.1*	2.5
Great Basin Sage Scrub (BSS)	0	8.9
<b>Total ACOE Acreage</b>	<b>59.1*</b>	<b>7.1</b>
<b>Total CDFG Acreage</b>	<b>59.1*</b>	<b>16.0</b>

\* Percent mitigation credit not yet determined

### 3.2 Proposed Uses of Mitigation Areas

Restoration and enhancement areas will be riparian and riverine open areas under the jurisdiction of CDFG and ACOE. Pursuant to the requirements of the permits, a conservation easement will be recorded over the entirety of the Santa Clara River within the limits of the Vista Canyon project area. These mitigation areas will function as riparian vegetation communities, and be part of the dynamic fluvial process of the stream system. There will be no public access to, or use of, the mitigation sites. The Los Angeles Department of Public Works may require a flood control maintenance easement in some areas along the buried bank protection to inspect and maintain the public drain system (outlets and bank protection integrity). If required, the limits of the wetland mitigation areas will be established outside of the flood control maintenance easement.

### 4.0 MITIGATION IMPLEMENTATION PLAN

Grading of the mitigation areas will be accomplished during general site development and buried bank installation activities. The mitigation will include:

- clearing and grubbing
- salvaging native vegetation mulch
- salvaging top soil from existing native habitat areas
- re-contouring wetlands mitigation areas to channel bottom grade as needed
- spreading salvaged top soils over surface
- applying native vegetation mulch

## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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- installing container plants
- applying native seed mix
- 120-day plant establishment period
- five-year maintenance and monitoring period.

### 4.1 Rationale for Expecting Project Success

The Santa Clara River is subject to high-velocity storm flows during the rainy season and sub-surface low flows in the dry season. The plant species to be used in the mitigation areas are native species that already occur on the project site and are adapted to these dynamic conditions. Furthermore, the vegetation communities proposed for restoration are the same as those that already occur on site.

To address the anticipated highly dynamic fluvial conditions associated with the Santa Clara River, the vegetation communities to be restored will be located in hydrologically compatible locations, with sparse riparian scrub designed for areas expected to have high velocity flows, and alluvial scrub designed for areas expected to receive less frequent storm flows. Velocity profiles prepared by PACE Engineering for the *Vista Canyon Ranch Draft EIR Flood Technical Report* (2009) were reviewed to determine the most appropriate locations for the riparian vegetation communities.

Control of invasive plant species in the habitat enhancement areas is expected to require a long-term commitment, as the invasive species present are tenacious and difficult to control. The enhancement areas will be maintained for the duration of the five-year maintenance and monitoring period so multiple follow-up visits will occur to address recurrence of invasive plant species. The suppression of invasive weeds over the extended maintenance period will allow native vegetation to become better established throughout the area because there will be less competition for water and nutrients.

### 4.2 Implementation Schedule

Ideally, project implementations should be timed so that container plants and the seed mix can be installed in the spring, after the threat of major precipitation events has decreased. This will allow for an establishment period to take place before the onset of the fall rainy season.

A preliminary implementation schedule is shown in Table 3.



## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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**Table 3**  
**Preliminary Project Implementation Schedule**

Activity	Date
Clearing and grubbing and mulch salvage	September 2011
Topsoil salvage and stockpiling	September 2011
Contouring channel and banks	September 2011
Topsoil application	September 2011
Mulch application	September 2011
Irrigation system installation	October 2011
Container plant installation	October 2011
Seed application	November 2011
Start of five-year long-term monitoring period	November 2011
End of 120-day plant establishment period	March 2012

### 4.3 Construction Plans

Following approval of this plan, construction drawings, and specifications may be prepared for construction purposes. If prepared, construction drawings and specifications will conform to all aspects of this plan and permit conditions required by the permitting agencies. Construction documents will incorporate the most current site condition information available. Any significant changes to site conditions and final mitigation plans may be subject to review and comment by permitting agencies. The plan package will include a site plan showing proposed work areas and final site facilities, any additional grading, construction details, irrigation and planting plans.

### 4.4 As-Built Conditions

As-built plans for the on-site mitigation areas will only be required if the installation substantially deviates from this plan and/or the permit conditions.

### 4.5 Existing Resource Impact Avoidance

If initial site vegetation clearing is unavoidable during the nesting bird season (March 15–September 1), pre-construction nesting bird surveys will be conducted by a qualified biologist to locate any active nests in vegetation to be removed within 300 feet of project limits. If nesting/breeding birds are discovered within the area to be impacted and/or within 300 feet of project impacts, the nest site shall be flagged/fenced and a buffer zone established. Width of the buffer zone will depend on the bird species present. Construction activities will be postponed within the buffer zone around the nest site until the young have fledged. If the birds begin nesting in habitat adjacent to the project site, postponement of work will not be required. Depending on proposed activities, the monitoring biologist may establish additional setbacks and exclusionary fencing to ensure that nesting birds are not disturbed.

## **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon**

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Horned lizards may also be present in the project work area and the biologist will relocate any horned lizards discovered in the work area to areas outside the area of impact.

### **4.6 Site Access**

No public access will be provided to the mitigation sites. The sites will be fenced and posted with signage at the top of bank indicating the presence of sensitive resource areas. Orange construction fencing and erosion control silt-fence will identify the limits of restoration along the natural creekbed. This orange fencing will remain in place and be maintained by the Restoration Contractor through the first growing season. If the construction fencing is damaged by storm flows, it may be recommended for replacement based on the Habitat Restoration Specialist's discretion.

### **4.7 Grading**

The restoration areas will not require any grading, other than re-contouring the temporary impact areas following installation of buried bank protection. Native topsoil will be removed during development of the site and stockpiled in a location where it will be unlikely to be disturbed. After completion of the buried bank protection, the native topsoil will be spread on the surface of the temporary impacts areas and channel banks. An example channel cross-section is shown in Figure 5.

### **4.8 Initial Non-Native Invasive Plant Removal**

Enhancement of the Santa Clara River will include an initial non-native invasive plant removal effort, followed by regular control of new seedlings and re-sprouts over the long-term maintenance period. A combination of physical removal and herbicide treatment will be used to control non-native invasive plants.

All pest control and removal work shall be performed in compliance with all applicable federal and state laws and regulations, safety precautions, and pesticide label directions. The Restoration Contractor shall possess a valid California Qualified Applicator Certificate or Qualified Applicator License, and Pest Control Business License or Maintenance Gardener Pest Control Business License, as appropriate for the Contractor's situation.

The Restoration Contractor shall refer to the specific pesticide label for information on proper timing, application rates, and any use restrictions. The Contractor must follow all applicable label directions, laws, regulations, and safety precautions when performing pest control. Should the Contractor require a specific pest control recommendation for any control effort, the Contractor shall consult a licensed Pest Control Adviser for a written recommendation.

## **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon**

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Physical removal of non-native plants, including the roots, may be the best method for those species for which the rootball can readily be pulled-out with the above-ground portions of the plant. These species will be physically removed before seed-set. If hand removal is possible only after seed-set, then seed heads will be cut-off, bagged, and removed from the site prior to the weed removal. Physical removal of the plants and their roots can only be done when the non-native plants are growing separate from desirable natives, not when the plants and their root systems are intertwined.

Herbicides will be used for the invasive exotic plant species that have root systems that are impractical to remove or that regenerate from small root fragments. Any herbicide use should be conducted using methods that minimize effects to adjacent/desirable native species, such as brush application or spot spraying. Only herbicides registered for aquatic use can legally be used in locations where it might come in contact with open water.

Follow-up control measures will likely be necessary for invasive plant species with extensive root systems that cannot usually be killed with one herbicide application. Follow-up herbicide treatment should be done at the biologically appropriate time when the recovering plants are still relatively small and before they have time to regain strength and vigor.

### **4.9 Erosion Control and Best Management Practices**

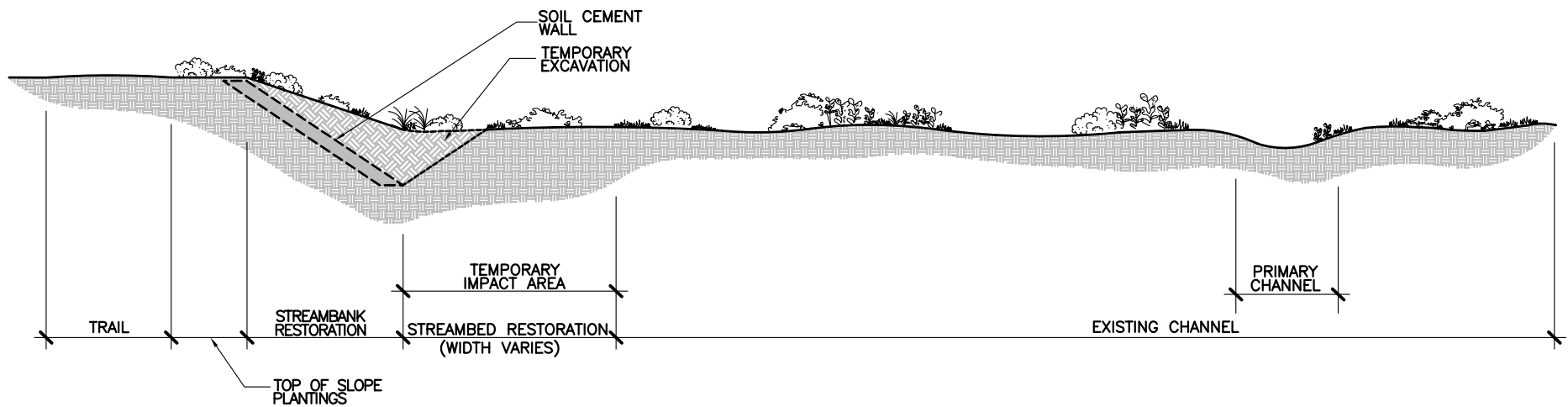
The enhancement areas are primarily located within a highly volatile flow channel. The Santa Clara River experiences either no or very low surface flow during the dry season, and high volume, high velocity peak storm flows during large storm events in the rainy season. Natural streambed scour associated with periodic high velocity storm flows is expected. Since this is considered a natural occurrence, no measures to modify or control fluvial processes in the enhancement areas are anticipated.

To minimize the potential for loss of soils and vegetation from the buried bank stabilization slopes, the installation and planting should be started in the spring after the likelihood of significant storm events has decreased. This will allow for an establishment period before the first fall rainy season. Silt fences, fiber rolls, and construction fencing may be incorporated into the best management practices (BMPs) based on the construction documents and Habitat Restoration Specialist's recommendation.

The Santa Clara River's dynamic and volatile seasonal flow pattern creates a factor of variability regarding the fluvial development that will take place within the restoration and enhancement areas. Project fencing and BMPs affected/lost due to large storm flow events will be replaced, modified, or not replaced at the discretion of the Habitat Restoration Specialist.



Example Photos of Existing Site Conditions (2/4/09)



GRAPHIC NOT TO SCALE

Vista Canyon Conceptual Wetland Mitigation and Monitoring Plan  
**Typical Cross-Section & Site Photos**

FIGURE  
**5**

## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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## **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon**

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### **4.10 Mulching**

Native vegetation removed during the grubbing phase of construction will be stockpiled and mulched. The mulch will be spread in piles for storage until use. The mulch will primarily provide organic matter to the soil, and secondarily may provide a source of native seed. The native mulch will be applied to the restoration areas and incorporated into the top 12 inches prior to planting container plants and applying seed.

### **4.11 Recommended Plant Palette for Mitigation Areas**

The restoration areas will be planted with container plants and seed. Enhancement areas generally will not be planted, but instead will rely on natural recruitment. Enhancement will consist mostly of invasive exotic plant species control. Some limited planting in enhancement areas may occur in places where large areas are disturbed from the removal of revetment structures or non-native invasive species.

There are three vegetation communities designed for the on-site restoration/enhancement mitigation areas: Riparian scrub, alluvial scrub, and Great Basin sage scrub. Riparian scrub and alluvial scrub, which are planned for designated areas within the river channel, consist of essentially the same planting palette. The primary difference between the two communities is that plant cover is much lower in riparian scrub than in alluvial scrub, due to the repeated scouring from high velocity channel flows. Therefore, the composition of species on the two planting palettes is similar.

Great Basin sage scrub occurs in areas that are transitional from riparian and alluvial scrub to upland vegetation. Therefore, the Great Basin sage scrub plant palette is designed for designated areas on the banks. The plant palette for this community includes some species that also are in the riparian and alluvial scrub planting palettes, and others that are more characteristic of upland vegetation communities. Specific planting locations will be shown on the construction drawings. Planting palettes are shown in Tables 4 through 9.

## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

**Table 4**  
**Great Basin Sage Scrub Container Plant Palette**

Scientific Name	Common Name	Size (gallons)	Spacing (feet on center)	Plants per Acre	Quantity for 8.9 Acres
<i>Artemisia californica</i>	California sagebrush	1	4	54	481
<i>Artemisia tridentata</i> var. <i>tridentata</i>	big sagebrush	1	6	145	1,291
<i>Atriplex canescens</i> ssp. <i>canescens</i>	four-wing saltbush	1	10	9	80
<i>Ceanothus crassifolius</i>	hoary-leaved ceanothus	1	8	14	125
<i>Eriogonum fasciculatum</i>	California buckwheat	1	4	54	481
<i>Leymus condensatus</i>	giant wild rye	1	6	24	214
<i>Quercus agrifolia</i>	coast live oak	15 gallon, natural form	30	6	53
<i>Sambucus mexicana</i>	Mexican elderberry	1	15	15	134
<i>Yucca whipplei</i>	our Lord's candle	1	3	97	863
<b>Total</b>				<b>418</b>	<b>3,722</b>

**Table 5**  
**Great Basin Sage Scrub Seed Mix**

Scientific Name	Common Name	Percent PLS	Pounds per Acre	Pounds for 8.9 acres
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	common fiddleneck	24	2	17.8
<i>Artemisia californica</i>	California sagebrush	9	2	17.8
<i>Artemisia tridentata</i> var. <i>tridentata</i>	big sagebrush	7	4	35.6
<i>Brickellia californica</i>	California brickel bush	7	4	35.6
<i>Camissonia bistorta</i>	California sun cup	18	1	8.9
<i>Chrysothamnus nauseosus</i>	rubber rabbit brush	5	2	17.8
<i>Eriastrum densifolium</i>	perennial eriastrum	5	2	17.8
<i>Eriodictyon crassifolium</i>	thickleaf yerba santa	16	8	71.2
<i>Eriogonum fasciculatum</i>	California buckwheat	10	6	53.4
<i>Gnaphalium palustre</i>	western marsh cudweed	8	1	8.9
<i>Lepidospartum squamatum</i>	scalebroom	6	6	53.4
<i>Lessingia filaginifolia</i> var. <i>filaginifolia</i>	California aster	3	4	35.6
<i>Lotus scoparius</i>	deerweed	54	2	17.8
<i>Phacelia ramosissima</i>	branching phacelia	76	2	17.8
<i>Salvia apiana</i>	white sage	64	2	17.8
<i>Salvia mellifera</i>	black sage	35	3	26.7
<b>Total</b>			<b>51</b>	<b>453.9</b>

Hydroseed Slurry Mix Shall Consist of the Following Per Acre:  
 2,000 pounds of Virgin Wood Fiber Mulch  
 1,000 pounds of Agricultural Gypsum  
 650 pounds 6-20-20-XB Fertilizer  
 100 pounds commercial guar gum-based binder  
 51 pounds of Seed as shown in Table 5

## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

**Table 6**  
**Alluvial Scrub Container Plant Palette**

Scientific Name	Common Name	Size (gallon)	Spacing (feet on center)	Plants per Acre	Quantity for 4.6 Acres
<i>Artemisia tridentata</i> var. <i>tridentata</i>	big sagebrush	1	6	24	110
<i>Atriplex canescens</i> ssp. <i>canescens</i>	four-wing saltbush	1	10	9	41
<i>Atriplex lentiformis</i>	big saltbush	1	10	9	41
<i>Baccharis salicifolia</i>	mule fat	1	8	54	248
<i>Chrysothamnus nauseosus</i>	rubber rabbit brush	1	5	35	161
<i>Eriastrum densifolium</i>	perennial eriastrum	1	3	97	446
<i>Eriogonum fasciculatum</i>	California buckwheat	1	4	54	248
<i>Leymus triticoides</i>	creeping wild rye	1	6	24	110
<i>Petalonyx thurberi</i>	Thurber's sandpaper plant	1	8	14	64
<i>Platanus racemosa</i>	western sycamore	5 gallon, natural form	30	4	18
<i>Populus fremontii</i>	Fremont cottonwood	1	30	4	18
<i>Salix laevigata</i>	red willow	1	10	17	78
<i>Sambucus mexicana</i>	Mexican elderberry	1	15	4	18
<i>Yucca whipplei</i>	our Lord's candle	1	3	97	446
			<b>Total</b>	<b>446</b>	<b>2,047</b>

**Table 7**  
**Alluvial Scrub Seed Mix**

Scientific Name	Common Name	Percent PLS	Pounds per Acre	Pounds for 4.6 Acres
<i>Artemisia douglasiana</i>	mugwort	5	2	9.2
<i>Artemisia dracunculus</i>	tarragon	6	3	13.8
<i>Artemisia tridentata</i> var. <i>tridentata</i>	big sagebrush	7	3	13.8
<i>Camissonia bistorta</i>	California sun cup	18	1	4.6
<i>Eriodictyon crassifolium</i>	thickleaf yerba santa	16	8	36.8
<i>Eriogonum fasciculatum</i>	California buckwheat	10	6	27.6
<i>Gnaphalium palustre</i>	western marsh cudweed	8	1	4.6
<i>Lepidospartum squamatum</i>	scalebroom	6	6	27.6
<i>Phacelia ramosissima</i>	branching phacelia	64	2	9.2
<b>Total</b>			<b>32</b>	<b>147.2</b>

Hydroseed Slurry Mix Shall Consist of the Following Per Acre:

2,000 pounds of Virgin Wood Fiber Mulch

1,000 pounds of Agricultural Gypsum

650 pounds 6-20-20-XB Fertilizer

100 pounds commercial guar gum-based binder

26 pounds of Seed as shown in Table 7



## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

**Table 8**  
**Riparian Scrub Container Plant Palette**

Scientific Name	Common Name	Size (gallon)	Spacing (feet on center)	Plants per Acre	Quantity for 2.5 Acres
<i>Artemisia tridentata</i> var. <i>tridentata</i>	big sagebrush	1	6	12	30
<i>Baccharis salicifolia</i>	mule fat	1	8	54	135
<i>Chrysothamnus nauseosus</i>	rubber rabbit brush	1	5	17	43
<i>Eriastrum densifolium</i>	perennial eriastrum	1	3	48	120
<i>Eriogonum fasciculatum</i>	California buckwheat	1	4	27	68
<i>Leymus triticoides</i>	creeping wild rye	1	6	12	30
<i>Petalonyx thurberi</i>	Thurber's sandpaper plant	1	8	7	18
<i>Populus fremontii</i>	Fremont cottonwood	1	30	5	13
<i>Salix laevigata</i>	red willow	1	10	4	10
<b>Total</b>				<b>186</b>	<b>467</b>

**Table 9**  
**Riparian Scrub Seed Mix**

Scientific Name	Common Name	Percent PLS	Pounds per Acre	Pounds f or 2.5 Acres
<i>Artemisia douglasiana</i>	mugwort	5	4	10.0
<i>Artemisia dracunculus</i>	tarragon	6	5	12.5
<i>Camissonia bistorta</i>	California sun cup	18	2	5.0
<i>Gnaphalium palustre</i>	western marsh cudweed	8	2	5.0
<i>Lepidospartum squamatum</i>	scalebroom	6	10	25.0
<b>Total</b>			<b>23</b>	<b>57.5</b>

Hydroseed Slurry Mix Shall Consist of the Following Per Acre:

2,000 pounds of Virgin Wood Fiber Mulch  
1,000 pounds of Agricultural Gypsum  
650 pounds 6-20-20-XB Fertilizer  
100 pounds commercial guar gum-based binder  
23 pounds of Seed as shown in Table 9

### 4.12 Container Plant and Seed Installation

Implementation of this plan must be coordinated with the Restoration Contractor, the City, Vista, the grading contractor, and the Habitat Restoration Specialist. Plant materials for the planting plan will include container stock, mulched material, and native seed mixes as indicated. All container plants will be checked for viability and general health upon arrival at the mitigation

## **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon**

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site by the Habitat Restoration Specialist. Plant materials not meeting acceptable standards will be rejected. Plant species and quantities will be confirmed after delivery by the Habitat Restoration Specialist and locations for installation will be marked on site temporarily with pin flags.

Standard planting procedures will be employed for installing container plants. Holes will be dug three times the diameter of the rootball of the plant and the same depth as the container. Holes will be filled with water and allowed to drain immediately prior to planting. Backfill soil containing amendments (as directed by the Habitat Restoration Specialist) will be placed in every planting hole following soaking, and container plants installed so that the root ball is entirely below grade, except for the oaks, which will be planted with the rootball about an inch above grade. Woody container plant species specified by the Habitat Restoration Specialist will be planted into the soil slightly deeper than standard, approximately 2 to 4 inches above the root collar of the plant. This additional planted depth for the above species will help insure sufficient rooting strength and provide additional protection against seasonal scour and/or uprooting due to high flow velocities after winter storm events.

Mulch will be applied around container plants to a diameter of 2 feet or 1.5 times the drip line, whichever is greater. Mulch will be three to four inches deep. This mulch is in addition to the mulch made from salvaging native material from on site.

### **4.13 Seed Application**

After container plant installation, mitigation areas will be seeded with the specified seed mixes for each vegetation community. Labels for each mixture will be inspected and approved by the Habitat Restoration Specialist prior to application. Seed may be applied in a hydromulch or seed imprinter. If applied in a hydromulch, the hydromulch shall contain the specified seed mix at the prescribed rate per acre, virgin wood cellulose fiber mulch at 2,000 pounds per acre, 650 pounds of 6-20-20-XB commercial fertilizer, 1,000 pounds agricultural gypsum, and a commercial guar gum-based binder at 100 pounds per acre.

### **4.14 Irrigation System Installation**

The primary goal of this restoration and enhancement mitigation effort is to establish native vegetation communities capable of maintaining and supporting themselves in perpetuity. However, native container plants and seed may require irrigation for establishment on the mitigation areas, especially during summer months. Due to the potential for high velocity storm flows in the channel, an irrigation system is not recommended for the enhancement area. A

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temporary, on-grade system is recommended for the bank slopes and the adjacent channel bottom restoration areas.

The temporary irrigation system will be installed to support the container stock plantings and seed mixtures until they can survive on their own based on observed and predicted seasonal rainfall, overland flow, and effective plant rooting depth.

All irrigation will be installed by the Restoration Contractor in accordance with the construction documents and specifications. The irrigation system will be designed with above-ground components to facilitate removal once the system is decommissioned.

All irrigation will only be used during plant establishment, as the goal of the restoration effort is to create native, self-sustaining plant communities. Irrigation use will be discontinued at least two years before the end of the five-year maintenance period to demonstrate the vegetation community's ability to survive without supplemental water.

A temporary water meter will be installed, or if available, the temporary irrigation system may be connected to adjacent permanent landscape irrigation. Irrigation design and layout will be provided with the final construction plans.

The irrigation system may utilize a series of solar-operated controllers that operate independent irrigation circuits, minimizing irrigation maintenance requirements for the project site. Irrigation on site will likely consist of PVC or HDPE pipe staked at grade, with coverage provided by spray heads, and possibly drip emitters where applicable.

Should portions of the irrigation system become damaged or lost, they will be replaced, and the design modified based on the individual circumstances per the Habitat Restoration Specialist's recommendations.

### **5.0 MAINTENANCE ACTIVITIES DURING THE MONITORING PERIOD**

All mitigation areas will be subject to the requirements specified in this plan. Vista will be responsible for ensuring the maintenance and monitoring of the mitigation site until release of mitigation obligations is granted by the permitting agencies.

Because the goal of this plan is to re-establish natural vegetation communities that can support themselves with little or no maintenance, the primary effort of the maintenance plan is concentrated in the first few seasons of plant growth following the restoration and enhancement efforts, when weeds can easily out-compete native plants. The intensity of the maintenance

## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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activity is expected to subside each year as the native plant materials become more established and local competition from non-native plants for resources in the mitigation areas is minimized through control of non-native plants.

### 5.1 Maintenance Activities

Maintenance activities will be conducted concurrent with installation of the mulch, container plant, and seed materials in the mitigation areas, and will continue throughout the initial 120-day establishment period, through the long-term maintenance and monitoring period, and concluding once success criteria have been met. Contractor maintenance activities on the site will be conducted monthly during the 120-day establishment period and years one and two of the project, every other month through year three, and quarterly for years four and five.

### 5.2 Pest Management

In general, little or no pest control is anticipated for the mitigation project, other than follow-up invasive exotic plant species control. The Habitat Restoration Specialist will advise the Restoration Contractor as to which pest species to control. The concepts of integrated pest management (Dreistadt 1994) will be used on this project. Weed species generally do not need to be controlled unless they are invasive and threaten to displace native plants. Target weed species include those on the Cal-IPC California Invasive Plant Inventory (Cal-IPC 2006). Re-establishment of the innocuous, naturalized annual weeds that are common to the area do not normally require extensive control efforts and are expected to be a permanent, if minor, part of the landscape.

The Restoration Contractor shall control common invasive annual weeds and grasses if they are present or appear in the project area. Annual weeds and grasses shall be controlled early in their lifecycles before they have the opportunity to bloom and set seed. Annual weed species that may require control in the project area include, but are not limited to: tumbling oracle (*Atriplex rosea*), mustard (*Brassica* sp., *Hirschfeldia incana*, and *Sisymbrium* sp.), Italian thistle (*Carduus pycnocephalus*), tocalote (*Centaurea melitensis*), garland chrysanthemum (*Chrysanthemum coronarium*), poison hemlock (*Conium maculatum*), horseweed (*Conyza canadensis*), cudweed (*Gnaphalium luteo-album*), prickly lettuce (*Lactuca serriola*), cheeseweed (*Malva parviflora*), sweetclover (*Melilotus* sp.), bristly ox-tongue (*Picris echinoides*), wild radish (*Raphanus sativus*), Russian thistle (*Salsola tragus*), London rocket (*Sisymbrium irio*), sow-thistle (*Sonchus* sp.), cocklebur (*Xanthium strumarium*), and various non-native annual grasses, such as wild oats (*Avena* sp.), false brome (*Brachypodium distachyon*), brome grass (*Bromus* sp.), barley (*Hordeum* sp.), ryegrass (*Lolium* sp.), annual bluegrass (*Poa annua*), Mediterranean schismus (*Schismus barbatus*), and Johnson grass (*Sorghum halapense*). Other annual weed and grass

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species may invade the project area could also require control. The Habitat Restoration Specialist will advise the Contractor as to which species to control.

Some common perennial, invasive exotics that could require follow-up control efforts or newly invade the mitigation and enhancement areas and require control include: giant reed (*Arundo donax*), pampas grass (*Cortaderia* sp.), artichoke thistle (*Cynara cardunculus*), fennel (*Foeniculum vulgare*), perennial pepperweed (*Lepidium latifolium*), tree tobacco (*Nicotiana glauca*), castor bean (*Ricinus communis*), fountain grass (*Pennisetum setaceum*), and salt cedar (*Tamarix* sp.), among others. These species may be successfully controlled by pulling if discovered early enough at the seedling stage, but may prove impossible to control without herbicides once they become established. The above listed invasive exotic species require 100% control during the maintenance and monitoring period. The Habitat Restoration Specialist may add additional invasive exotic species to this list as appropriate, should the species appear at the project site.

Invertebrate pests, such as snails, slugs, insects, mites, spiders, etc., are not expected to be a problem in the project area, but will be controlled by the Contractor, if necessary. Vertebrate pests such as gophers, ground squirrels, rabbits, rats, voles, etc. may become a problem and will be controlled by the Contractor, if necessary. Vertebrate pests classified as non-game mammals by CDFG may be taken at any time and in any manner, but game mammals have certain restrictions that must be met before they can be controlled, and a hunting license and/or scientific collecting permit may be required. Snail control may be required during the establishment period when the irrigation system is operated regularly. Plant diseases could become a problem during the plant establishment period, but can generally be prevented or controlled by cultural measures.

Pest control will be conducted following all applicable laws, regulations, label directions, and safety precautions. Should the Restoration Contractor require specific pest control recommendations, the Contractor shall consult a licensed Pest Control Adviser. The landscape contractor shall provide reports of all pest control measures implemented at the site, including details of method used, including any pesticide applications. Copies of any written recommendations shall also be provided. The Restoration Contractor shall provide copies of all Pesticide Use Reports to the City to document pesticide use and reporting.

### 5.3 Trash Removal

Trash will be removed from the mitigation areas by hand during maintenance visits. Trash consists of all man-made materials, equipment, or debris dumped, thrown, washed, blown, and left within the mitigation areas. Trash and inorganic debris washed or blown onto the mitigation site will be removed regularly. Deadwood and leaf litter of native trees and shrubs will not be

## **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon**

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removed. Downed logs and leaf litter provide valuable micro-habitats for invertebrates, reptiles, small mammals, and birds. In addition, the decomposition of deadwood and leaf litter is essential for the replenishment of soil nutrients and minerals.

### **5.4 Irrigation Maintenance**

The restoration areas will be irrigated to promote plant survival during the drier parts of the year, primarily the summer months. Irrigation may be used in winter months to simulate an average or above average rain season if natural precipitation is lacking. Irrigation is expected to last for a maximum of three years. Once the plants have become established, irrigation will be gradually reduced over time to acclimate plants to a non-irrigated condition prior to complete cessation of irrigation. Irrigation from June to November may be minimized to allow plants to experience normal drought cycles and to promote appropriate root growth. The Restoration Contractor will maintain the irrigation system at the optimum level of operation.

Consultation with the Habitat Restoration Specialist will be necessary to determine the timing for the cessation of irrigation. Irrigation should stop at the earliest possible date without risking significant plant loss. It is expected that the irrigation system will be abandoned no earlier than the end of year one. Irrigation is expected to be phased out in year two and discontinued at the end of year three of the five-year monitoring and maintenance period. Irrigation components, such as valves and sprinkler heads, may be salvaged for re-use elsewhere at the end of the establishment period.

## **6.0 MONITORING PLAN FOR THE MITIGATION AREAS**

### **6.1 Construction/Installation Monitoring**

The Habitat Restoration Specialist will make regular site visits during project implementation. The Habitat Restoration Specialist also will review activities for conformance to this plan, environmental permit conditions, and the requirements of contract plans and specifications. Each site observation visit will be documented in an observation report. Photo-documentation of site conditions will be conducted, as needed.

### **6.2 120-Day Plant Establishment Period and Monitoring**

Upon successful completion of project installation as determined by the Habitat Restoration Specialist, the five-year long-term monitoring phase will begin. During the first 120 days of the long-term monitoring period, container plants will be monitored for health and vigor. Should any of the container plants die during the 120-day plant establishment period, they should be replaced in-kind at the expense of the contractor to 100% the original quantities at the

## **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon**

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recommendation of the Habitat Restoration Specialist. Should seed/hydroseed fail to germinate within the 120-day plant establishment period, it should be reapplied at the expense of the contractor at the recommendation of the Habitat Restoration Specialist. Monitoring will occur monthly (every 30 days) during the 120-day plant establishment period by the Habitat Restoration Specialist, who will make recommendations to the contractor to ensure conformance with the 120-day plant establishment requirements.

### **6.3 Monitoring Methods**

After each site visit, a site observation report will be provided to the City, Vista, and to the Restoration Contractor. The site observation report will include a description of the project status, site conditions, and any maintenance recommendations or remedial actions.

Monitoring of the mitigation areas will be performed by the Habitat Restoration Specialist during the 120-day establishment period, and regularly throughout the duration of the project. Both horticultural (qualitative) monitoring and biological (quantitative) monitoring will be conducted at the mitigation areas. On an annual basis, the Habitat Restoration Specialist will provide a complete summary of results of the monitoring activities completed in the prior year period.

### **6.4 Performance Standards and Success Criteria**

Vegetative cover requirements are based on the existing vegetation communities in the portion of the Santa Clara River within the Vista Canyon project site. It is not uncommon for riparian scrub along this portion of channel to have less than 10% native vegetation cover due to the excessively permeable substrate, lack of perennial surface flow, and high velocity storm flows during winter months. Alluvial scrub may have slightly higher native vegetative cover, but still is generally relatively low at 20%–40%.

Performance criteria will be utilized to help assess the annual progress of the mitigation area, and are regarded as interim project objectives designed to achieve the final goals. Fulfillment of these criteria will indicate that the mitigation areas are progressing toward the vegetation communities that constitute the long-term goals of the plan. If mitigation efforts fail to meet the performance standards listed in any one year, the Habitat Restoration Specialist will recommend remedial actions to be implemented (e.g., supplemental planting, seeding, transplanting, changes to cultural practices) that will enhance the vegetation communities to a level in conformance with these standards. Specific performance criteria by vegetation community are discussed in Section 6.7 and Table 10.

At the end of the 120-day establishment period, all native container plantings shall achieve 100% survival and seeding will show signs of germination. Weeds will make up no more than 5% of

## **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon**

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the entire cover on site, and invasive exotic plant species such as giant reed and salt cedar will be fully controlled on the project site.

### **6.5 Qualitative Monitoring**

Data of native vegetation coverage, weed presence, and site progress will be collected during monitoring visits to be used in the annual monitoring report. Qualitative monitoring will be conducted to assess native container plant vigor and development, seedling recruitment from native hydroseed and natural sources, soil moisture content, presence/absence of plant pests or diseases, erosion and/or drainage conditions on site, presence/absence of non-native or invasive plant species, trash or debris accumulation, wildlife presence/absence, and project fencing. All qualitative monitoring visits to the mitigation areas will be documented with a monitoring report, which will be forwarded to the Restoration Contractor, City, and Vista. Any project deficiencies will be noted in the monitoring report, with accompanying recommendations for maintenance or remedial actions.

### **6.6 Quantitative Monitoring**

Quantitative monitoring will be conducted to determine container plant survivorship/mortality, total native species cover and composition and total non-native species cover and composition.

Quantitative monitoring will be conducted by establishing permanent vegetation transects within the restoration and enhancement mitigation areas at random locations at the end of year one. These transects will be utilized to help determine achievement of the yearly performance standards and compliance with agency standards, and a permanent photo-documentation station will be established along each transect to record the progress of the mitigation site and graphically record plant establishment over the five-year period.

Transects will be sampled using the point-intercept method. A transect tape will be run between two posts, and vegetative intercept line will be visually projected above and below the tape at every half-meter mark. Transects may vary in length based on location, and size of the individual restoration or enhancement area. Each herb, shrub, or tree that intercepts the projected line will be recorded by species. In addition, all plant species present within the five-meter wide “species richness” portion of each transect will be recorded by species. All data will be utilized to determine total percent plant cover, percent native cover, percent non-native cover, and overall species richness and diversity. Quantitative monitoring will be conducted once annually in the summer or fall beginning in year one and extending through year five of the mitigation project. Approximately five transects will be installed total. Transects will be either 25 or 50 meters long,



## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

depending on the location. Transect locations will be established by the Habitat Restoration Specialist. Native vegetation cover must meet standards shown in Table 10.

**Table 10**  
**Percent Native Vegetation Cover Success Criteria**

<b>Vegetation Community</b>	<b>Percent Native Cover</b>
Alluvial Scrub	30%
Riparian Scrub	10%
Great Basin Sage Scrub	60%

### 6.7 Assessment of Functions and Values

A CRAM analysis will be conducted in year five to assess the functions and values of the restoration and enhancement areas. The data from the analysis will be compared to the results of the pre-project CRAM analysis described in Section 1.5.1. One of the goals of this plan is to ensure that the functions and values of the existing areas prior to project implementation are not diminished post-development.

### 6.8 Monitoring Schedule

A preliminary monitoring schedule is shown in Table 11.

**Table 11**  
**Monitoring Schedule**

<b>Year</b>	<b>Frequency</b>	<b>Annual Report</b>
1	Monthly	January
2	Every other month	January
3	Every other month	January
4	Quarterly	January
5	Quarterly	January

## 7.0 REPORTING

### 7.1 Annual Monitoring Reports

Annual monitoring reports will be submitted to the permitting agencies and City during the five-year maintenance and monitoring period of the proposed project. Annual reports outlining the results of the vegetation community monitoring will be submitted at the first of each calendar year. The monitoring reports will describe the existing conditions of the project areas derived from qualitative field observations and quantitative vegetation data collection. The reports will provide a comparison of annual success criteria with field conditions, identify all shortcomings

## **Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon**

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of the project, and recommend remedial measures necessary for the successful completion of the enhancement project. Each yearly report will provide a summary of the accumulated data. Annual reports also will include the following:

- A list of names, titles, and companies of persons who prepared the annual report and participated in monitoring activities
- A copy of the resource agency permits, special conditions, and subsequent letters of modification
- Prints of biological monitoring photographs, as appropriate
- Maps identifying monitoring areas, planting zones, and weed removal areas, as appropriate
- Quantitative data from transect measurements in years one through five of the mitigation efforts.

### **7.2 Agency Notification at End of Monitoring Period**

Vista will notify the permitting agencies upon submitting the annual report for the final year that the final success criteria have been met at the end of the five-year monitoring period, and request acceptance of the site and release from the permit conditions. Early release may be possible if performance standards are met early and the permitting agencies agree with the level of establishment. Removal of the irrigation system, temporary fencing, and signage would occur prior to final sign-off.

### **7.3 Regulatory Agency Confirmation**

Following receipt of the notification of completion, the permitting agencies may request a site visit to confirm completion of the mitigation effort.

## **8.0 COST ESTIMATE**

This cost estimate is based on the project as described in this CWMMP, and includes estimated costs for construction, installation and monitoring of the approximately 16-acre wetland mitigation area. The cost estimate does not include any costs associated with construction of the development, including the buried bank structures or any associated construction monitoring. The total cost estimate combining items A through E below is **\$1,393,000**.

## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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### Item A: Site Work and Construction

Includes site clearing, collection and chipping of native brush, topsoil salvage and replacement, incorporation of soil amendments and fertilizer, spreading native mulch, and installation of temporary construction fencing and silt fencing. It should be noted that some of these activities (e.g., soil salvage and replacement, installation of construction and silt fencing) may be included with the overall site grading contract rather than the wetlands mitigation work.

**Cost Estimate:** .....\$615,000

### Item B: Temporary Irrigation System

Includes the installation of an on-grade temporary irrigation system. Estimate assumes that the system can be tied in to an existing back-flow preventer, pressure regulator and water meter.

**Cost Estimate:**.....\$192,000

### Item C: Plant and Seed Installation

Includes installation of 6,236 one-gallon container plants and the hydroseed as specified in this CWMMP.

**Cost Estimate:** .....\$158,000

### Item D: 5-Year Maintenance Period

Includes monthly maintenance during the first year and bi-monthly maintenance thereafter until the end of the 5-year maintenance and monitoring period.

**Cost Estimate:** .....\$355,000

### Item E: Biological Monitoring During 5-Year Maintenance Period

Includes monitoring mitigation installation work, preparing an as-built report, monthly monitoring during the 120-day plant establishment period, bi-monthly monitoring during the first year, quarterly monitoring during years 2–5, quantitative data collection in years 3–5, and preparation of five annual monitoring reports.

**Cost Estimate:** .....\$73,000

**TOTAL COST ESTIMATE (Items A through E)** .....\$1,393,000

# Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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## 9.0 CONTINGENCY MEASURES

If performance criteria are not met for all or any portion of the mitigation areas or if the final success criteria are not met, the Habitat Restoration Specialist and Vista will prepare an analysis of the cause(s) of failure within the appropriate annual report and, if determined necessary by permitting agencies, propose remedial action for agency approval. If the mitigation site has not met the performance criteria by the end of the five-year, long-term maintenance and monitoring period, Vista's maintenance and monitoring obligations will continue until contingency measures are negotiated and implemented to bring the mitigation site into compliance with the established standards or until the permitting agencies grant final mitigation project permit compliance/approval.

### 9.1 Adaptive Management Plan

Adaptive management will be implemented in the event of unforeseen or unpredictable circumstances. Adaptive management is defined, for purposes of this plan mitigation project, as a flexible, iterative approach to the long-term management of biological resources that is directed over time by the results of ongoing monitoring activities and direct observation of environmental stressors that are producing adverse results within the mitigation areas. Adaptive management will include the utilization of regular qualitative assessments and rapid qualitative assessment data gathered in the field prior to and during the mitigation effort to assess the health and vigor of vegetation communities within the mitigation areas. Following an event that causes damage to all or part of a mitigation area, the data will be used in part to drive management considerations for repair of the damaged areas. Achieving the key goals of mitigation completion and establishment of self-sustaining native vegetation communities will be the focus of all adaptive management decisions. Individual environmental stressors are discussed below along with an anticipated range of management responses to correct damage that may occur to the mitigation areas.

#### 9.1.1 Herbivory

Some grazing and browsing by native mammals is expected to occur within the mitigation area. The plant palettes for each vegetation community have been designed to accommodate a moderate level of plant browsing. If browse levels should become elevated (i.e., if significant plant mortality and cover reduction occurs) as indicated by qualitative or quantitative monitoring of the mitigation site, remedial measures may be recommended. Browse guards (plastic fencing) may be installed around the base of tree and young shrub container plants in affected areas to reduce plant mortality. In addition, remedial planting or seeding may be necessary depending upon the stage of the mitigation effort. If irrigation has not been ceased, then remedial planting

## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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with container plants may be possible to restore cover. If irrigation has ceased, then remedial seeding utilizing hand tools may be possible within affected areas to help restore cover. Each of these options would require the use of contingency funds to restore affected areas.

### 9.1.2 Flooding

Flooding is anticipated to occur annually within the active stream channel. Flooding may periodically reduce overall plant cover within the active stream channel. If monitoring of the channel indicates that cover is being reduced below acceptable levels, remedial planting (if irrigation is operational) or seeding may be required. Additional mulch, cuttings, or container plants may be placed in strategic areas to address changed flow characteristics of the stream channel. Due to the highly volatile nature of the Santa Clara River flood regime, additional flow entrainment or velocity protection features may be recommended.

### 9.1.3 Drought

Seasonal drought is a normal annual cycle in northern Los Angeles County, and all plant palettes have been designed with drought tolerant plant species that are capable of withstanding seasonal fluctuations in available moisture. However, an extended drought could potentially occur including low seasonal rainfall and prolonged high temperatures that may negatively affect the mitigation areas (e.g., lower native cover, higher plant mortality, increased potential for pest infestations on site, etc.). Irrigation will reduce or eliminate the effects of drought on container plants and seedlings during the first three years of the mitigation effort. Any remedial options that may be necessary after two years from the installation date will likely require an additional period of site irrigation to relieve plants from drought stress and/or provide for new seed growth. All irrigation components will be left in place after year three in case remedial seeding and/or container planting is required at a later project date. If the irrigation system is required at a later date, it should be used only as necessary (i.e., periodic watering versus regular daily watering).

## 10.0 REFERENCES

- California Invasive Plant Council (Cal-IPC). 2006. *California Invasive Plant Inventory*. Cal-IPC Publication 2006-02, California Invasive Plant Council: Berkeley, California.  
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## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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- Dreistadt, Steven H. 1994. *Pests of Landscape Trees and Shrubs, An Integrated Pest Management Guide*. The Regents of the University of California. 328 pages.
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- Forde, A.M., and E. Read. 2008. *Biological Assessment Vista Canyon Ranch Los Angeles County, California*. Prepared for Vista Canyon Ranch L.L.C. and The River Project. August 27.
- PACE Advance Water Engineering. 2009. *Vista Canyon Draft EIR Flood Technical Report*. February.
- Woodruff, G.A., W.J. McCoy, and W.B. Sheldon. 1970. *Soil Survey Antelope Valley Area California*. U.S. Department of Agriculture, Soil Conservation Service, Washington D.C., in cooperation with the University of California Agricultural Experiment Station, Davis, California

## Conceptual Wetland Mitigation and Monitoring Plan for Vista Canyon

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# **APPENDIX A**

## *Soil Test Results*



# **WALLACE LABORATORIES**

**365 Coral Circle**

**El Segundo, CA 90245**

**phone (310) 615-0116 fax (310) 640-6863**

February 9, 2009

Doug Gettinger and Andy Thomson, dgettinger@dudek.com, athomson@dudek.com  
Dudek & Associates, Inc.  
605 Third Street  
Encinitas, CA 92024

RE: Vista Canyon Ranch Project, Job No. 6115-99

Dear Doug and Andy,

CCG Area 2/4/2009

N.E. Hill Area 2/4/2009

South Knob Area 2/4/2009

River Sample 1 2/4/2009

River Sample 2 2/4/2009

The soils range from slightly acidic to slightly alkaline. The pH ranges vary from 6.24 to 7.60. Salinity is low and extend from 0.15 to 0.26 millimho/cm. Nitrogen is modest. Phosphorus, boron and sulfur are low. Potassium is low or modest except for N.E. Hill Area 2/4/2009. Zinc is low except for N.E. Hill Area 2/4/2009. Copper is low for River Sample 1 2/4/2009. magnesium is low for River Sample 1 and 2 2/4/2009. Sodium is low.

## **Recommendations**

General soil preparation on a square foot basis. Broadcast the following materials uniformly. The rates are per 1,000 square feet. Incorporate them homogeneously 6 inches deep:

Ureaformaldehyde (38-0-0) – 8 pounds

Triple superphosphate (0-45-0) – 4 pounds

Potassium sulfate (0-0-50) – 8 pounds for CCG Area and South Knob Area

K-Mag (sul-po-mag) (0-0-22) – 15 pounds for River Sample 1 and 2

agricultural gypsum - 8 pounds

good quality soil amendment – about 1 to 2 cubic yards if needed to condition the soil  
and to provide slow-release nutrients

For preparation on a volume basis, uniformly blend the following materials into the soil.  
Rates are per cubic yard:

Ureaformaldehyde (38-0-0) – 1/3 pound

Triple superphosphate (0-45-0) – 1/4 pound

Potassium sulfate (0-0-50) – 1/3 pound for CCG Area and South Knob Area

K-Mag (sul-po-mag) (0-0-22) – 2/3 pound for River Sample 1 and 2

agricultural gypsum – 1/4 pound

good quality soil amendment - about 5% to 10% by volume if needed to condition the  
soil and to provide slow-release nutrients

**Soil Analyses   Plant Analyses   Water Analyses**

Soil amendment:

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 parts per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
9. Carbon:nitrogen ratio is less than 25:1.
10. The compost shall be aerobic without malodorous presence of decomposition products.
11. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen for soil amending.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

arsenic	20	copper	150	selenium	50
cadmium	15	lead	200	silver	10
chromium	300	mercury	10	vanadium	500
cobalt	50	molybdenum	20	zinc	300
		nickel	100		

Higher amounts of salinity or boron may be present if the soils are to be preleached to reduce the excess or if the plant species will tolerate the salinity and/or boron.

Monitor the site with periodic soil testing.

Sincerely,

Garn A. Wallace, Ph. D.  
Executive Director  
GAW:n

**WALLACE LABS**  
**365 Coral Circle**  
**El Segundo, CA 90245**  
**(310) 615-0116**

# SOILS REPORT

Print Date Feb. 6, 2009 Receive Date 2/6/09

Location Vista Canyon Ranch Project, Job No. 6115-99  
 Requester Douglas Gettinger, Dudek

graphic interpretation: \* very low, \*\* low, \*\*\* moderate

\*\*\*\* high, \*\*\*\*\* very high

## ammonium bicarbonate/DTPA

extractable - mg/kg soil

Interpretation of data

low medium high

0 - 7 8-15 over 15

0-60 60-120 121-180

0 - 4 4 - 10 over 10

0- 0.5 0.6- 1 over 1

0 - 1 1 - 1.5 over 1.5

0- 0.2 0.3- 0.5 over 0.5

0- 0.2 0.2- 0.5 over 1

ratio of calcium to magnesium

needs to be more than 2 or 3

should be less than potassium

Sample ID Number

### elements

phosphorus

potassium

iron

manganese

zinc

copper

boron

calcium

magnesium

sodium

sulfur

molybdenum

nickel

aluminum

arsenic

barium

cadmium

chromium

cobalt

lead

lithium

mercury

selenium

silver

strontium

tin

vanadium

### Saturation Extract

pH value

ECe (milli-

mho/cm)

calcium

magnesium

sodium

potassium

cation sum

chloride

nitrate as N

phosphorus as P

sulfate as S

anion sum

boron as B

SAR

est. gypsum requirement-lbs./1000 sq. ft.

relative infiltration rate

estimated soil texture

lime (calcium carbonate)

organic matter

moisture content of soil

half saturation percentage

09-37-32

CCG Area 2/4/2009

graphic

6.00 \*\*

70.52 \*\*\*

16.00 \*\*\*\*\*

1.25 \*\*\*\*

0.90 \*\*

0.68 \*\*\*\*

0.16 \*\*

418.11 \*\*\*\*

375.57 \*\*\*\*\*

13.95 \*

5.19 \*

nd \*

0.23 \*

nd \*

0.04 \*

1.26 \*

0.03 \*

nd \*

0.02 \*

2.27 \*\*

0.22 \*

nd \*

nd \*

nd \*

2.62 \*

nd \*

0.14 \*

6.68 \*\*\*

0.18 \*

millieq/l

17.8 0.9

5.5 0.5

16.7 0.7

2.2 0.1

2.1

9 0.3

7 0.5

0.5 0.0

9.2 0.6

1.3

0.39 \*\*

0.9 \*

44

fair/slow

sandy loam

no

fair/low

8.3%

18.7%

18.7%

09-37-33

N.E. Hill Area 2/4/2009

graphic

6.45 \*\*

120.20 \*\*\*\*\*

31.47 \*\*\*\*\*

2.97 \*\*\*\*

8.19 \*\*\*\*

1.34 \*\*\*\*

0.09 \*

410.91 \*\*\*\*

219.01 \*\*\*\*\*

23.86 \*

4.79 \*

0.03 \*\*\*

0.33 \*

nd \*

0.04 \*

1.18 \*

0.04 \*

nd \*

0.04 \*

5.80 \*\*\*

0.20 \*

nd \*

nd \*

nd \*

2.73 \*

nd \*

0.18 \*

6.24 \*\*\*

0.16 \*

millieq/l

15.9 0.8

4.5 0.4

16.2 0.7

3.3 0.1

2.0

3 0.1

9 0.6

0.5 0.0

6.9 0.4

1.2

0.36 \*\*

0.9 \*

4

slow/fair

sandy loam

no

fair/low

6.2%

18.7%

18.7%

09-37-34

South Knob Area 2/4/2009

graphic

3.17 \*\*

61.27 \*\*\*

4.16 \*\*\*

0.53 \*\*

0.32 \*

0.33 \*\*\*

0.05 \*

420.49 \*\*\*\*

220.33 \*\*\*\*\*

20.77 \*

1.28 \*

0.01 \*\*

0.03 \*

nd \*

0.01 \*

0.50 \*

0.02 \*

nd \*

0.02 \*

0.31 \*

0.23 \*

nd \*

nd \*

nd \*

0.92 \*

nd \*

0.08 \*

6.98 \*\*\*

0.26 \*

millieq/l

33.0 1.6

8.8 0.7

15.9 0.7

3.4 0.1

3.2

6 0.2

11 0.8

0.5 0.0

3.1 0.2

1.2

0.16 \*

0.6 \*

4

fair/slow

sandy loam

low

low/fair

5.6%

17.7%

17.7%

09-37-35

River Sample 1 2/4/2009

graphic

2.43 \*

80.01 \*\*\*

4.69 \*\*\*

0.72 \*\*\*

0.31 \*

0.14 \*

0.12 \*\*

296.80 \*\*\*

31.45 \*\*

5.41 \*

3.61 \*

nd \*

nd \*

0.30 \*

0.01 \*

6.59 \*\*

nd \*

nd \*

0.01 \*

0.10 \*

0.14 \*

nd \*

nd \*

nd \*

2.51 \*

nd \*

0.08 \*

7.29 \*\*\*

0.26 \*

millieq/l

18.6 0.9

4.8 0.4

13.4 0.6

15.1 0.4

2.3

4 0.1

6 0.5

0.6 0.0

9.8 0.6

1.2

0.24 \*\*

0.7 \*

1

fair/good

gravelly sand

no

low/fair

2.0%

13.4%

13.4%

09-37-36

River Sample 2 2/4/2009

graphic

1.36 \*

38.96 \*\*

6.14 \*\*\*

0.46 \*\*

0.19 \*

0.58 \*\*\*\*

0.11 \*\*

397.42 \*\*\*

33.35 \*\*

8.73 \*</

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